



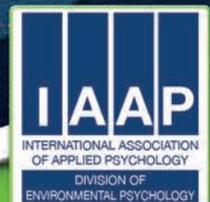
ICEP
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International Conference
on Environmental Psychology

THEORIES OF CHANGE AND SOCIAL INNOVATION IN TRANSITIONS TOWARDS SUSTAINABILITY

A Coruña · Spain. August 30 - 31 · September 1, 2017



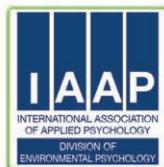
BOOK OF ABSTRACTS



ICEP
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International Conference on Environmental Psychology
THEORIES OF CHANGE IN SUSTAINABILITY
TRANSITIONS AND SOCIAL INNOVATION

A Coruña • Spain. August 30 – 31 • September 1, 2017



People-Environment
Research Group



Department of Psychology
Faculty of Educational Sciences

UNIVERSIDADE DA CORUÑA

TABLE OF CONTENTS



<u>Introduction</u>	24
<u>Organizing Committee</u>	28
<u>Steering Committee</u>	28
<u>Scientific Committee</u>	28
<u>Keynotes</u>	29
Introductory talk:	30
Promoting sustainable lifestyles, social innovation and wellbeing in europe: Lessons from three large-scale interdisciplinary projects Ricardo García-Mira & Adina Dumitru. University of A Coruña, Spain	
Graumann - Keynote Lecture 1:	32
Collective problems require collective answers: a social identity model of pro-environmental actions Immo Fritsche. Leipzig University, Germany	
Keynote Lecture 2:	33
Unprecedented disasters and environmental emergencies: What the rise of right-wing populism means for transitions towards sustainability, and what we should do next Winnifred R. Louis. University of Queensland, Australia	
Keynote Lecture 3:	33
Understanding intrinsic motivation to engage in pro-environmental actions Linda Steg. University of Groningen, The Netherlands	
Keynote Lecture 4:	34
Can detention be humane and sustainable? Richard Wener. New York University, USA	
Keynote Lecture 5:	35
Sustainability, learned helplessness and empowerment. Revisiting the challenges for environmental psychology Enric Pol. University of Barcelona, Spain	

SSI-01 SYMPOSIUM: SUSTAINABLE FOOD CONSUMPTION I 37

- 327 Developing an agent-based model of food consumption: the importance of understanding daily routines 38
Craig, T. & Mac Diarmid, J.
- 101 The psychology of sustainable seafood consumption 38
Richter, I.G.M., & Klöckner, C.A.
- 265 Sustainable food consumption in Germany - results of a representative survey 39
Gellrich, A. & Scholl, G.
- 044 Predictors of household food waste (prevention) – an integrative review 40
Schmidt, K.

SSI-02 SYMPOSIUM: TRANSITION OF THE TRANSPORT SECTOR I 41

- 122 The “Range Myth” in Electric Car Adoption: New Findings and Implications for Researchers and Policy Makers 42
Bobeth, S. & Matthies, E.
- 050 Abstract electric vehicle rental and EV-adoption 43
Langbroek, J.H.M., Franklin, J.P. & Susilo, Y.O.
- 223 The assessment, acceptance and implication of the use of different autonomous e-cars 44
Hartmann, C., Graf, M., Reijnen, E. & Hackenfort, M.
- 072 Who is Likely to Travel by Air? An Analysis of Attitudes, Socio-Economic Factors and travel Opportunities 45
Bruderer Enzler, H.
- 098 A systematic review and meta-analysis of psychological correlates of travel mode choice 46
Hoffmann, C., Abraham, C., White, M.P., & Skippon, S.

SSI-03 SYMPOSIUM: FACTORS INFLUENCING THE EFFECTIVENESS AND ACCEPTABILITY OF ENVIRONMENTAL POLICY 47

- 158 Acceptability of political measures for the German energy transition-Spillover effects due to environmental vs. monetary framing of behavioural information 48
Steinhorst, J. & Matthies, E.
- 264 The motivational impact of smart incentives to promote sustainable behaviour 49
Zeiske, N., Van der Werff, E., & Steg, L.
- 274 Trust and emotions as motivators of policy acceptance: The case of the Irish water charges 49
Rodríguez Sánchez, C., Schuitema, G., & Claudy, M.
- 306 Public acceptability of energy transitions: Why addressing concerns may not always be effective 50
Sharpe, E.J., Steg, L., & Perlaviciute, G.
- 362 ‘I may join if we want the same!’ – Goal congruence stimulates interest in environmental community initiatives 51
Sloot, D., Jans L., & Steg, L.

SSII-01 SYMPOSIUM: SUSTAINABLE FOOD CONSUMPTION II		53
031	Visioning a green future or longing for the good old days? Basic drivers of organic food consumption in Europe Thøgersen, J.	53
057	Assumptions regarding low-CO2 products: halo effect and its consequences Leygue, C.	53
095	Consumer drivers of change towards more sustainable diets Verain, M.C.D., Bouwman, E.P., & Snoek, H.M.	54
100	Food waste as the consequence of conflicting household management goals Van Geffen, L.E.J., Sijtsema, S.J., Van Herpen, E., & Van Trijp, J.C.M.	55
SSII-02 SYMPOSIUM: THE POTENTIAL OF MINDFULNESS FOR CHANGING ENVIRONMENTAL BELIEFS AND BEHAVIORS		56
060	Environmentally significant outcomes of a mindfulness-based meditation intervention study: the connection of materialism, compassion and sustainable consumption Geiger, S.M., Fischer, D. & Schrader, U.	57
132	Mindfulness is related to eco-friendly behavior through social dominance Panno, A., Carrus, G., Giacomantonio, M., Maricchiolo, F., Pirchio, S., & Mannetti, L.	58
288	Meditation: More happiness and less materialism? Experience differences and mediator effects Mikhof, A.	59
SSII-03 SYMPOSIUM: TRANSITION OF THE TRANSPORT SECTOR II		59
333	Changing trip behavior in a higher education institute: The role of parking fees Carmi, N. & Becker, N.	59
054	Determinants of More Sustainable Modes of Transportation for the Commute Kibbe, A., Arnold, O. & Kaiser, F.G.	60
192	The barriers and drivers to active and sustainable travel in the state of São Paulo: A cross-cultural comparison and assessment of broad-scale investments in cycling infrastructure Bösehans, G.	61
058	The role of ambient light conditions in encouraging active travel Uttley, J.A. & Fotios, S.A.	62
010	Pedestrian route taking behaviour at night and street lighting: A pilot study Davoudian, N. & Mansouri, A.A.	63
SSII-04 SYMPOSIUM: PERCEPTION OF CLIMATE CHANGE AND RELATED INNOVATIONS: THE ROLE OF EMOTIONS AND AFFECT		64
165	How do you feel about climate change? A study of scientists, students and the general population Wang, S.Y., Leviston, Z., Hurlstone, M., Walker, I., & Lawrence, C.	65
240	Tariff design and acceptance: Using insights from behavioural economics Mahmoodi, J., Brosch, T, Hille, S.L. & Patel, M.	66
170	The unanimous positive imagery of Solar Power Sütterlin, B. & Siegrist, M.	67
087	Predictors of emotions about a hydrogen fuel station project: perceived outcomes, perceived fairness, trust and prior awareness Huijts, N.M.A.	68

061	Emotions towards new technologies and products: A matter of value-compatibility Contzen, N., Perlaviciute, G. & Steg, L.	68
SSIII-01 SYMPOSIUM: EXAMINING ENVIRONMENTAL BEHAVIOUR IN THE ORGANIZATIONAL CONTEXT		70
156	A social marketing perspective on employee pro-environmental behaviour Wells, V.	70
208	Motivating workplace energy conservation using feedback and peer education Riemer, M., & Carrico, A.R.	71
219	Using loyalty programmes to increase the adoption of sustainable innovations in households Lans, A., Ter Mors, E., Staats, H., Van Dijk Wesselius, E.J., Van der Weiden, E., & Van Suylekom, S.	72
246	The effects of Corporate Environmental Responsibility and biospheric values on pro-environmental behaviour at work Ruepert, A.M., Keizer K. & Steg, L.	73
331	How can we help people save energy in challenging organisational contexts? An exploratory feasibility study on energy visualisation in social services offices Pahl, S., Wyles, K.L., Boomsma, C., Goodhew, J., & Jones, R.	73
SSIII-02 SYMPOSIUM: PSYCHOLOGICAL DETERMINANTS, BARRIERS AND POTENTIALS RELATED TO (UN)SUSTAINABLE LIFESTYLE CHOICES AND WELLBEING IN EUROPEAN SOCIETIES		74
028	Psychological determinants, barriers and potentials related to (un)sustainable lifestyle choices and wellbeing in European societies Krause, K. & Schulte, M.	75
134	Social cognition and sustainable lifestyles Carrus, G. & Panno, A.	76
328	Lowering time pressure and increasing well-being via flexible working policies Craig, T.	77
366	Understanding dynamics of sustainability transitions in European societies: a multi-method, interdisciplinary approach García-Mira, R. & Dumitru, A.	77
367	Promoting sustainable lifestyles choices: evidence from an interdisciplinary European project on four European regions Dumitru, A., García-Mira, R., Blobaum, A., Carrus, G., & Macsinga, I.	79
368	Understanding motivations to join sustainability initiatives: a comparison of Romanian and Spanish cases Macsinga, I., Dumitru, A., García-Mira, R., Pandur, V., Díaz-Ayude, A., & Martínez-Cabrera, H.	80
SSIII-03 SYMPOSIUM: FACTORS AND PROCESSES UNDERLYING PUBLIC PERCEPTIONS OF ENERGY SYSTEMS, TRANSITIONS, AND TECHNOLOGIES		80
303	'Who pays for energy transitions?' Public acceptance of cost associated with energy system change in the UK Demski, C., Evensen, D., & Pidgeon, N.	81
305	'Beyond a fuel' Context and relatedness in perceptions of nine energy sources and technologies in Wales, UK Nash, N. & Whitmarsh, L.	82

316	Public concerns and preferences regarding energy supply systems: A comparison across four European countries Böhm, G., Arnold, A., & Tvinnereim, E.	83
324	Perception of externally controlled manmade risks associated with energy production Vrieling, L., Perlaviciute, G., & L. Steg, L.	84
SSIV-01 SYMPOSIUM: THE ROLE OF AFFECT AND EMOTION IN SUSTAINABLE BEHAVIOR		85
036	Not my future: The neural representation of climate change consequences Brosch, T.	85
051	Feeling guilty and seeing green: Understanding guilt's influence on pro-environmental behavior through mediating cognitive processes Graton, A. & Ric, F.	86
062	The distinct impact of emotions on environmental decision-making Hahnel, U.J.J. & Brosch, T.	87
124	Risk perceptions and emotions towards earthquakes caused by gas production Perlaviciute, G., Steg, L., Hoekstra, E.J., & Vrieling, L.	88
SSIV-02 SYMPOSIUM: PUBLIC PERCEPTIONS OF CLIMATE CHANGE: INSIGHTS FROM INTERNATIONAL COMPARISONS		89
179	The role of social norms in shaping individual and national responses to climate change: A comparison across four European countries Steenjtes, K., Pidgeon, N., Poortinga, W., Boehm, G. & Bertoldo, R.	90
185	Public perceptions of climate change in Peru Brügger, A., Tobias, R., & Monge, F.S.	91
226	Prevalence and distribution of climate scepticism in four European countries Poortinga, W., Steentjes, K., Pidgeon, N., Böhm, G., Arnold, A., Tvinnereim, E., Mays, C., Poumadere, M. & Corner, A.	92
230	Emotional reactions to climate change: A comparison across four European countries Böhm, G., Mays, C., Steentjes, K. & Tvinnereim, E.	93
SSIV-03 SYMPOSIUM: THEORETICAL ADVANCES IN RESTORATIVE ENVIRONMENT RESEARCH		94
139	Children's restorative experiences and pro-environmentalism: How are they linked? Collado, S. & Staats, H.	94
119	Joining attention restoration theory with behavior setting theory: The role of perceived interdependencies for restorative processes Von Lindern, E.	95
334	The Environmental Psychophysiology of Light: Lessons for Research on Restorative Environments Hartig, T. & Beute, F.	96
270	Stress and fatigue while understimulated: The other end of restoration needs Staats, H.	97

SSV-01 SYMPOSIUM: CARBON CAPTURE, UTILISATION AND STORAGE (CCUS): PERCEPTIONS AND ACCEPTANCE	98
004 Green framing in low-carbon technology communication; How emphasis on environmental benefits can feel like manipulation De Vries, G.	99
323 Determinants of public acceptance of CCS technology: Results from a survey study in Spain Sala, R. & Oltra, C.	100
330 Public engagement with CCS: barriers, key issues and ways forward Xenias, D. & Whitmarsh, L.	101
365 Lay perceptions of Carbon Dioxide Utilization (CDU) technologies in the UK and Germany: A qualitative interview study Jones, C.R., Olfe-Kraütlein, B. & Kaklamanou, D.	102
364 Unequal brothers - Comparing public perceptions of CCS and CCU Arning, K., Linzenich, A., Van Heek, J. & Ziefle, M.	103
SSV-02 SYMPOSIUM: SYMPOSIUM ON SOCIAL ACCEPTANCE OF LARGE SCALE ENERGY INFRASTRUCTURE	104
259 Different-level identities and responses to energy infrastructures at different scales: A post-Brexit reflection on responses to grid extension in the UK Batel, S. & Devine-Wright, P.	104
267 Evaluating the consultation of the German grid development plan (NEP) and to what extend the participation influences acceptance of the grid development Hinse, M., Gruendler, J., Hildebrand, J., Rühmland, S. & Schweizer-Ries, P.	105
317 The importance of place meanings for understanding the social acceptance of tidal and offshore wind energy Devine-Wright, P., Wiersma B. & O'Neill, S.	106
325 Using a narrative approach to understand place attachments and responses to power line proposals: The importance of life-place trajectories Bailey, E., Devine-Wright, P. & Batel, S.	107
SSV-03 SYMPOSIUM: THE ROLE OF CONNECTION TO NATURE IN PREDICTING SUPPORT FOR PRO-ENVIRONMENTAL BEHAVIOR	108
355 Connection to animals and support for wildlife protection among zoo visitors in Chengdu, China Clayton, S.D., Bexell, S. & Ping, X.	109
356 The role of environmental values, environmental identity, and contact with nature, in predicting support for pro-environmental behaviours Loureiro, A. & Olivos, P.	109
357 How to promote "green" behavior in the Azores: exploring the relationship "personal values – connection to nature" for clues Arroz, A.M., Amorim, I.R., Gabriel, R., Cordeiro Ferreira, T. & Rego, I.E.	110
358 Connection to nature and conservation of biodiversity in the Azores Amorim, I.R., Arroz, A.M., Gabriel, R., Rego, I.E., Borges, P.A.V., Lima, M.L. & Clayton, S.D.	111
359 Bonds with the place, beliefs about the relationship with the environment and protest against petrol exploration Hernández, B., Muiños, G., Suárez, E., & Ruiz, C.	112

SSVI-01 SYMPOSIUM: PERSON-CENTRED APPROACHES TO RESTORATIVE ENVIRONMENTS	114
065 The restorative potential of walking in urban settings: a person-centred approach Bornioli, A.	115
159 Examining the relationship between individual associations with naturalness and perceived restorative value White, E.V. & Gatersleben, B.	115
214 Risk and Restoration in Nature Gatersleben, B. & Andrews, M.	116
235 Memories of seasons and the self in restorative perceptions of favourite places. Ratcliffe, E. & Korpela, K.M.	117
SSVI-02 SYMPOSIUM: PRO-ENVIRONMENTAL BEHAVIOUR ANTECEDENTS IN DIFFERENT CULTURAL CONTEXT: THE ROLE OF VALUES	118
082 The relationship between values, environmental self-identity, and pro-environmental behaviour in Lithuania Balundė, A., Poškus, M.S., Perlaviciute, G., & Steg, L.	119
088 Healthy values for a healthy environment? The case of Lithuanian high-school students Poškus, M.S.	119
093 When threatening climate change information inhibits pro-environmental behavior: A cultural comparison between Austria and Argentina Uhl, I., Jonas, E., Hansen, N. & Klackl, J.	120
143 Public participation and public acceptability of energy transition- a comparative research in the Netherlands and China Liu, L., Bouman, T., Perlaviciute, G. & Steg, L.	121
190 Values and intention of pursuing a career in sustainability Međugorac, V., Šverko, I. & Babarović, T.	121
SSVII-01 SYMPOSIUM: THE ORIGINS AND CONSEQUENCES OF CHILDREN'S AND ADOLESCENTS' ECOLOGICAL BEHAVIOR	123
011 Nature-based environmental education of children: Fostering ecological behavior through intellectual and motivational aptitudes Otto, S. & Pamela Pensini, P.	124
013 The role of parents, peers and environmental self-identity for adolescents' energy saving behaviour Wallis, H. & Matthies, E.	125
014 The Origins and Educational intervening with environmental competence Bogner, F.X.	125
018 The downturn of pro-environmentalism in adolescence: Dive or dip? Krettenauer, T.	126
363 Normative considerations and pro-environmental behaviour in primary school children Zeiske, N., Steg, L., Venhoeven, L., & Van der Werff, E.	127

SSVII-02 SYMPOSIUM: WE' CAN DO WHAT' I' CANNOT': A SOCIAL IDENTITY PERSPECTIVE ON REACTIONS TO CLIMATE CHANGE	128
301 Group reactions to nature conservation policies Carrus, G. & Panno, A.	128
304 Authoritarianism as a Group-Based Reaction to Climate Change Threat Barth, M., Masson, T., & Fritsche, I.	129
308 Motivated Control Perceptions as a Response to Climate Change Threat Masson, T.	130
SSVII-03 SYMPOSIUM: THE SOCIAL SIDE OF ENVIRONMENTAL ISSUES, ATTITUDES AND BEHAVIORS	131
285 A Social Perspective: How Identity, Ideology, and Power Shape How Groups Perceive and Respond to Environmental Challenges Pearson, A.R.	132
197 Using social identity to understand and promote climate change and environmental attitudes and behaviour Fielding, K.S., Hornsey, M. & Lauren, N.	133
148 The Power of Communities: How Community Energy initiatives promote Sustainability Jans, L., Steg, L. & Sloot, D.	133
169 The value of what others value: How personal and group values relate to pro-environmental attitudes and behaviours Bouman, T. & Steg, L.	134
SSVIII-01 SYMPOSIUM: BEYOND THE STANDARDS: THE PSYCHOLOGY OF THERMAL COMFORT	136
091 Emotions and thermal comfort – feeling warmer when feeling happier Huebner, G.M. & Shipworth, D.	136
162 Personal Control and it's Impact on Thermal Comfort and Satisfaction Hellwig, R.	137
280 The influence of personality traits on perceived thermal sensation, preference, and comfort Schweiker, M., Schakib-Ekbatan, K. & Becker, S.	138
SSVIII-02 SYMPOSIUM: ENERGY SYSTEMS INTEGRATION: AN INNOVATIVE HUMAN FACTORS APPROACH	139
160 Energy systems integration and psychology: Where do we start? Zawadzki, S.J., Souto, L., Lemmen, N. H., Steg, L., Bouman T., & Scherpen, J.M.A.	140
172 How much persuasion do you need to do the right thing? A field study on self-persuasion and socially desirable behavior. Lemmen, N.H., Keizer, K. & Steg, L.	141
174 How social role impacts support for Smart Energy Technologies: Do you think differently as a householder, an employee, or a citizen? Spence, A., Leygue, C., Goulden, M. & Wardman, J.	142
183 Going green: a matter of feelings or calculations? Taufik, D., Bolderdijk, J.W. & Steg, L.	143
194 The Effects of Attribute Translations on Purchase Decisions in the Energy Domain Mertens, S., Hahnel, U.J.J. & Brosch, T.	143

SS-VIII-03 SYMPOSIUM: NATURE EXPERIENCE AND WELL-BEING	144
341 Forest walk with and without psychological tasks to enhance restoration: Results for sustained attention Pasanen, T.P. & Korpela, K.M.	145
348 Nature as a resource for occupational well-being Hyvönen, K. & Salonen, K.	146
352 Profiles of outdoor activities in nature and occupational well-being Korpela, K.M., Hyvönen, K., Kirves, K. & Salonen, K.	147
374 Towards measuring comprehensive nature experience Salonen, K., Kirves, K. & Korpela, K.M.	148
SS-VIII-04 SYMPOSIUM: BEHAVIOURAL SPILLOVER: EMPIRICAL EVIDENCE FROM MULTI-METHOD RESEARCH	149
016 Behavioural and policy spillover of the English Plastic Bag Charge: Findings from a longitudinal mixed-methods research Sautkina, E., Thomas, G.O. & Poortinga, W.	150
037 The Welsh Single-Use Carrier Bag Charge and behavioural spillover Thomas, G.O., Poortinga, W. & Sautkina, E.	151
112 Behavioural spillover in the UK and Brazil: findings from two large-scale longitudinal surveys Capstick, S., Whitmarsh, L. & Nash, N.	152
199 Pro-environmental actions and behavioural spillover effects across cultures: When (and where) does one thing lead to another? Nash, N., Whitmarsh, L. & Capstick, S.	152
PAPER SESSIONS	154
PSI-01 PLACE, IDENTITY AND BEHAVIOR	155
002 Territory, community-based tourism and environmental protection in two Brazilian quilombos Massola, G.M., Dos Santos, A.O., Svartman, B.P., & Galeao da Silva, L.G.	155
260 Sense of place and eucalyptus trees: an interdisciplinary approach to the state of Galician woodlands Martínez-Cabrera, H. & Rodríguez-Rodríguez, G.	156
047 The house space appropriation in one community in Rio de Janeiro. Alves de Souza Filho, E.	160
PSI-02 EXPLORING SUSTAINABLE CONSUMPTION BEHAVIOR I	161
268 Consumers' goal frames and rebound behavior in car purchase decisions Becker, S. & Mack, B.	161
080 Collaborative Consumption: Behavioral predictors and energy balance Bachmann, F., Artho, J., Haefeli, U., Hanimann, A., Jonas, K. & Matti, D.	161
187 Nudging consumers towards sustainable choices in out-of-home catering Bauske, E. & Langen, N.	162
078 Heterogeneity in the Effect of Green Energy Defaults Liebe, U., Gewinner, J. & Diekmann, A.	164

PSI-03 SUSTAINABLE LIFESTYLE	165
113 Waste behaviours at home, at work and on holiday: what influences behavioural consistency across contexts? Whitmarsh, L., Haggan, P. & Thomas, M.	165
118 I am therefore I do? An investigation of spillover effects from work to home through the lens of environmental identity Verfuerth, C. Oates, C.J., Gregory-Smith, D. & Jones, C.R.	166
155 Time is wealth: Part-time work as a means to foster sustainable lifestyles? Moser, S. & Bader, C.	167
015 Parenthood and environmental concern: A longitudinal investigation of the legacy hypothesis Poortinga, W., Thomas, G.O., Whitmarsh, L., Fisher, R. & Milfont, T.L.	168
345 Understanding intergenerational relationship in car ownership desire: The influence of parents on young people Nishihara, N., Schmoecker, J.-D., Kim, J., Nakamura, T. & Uno, N.	169
PSI-04 CLASS AND CULTURE IN PRO-ENVIRONMENTAL BEHAVIOR	170
023 Values and environmentalism: A cross-cultural meta-analysis across 5 countries Karl, J.Q.A. & Milfont, T.L.	170
138 Can Middle Class Environmentalism Develop from Environmentalism of the Poor? Bettin, J. & Wollni, M.	171
203 The values of sustainable development in rural Gabon Nanda, N.S. & Rioux, L.	171
168 Agroecological beliefs in agrarian sciences Fiamoncini, D.I. & Pato, C.	172
276 In what ways are socio-cultural variables connected to climate attitudes and behaviors? The Czech Republic divided by value orientation Chabada, T., Krajhanzl, J., Svobodová, R. & Skalík, J.	173
PSI-05 EMOTIONAL DIMENSIONS OF SUSTAINABILITY I	174
332 Emotional Patterns in Environmentally-relevant Stimuli Willis, R.L., Provost, S.C. & Christidis, L.	174
273 Proud to give, too guilty to take: Decision frame moderates the impact of incidental emotions on energy consumption Tarditi Joz-Roland, C.T., Hahnel, U.J.J. & Brosch, T.	175
083 Feelings are important: Tangible and intangible cues used in environmental evaluation Anderson, N.M., Ford, R.M. & Williams, K.J.H.	176
PSII-06 EXPLORING SUSTAINABLE CONSUMPTION BEHAVIOR II	177
056 Sustainable consumer choice: The discrepancy between common research practices and reality Klein, S.A. & Hilbig, B.E.	177
266 The impact of carsharing on consumers' quality of life Becker, S., Martin E., Shaheen S., Stocker A. & Lazarus J.	177
300 Integrating multi-disciplinary perspectives in sustainable energy consumption research: Findings from a swiss household energy survey Schubert, I., Sohre, A. & Burger, P.	178

- 361 The role of grassroots innovations in promoting local sustainable consumption. Motivations, values and learning outcomes within the “Galician network of conscious and responsible consumption” 179
Lema-Blanco, I., García-Mira, R. & Muñoz Cantero, J.M.

PSII-07 HEALTH AND ENVIRONMENTAL BEHAVIOR 180

- 126 An ecosystems approach to indigenous mental health: Psychological resilience in the traditional cree food system 180
Spiegelaar, N.
- 182 Nature walks versus medication: A randomized, double-blind, placebo-controlled treatment comparison for attention problems in Attention Deficit/Hyperactivity Disorder 182
Stevenson, M.P., Schilhab, T., Healey, D., Glue, P. & Bentsen, P.
- 335 Environmental stress model with cancer patients 183
Ortega Andeane, P., Dumitru, A., Irepan, M. & Salvador-Ginez, O.
- 354 Motivational Interviewing (MI) in environmental inspections and enforcement conversations and quality assurance of MI 184
Forsberg, L. & Wickström, H.
- 353 Food safety inspectors trained in Motivational Interviewing increased compliance with waste sorting legislation in restaurants 184
Wickström, H., Forsberg, L., Herzing, M. & Jacobson, A.
- 294 Mothers’ environment stress and association with household chaos and density 185
Sánchez-Mondragón, G. & Flores Herrera, L.M.

PSII-08 POLICY ACCEPTABILITY 186

- 252 Acceptability of sustainable policies 186
Van der Werff, E., Steg, L. & Ruepert, A.M.
- 238 Energy security in Greece and Turkey: The importance of pro-environmental and pro-cultural orientations in shaping public concern 186
Jones, C.R., Kaklamanou, D. & Lazuras, L.
- 282 Acceptability of wilderness conservation policies in Czech Republic 187
Skalík, J., Cada, K., Chabada, T. & Krajhanzl, J.
- 373 A review to the willingness to pay (WTP) - willingness to accept (WTA) disparities in environmental evaluation: Experimental results of the endowment effect 188
Dopico, J.A. & González, M.A.
- 136 Determinants of intention to donate for the landscape of night view towards eco-friendly lights: A case of study of implementations of energy saving lights in Hakodate, Japan 189
Ohnuma, S., Kobayashi, T., Anpo, Y., Nakamata, T., Iino, M. & Yokoyama, M.

PSII-09 SUSTAINABLE TRAVEL BEHAVIOR 190

- 035 The green road taken: Sustainable travel behavior of individuals within the Campbell Paradigm 190
Kaiser, F.G. & Arnold, O.
- 121 A Repertory Grid Analysis of Perceptions of Travel Modes 190
Hoffmann, C., Abraham, C., Skippon, S. & White, M.P.
- 130 Energy-efficient business travel: motivation in behavior intervention programs 191
Olsson, L.E. & Friman, M.

321	The role of individual determinants and socio-cultural context in shaping car travel: comparing cases of Sweden and Estonia Orru, K., Poom, A. & Nordlund, A.M.	192
343	Development and Evaluation of BLAZE Information System Sunio, V., Schomöcker, J.-D., Estuar, R., Gotangco, C.K. & Favis, A.M.	193

PSII-10 EMOTIONAL DIMENSIONS OF SUSTAINABILITY II **194**

009	Emotional responses to climate change related artwork and identification with the artist as drivers of motivation to act – a multilevel study of audience responses at the ARTCOP21 Klöckner, C.A. & Sommer, L.K.	194
198	Using Twitter to measure opinions and sentiments about environmental issues during the 2016 US presidential election Mumenthaler, C., Hahnel, U.J.J. & Brosch, T.	195
205	Using big data in restorative environments research: A case study analyzing urban twitter sentiment Lee, K.E., Naghizade, E., Rashidi, L., Kim, K.H., Winter, S., Faux, N. & Kendal, D.	196
094	Intergroup contact as a means to foster identification with humanity and pro-environmental behavior intentions Römpke, A.-K., Fritsche, I. & Reese, G.	197

PSII-11 RESTORATIVE ENVIRONMENTS **198**

052	A tale of two sticks: walking towards restoration Subiza-Pérez, M., Vozmediano, L. & San Juan, C.	198
290	Human voice, natural threat, and restoration Benfield, J. & Cherian, B.	199
319	Effects of the Restoration Skills Training (ReST) Course on the Ability to Cope with and Attain Restoration from Stress and Fatigue Lymeus, F., Vincenti, J., Zetterberg, A., Lindberg, P. & Hartig, T.	200
242	Eye movements measured across images with a various level of fascination Franěk, M., Sefara, D., Petruzalek, J. & Cabal, J.	201

PSIII-12 SUSTAINABILITY IN WORK SPACES **202**

254	Knowledge workers' subjective experience of privacy in open office environments Weber, C. & Gatersleben, B.	202
255	How culture can make or break design Bauer, A.C.	203
128	Activity-based workplaces: changes in cognitive performance among worker previously employed at cellular offices or open-plan offices Jahncke, H., Mathiassen, S.E., Hallman, D., Edvinsson, J. & Persson, L.	203
338	Organizational sustainable climate and practices as determinants of pro-environmental behaviours at work: the mediating role of personal norm Mouro, C. & Duarte, P.	204
202	Interactions around energy use in the workplace: effects of legitimate and illegitimate overuse Leygue, C., Ferguson, E. & Spence, A.	205

PSIII-13 SUSTAINABILITY IN NEIGHBORHOOD SPACE: SOCIAL AND PSYCHOLOGICAL ASPECTS		206
227	Are neighborhoods social or environmental places? Social and environmental predictors of neighborhood maintenance Muiños, G., Hernández, B., Hidalgo, M.C. & Moreno, P.	206
318	Rehabilitation of deteriorated apartment housing through Community Space Reform in South Korea Shon, S.K. & Shon, D.H.	207
189	Environment-behaviour studies in Architecture & Urbanism: Integrating disciplines Villegas de la Ossa, G.	208
PSIII-14 PREDICTING PRO-ENVIRONMENTAL BEHAVIOR: MOTIVATIONS, VALUES AND NORMS		209
298	Predicting eco-driving intentions: The role of a value versus knowledge- triggered norm-activation process to eco-drive Unal, A.B., Steg, L. & Gorsira, M.	209
026	Beware the backfire effects: self-affirmation, information about the worst effects of climate change being avoidable, and pro-environmental motivation Sparks, P., Jessop, D.C., Becker, S., Cook, H. & Uchendu, B.	210
097	Why (should) I bother? Senior secondary school students' motivational profiles toward the environment Sass, W., Boeve-de Pauw, J., Donche, V. & Van Petegem, P.	211
281	Exploring beliefs on sustainable transport choices: The case study of the metropolitan area of Cagliari (Sardinia, Italy) Fornara, F., Manca, S., Mura, N., & Tiroto, F.	212
239	Improving estimations of interventions effects on sustainable behavior: The problem of highly biased samples and a way out Henn, L., Otto, S. & Arnold, O.	213
PSIII-15 NATURE CONNECTEDNESS AND EDUCATIONAL ENVIRONMENTS		214
272	Guided Brown Bear walks as an intervention to address human fear of brown bears Johansson, M., Stoen, O.G., Frank, J. & Flykt, A.	214
003	Relationships between people's feelings toward nature and their daily nature-related activities Shibata, S.	215
161	Greening school grounds: the benefits of greening a school ground on primary school children's wellbeing and functioning. Van Dijk-Wesselius, E.J., Maas, J., Hovinga, D., Van Vugt, M. & Van den Berg, A.E.	216
184	The effect of green areas within school environments upon child's attentional, emotional and prosocial components Amicone, G., De Dominicis, S., Perucchini, P., Petruccelli, I., Gherardini, A., Costantino, V. & Bonaiuto, M.	216
349	Forest school: Wellbeing and nature connectedness Hinds, J., Camic, P. & Roberts, A.	217

PSIII-16 PERCEPTION OF SAFETY		218
059	Road lighting and reassurance – cognitive, emotional and behavioural responses Liachenko-Monteiro, A., Uttley, J.A. & Fotios, S.A.	218
234	Measuring the effect of dynamic lighting on pedestrian speed by means of overhead Kinect™ sensors and continuous pedestrian tracking algorithms Haans, A., Corbetta, A., Kumar, P. & Toschi, F.	219
257	The concept and measurement of atmosphere as an attribute of the socio-physical environment related to the development of aggression Kalinauskaite, I., Haans, A., De Kort, Y. & Ijsselstein, W.	220
360	Neurophysiological measures for perception of insecurity in urban landscape Piccinin, G., Babiloni, F., & Bonaiuto, M.	221
020	Facial Emotion Recognition: A characteristic task for interpersonal judgements between pedestrians Fotios, S.A. & Johansson, M.	222
133	Walking after dark – The impact of outdoor lighting on pedestrians’ perception, evaluation and behaviour Rahm, J. & Johansson, M.	223
PSIV-17 RISK AND HAZARDS: PERCEPTION AND MANAGEMENT		224
024	Changing legal responsibility for cyclist-vehicle collisions to offset risk compensation behaviour Bohm, A. & Fotios, S.A.	224
077	Unveiling CCU product acceptance: The impact of benefit and risk perceptions in different user groups Linzenich, A., Arning, K., Van Heek, J. & Ziefle, M.	225
086	Incorporating public values in natural disaster planning Ford, R.M., Rawluk, A. & Williams, K.J.H.	226
340	Risk perception and hazard response in natural disasters among Mexico City residents: A structural equation modeling approach Salvador-Ginez, O. & Ortega Andeane, P.	227
350	Climate change risk perceptions among hurricane survivors: Role of resource loss, posttraumatic stress, coping, and resilience Sattler, D.N. & Graham, J.	228
135	Materials developed for deliberation on the pros and cons of nuclear power generation and their educational effect: confidence rating and behavioural intention to gather information Maeda, H. & Kusumi, A.	229
PSIV-18 NATURE BASED SOLUTIONS IN URBAN SPACES		230
320	Contrasting views and practices of rest: Rest with nature view versus none, and guided practice in mindfulness of nature scenery versus mindfulness of breath Lymeus, F., Shamsaee, N., Lindberg, P. & Hartig, T.	230
369	Generating a reference framework for evaluating nature-based solutions in cities: the CONNECTING project Dumitru, A. & García-Mira, R.	230
188	Urban rivers and physical activity promotion: Toward an ecological-experimental approach Gargiulo, I. & Benages, M.	231
079	From smell to action, a study of smell-sensitivity and uses of nature Truong, M.-X., Bonnefoy, B. & Prévot, A.-C.	233

PSIV-19 SUSTAINABILITY IN ORGANIZATIONAL ENVIRONMENTS		234
084	The effect of introducing new rules for promoting energy saving behavior in companies Sugiura, J. & Nagashima, M.	234
326	How office design affects our wellbeing Wackernagel, S.	235
221	Role theory applied to investigating leadership in sustainability through an environmental psychology perspective in a qualitative study De Mello E Souza, D. & Bassani, M.A.	235
145	Motivations and barriers to sustainability in commercial buildings: A qualitative investigation Whitney, S. & Riemer, M.	236
311	A review of the effects of background speech on word processed writing Van De Poll, M.K.	237
092	Fishers as stewards of the seas: Commercial fishers' response to the fishing for litter scheme Wyles, K.L., Pahl, S., Carroll, L. & Thompson, R.C.	238
PSIV-20 PREDICTING PRO-ENVIRONMENTAL BEHAVIOR: INDIVIDUAL AND CONTEXTUAL FACTORS		239
108	Recycling behaviour: A meta-analysis on the influence of individual and contextual factors Geiger, J.L., Van der Werff, E., Unal, A.B. & Steg, L.	239
070	The influence of community relations and low-carbon knowledge to low-carbon lifestyle Zhang, H.	240
096	Goal facilitating agents improve the intention-behavior relationship on environmentally friendly clothing consumption Steensen Nielsen, K. & Bauer, J.M.	240
220	Protecting the environment for selfish reasons: Altruism is not the only pathway to sustainability De Dominicis, S., Schultz, P.W. & Bonaiuto, M.	241
224	Stickiness of pro-environmental behaviours: what factors characterise persistence of water-related behaviours? Dean, A.J., Smith, L.D.G. & Fielding, K.S.	242
PSIV-21 SUSTAINABLE TRANSITIONS AND CLIMATE CHANGE ADAPTATION		243
076	Effects of policy measures and moderating factors on climate change adaptation among private forest owners in Sweden Eriksson, L.	243
131	Experiences of black outs impact perceptions of energy security and climate change and increase intentions to save energy Spence, A. & Leygue, C.	244
141	Linking the environmental and moral self: When self-activation affects decision-making within an integrated self-attributes framework Conte, B., Hahnel, U.J.J. & Brosch, T.	245
256	Continuity and discontinuity in narratives about ecological change: Understanding artisanal fishers' responses to Climate Change governance Mouro, C., Santos, T. & Castro, P.	246
263	Explaining intentions and engagements in behaviors to adapt to climate change of people in and around Cusco (Peru) Tobias, R., Ebinger, M., Brügger, A. & Monge, F.S.	247

PSV-22 EXPLORING ENERGY SAVING IN HOUSEHOLD	248
075 Early adopter of electric vehicles in Sweden: Attitudinal influence on preferred measures for increased future EV adoption Nordlund, A.M.	248
102 Do fine feathers make fine birds or persons? Explaining the spillover from smart energy technology adoption to other sustainable energy behaviours Peters, A.M., Van der Werff, E. & Steg, L.	249
258 Participative implementation processes of energy balancing concepts in different regions in Germany Knemeyer, A.K., Becker, D., Hildebrand, J. & Schweizer-Ries, P.	250
129 On how to bridge the intention-behavior gap. An intervention study based on an action-theory inspired website supplementing smart meter and smart home devices Mack, B., Tampe-Mai, K., Kouros, J., Roth, F. & Diesch, E.	251
PSV-23 SOCIAL INFLUENCE AND PRO-ENVIRONMENTAL BEHAVIOR	252
186 Going with the flow: Exploring the efficacy of social norms for private showering behaviour Gallagher, E., Verplanken, B. & Walker, I.	252
218 Making the Smart Meter Social Promotes Long-term Energy Conservation De Dominicis, S., Sokoloski, R., Jaeger, C.M. & Schultz, P.W.	253
283 Social Norm Effects on Pro-Environmental Behavior: Case of Cycling Campaign Skalík, J., Brechan, I., Urban, J. & Chabada, T.	254
344 Using Contest-based or Norm-based Interventions? Bergquist, M., Nilsson, A., Hansla, A. & Ejelöv, E.	255
PSV-24 DETERMINANTS OF PRO-ENVIRONMENTAL BEHAVIOR	256
284 Can Cycling to work program change environmental attitude and lead to environmental spill-over? Urban, J., Chabada, T., & Skalík, J.	256
247 Role of psychological and socio-demographical factors for electric bike use in Norway Simsekoglu, Ö., Klöckner, C.A.	257
120 The heterogeneity of sustainability attitudes: Findings from a cross-country study Bögel, P.M., Brstilo, I., Bekmeier-Feuerhahn, S. & Sippel, C.S.	258
289 Interventions affecting attitudes and behaviours related to climate change Chabada, T., Urban, J. & Skalík, J.	259
231 Beyond pro-environmental behavior: The VBN model explaining sustainable behaviors Muiños, G. & Suárez, E.	260
164 Developing a critical to understand pro-environmental actions: Contributions from Social Representations and Social Practices Theories Batel, S., Castro, P., Deveine-Wright, P. & Howarth, C.	260
PSV-25 EDUCATIVE SPACES AND PRO-ENVIRONMENTAL BEHAVIOR	261
271 Effect of campus design on human needs and educational objectives Sherif, N. & Gabr, H.S.	261
217 Just switch off – Experiments to save energy in computer rooms Zimmermann, S., Müller, P., & Bäumer, T.	262
351 Understanding the relationship between university physical learning environments and student and staff outcomes: A systematic review Mckay, D.R., Edgerton, E., McKechnie, J., Simpson, A., & Mesbahi, E.	263

069	Motivation to change energy consumption - What motivates universities to save energy? Wenge, I.H., Krause, K. & Kastner, I.	264
PSV-26 ENVIRONMENTAL INFORMATION AND COMMUNICATION		265
008	The effect of images on processing pro-environmental messages: the role of discrete, negative emotions Schultz, T., Fielding, K.S., Newton, F. & Louis, W.	265
042	The Relevance of Trust and Distrust in CCU Industry for CCU Product Acceptance Van Heek, J., Linzenich, A., Arning, K. & Ziefle, M.	265
144	Communication strategies to increase fruit and vegetable consumption Bouwman, E.P., Verain, M.C.D. & Snoek, H.M.	267
251	Bridging the distance of climate change communication Loy, L.S. & Spence, A.	267
PSVI-27SOCIAL INNOVATION AND COMMUNITY ENGAGEMENT		269
370	The role of new social movements in promoting sustainable lifestyle change: the case of the Slow Food Movement Dumitru, A., Lema-Blanco, I. & García-Mira, R.	269
212	Communities as key drivers for energy transition Rau, I., Hildebrand, J., Heib, S. & Schweizer-Ries, P.	270
236	Why citizen involvement in biodiversity-related participatory programs seems to reach a limited public? A case study in France Conversy, P., Maclouf, E. & Prévot, A.-C.	271
PSVI-28 ENERGY TRANSITIONS IN HOUSEHOLD		272
142	Nudging consumers towards better green choices: a field experiment on electricity demand-side response Nicolson, M.L., Huebner, G.M. & Shipworth, D.	272
163	Do Future-Oriented Persons Use Less Energy? A Study Combining Survey and Metered Electricity Usage Data Bruderer Enzler, H., Diekmann, A. & Liebe, U.	273
228	Adapting to limited and intermittent energy supplies: A cross-cultural study on building resilience Hope, A., Roberts, T. & Walter, I.	274
229	Insights from a practice-theory approach to simulate the dynamics of household energy use Hope, A. & Narasimhan, K.	275
154	Testing the Ringelmann effect on the energy consumption of communal electricity users: Does a larger group size reduce the motivation to save energy? Carmi, N. & Mostovoy, N.	276
109	How Energy Policies Drive or Inhibit Energy Transition – A Comparison of Double-dividend and Spillover Effects of Photovoltaic investments in Diverging Photovoltaic Regimes Braito, M., Flint, C., Muhar, A. & Penker, M.	276
PSVI-29 IDENTITY AND PRO-ENVIRONMENTAL BEHAVIOR		277
022	Identities in Environmentally Significant Behavior: A Factor-Analytical Approach Udall, M., De Groot, J.I.M. & De Jong, S.B.	277

209	Environmental Identities and the Perceived Social Status of Pro-environmental Behaviours Uren, H.V., Roberts, L.D., Dzidic, P.L. & Leviston, Z.	278
269	Identity of green consumers: Why tough guys don't buy conventional light bulbs and frail women researchable batteries? Braun Kohlová, M., Urban, J. & Skopková, H.	279
207	Boosting self-perceptions to increase positive spillover Lauren, N., Dean, A.J., Smith, L.D.G. & Louis, W.	280
237	Utilizing the social identity approach to save water: Insights from the field Lede, E., Meleady, R. & Seger, C.	281
146	Mapping the relationship between identity, belonging, and motivation for environmental and cultural protection in the Dutch Caribbean Mac Donald, S. & Staats, H.	281
166	The relationship between connectedness to nature and environmental identity: results of a systematic review Jovarauskaite, L. & Balunde, A.	282

PSVI-30 GREENING EDUCATIONAL SPACES **283**

346	The impact of a course on Sustainable Consumption of clothing and food using ICT in university students: an approach for environmental citizenship Rivera, B. & Díez-Martínez, E.	283
173	Broadening the scope: career choice as a form of pro environmental behaviour Međugorac, V., Šverko, I. & Babarović, T.	284
063	ENED-GEM: A conceptual framework model for psychological enjoyment and learning mechanisms in educational games about the environment. Fjællingsdal, K.S. & Klöckner, C.A.	285
157	Energy saving behavior at the university - Norms, pragmatism or social identity? Heib, S., Hildebrand, J. & Schweizer-Ries, P.	285
195	A pilot study of energy-efficient lighting and perceptions in preschool environments Mattsson, P. & Laike, T.	286
021	What characterizes climate change related art that activates the audience? – a study on the ArtCOP21 event in Paris Sommer, L.K. & Klöckner, C.A.	287

PSVI-31 COGNITIVE PROCESSES AND BEHAVIOR **288**

347	The connection between cognition and behavior: A two-step model analysis Bauer, A. & Menrad, K.	288
293	Test of the cultural cognition of global warming: polarization or just a differential effect? Urban, J., Franěk, M. & T. Chabada	289
292	Environmentalists do not cheat: experimental study of moral licensing in environmentalists Urban, J., Braun Kohlová, M. & Skopková, H.	290

POSTER SESSIONS:

292

PO I - 01 BEHAVIOR AND ENERGY CONSUMPTION

293

- 038 No drought about it? The influence of personal experience on views of climate change 293
Becker, S. & Sparks, P.
- 295 Ability to save electrical energy at home 294
Valencia Chavez, G.C., Flores Herrera L.M., & Bustos Aguayo, M.
- 243 It's time to switch: When do consumers switch to more energy-efficient appliances? 295
Kühne, S.J., Reijnen, E., & Hackenfort, M.
- 067 Household energy reduction - content analysis of participators experiences of an intervention 296
Weimer, K., Ahlström, R., & Lisspers, J.
- 377 Achieving transitions in UK energy and material use: Public deliberations of a low carbon future 297
Cherry, C. Steentjes, K. Pidgeon, N.
- 379 The impact of learning environment on academic performance 297
López-Chao, V.A., García-Mira, R. & J.M. Muñoz-Cantero

PO I - 02 SUSTAINABLE BEHAVIOR

298

- 005 Sustainable Transport – The Importance of Design and Emotion 298
Hofmann, D.
- 123 Attitude change in personal travel - A qualitative investigation 299
Hoffmann, C., Abraham, C., Skippon, S. & White, M.P.
- 030 A Study on Urban Elderly's Activity Characteristics and Satisfaction towards Neighborhood Space Affordance in Taiwan 300
Tung C -M.
- 244 Integrated multimodal mobility concepts: Preferences and intention to adopt among car-sharing users 301
Hanss D. & Peters, A.
- 027 The right traits for recycling 302
Poškus, M.S. & Žukauskienė, R.

PO I - 03 SUSTAINABLE CONSUMPTION

302

- 090 Yes, we can! Positive campaigns mitigate compensatory "mental bookkeeping" effects and promote pro-environmental behaviors 302
Chatelain, G., Hille, S.L., Sander, D., Patel, M., Hahnel, U.J.J., & Brosch, T.
- 381 The role of responsible consumption initiatives in promoting sustainable lifestyles 303
Isabel Lema-Blanco, Ricardo García-Mira, & Jesús Miguel Muñoz Cantero
- 279 The role of descriptive norm and anticipated emotions in reducing meat consumption 304
Fornara, F., & Tiroto, F.
- 286 Water consumption feedback devices: Intention to adopt and correlates 305
Hanss, D. & Peters, A.
- 211 Nature connectedness and pro-environmental behavior: leverage point for sustainability transition 306
Klanięcki, K.

PO I - 04 BEHAVIOR IN WORK SPACES	307
232 Safety of defensive and coping person's behavior Nikiforova, D.M., Boyko, A.D. & Krivoshchekova, M.S.	307
210 Involvement in extremist groups in the Internet environment: the psychological aspect Kruzhkova, O.V., Vorobyeva, I.V. Nikiforova, D.M. & Krivoshchekova, M.S.	308
248 The comfort advantage in "Green" buildings: A reflection of biased self-reports? Holmgren, M.	309
291 Investigating multi-stakeholder risk perceptions associated with coastal flooding - the PACA coastline, France Dias, P., Bailey, E., Schleyer-Lindenmann, A., & Bohn-Bertoldo, R.	310
339 Environmental chaos at home and in school and its impact on child anxiety Campos Gil, J.A., Salvador-Ginez, O. & Ortega Andeane, P.	311
371 Participatory design methodology research for Elementary School restroom remodeling An, E.H. & Paik, J.	312
PO II - 05 NATURE CONNECTEDNESS	314
053 Awe emotion and psychological restoration in natural and urban environments Collado, S., Manrique, H. & Corraliza, J. A.	314
073 Human-Animal Relations viewed by lay and environmentally-involved people: Esteem to Humanity and Empathy with Nature Sevillano, V. & Fiske, S.T.	315
275 Typology of natural settings linked to transcendent experiences Lorenzo, E.L. & Corraliza, J.A.	316
287 Psychological restoration depends on stimulus-source attribution Haga, A.	316
085 Analyzing the restorative value of virtual (3D) environments Martínez-Soto, J., González Medina, S.A., & Bautista Blanco, L.Y.	317
PO II - 06 URBAN SPACES EVALUATION	318
107 To evaluate the neighborhood parks by using the Child-Friendly Environment Indicators Tseng, T.A., & Tung, C.-M.	318
140 Factor structure of the dispositional empathy with nature scale in Spanish Sevillano, V., Corraliza, J.A., & Lorenzo, E.L.	320
147 Development and validation of a questionnaire addressing flexible work and recovery Edvinsson, J. & Jahncke, H.	321
380 Symmetrical Analysis of Social Movements for Food Sovereignty Tamayo, P.A. & Molina, N.	322
048 Brasília city maps by its inhabitants Alves De Souza Filho, E. & Beldarrain-Durandegui, A.	322
222 A study of children's independent mobility under the characteristics of neighborhoods of central areas in Taoyuan city, Taiwan Tung, C.-M., Tseng, T.Z., & Wang, S.Y.	323

PO II - 07 ENVIRONMENTAL ASSESSMENT	324
151 Vandalism in the urban environment Kruzhkova, O.V., Vorobyeva, I. V., & Krivoshchekova, M.S.	324
152 Vandalism of staff in the organization Kruzhkova, O.V., Devyatovskaya, I.V., Obolenskaya, A.G., & Krivoshchekova, M.S.	325
196 Using scenarios to explore how values are expressed in bushfire policy and planning Rawluk, A., Williams, K.J.H. & Ford, R.M.	326
213 Atrium in residential buildings – a design to enhance social interaction in urban areas Krook, M., Danileski, I., & Weimer, K.	327
336 Coping styles, environment, and stress in women with cancer Ortega Andeane, P., Irepan, M., Salvador-Ginez, O. & Estrada, C.	328
372 Generational Differences of User's Behavior in General Hospital Choi, Y., Oh, J. & Par, H.	329

PO II - 08 ENVIRONMENTAL ATTITUDES AN BEHAVIOR	330
---	------------

376 Dynamic pricing and real time information. Imenes, A.G.	330
081 Evaluation of a psychoeducational program and its Theory of change for environmental behavior promotion Díaz-Marín, J.S.	330
137 Difference of background music evaluation depending on activities at a Cafe Maki, K.	331
167 The transformative potential of teaching mindfulness meditation to adolescents: environmentally significant outcomes of a school-embedded intervention study Böhme, T., Geiger, S.M. & Schrader, U.	332
178 The reasons for change of privacy practices in public space: A cross-cultural study Akca, E., Goregenli, M., & Bonaiuto, M.	333
378 Examining people's views on the financing of a low carbon energy transition in the UK Becker, S., Demski, C., Evensen, D., Roberts, E. & Pidgeon, N.	333

AUTHOR INDEX	335
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INTRODUCTION





introduction

The International Conference of Environmental Psychology (ICEP)* is now organized by the Division 4 (Environmental Psychology) of the International Association of Applied Psychology (IAAP): www.iaapsy.org/divisions/division4

Division 4 of the IAAP gathers together researchers focusing on the study of interactions between people and their physical settings and the effects that one has on the other. Understanding this relationship can contribute to investments and policies that support environmental conservation, mitigation of climate change and human wellbeing and thus a harmonious relation between social and ecological systems.

The conference is a place of encounter, debate and interaction around the science and practice of Environmental Psychology and aims to facilitate state-of-the-art scientific exchange and communication on Environmental Psychology topics. ICEP 2017 will focus on the theme of "Theories of Change in Sustainability Transitions and Social Innovation" in order to promote debate on cutting-edge theoretical developments and recent empirical studies on the individual and social factors having an impact on sufficiently fast-paced transitions to sustainability, and on most promising social innovation models that can address the wicked problems of climate change, inequality, social alienation and decreasing human wellbeing.

Changing our lifestyles, societies and economies in a sustainable direction is possible only through broad consensus on the goals and pace of transformation. Fast concerted action requires a keen understanding of the role of both individual and collective change agents and the mechanisms underlying their successes and failures in bringing about societal transformation. Both sustainable and social innovation initiatives, political actors and science itself are striving to understand the mechanisms for such transformation and harness their potential.

Despite increases in affluence, societies in the global North are confronting the manifold challenges of climate change, and a failure of the modernistic promise of increased wellbeing, decreasing inequality and meaningful leisure. Increased pressure on natural resources has been a direct result of conceptions of wellbeing that posit a materially rich life as a 'good life' and have contributed to unsustainable cycles of intense resource consumption, decreasing health and wellbeing, time pressure, and social alienation. Climate change, together with the failure of materialistic lifestyles to deliver wellbeing have lead to a questioning of the assumptions underlying current societal and economic arrangements.

Scientific theorizing has also aimed to uncover the trajectories sustainability and social innovation initiatives follow in their efforts to achieve social transformation, the motivations underlying individuals' involvement in environmental action, the patterns of interactions between individual and collective agency on the one hand, and existing systemic factors constraining or facilitating their action on the other.



introduction

Environmental Psychology is uniquely placed to address the role of individuals and social groups in transitions towards sustainability and in creating thriving communities, human wellbeing, and environmental balance and we hope that ICEP 2017 will be a milestone in the scientific debates of our discipline, as well as a context for the discussion of practical and policy implications of research.

We'd like welcome each of you to A Coruna for the ICEP-2017 Conference. We hope that it can be a forum that brings together passionate and creative researchers to share ideas and establish innovative research networks. Looking at the more than 300 people who registered for the conference, it definitely seems like this is an exciting time for Environmental Psychology, as our professional community keep growing and developing. The world of Environmental Psychology is an exciting field in which to work or study, as the variety of research themes in the programme demonstrates. We hope that this will be an event you will enjoy, for its high quality scientific exchange and its practical relevance.

In the following pages, we give you an idea of what you can expect to find here. After an introductory talk given by the People-Environment Research Group of the University of A Coruna, we have five keynote speakers that will present us with different research perspectives and agendas. We selected 329 papers, structured in 31 Sessions and 25 Symposia. A total of 45 Posters will be also presented in two sessions. Finally, our social programme includes a welcome reception, a tour through the historic parts of the city, and the traditional gala dinner and will offer occasions for participants to meet and network in a relaxed atmosphere, while also engaging with our 800 year old city.

I'd like to thank each of you for attending this conference and bringing your expertise to this exciting event. As Environmental psychologists, you have the vision, knowledge, and experience to bring our field forward and contribute to solving real-world problems.

On behalf of the Steering Committee of the ICEP-2017

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Otto-von-Guericke University, Germany

Petra Schweizer-Ries
Hochschule Bochum University of
Applied Sciences, Germany

Jennifer Senick
Rutgers Center for Green Building, USA

Henk Staats
Leiden University, Netherlands

Linda Steg
University of Groningen, Netherlands

Clare Twigger-Ross
Collingwood Environmental Planning, UK

Charles Vlek
University of Groningen, Netherlands

KEYNOTES





Wednesday
30th August

Assembly Room · Floor -3

10:00 - 11:00 h.

Introductory talk

Promoting sustainable lifestyles, social innovation and wellbeing in europe:Lessons from three large-scale interdisciplinary projects

Ricardo García-Mira & Adina Dumitru. University of A Coruña, Spain

The need for a societal transition towards sustainability requires the concerted action of a variety of stakeholders and a keen understanding of the factors supporting or hindering the processes composing it. Transformative social innovation, defined as innovation that aims to achieve broad societal change, can be a key element in achieving sustainability. Profound changes in lifestyles are needed to achieve sustainable, smart and inclusive societies. The contemporary intertwined challenges of climate change, raising inequality, alienation, and decreasing wellbeing require applied and transdisciplinary approaches to knowledge generation and Environmental Psychology has a key role to play in the understanding of these processes of societal change.

Through a series of international interdisciplinary research projects we have sought answers to the questions of: how do psychological factors interact with economic, political or technological ones in determining sustainable lifestyle change and transformations towards a green economy? How can we promote sustainable lifestyle change that also leads to enhanced wellbeing? What drives people towards environmental long-term activism and what is the role of human agency and empowerment in societal transformation towards sustainability? What role do sustainability and social innovation initiatives and networks play in processes of sustainable transformation? What are the effects of being a member of sustainability initiatives in terms of environmental impact and wellbeing? How can we best measure and evaluate interventions targeting urban sustainable change efforts towards sustainable transformation and what indicators are most appropriate? We will bring evidence from three large scale European projects to provide some answers to these questions.

The GLAMURS project has adopted an innovative and systemic approach to lifestyles, considering them to be patterns of time use in daily life domains and contexts, that take place in given locations and have associated consumption patterns, rather than a simple sum of independent behavioral choices. How people structure their everyday life, how they make decisions regarding their work, home and leisure life, and what brings them happiness and wellbeing have important consequences for sustainable lifestyles. Instead of focusing on European citizens' consumption patterns and attempting to change them, a piecemeal approach that has not delivered expected results, we have inquired into how the ways in which everyday life is organized might actually create obstacles, but also possibilities for change.

In order to provide a comprehensive account of the conditions and dynamics for sustainable lifestyle and economic transformation in Europe, GLAMURS has:

- Explored the complex interactions and links among economic, social, cultural, political and technological factors influencing sustainable lifestyles and transformations to a green economy across societal levels (from individual to social, and from micro- to macro-economic levels).

- Developed and evaluated comprehensive models of lifestyle change at a European level in key sustainability domains, and
- Provided assessments of these models in terms of psychological, social, economic and environmental effects.

The project studied and compared across seven European regions and six lifestyle domains that are relevant for sustainability, and the project's focus was on both regular citizens as well as frontrunners of sustainability, by including sustainability initiatives in each region that have established as their objective to influence several or all of the above-mentioned domains: food and energy cooperatives, repair cafes, transitions towns, ecovillages, sustainable clothing cooperatives, a governmental work-smart programme and a whole bio-region have been among studied cases, and results provide insights into conditions for transitions to sustainable regions.

Social innovation has become a hot topic in policy discourses (Haxeltine et al., 2016). The European Project TRANSIT (Transformative Social Innovation Theory) aims to develop a middle-range theory of transformative social innovation (TSI) through a combination of deductive theoretical reasoning and extended empirical research on 20 transnational networks of social innovation (SI) initiatives, and around 80 local initiatives in Europe and Latin America. It has set itself the theoretical challenge of resolving the linkages and feedbacks between individuals, social activities and the wider socio-material context in which social innovation takes place. It thus adopts the view that SI initiatives can have transformative ambitions, but social change is the result of co-production, through complex interactions among diverse actors, objects and ideas in a given socio-material context. Theoretical resources from transition studies, social innovation and social psychology are used, among others, to inform research.

The idea of nature-based solutions (NBS) has emerged as both a challenge and an opportunity to assist urban communities in the transition to sustainability. But nature-based solutions are still a complex problem for many city-makers, and there are still many obstacles (physical, cultural, ecological, legal, etc.) to embedding these kinds of solutions into urban planning, policy frameworks, and innovative city design. Individually, cities have been experimenting and testing site-specific solutions and strategies (from micro to macro scale) over the decades and that continue to be living examples of effective urban successful transition strategies.

Connecting is a H2020 European project that aims to create an open innovation ecosystem approach in cities across the world, by bringing together city governments, SMEs, academia and civil society to co-produce usable and actionable knowledge on nature based solutions and their benefits in cities. A series of European cities, as well as non-European ones are involved in the project, as frontrunner, fast-follower or multiplier cities that will be involved in large-scale demonstration of nature-based solution implementation, through a process that is participatory and involves city-to-city learning. Besides such demonstrations, the project aims to develop and test a truly global, comprehensive and robust mechanism that will be used to monitor and evaluate the effectiveness of nature-based solutions implementation in cities, with regards to five impact categories: climate change adaptation and resilience; health and wellbeing; social cohesion; economic development potential; and green business opportunities.

Graumann - Keynote Lecture 1:

Collective problems require collective answers: a social identity model of Pro-environmental actions

Immo Fritsche. Leipzig University, Germany

Large-scale environmental crises, such as, for instance, global climate change, are both outcome and determinant of aggregated human behavior. However, most of the pertinent research still focusses on attributes of *individuals* and how these determine sustainable action (e.g., perceptions of personal self-efficacy, personal costs and gains) and how *individuals* are affected by crises (e.g., individual health). Although collectives are of course made up of individuals, social identity research shows that people think and act differently depending on whether they think of themselves as individual persons (“I”) or as collectives (“We”). I present a social identity model of pro-environmental action, highlighting the decisive role, social identity plays for individuals’ appraisals of and responses to large-scale environmental crises. The model proposes three social identity variables to affect people’s private and public-sphere pro-environmental actions. First, *ingroup norms and goals* specify whether, and to what extent, people’s group stands for pro-environmentalism. Second, *collective efficacy* beliefs indicate whether the group is able to bring about significant change to reduce crisis. Third, for the previous variables to affect individual actions, individuals have to self-categorize and *identify* with the group in a situation. This can be any group (e.g., citizens of a country, gender groups, ideology groups etc.), and not just groups that are inherently related to environmental action (e.g., environmental action groups, motorist groups). These variables are both affecting (e.g., climate change denial in US conservatives) and are affected by environmental crisis appraisals. Whereas group-specific perceptions and emotions (e.g., collective guilt or anger) may determine ingroup norms and efficacy beliefs, helplessness or threat appraisals resulting from environmental crises can immediately foster collective responses by automatically strengthening collective self-definition and group-based action intention. I will illustrate the causal links proposed in the model by our own and others’ experimental and correlational research and discuss the model with regard to both theory development and application potentials. Specifically, research on the power of “We” may not just complement campaigners behavioral change toolbox but may also tell a lot about the human potential to tackle collective challenges of unprecedented complexity.



Thursday
31th August

Assembly Room · Floor -3

12:00 - 13:00 h.

Keynote Lecture 2:

Unprecedented disasters and environmental emergencies: what the rise of right-wing populism means for transitions towards sustainability, and what we should do next

Winnifred R. Louis, Kelly Fielding, & Joanne Smith. University of Queensland, Australia

The rise of right-wing populism has seen a vigorous destruction of institutions, regulations and programs to mitigate climate change and to promote sustainability. Around the world, the rise in power of new right-wing movements has provoked a sense of crisis among environmentalists. In this talk I will discuss what I think we did right, what we got wrong, and what we need to do next. I will present environmental behaviour as a property of groups as well as individuals, and I will argue that many environmentalists have ignored group processes that are well known, predictable and fundamental. This neglect has greatly undermined our persuasive efforts with political opponents. I approach the topic as a social psychologist who studies decision-making in conflict, and I argue that by employing tactics known to create backlashes in conflict, environmentalists co-create variants of reactionary partisanship. Partisanship on environmental issues means that climate scepticism and indifference to sustainability become badges of political ideology, with profound negative consequences for the planet whenever conservatives come to power. Yet this dynamic is not inevitable. I present a series of studies linking decisions made by individuals with group identities and norms (groups' standards or rules), and demonstrating particular forms of positive persuasion vs. toxic backlash. The key problem that I identify across the studies is that persuasive messages that work for true believers are ineffective or counter-productive with opponents. I close with five key recommendations for change in our approach: now that we have built a sense of problem recognition and motivation on our side of the political fence, we must change tactics to foster those beliefs and motivations among other voters and citizens. The social psychology of group processes and intergroup relations provides tools for new bipartisan transitions towards sustainability.

Thursday 31th August · 17:00 - 18:00 h.

Keynote Lecture 3:

Understanding Intrinsic Motivation To Engage In Pro-Environmental Actions

Linda Steg. University of Groningen, The Netherlands

Anthropogenic climate change is largely brought about by human activities and can be altered when people consistently act pro-environmentally. Current approaches to address anthropogenic climate change mainly target extrinsic motivation, by offering incentives to change personal costs and benefits of behaviour. Such incentives run the risk of undermining intrinsic motivation to act pro-environmentally. This is problematic, as intrinsic motivation is a solid source of consistent pro-environmental behaviour. Intrinsically motivated people behave without being coerced or incentivised, as doing so is meaningful and makes them feel good. I will discuss individual factors that foster intrinsic motivation to engage in pro-environmental behaviour, including values. Next, I will elaborate on how contextual factors affect intrinsic motivation and pro-environmental actions, and emphasise that it is key to study the interplay between individual and contextual factors more systematically in environmental psychology.



Friday
1st September

Assembly Room · Floor -3

12:00 - 13:00 h.

Keynote Lecture 4:

Can detention be humane and sustainable?

Richard Wener. New York University, USA

Perhaps the most profound act a state can take – one that can be both legal and common – is to take away a person's freedom, yet many millions remain locked up every day. Only in prisons are people kept for long periods of time in conditions that so significantly violate basic notions of our rights and who we are. We lose control over uses of space as basic as determining where and with whom we sleep, when we can rise, eat, bathe, read, work and recreate. Notions of privacy we learn from childhood are largely eliminated, including our ability to enter or leave a social situation, to dress, clean or toilet out of sight of others. Moreover, the above describes normal conditions ("general population") and does not touch on more extreme situations, such as solitary confinement.

One hopes that legal jurisdictions commit people to such conditions only when other options fail, and with the most careful thought and consideration, but we know this is not the case many places and many times.

Prisons can also have a profound impact on the sustainability of communities. They can change the definition and image of a town as place names get forever associated with the local penitentiary. They may use inordinate amounts of precious and scarce resources, such as potable water, and sometimes, in exchange, return sewage and other sources of pollution.

This talk will use evidence-based understanding and value-based principles to discuss how prisons can be designed and run to meet international standards of humane treatment, be safe and secure, allow for possibilities for offering services that can lead to positive outcomes, and do so while maintaining sustainable models of design and operation.

Keynote Lecture 5:

Sustainability, learned helplessness and empowerment. Revisiting the challenges for environmental psychology

Enric Pol. University of Barcelona, Spain

As environmental psychologists, on a turbulent and changing world, we must be constantly reviewing our research agenda and priorities, to ensure our contribution to the improvement and well-being of our society, now and for future generations. This is the challenge of sustainability in its original sense following Brundtland Report (1987).

Pol Castrechini & Carrus (2017) emphasize opposition of two social models, which can change or vary the internal dynamics and research of our discipline: a society installed or moving towards a learned helplessness vs. a society where values of solidarity, social cohesion and work for empowerment are predominant. We often talk about the need to move towards sustainability, but socioeconomic and political dynamics do not seem to go in that direction.

Our studies (CIS, 2002) and others provide data to state that without social cohesion and identity, there is no coping capacity or resilience, then sustainability is not possible. In addition, current social dynamics linked to precariousness and labour rights lost, refugee movements or migrations directly or indirectly related to climate change, do not seem to prioritize sustainability challenges when immediate survival arise. In addition, we have to consider how urban form and organization of the city, can facilitate or hinder necessary cooperation and social cohesion, or to lead to a decreased perception of well-being and quality of life.

Dominant psychological literature, when concerned about sustainability, use to focus in predicting behaviour and on attitude-behaviour relationships, from eminently individual explanation models, not taking into account sufficiently, contextual factors that can drastically change behaviour, despite having a 'positive' attitude. Furthermore, forms of communication and explanation of changes linked to new technologies, instead of facilitating transition, ends up generating scepticism and incredulity about what it was considered 'to be sustainable' and essential until then. This puts communication processes in the centre of the object to analyse from environmental psychology to achieve sustainability.

In any case, in a world evolving in an unpredictable way, from the analysis and development of environments allegedly facilitating sustainability, we must analyse and propose minimal ways that satisfy social needs offering the person coping capacity and resilience. We know that this is not possible without a minimum of cooperation options, trust and empowerment. We need to revisit what was already raised in architectural psychology of the 60's and 70's (Canter, 1969, Honikman 1970, Küller 1973 Proshanky, Ittelson & Rivlin, 1970): What are the minimum ways that guarantee (or not disrupt) psychological processes and provide psychosocial well-being in the interaction of people with their everyday environment, housing, neighbourhood, city, and provide a sense of belonging to the group or community.

SYMPOSIA





Wednesday
30th August

11:30-13:00 h

SSI-01 SYMPOSIUM:

Room: +1.1

SUSTAINABLE FOOD CONSUMPTION I

Schmidt, K.^{1*}, Craig, T.², Gellrich, A.³, Leygue, C.⁴, Mansell, T.⁵, Richter, I. G. M.⁶, Thøgersen, J.⁷, Van Geffen, L.⁸ & Verain, M. C. D.⁸

¹ Otto-von-Guericke University, Magdeburg, Germany

² James Hutton Institute, Aberdeen, Scotland (United Kingdom)

³ The German Environment Agency (Umweltbundesamt, UBA), Dessau-Roßlau, Germany

⁴ University of Nottingham, Nottingham, England (United Kingdom)

⁵ University of Bath, Bath, United Kingdom

⁶ Norwegian University of Science and Technology, Trondheim, Norway

⁷ Aarhus University, Aarhus, Denmark

⁸ Wageningen University & Research, Wageningen, Netherlands

Theme: Sustainable lifestyles

Abstract:

The modern food system faces many sustainability challenges. These challenges range from the depletion of rivers and groundwater for irrigation, nutrient pollution from the application of nitrogen for fertilizers, through high amounts of greenhouse gas emissions and land use to major threats of biodiversity (e.g. Davis et al., 2016; Food and Agriculture Organization of the United Nations, 2013).

In reference to the expected global population growth and increasing per-capita affluence, food production must increase substantially while at the same time minimizing environmental impacts (*'sustainable intensification'*; e.g. Davis et al., 2016). Apart from technological improvements in the food production sector (e.g. resource-conserving processes in agriculture and industrial production), changes are also needed in food consumption. Considering global market regulation by supply and demand, consumers can significantly improve the sustainability of the global food system by considering the quality and quantity of their consumed food. Due to this close relation between the sustainability of the global food system and individual behavior of private consumers, investigating relevant determinants of various types of sustainable food consumption and developing appropriate intervention strategies can be seen as an important research task especially for social sciences such as (environmental) psychology. Therefore, the proposed symposium will address the issues of sustainable food consumption. Referring to several essential types of sustainable food consumption (i.e. organic food consumption, consumption of meat and dairy products, seafood consumption, (household) food waste etc.), the symposium consists of studies working with diverse research designs (i.e. quantitative surveys on national/ international levels, qualitative and experimental methods as well as an integrative literature review), not only identifying relevant determinants of the above mentioned behaviours, but also indicating appropriate entry points for psychological interventions in order to (further) promote sustainable food consumption.

References:

Davis, K. F., Gephart, J. A., Emery, K. A., Leach, A. M., Galloway, J. N., & D'Odorico, P. (2016). Meeting future food demand with current agricultural resources. *Global Environmental Change*, 39, 125-132.

Food and Agriculture Organization of the United Nations. (2013). Food waste footprint. *Impacts on natural resources*. Summary Report.

327 Developing an agent-based model of food consumption: the importance of understanding daily routines

Craig,¹ T. & Mac Diarmid, J.²

¹ The James Hutton Institute, Aberdeen, Scotland

² The Rowett Institute, Aberdeen, Scotland

Keywords: agent-based-model; food; sustainability; health

Abstract:

Person-environment relationships are intuitively straightforward to understand, but actually quite hard to represent in the form of a model (e.g. a statistical model). Pretty much all models suffer from a tension between the desire to simplify the world and the desire to be as realistic as possible. When we build any model to represent what might be termed “the real world”, we inevitably decide that some aspects of the world are more worthy of representation in our model than others.

Numerous statistical methods have allowed social scientists to observe the world in a particularly structured manner, and then to form models of the world that allow us to account for the things we observe. This presentation will discuss this issue with reference to a programme of research looking at food culture and dietary choice, and will discuss the relationship between conceptual models and agent-based models aimed at understanding how to understand future shifts in population towards healthy and sustainable diets.

Empirically-grounded agent-based-modelling allows us to construct a virtual population of heterogeneous agents based on data collection tools like questionnaires, interviews, or experiments, and then to simulate the behaviour of these agents into the future.

Essentially, the agent-based modelling approach allows us to explore the logical consequences of believing our theories or empirical models to be true. As well as discussing some specifics about agent-based modelling, the intention of this talk is also to show that the computational social science approach need not be offputtingly technical in nature. Rather, the discussion between computational and social scientists is often extremely creative, and useful not only to model existing theoretical or conceptual ideas, but to make suggestions for areas where theoretical ideas might be usefully developed.

Habit and routines are understood to be important determinants of everyday food choices, and the specific challenge addressed in this presentation is the difficulty of translating both theoretical and empirical accounts into a form that allows routines to be represented within an agent-based model.

101 The psychology of sustainable seafood consumption

Richter, I.G.M., & Klöckner, C.A.

Norwegian University of Science and Technology

Keywords: seafood, fish, sustainable diets, consumption, social norms

Abstract:

Increasing mass-consumption of seafood drives the oceans to complete exploitation (FAO, 2016). The consequence are damaged ecosystems, endangered future food security and an impeded performance of the oceans in climate change mitigation (Worm et al., 2006). Besides necessary changes on industrial and governmental levels, it is the consumer’s responsibility to shift consumption patterns.

In this talk, key findings of a 3-year PhD project on the psychology of sustainable seafood consumption will be presented.

First, a definition for sustainable seafood consumption and possibilities to translate this definition into consumer behaviour will be discussed. Four key behaviours are critically examined in regards to advantages and disadvantages.

The second sub-project during this PhD has been specifying a model for sustainable seafood consumption with Structural Equation Modelling. Data has been obtained through a data collection with a representative Norwegian sample (N=1190). Social norms, perceived behavioural control, trust, health aspects and convenience preference have been found to be the factors that significantly predict sustainable seafood consumption. This pattern remains stable over time as revealed in a second data collection.

The third sub-project of this PhD has been a field study based on the previous findings. An intervention was designed on social norms and their influence on sustainable seafood label use. Social norm interventions have been found to powerfully steering people into a pro-environmental direction across behaviours like electricity use, recycling or resource saving (Goldstein, Cialdini, & Griskevicius, 2008; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007).

In supermarkets in Germany and Norway signs in eight different conditions have been implemented. The conditions include one pure informational- and seven social norm conditions with increasing reference group size. As dependent measure, number of seafood products with label versus number of seafood products without label has been assessed.

Seafood consumption increases significantly during the experimental period. This applies to both, labelled and non-labelled seafood. Further, social norm messaging leads to a negative feedback effect in terms of consumers buying more non-labelled seafood. However - larger reference groups have a stronger impact on the purchase of labelled seafood than smaller reference groups.

We conclude that consumers are triggered to buy seafood by the sign on the seafood counter, however omitting the concrete message. Further, social norm messaging leads to unwanted effects in consumer contexts, a finding that needs to be explored in more depth. The last conclusion we draw is that the reference group size is crucial for social norm interventions.

References:

- FAO. (2016). State of World Fisheries and Aquaculture 2016. Retrieved from Rome:
 Goldstein, N., Cialdini, R., & Griskevicius, V. (2008). A Room with a Viewpoint: Using Social Norms to Motivate Environmental Conservation in Hotels. *Journal of Consumer Research*, 35(3), 472-482. doi:10.1086/586910
 Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2007). The Constructive, Destructive, and Reconstructive Power of Social Norms. *Psychological Science*, 18(5), 429-434. doi:10.1111/j.1467-9280.2007.01917.x
 Worm, B., Barbier, E. B., Beaumont, N., Duffy, J. E., Folke, C., Halpern, B. S., . . . Watson, R. (2006). Impacts of Biodiversity Loss on Ocean Ecosystem Services. *Science*, 314(5800), 787-790. doi:10.1126/science.1132294

265 Sustainable food consumption in Germany - results of a representative survey

Gellrich, A.¹ & Scholl, G.²

¹ Federal Environment Agency, Dessau-Roßlau, Germany

² Institute for Ecological Economy Research, Berlin, Germany

Keywords: food consumption; sustainable consumption; meat consumption; food waste; representative survey

Abstract:

The oral presentation will refer upon a representative survey being part of the research project "Environmental Consciousness in Germany 2016". Sustainable food consumption was treated as one focal topic of the survey. The current unsustainability of worldwide food production and consumption patterns raises the question how food supply systems could become more sustainable. Societal and environmental developments make this requirement even more urgent: A growing population with both more people being affluent and extremely poor, climate change and the therewith connected challenges will make the problems arising from the unsustainability of food production even more severe in future (Reisch, Eberle & Lorek, 2013; Davis et al., 2016). As the sustainability of the global food system and individual behavior of private consumers are highly interconnected, investigating underlying motives of food consumption as well as conditions under which behavior change might take place seems highly relevant.

For a deeper understanding of relevant patterns and drivers of (un)sustainable food consumption, a representative survey with 2.000 persons was carried out in July and August 2016. Besides several questions on meat consumption and food waste – as proxies of the sustainability of food consumption –, the

survey contained questions to assess general environmental attitudes as well as socio-demographic variables and social milieus. The results show growing interest in organic food and vegetarian diets. Seldom meat consumption is more popular among women and in the older generation. In the younger generation, both most frequent meat-eaters as well as most vegetarians are found. A strong reason for frequent meat consumption is its good taste in the eyes of the meat eaters. Frequent meat-eaters are willing to reduce meat consumption especially if it became more expensive, e.g. because of higher requirements on animal animal welfare. People who already eat meat only seldom (or never) regard perceived healthiness of a meat-reduced or meat-less diet, animal welfare and environmental and climate protection as main drivers for their consumption patterns. With regard to food waste the survey revealed that its reported occurrence is higher in younger age groups than in population average. In addition, we found that woman, older people and people with lower incomes tend to be more thoughtful with regard to food waste and its negative impacts.

These results will be discussed against the background of market data and food politics and with regard to designing target-group-specific campaigns for sustainable food consumption.

References:

Reisch, L., Eberle, U. & Lorek, S. (2013). Sustainable food consumption: an overview of contemporary issues and policies. *Sustainability: Science, Practice & Policy*, 9 (2), 7-25.
 Davis, K. F., Gephart, J. A., Emery, K. A., Leach, A. M., Galloway, J. N., & D’Odorico, P. (2016). Meeting future food demand with current agricultural resources. *Global Environmental Ch*

044 Predictors of household food waste (prevention) - an integrative review

Schmidt, K.

Otto-von-Guericke University, Magdeburg, Germany

Keywords: household food waste prevention; predictors; review

Abstract:

Introduction: Of all food that is produced for human consumption globally 1.3 billion tons per year are wasted. Except for economic and social issues, these high amounts of unconsumed food also greatly contribute to global environmental problems, e.g. climate change, water scarcity as well as increasing deforestation and species extinction (Food and Agriculture Organization of the United Nations (FAO), 2013). In this context, industrialized countries are especially characterized by high amounts of household food waste – i.e. food that is discarded as a result of household member’s inadvertence or conscious decisions for discarding, although being still suitable for human consumption (e.g. Priefer et al., 2016).

Theoretical background: During the last 15 years, more and more academic research have attempted to explain why the majority of wasted food in industrialized countries is a product of household member’s behavior by using various methods (Porpino, 2016) in order to identify a variety of predictors of household food waste(prevention). Therefore an integrative review approach was employed to systematically summarize the research literature on this topic and to finally develop a comprehensive theoretical framework to explain household food waste (prevention), considering all so far identified predictors.

Methods Using a systematic search strategy, databases including ScienceDirect, PsycINFO and Google Scholar were searched primarily. Considering relevant inclusion criteria (i.e. studies published between 2000-2016 in the English or German language, focussed on household food waste (prevention), presenting original research without severe methodical shortcomings) 49 studies were initially included in the review process.

Results The so far identified predictors of household food waste (prevention) could be clustered into four main categories: (I) Social framework conditions and socio-demographic predictors (e.g. age, income etc.), (II) perceptual predictors (e.g. perceived environmental consequences of household food waste), (III) Motivational predictors (e.g. social norms to prevent household food waste) and (IV) Behavioral predictors (e.g. specific habits like planning or shopping habits).

Conclusions The current review integrates previous research on various predictors of household food waste (prevention) into a comprehensive theoretical framework. Apart from that, it also indicates a great need for further research to understand this important type of sustainable food consumption, in order to derive appropriate interventions strategies and further promote household food waste prevention. The examined studies are comparable only to a very limited extent as they are based on different scientific disciplines, refer to different populations, examine different exploratory as well as different outcome variables and are characterized by considerable methodological differences in terms of how variables were measured and data was analyzed.

References:

Food and Agriculture Organization of the United Nations (FAO). Food wastage footprint. Impacts on natural resources. Summary Report. 2013.
 Priefer, C., Jörissen, J., & Bräutigam, K. R. (2016). Food waste prevention in Europe—A cause-driven approach to identify the most relevant leverage points for action. Resources, *Conservation and Recycling*, 109, 155-165.
 Porpino, G. (2016). Household Food Waste Behavior: Avenues for Future Research. *Journal of the Association for Consumer Research*, 1(1), 41-51.

SSI-02 SYMPOSIUM:

Room: +1.2

PSYCHOLOGICAL CONTRIBUTIONS TO THE TRANSITION OF THE TRANSPORT SECTOR

Bobeth, S.^{1*}, Langbroek, J.H.M.², Hartmann, C.³, Bruderer Enzler, H.⁴, Hoffmann, C.⁵, Carmi, N.⁶, Kibbe, A.¹, Bösehans, G.⁷, Uttley, J.A.⁸ & Davoudian, N.⁹

- ¹ Otto-von-Guericke-University, Magdeburg, Germany
- ² KTH Royal Institute of Technology, Stockholm, Sweden
- ³ ZHAW, Zurich, Switzerland
- ⁴ ETH Zurich, Zurich, Switzerland
- ⁵ University of Exeter, Exeter, United Kingdom
- ⁶ Tel-Hai Academic College, Tel-Hai, Israel
- ⁷ University of Bath, Bath, United Kingdom
- ⁸ University of Sheffield, Sheffield, United Kingdom
- ⁹ University College London, London, United Kingdom

Themes: Sustainability transitions; sustainable lifestyles

Abstract:

Global transport is growing rapidly and is responsible for approximately 1/4 of CO2 emissions today. It contributes heavily to the rapid exploitation of oil as a dwindling fossil fuel and induces further negative effects on humans and nature including air pollution, noise, land take, and accident risk. Accompanying political regulations and technological innovations, tackling these multifold challenges requires a major shift in humans' travel behavior. Therefore, environmental psychologists can and should make an important contribution to the transition of the transport sector. During the course of the symposium, we present multifaceted approaches to the analysis and promotion of sustainable transport behavior within ten presentations.

The symposium's first half mainly deals with questions concerning aviation and car travel. We start with an analysis of air travel determinants. The study is based on population survey data from Switzerland, which allowed for a unique comparison of socio-demographic, spatial, and attitudinal determinants. We will then emphasize the role of psychological factors and communication to tackle the infamous range problem of electric cars, based on data from a discrete choice experiment with new-car buyers in Germany. Next, findings from a study with car renters in Sweden reveal both predictors for electric car rental and consequences of rental for the decision-making process towards the purchase of an (own) electric car. The fourth presentation deals with the topic of the acceptance of different models of self-driving cars (e.g. private ownership or fleet model) in terms of ecological, social, financial, and other aspects in the near future. The findings are based on an online survey conducted in Switzerland. The findings are based on an online survey conducted in Switzerland. In the fifth presentation, we will sum up recent research on the cognitive predictors of car use and non-car use with results from a systematic review of international studies on that topic.

The symposium's second half shifts the focus even more towards comparative travel mode choice and ways to promote active forms of transportation and public transport. We start with two analyses of sustainable vs. non-sustainable travel mode choice behavior with commuters to universities. Results from a discrete choice experiment from Israel shows the trade-offs between internal factors, such as attitudes and social norms, and external factors, such as the introduction of a parking fee. A field observation study from Germany highlights the role of environmental attitude in sustainable travel mode choice and demonstrates an additive effect of environmental attitude and external costs. We then explore the interplay between newly built cycling infrastructure and its usage with results from a field study in a Brazilian metropolis, pointing to recommendations for further cycling promotion measures. Next, based on data gathered with a novel methodological approach using biannual clock changes in a five-year study in the USA, we emphasize the role of daylight and lighting for the promotion of walking and cycling. Finally, findings from a qualitative walkability study carried out in Iranian residential areas underline the consequences of street lighting for travel mode choice between walking and taking the car.

122 The “Range Myth” in Electric Car Adoption: New Findings and Implications for Researchers and Policy Makers

Bobeth, S. & Matthies, E.

Otto-von-Guericke-University, Magdeburg, Germany

Keywords: Electric cars, Adoption, Range

Abstract:

In the Paris Agreement, the international community agreed on the long-term goal of deep decarbonization of the global economy, i.e. to strictly reduce CO₂ emissions in order to mitigate climate change. This poses major challenges for the transport sector, which is responsible for 23 percent of global CO₂ emissions today (Creutzig et al., 2015; Sims et al., 2014). Along with the need for an overall reduction of motorized individual transport, electric cars can contribute to CO₂ emission reductions as they promise efficiency gains compared to combustion engine cars (Hawkins, Singh, Majeau-Bettez, & Strømman, 2013). Many governments in countries of the Global North promote electric cars and employ policy measures to foster electric car adoption (e.g., Sierczula, Bakker, Maat, & Van Wee, 2014). Nevertheless, in Germany and many other countries, the sales rates have been disappointingly low.

Adoption research explores the underlying reasons for the slow uptake of electric cars in households. Multiple authors have identified cost aspects (e.g., Hidrue, Parsons, Kempton, & Gardner, 2011; Oliveira, Dias, & Sarabando dos Santos, 2015) and aspects connected to the range of electric cars (e.g., Dimitropoulos, Rietveld, & van Ommeren, 2013; Lieven, 2015) as especially important from the perspective of lay people. Studies with experienced owners of electric cars strengthen the importance of costs, while range is reported to be less problematic by owners than by lay people (Figenbaum, Kolbenstvedt, & Elvebakk, 2014). This is not surprising considering findings from objective data on everyday mobility patterns (Infas & DLR, 2010; Needell, McNerney, Chang, & Trancik, 2016) and findings from psychological studies that demonstrate the discrepancy between objective range needs and reported range preferences by lay people (Franke & Krems, 2013).

In early 2016, we conducted an online survey with 284 new car buyers in Germany. Our aim was to investigate possibilities to lower the perceived range barrier for lay people. We included a discrete choice experiment in the survey, in which we presented range with two different displays as an attribute in the choice experiment. One half of the sample received the range displayed in kilometers (range display A). The other half received the range displayed as public charging requirement per month (range display B), which we calculated based on average car driving patterns from Germany. For data analysis, we performed mixed-logit models. We performed further correlative analyses of socio-demographic, contextual, and psychological predictors of range perception. We found the odds ratio to be the highest of all attributes included in the choice experiment with range display A, but to drop significantly (and below other attributes) with range display B.

Our results suggest that policy makers and electric car manufacturers should debunk the range myth by communicating range in a way that makes implications for everyday usage more transparent to lay people. Researchers should further investigate the range myth and its underlying psychological effects in order to identify appropriate communication measures for the promotion of electric cars.

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050 Abstract electric vehicle rental and EV-adoption

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Keywords: Electric vehicle adoption; car rental; Transtheoretical Model of Change

Abstract:

Introduction: Despite the fact that large-scale deployment of electric vehicles (EVs) has societal benefits such as health benefits and environmental benefits, adoption rates are still low. In the Swedish island of Gotland, the project Elbilslandet has been launched in order to provide charging infrastructure to make the island “EV-proof” and stimulating rental companies to rent EVs. This study is connected to the project.

Theoretical background: The aim of this study is to investigate the role of car rental during summer vacations in the process of electric vehicle adoption. For this study, constructs from the Transtheoretical Model of Change (Prochaska et al., 1991) as well as the Protection Motivation Theory (Rogers, 1975) have been used to investigate the process of and motivations for changing from internal combustion engine vehicle (ICEV) to EV. The research questions are whether people in different stages-of-change have a different likelihood to rent an EV rather than an ICEV and whether people renting an EV have a higher likelihood to go to more advanced stages-of-change.

Methods: Right after the car rental in Gotland, the respondents (N=158 for 2015 and 2016) were asked to participate in a survey in which they answered to socio-cognitive, behavioural and socio-economic questions. After 12 months, they participated in a follow-up questionnaire where the socio-cognitive questions were repeated in order to investigate whether there are any observable changes.

Results: At the moment of rental, the persons renting an electric vehicle were on average in a more advanced stage-of-change towards electric vehicle adoption (Mann Whitney-U-test). 11 percent of the respondents renting an electric vehicle were in the pre-contemplation stage, whereas 30 percent of the respondents renting a gasoline vehicle were in the pre-contemplation stage. Persons renting EVs have also reported to have a significantly higher level of knowledge about EVs and think more positively about

the instrumental aspects of EV-use. For example, they think that EV-use is cheaper and value the range problems as less important.

Twelve months after EV-rental, based on preliminary results, there is a trend of respondents moving to a more advanced stage-of-change. One third of the respondents have moved to a more advanced stage-of-change, two respondents have moved to a less advanced stage-of-change and the other respondents have stayed equal. Three respondents have adopted an electric vehicle within the period between the first survey and the follow-up questionnaire. All people having rented an ICEV did not change stage-of-change. A follow-up questionnaire for the 2016-cohort will be added to the analysis early 2017.

Conclusions: Based on this study, EV-rental reaches people that are already considering changing to an EV and there seems to be a trend of people renting an EV to move to more advanced stages-of-change within one year.

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223 The assessment, acceptance and implication of the use of different autonomous e-cars

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Keywords: autonomous e-cars, innovation, acceptance, environmental consequences

Abstract:

Greenhouse gas emissions from the transportation sector, especially from private one, are one of the main reasons for global climate change (IPCC, 2014). In addition to the importance of mobility behaviour change, technological innovations such as electric driven cars (e-cars) are developed as an environmental friendly travel mode alternative to address the ecological problem of the transportation system in the private and public sector. Lately, innovations in this area went further and focused on autonomous e-cars, which are predicted to be widely adapted in roughly 20 years from now (Beiker, 2015). Though autonomous cars are highly anticipated, it is still an open question, how they are going to be used: whether they are widely shared or individually used to commute, providing that autonomous cars offer the possibility to for instance work while being driven. Yet, very few is known about the acceptance to share or carpool autonomous cars and the corresponding social, ecological and financial implications for its users and society in general.

Comprehensive research concerning different mobility concepts (e.g. Grischkat et al., 2014, Schaefers, 2013) and innovative concepts such as the e-car (Noppers et al., 2015) have been conducted. However, the innovative character of an autonomous e-car reveals a new area in the mobility field of psychological based research. This study applies theories such as *diffusion of innovation* (Rogers, 1983), the *norm-activation-model* (Schwartz, 1977) and reverts to concepts such as *values, norms, goals and motives* from research with the focus on e-cars and pro-environmental behaviour (Noppers et al., 2015; Perlaviciute & Steg, 2014; Steg, 2005).

Based on an online survey, (estimated 100) car drivers will be asked about their daily mobility patterns (including travel related information like time, length, cost, congestion). Based on this individual mobility analysis, the participants will be randomly introduced to one of three future concepts of an autonomous e-car usage (individual, shared or pooled). They also will be provided with expected consequences when using the new type of car e.g. less costs, more productive time, less carbon emissions. The likelihood to use the new type of car and additional variables (e.g. subjectively estimated environmental, social, financial, comfort, and time consequences) will be evaluated. The data will be statistically analysed to detect differences in the assessment, the acceptance and likelihood to use or buy one of those new driving opportunities.

The authors expect detailed insights into the prospective autonomous e-car user's behaviour. Answers will be given concerning the preferred mobility concept, the evaluation of the environmental impact and the role of commuting-time, cost and social matters. Due to the ongoing recruiting process, results and implications will be fully available within the next months.

In one of the first attempts so far the impact of a self-driving-vehicle system which is pushed by technical innovations from industry and policy will be assessed. Hence, the environmental impact of these new ways of commuting can be reconsidered. Therefore, it seems to be valuable to set up studies which estimate the potentials and drawbacks of that new mobility era.

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072 Who is Likely to Travel by Air? An Analysis of Attitudes, Socio-Economic Factors and Travel Opportunities

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Keywords: Air travel, distance to airport, airport access, spatial data, environmental concern, income, partisanship

Abstract:

Air travel for private purposes has increased sharply over the past decades and causes a non-negligible amount of greenhouse gas emissions. Therefore, it is important to know its determinants. The present study examines socio-demographic, spatial and attitudinal predictors of air travel for private purposes.

The analyses are based on data from the Swiss Environmental Survey 2007 and a subsequent computation of the respondents' environmental impact by air travel, as well as spatial data from various sources.

A lognormal hurdle model indicates that persons with higher environmental concern are less likely to travel by air and if they still do, they travel less. While political orientations do not affect whether a person travels by air, the results indicate that among those who do fly, respondents voting for the Green Party cause lower emissions than those opting for other left or center parties. Furthermore, higher incomes are associated with more air travel whereas living with children is associated with less air travel. Being young and in good health are further predictors of increased air travel. In addition to these socio-demographic and attitudinal characteristics, airport access is also related to air travel in the sense that living closer to airports, in particular to large ones, is correlated to more air travel. The result is robust to alterations of the accessibility measure used and also upholds when population density is controlled for. Thus beyond urbanity, access to travel opportunities is a relevant predictor of air travel.

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098 A systematic review and meta-analysis of psychological correlates of travel mode choice

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Keywords: travel mode choice, systematic review, meta-analysis

Abstract:

Reduced private car use can limit greenhouse gas emissions and improve public health. Social-psychological research has identified a range of potentially-modifiable cognitive mechanisms that can be targeted in soft interventions (Bamberg, Fujii, & Gärling, 2011; Richter, Friman, & Gärling, 2010). It is unclear, however, how promotion of alternative transport choices can be optimised. Recent reviews revealed that evidence of effectiveness of car use reduction interventions is sparse (Arnott et al., 2014; Graham-Rowe, Skippon, Gardner, & Abraham, 2011; Macmillan, Hosking, Connor, Bullen, & Ameratunga, 2013). A systematic review and meta-analysis was conducted to identify those potentially-modifiable cognitive mechanisms that have been related to car use and use of alternative transport modes. The review highlighted the wide range of mechanisms and the limited number of theories used to conceptualise these. A qualitative synthesis of measures of potentially-modifiable mechanisms based on 43 studies yielded 26 conceptually-distinct mechanism categories. Included studies were assessed to be of low to moderate methodological quality. Meta-analyses of associations between these mechanisms and car use/non-use generated 205 effects sizes (Pearson's *r*) from 35 studies. The strongest correlates of car use were intentions, perceived behavioural control, attitudes and habit. The strongest correlates of alternative transportation choices were intentions, perceived behavioural control, and attitudes. Findings support continued use of the Theory of Planned Behaviour (Ajzen, 1991) but offer less support for mechanisms derived from the Norm Activation Model (Schwartz, 1977). Heterogeneous measures of both, change mechanisms and of driving and use of alternative transport modes, were employed across the included studies. In particular, the range of attitude measures identified emphasises that the importance of attitudes critically depends on what type of attitude is being investigated. Notably, drivers' environmental and health-related attitudes did not have strong associations with car use.

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FACTORS INFLUENCING THE EFFECTIVENESS AND ACCEPTABILITY OF ENVIRONMENTAL POLICY

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Theme: Individual factors underlying environmental attitudes and behaviour

Abstract:

To reach the targets set in the Paris climate agreement, environmental policy interventions are required to promote behaviour change on a broad scale. A key question is how to design policies that are both effective at promoting behaviour change and acceptable to the public. This symposium will discuss which individual factors – such as values – and policy characteristics – such as framing – affect the effectiveness and acceptability of policy.

Geertje Schuitema and Carla Rodríguez Sánchez will explore the role of emotions in the acceptability of water charges introduced in Ireland. They will discuss how the strength of positive or negative emotions, such as anger, can predict the acceptability of policies with personal financial implications. They will discuss the importance of focussing on affective factors, rather than purely rational arguments, in policy communication.

Julia Steinhorst will present on how promoting pro-environmental behaviour in the private sphere may promote pro-environmental behaviour in the public sphere, such as policy support. Specifically, she will discuss how the framing of energy-saving messages can affect domestic energy saving behaviour. In particular, she will provide insights into how these framing effects not only influence targeted behaviour but may also spill over to policy support.

Nadja Zeiske will discuss the motivational impact of policy framing within the context of sustainable travel behaviour. She will present her longitudinal research on the effectiveness of financial incentives, in combination with individual factors, notably values and identity, in promoting engagement in sustainable travel behaviour. Particularly, Nadja will focus on how different goals of financial incentives can affect people's motivation to travel with sustainable modes of transport.

Daniel Sloot will discuss how different goals (such as financial, social, or environmental) can motivate people's interest in environmental community initiatives. He will particularly focus on the relative importance of social and environmental goals in comparison to financial goals. These results provide insights for policy makers and practitioners into the factors that stimulate interest and engagement with environmental initiatives and policies.

Elliot Sharpe will explore the effectiveness of self-persuasion techniques in increasing policy acceptability. He will demonstrate that asking people to reflect on the importance of their pro-environmental values may not be an effective strategy for increasing policy acceptance. Based on findings from experimental research, he will discuss the implications for value theory and policy communication.

Each researcher will discuss their results as part of their individual presentations. To close the symposium, Nadja Zeiske and Elliot Sharpe will discuss links between the individual presentations and draw overarching conclusions about how to apply the research in the design and implementation of environmental policy.

158 Acceptability of political measures for the German energy transition - Spillover effects due to environmental vs. monetary framing of behavioural information

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Keywords: monetary framing; acceptability of environmental policies; personal norm

Abstract:

Introduction: The acceptability of low carbon policies, is an important precondition for societal transformations, such as the German Energiewende. This long-term experimental study examined potential spillover effects on the acceptability of low carbon policy measures due to environmental vs. monetary framing of electricity saving tips.

Theoretical background: Environmental interventions usually aim at promoting a broader set of pro-environmental behaviours, rather than just the one targeted. This implicit assumption that the promotion of one pro-environmental behaviour will increase chances of further pro-environmental behaviour (positive spillover) has been supported empirically under certain circumstances only, e.g. due to environmental priming (Evans et al., 2013). While spillover effects have mainly been studied for behaviour in the private sphere (e.g. saving electricity), there is a need for research regarding behaviour in the public sphere (e.g. the acceptability of low carbon policies), due to its potentially higher environmental impact (Stern, 2000). Behaviour in the private sphere has been shown to correlate with high-impact behaviour in the public sphere (Stern, Dietz, Abel, Guagnano, & Kalof, 1999; Thøgersen & Noblet, 2012; Tobler, Visschers, & Siegrist, 2012; Willis & Schor, 2012). To date, however, there is a need for experimental evidence. Furthermore, the reasons for the occurrence of positive spillover have not yet been completely uncovered. Positive spillover has been shown to vary with the strength of a person's pro-environmental norms (Thøgersen, 2004; Thøgersen & Olander, 2003) and the type of the value or goal (environmental vs. monetary) that is made salient (Evans et al., 2013; Spence, Leygue, Bedwell, & O'Malley, 2014).

Methods: Clients of a local German energy provider were randomly assigned to repeatedly receive electricity saving tips with environmental framing (saving potential in CO₂) or monetary framing (saving potential in €). The control group did not receive any tips. Two follow-up surveys four (N= 333) and nine months (N=258) later assessed the acceptability ratings for low carbon policies (infrastructure changes for renewable energy and subsidization). The personal ecological norm for saving electricity was measured prior to the intervention.

Results: Analysis of variance and non-parametric methods revealed no main effect due to framing. However, there was an interaction effect between type of framing and the (prior) personal ecological norm for electricity saving. Participants with a high personal ecological norm reported higher low carbon policy acceptability in the environmental framing group than the monetary framing and control group. For participants with a low personal ecological norm, however, there were no framing effects, except a delayed negative effect on the acceptability of subsidization, possibly due to reactance.

Conclusions: The results of the present study indicate that promoting pro-environmental behaviour in the private sphere can, under certain circumstances, increase chances for further pro-environmental behaviour in the public sphere. This positive effect is observable under environmental framing only, especially when environmental aspects are morally important to the addressee. Thus, environmental framing should generally be preferred over monetary framing, because the latter can limit desired spillover effects.

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264 The motivational impact of smart incentives to promote sustainable behaviour

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Keywords: intrinsic motivation; smart incentives; sustainable behaviour

Abstract:

Global environmental problems stem for a large part from human activities. Mitigation of such problems therefore can be realised if people consistently engage in sustainable behaviours. To motivate people to act sustainably, various incentives can be implemented. Current measures to encourage sustainable behaviours often rely on incentives that target people's extrinsic motivation; that is, their motivation to engage in sustainable behaviour in order to attain some external desired outcome, such as monetary rewards. Such incentives often come with negative side effects, notably the crowding out of intrinsic motivation, resulting in mere short term behaviour changes, as well as tainting people's moral self-image, which may even cause the incentive to backfire (Bolderdijk & Steg, 2015). Recent research has proposed that incentives that target and strengthen people's intrinsic motivation are more effective in stimulating a range of durable sustainable behaviours (Bolderdijk, Steg, Geller, Lehman, & Postmes, 2013; Schwartz, Bruine de Bruin, Fischhoff, & Lave, 2015). The question remains how incentives can be designed and framed to strengthen people's intrinsic motivation to promote engagement in a range of sustainable behaviours. The current research aimed to test the motivational impacts of incentives to promote sustainable behaviours, and how people's intrinsic motivation can be strengthened and secured. In line with previous research on the influence of people's normative considerations on sustainable behaviour, we expect that incentives that emphasize the environmental goal behind the desired sustainable behaviour, as well as link the engagement in the sustainable behaviour to an individuals' environmental values and self-identity, may be particularly effective in targeting and strengthening people's intrinsic motivation act sustainably. Across two experimental studies, we examined the effects of differently framed incentives on participants' intrinsic motivation to engage in various sustainable behaviours. Our results provide first insights into the motivational impacts of smart incentives to promote sustainable behaviours, and how such incentives may be designed and framed in order to strengthen people's intrinsic motivation to engage sustainable behaviour. Future research and implications are discussed.

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274 Trust and emotions as motivators of policy acceptance: The case of the Irish water charges

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Keywords: Policy Risk, Public Acceptance, Emotions

Abstract:

Introduction: Lack of public acceptance to certain policies is often the result of high perceived risks or a lack of benefits associated with such policies (Lubell et al., 2006), which is referred to as 'policy risk': "a regulation or policy that may present economic, environmental or social risks to an individual or enterprise" (Niles et al., 2013, p. 1752). While most research on policy acceptance has focused on public's

cognitive or moral evaluations, little attention has been paid to the affective determinants of policy acceptance. This study addresses this gap by investigating the role of trust and emotions in public acceptance of a new water charges recently introduced in the Republic of Ireland.

Theoretical background: Building on research from adjacent disciplines (e.g. Midden & Huijts, 2009), we argue that trust and emotions toward a risk policy can evoke an affective pathway (affect heuristic process) that determines their evaluations of risks and benefits generating the basis of acceptance judgment, particularly in uncertain or new self-relevant situations. We tested this in the case of the water charges that were introduced in Ireland in 2015 since their introduction was considered to have major personal consequences for people and lead to large scale public demonstrations and boycotts.

Method: Survey study (N=505) using structural equation modeling, multigroup analysis and regression with different objectives.

Results: Results of the structural equation modeling showed that general trust in government can shape emotions regarding water charges, which in turn, directly and via perceived risks and benefits, influenced policy acceptance. In addition, due to the important role of emotions in the empirical model we analyzed which specific ones are the most relevant for policy acceptance. In the case of the Irish water negative emotions were much stronger and more important than positive emotions, "anger" being the most significant one, followed by "hostile". "Relaxed" and "enthusiastic" were the most important positive emotions related to acceptance of the water charges. In addition, a multigroup analysis to analyze the moderating effect of knowledge in this process showed a limited moderating effect, indicating that knowledge levels did not play a strong role in the relationships of the model to explain policy acceptance of the water charges.

Conclusions: Overall, our results indicate that trust and emotions can steer the perception of risks and benefits, suggestion emotions are often justified with rational argument in terms of costs and benefits. This has important practical implications, as communication strategies often focus on rational arguments. Our results suggest that they should take affective factors much more into account too in communication strategies.

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306 Public acceptability of energy transitions: Why addressing concerns may not always be effective

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Keywords: acceptability of energy transitions; values; motivated reasoning

To mitigate the effects of climate change it is important to transition towards a sustainable energy system. However, the public acceptability of energy system changes can be a barrier to achieving a sustainable energy transition. Therefore, it is important to research factors that influence the acceptability of energy sources and strategies for increasing support for a sustainable energy transition. The acceptability of energy sources depends on the extent to which they are expected to affect people's core values (Perlaviciute & Steg, 2015). For example, those who strongly endorse biospheric values (valuing the environment) give positive evaluations of renewable energy because it is expected to have positive implications for these values, such as reductions in carbon emissions. In contrast, those who strongly endorse egoistic values (valuing personal gain) give negative evaluations of renewable energy because it is expected to have negative implications for these values, such as high financial cost and intermittent energy supply. It is assumed that people are subsequently

motivated to evaluate energy sources as either wholly positive or wholly negative in line with their initial value-based judgements. As result, they may form judgements about consequences of energy sources that are not important to them given their values. For example, those who strongly endorse egoistic values appear to give negative evaluations of renewable energy primarily based on implications for their egoistic values in terms of financial cost and intermittency. However, to support their value-based judgements, they may also argue they do not support renewable energy because they do not believe that it will have important positive environmental consequences. Addressing such pseudo concerns may not increase acceptability because they do not reflect that actual concerns that drive evaluations of energy sources (cf. Steg, Perlaviciute, & Van der Werff, 2015). As yet, this assumption has not been empirically tested. Through use of experimental studies, the present research empirically tests the effect of providing information to target these pseudo evaluations on the acceptability of energy sources. We expect that addressing concerns about the possible benefits of energy sources that are not key to people given their core values will not enhance acceptability, whereas arguments that do address key concerns will. We will also explore perceptions of the persuasiveness of arguments that either address people's value-based evaluations or address evaluations not key given people's important personal values. Notably, based on Social Judgement Theory (Sherif, Sherif, & Nebergall, 1965) we argue people will reject information that does not match their initial position. Thus, people may not consider arguments that do not align with their value-based judgements as persuasive. Results indicate why rational arguments addressing people's concerns about consequences of energy sources may not always be an effective strategy for increasing acceptability, particularly when these arguments do not address concerns related to people's key values. In providing a deeper understanding of how core values drive evaluations of energy sources, the current research provides novel insights into developing effective strategies for framing and communication of energy policy.

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362 'I may join if we want the same!' - Goal congruence stimulates interest in environmental community initiatives

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Keywords: motivational goals; goal congruence; interest in sustainability initiative

Abstract:

Environmental community initiatives are seen as an increasingly popular way of stimulating a sustainable energy transition. Initial research has provided evidence that these initiatives may indeed promote sustainable behaviours, such as energy use. But how are these initiatives created, and why do other community members become interested in being involved in them? What is the importance of communicating the initiatives' initial goals to potential members? So far, research has largely focused on individual motivations (e.g., biospheric values or goals) in explaining why people engage in sustainable behaviours, such as joining an environmental community initiative (Steg et al., 2014; Stern et al., 1999). However, community initiatives bring people together to act towards group (e.g., community) goals, rather than only realising goals individually. This indicates that a focus on individual motivation only might be too narrow – rather, it should also matter what the community initiative itself stands for. In line with this, recent research has suggested perceived congruence between one's own and others' motivations might be an important basis for subsequent engagement in group behaviour (Smith & Postmes, 2011; Smith et al., 2014). Based on this, we propose it is not only an individual motivation that predicts whether community members become interested in a newly forming community initiative. Rather, the fit, or congruence, between one's own goals and what goals one perceives the initiative to strive for, could be an important factor in predicting the interest to become involved.

We present a correlational field study ($N = 130$) in a newly forming community energy initiative. Specifically, we asked community members about the extent of their own goals (e.g., financial, environmental, or community motivations) in potentially joining the initiative, and to what extent they perceived the initiative takers to hold these same goals. We conducted polynomial regression analysis to analyse how the congruence between own goals and perceived initiative takers' goals predicted initial interest in the initiative. Results corroborated our expectations: Higher congruence in environmental and community motivation were significantly associated with a stronger interest in the community energy initiative. Conversely, congruence did not have an effect in the case of financial motivations to join such an initiative. These insights advance the literature on value and goal congruence and extend their application to a novel behavioural context. Furthermore, these insights are important in informing policy makers and practitioners in better facilitating environmental community initiatives, and communicating their goals to potential members in an effective way.

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SUSTAINABLE FOOD CONSUMPTION II

031 Visioning a green future or longing for the good old days? Basic drivers of organic food consumption in Europe

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Keywords: Values; organic food; consumption**Abstract:**

For environmental and animal welfare reasons, organic food production abandons chemical pesticides and fertilizers, GMOs, and a range of modern intensive husbandry technologies. This means that some consumers may think of organic food production as traditional, pre-industrial agriculture, others as a new and innovative trend. Research on why consumers buy organic food has mainly focused on their possible self-interested versus ethical motives. There is little research on whether organic food is viewed as modern and innovative or as traditional and conservative food products – as a means to slow down the pace in a longing for the “good old days” or to increase the pace of transformation towards a green future? To answer this question, this paper examines how organic food consumption relates to European consumers’ basic value priorities and whether these relationships are the same or different across countries in Europe. Data come from a survey of a representative sample of adults from 10 European countries (N ≈ 1000 from each country). Organic food consumption is measured with three items (tomatoes, eggs and milk). Human values are measured by a short, 21-item version of Shalom Schwartz’s Picture Values Questionnaire (PVQ). For this study, the 21 items were reduced to the four main value dimensions: Self-enhancement, self-transcendence, conservation, and openness to change. Response tendencies were controlled by means of the average of all 21 items. In the main analysis, nine country-dummies were included first, followed by the response-tendency index, followed by three of the four main value dimensions (self-enhancement did not reach significance in any of the 10 countries). Finally, the 2-way interactions between country dummies and the three value orientations were included. Because of the large number of interaction terms, SPSS’s “stepwise” procedure was used for the last step, meaning that only interactions that were statistically significant when controlling for the formerly mentioned variables entered the analysis. The key findings were that (a) self-transcendence has a positive and conservation a negative direct effect on organic consumption, and (b) there are some country-specific effects, revealed by significant interactions between country-dummies and value dimensions. Specifically, (1) in Poland and Spain, conservation values are less and in Denmark more (negatively) related to organic food consumption, (2) in UK and France, organic food consumption is positively related to openness to change, and (3) in Denmark and the Netherlands, self-transcendence values have a significantly stronger impact on organic food consumption than in the other countries. The results suggest that organic food is not consumed because of its consistency with traditional values, on the contrary, they are more likely to be demanded by consumers scoring low on conservation values and, in some countries, high on openness to change. In addition, consumers buy them because of their environmental and ethical benefits, as revealed by the positive relationship with self-transcendence values. Implications for the understanding and promotion of organic food consumption are discussed.

057 Assumptions regarding low-CO2 products: halo effect and its consequences

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Keywords: Sustainable food; Halo effect; Implicit attitudes**Abstract:**

Introduction: Climate change, largely brought about due to greenhouse gas emissions, is one of the most serious issues facing society. A part of these emissions is indirectly related to consumer choices, through the emissions embedded in the products they chose, particularly food (Bin & Dowlatabadi, 2005). The present empirical work aims at establishing the presence of a halo effect regarding sustainable products and at investigating its consequences.

Theoretical background: A halo effect is described as the phenomenon where an object or a person is assumed to possess positive (or negative) attributes because it is described as possessing another (unrelated) positive (or negative) attribute (Thorndike, 1920). Previous research has shown that information regarding the sustainability of a product (e.g., organic vs non organic food) can result in positive or negative assumptions (Lee, Shimizu, Kniffin, & Wansink, 2013; Schuldt & Hannahan, 2013). Here we want to investigate potential halo effects at various levels of information processing (explicit and implicit), and focus on information regarding CO₂ emissions.

Methods: In two experiments we manipulated the information presented to participants regarding a fictitious meat brand. In the sustainable condition, the production, packaging, and transport of the meat resulted in high emissions of CO₂. In the unsustainable condition they resulted in low emissions of CO₂. All other information regarding the meat (e.g., quality, price) was kept the same in both conditions.

Results: Both studies reveal a halo effect at the explicit level due to information regarding the amount of CO₂ emissions involved in the production: beef described as being low in CO₂ (sustainable) was assumed by participants to be healthier and tastier than beef described as being high in CO₂ (unsustainable), even if these aspects are not influenced by the level of CO₂ involved in the meat production. In addition, in study 1 (N = 100) these assumptions were found to be the driver of subsequent decisions regarding purchase: participants wanted to pay more for the sustainable product than for the unsustainable one, and this effect was mediated by the evaluations of taste and healthiness of the product. In study 2 (N = 100), we observe that these effects carry on at the implicit level, where we observed stronger associations between the sustainable beef and (good) taste-related words on a Single Category IAT.

Conclusions: Halo effects resulting from environmental claims can affect behaviour and penetrate implicit levels of processing. Taken together these effects confirm and extend evidence that environmental claims are useful in encouraging people to make sustainable choices.

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095 Consumer drivers of change towards more sustainable diets

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Keywords: sustainable diets; consumer behaviour; determinants

Abstract:

Introduction: Contemporary European diets face many sustainability challenges. Technological progression can help in achieving a more sustainable food system, but will not be sufficient. In addition, dietary changes are needed. The SUSFANS-project aims to strengthen food and nutrition security in Europe, by advising food policy makers regarding healthy and sustainable food production and consumption. As a part of this project, the current research aims to identify the main determinants of various types of sustainable food consumption across different European countries, in order to identify promising pathways towards more sustainable diets.

Theoretical background: Consensus exists about the desirability of a switch towards less animal-based and more plant-based diets, which would benefit not only sustainability, but also health. Another pathway towards more sustainable diets is the consumption of food products that have been produced in a sustainable way (e.g. local products) (Reich, Eberie & Lorek, 2013; Verain, Dagevos & Antonides, 2015). From the literature we know that demographics, general drivers, specific drivers and food choice motives are important determinants of sustainable diets.

Methods: A web-survey has been conducted on determinants of sustainable food behavior in a representative sample in five European countries (NL, DK, CZ, FR and IT; total n= 5043).

Results: Consumers mainly perceive sustainable food in terms of the environmental aspects and less in terms of social and economic aspects, but these perceptions vary across countries. Self-reported intake was highest for seasonal/local food, followed by free range products/products with a sustainability logo/eating smaller portions, followed by organic/fair trade products. Consumption of meat-free meals is the least common sustainable food behavior. When asked about their openness to different types of meat replacements, consumers were most open to animal-based alternatives to meat (fish, cheese and eggs), followed by plant-based alternatives (e.g. nuts, legumes), and least open to new products (insects and in vitro meat). Openness for alternatives to meat is mainly determined by general food drivers (e.g. food neophobia), specific sustainability and health drivers (e.g. attitudes towards sustainable food consumption) and demographics (e.g. gender). The main determinants for self-reported sustainable food behaviours and willingness to pay for sustainable food products are merely determined by specific drivers for sustainable food (e.g. attitudes towards sustainable food consumption) and sustainability motives.

Conclusions: We can conclude the consumption of seasonal fruits and vegetables is the sustainable behavior that is most often performed, whereas the reduction of meat is least popular. The degree to which consumers are open to sustainable diets depends on their demographic as well as psychographic characteristics, but the determinants differ across different types of sustainable behaviors. Implications for food policies are formulated to effectively stimulate sustainable diets in Europe.

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100 Food waste as the consequence of conflicting household management goals

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Keywords: consumer behaviour; food waste; conflicting goals

Abstract:

There is more food in the world than required to feed us all, and yet there is not enough to feed humanity. This is the consequence of the large amounts of food being wasted across the food chain. Consumers are the main contributor to food waste in higher income countries, but deeper understanding of why they waste food is still only partial. So far, it is known that most consumers waste food despite their motivation to prevent it. Additionally, it is known that household food waste is the consequence of an accumulation of household behaviours performed scattered over time. This suggests that acting upon the motivation to reduce waste may be hampered by barriers in the household consumption context. Using the motivation, abilities and opportunities framework (MOA, Ölander and Thørgersen, 1995), this study qualitatively explores the barriers consumers face while trying to prevent household food waste.

Twenty-four focus groups were conducted, equally divided over The Netherlands, Germany, Hungary and Spain and with a total of 147 participants. Each focus group first discussed a homework assignment, to raise the participants' awareness of their own food waste situation. Subsequently, the discussion focussed on motives to prevent and generate food waste, feelings when wasting food, as well as barriers to prevent food waste in terms of abilities and opportunities. Finally, it was explored to what extent the acceptability of wasting food differed for different types of food products, and across different day-to-day situations. The data was analysed through standard content analysis procedures, using Nvivo Software.

We found that participants were motivated to prevent food waste primarily due to foods' monetary value and because they considered wasting food morally wrong. Dominant emotions related to wasting food were sadness and guilt. However, it was reported that considerable amounts of food are still wasted, mainly due to the taste, quality or quantity of the food. Interestingly, when discussing this more thoroughly, it

appeared that participants act upon a variety of goals while managing food in the household and that these goals are often in conflict with food waste prevention. In day-to-day situations, participants reported to feel limited in their ability to align intended food waste prevention with these other goals due to barriers in skills and knowledge regarding handling food. Additionally, participants feel constrained in their opportunity to align the goals due to limited available time and energy, their social and work life, household dynamics and products offered in the supermarket.

To conclude, participants feel motivated to prevent food waste but struggle with other more prioritized goals related to managing food in the household. They experience barriers in their abilities and opportunities to act upon these prioritized goals and food waste prevention. Therefore, household food waste seems to be the consequence of acting upon conflicting goals while managing food in the household.

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SSII-02 SYMPOSIUM:

Room: +1.2

THE POTENTIAL OF MINDFULNESS FOR CHANGING ENVIRONMENTAL BELIEFS AND BEHAVIORS

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Theme: Individual factors underlying environmental attitudes and behavior, underlying motivations of individual's involvement in environmental behavior, Quality of life and well-being, Environmental education for sustainability

Abstract:

In recent years, multiple benefits of mindfulness meditation training have been scientifically evidenced (Brown, Ryan, & Creswell, 2007; Grossman, Niemann, Schmidt, & Walach, 2004) and recognised by an ever wider audience. With regards to environmental issues, there is emerging evidence that mindfulness meditation practice and resulting mindfulness can increase environmental behaviour (e.g. Barbaro & Pickett, 2015; Brown & Kasser, 2005; Jacob, Jovic, & Brinkerhoff, 2009). However, research on how mindfulness, that is, a greater awareness for momentary experience, would lead to more responsible behaviour with regards to environmental issues leaves a fragmented picture (Fischer, Stanzus, Geiger, Grossman, & Schrader, submitted). A number of different mediators for the supposed relationship have been proposed (Ericson, Kjønstad, & Barstad, 2014) and empirically investigated in the few existing studies on the subject such as materialistic values and wellbeing (Brown & Kasser, 2005), compassion and connectedness to nature (Barbaro & Pickett, 2015).

In this symposium we seek to further explore the relationship between meditation practice, mindfulness, environmentally beneficial attitudes and beliefs and according behaviour. The first contribution by Guiseppe Carrus et al. will present evidence for a mediation of the influence of mindfulness through reduced social dominance orientation, which in turn is a negative predictor for ecological behaviour and belief in climate change (Jylhä & Akrami, 2015). In the second contribution, Elena Sautkina will address the research gap concerning the role of compassion as a mediator, that has shown to be an outcome of mindfulness meditation training (Lim, Condon, & DeSteno, 2015) and independently, to have a positive influence on pro-environmental intentions (Pfattheicher, Sassenrath, & Schindler, 2015). The third contribution by Anna Mikhof will present data from a large cross-sectional study supporting a sequential chain from meditation practice through mindfulness and reduced stress to reduced materialism, which result in a greater-

wellbeing (Dittmar, Bond, Hurst, & Kasser, 2014). In the fourth contribution, Sonja Geiger et al. will present results of an experimentally controlled intervention study comprising an 8-week training in mindfulness meditation practice. The presentation will focus on the outcomes in wellbeing, compassion, material values and sustainable consumption.

While this symposium unites a variety of insights from four independent research groups, it shows a significant commonality of topics and approaches. This will allow us to draw joint conclusions about the potential of mindfulness for supporting ecologically sustainable beliefs and behaviours, while also producing collateral individual benefits, such as improved wellbeing, and social benefits resulting from less materialistic and more compassionate attitudes. The usefulness of mindfulness training in environmental education will be discussed.

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060 Environmentally significant outcomes of a mindfulness-base meditation intervention study: the connection of materialism, compassion and sustainable consumption

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Abstract:

The search for effective approaches to promote ecologically and socially sustainable consumption patterns is still an urgent matter in face of unchanged environmental deterioration. Current research results suggest that mindfulness experiences could be such an approach for strengthening sustainable consumption, albeit mostly based on correlational data (Fischer, Stanzus, Geiger, Grossman, & Schrader). Evidence from experimental studies on the effectiveness of meditation for sustainable consumption is sparse to date. Three potential mediators that have shown to be related to mindfulness on one side while being positively related to ecological behaviour: materialistic values (Hurst, Dittmar, Bond, & Kasser, 2013), connectedness to nature (Mayer & Frantz, 2004) and compassion (Pfafftheicher, Sassenrath, & Schindler, 2015) were tested in such an experimental design. Co-benefits of mindfulness in form of increased subjective well-being were also investigated (Brown & Ryan, 2003).

In our three-year research project on sustainable consumption through mindfulness training (BiNKA – acronym from the German title), the effects of a mindfulness meditation training on sustainable consumption and related variables have been investigated with an experimental pre-post study design, allowing to draw causal conclusions. The treatment (n=76 experimental condition, n=84 wait control) included an 8-week long mindfulness-based meditation training with a subtle adaptation to consumption topics. Sustainable consumption itself was measured in the consumption areas of

nutrition and fashion with self-report questionnaires, like the other variables before and after completion of the training.

Although preliminary analyses (with $n = 64$ having completed the meditation training and surveys to date) suggest that there are no significant increases in sustainable consumption itself, materialistic orientations seem to have decreased from meditation practice and well-being of participants has increased. The usefulness of mindfulness based meditation trainings as a means for environmental education will be discussed. In absence of direct beneficial effects on sustainable consumption, mindfulness meditation might still be beneficial for creating the change in values necessary for more sustainable societies.

Keywords: mindfulness, sustainable consumption, compassion, material values, subjective well-being, environmental education

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132 Mindfulness is related to eco-friendly behavior through social dominance

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Keywords: Mindfulness; Social Dominance Orientation; Pro-environmental Behavior

Abstract:

The urgency to reduce human's ecological footprint is boosting research concerned with promoting pro-environmental behaviour (Intergovernmental Panel on Climate Change – IPCC, 2015). In recent years, mindfulness has been considered as a potential source of ecologically friendly attitudes and behavior. Present research is aimed at consolidating and expanding previous knowledge by proposing that mindfulness is related to both pro-environmental behavior and belief in global climate change through social dominance orientation. In particular, we advance that mindfulness could be associated with reduced social dominance orientation (SDO), which, in turn, has a negative relationship with ecologically friendly inclinations.

A first study has been conducted on undergraduate students ($n = 279$) and found, as expected, that trait mindfulness was related to pro-environmental behavior through SDO. A second study using a known-groups approach compared practitioners and non-practitioners of Buddhist meditation, which is known to develop a mindful stance. Moreover, in the Study 2 a measure of belief in global climate change was adopted as a further outcome. Again, trait mindfulness was related to pro-environmental inclinations (pro-environmental attitude and belief in global climate change) through SDO. Theoretical and practical implications are discussed.

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288 Meditation: More happiness and less materialism? Experience differences and mediator effects

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Abstract:

While materialism seems to be related with numerous dysfunctional tendencies (Dittmar, Bond, Hurst & Kasser, 2014), a lot of positive effects of meditation have been identified in the field of health, work and relationships (Goyal, Singh, Sibinga, Gould, Rowland-Seymour, Sharma et al., 2014). Against this backdrop, and the hardly empirically investigated relationship between meditation and materialism, we conducted an online study with a meditating sample (n= 240). We found significant differences with regards to all assessed meditation dimensions, meditation depth, mindfulness, psychological well-being and self-esteem. While men reported more obstructions in the meditation practice, meditating women showed stronger tendencies for ecological care and pro-vegetarian attitudes.

Materialism correlated negatively with meditation experience, mindfulness, physical and psychological well-being, autonomous self-construal and life satisfaction. Moreover, we found evidence for indirectly attenuating effects of meditation on materialism. While the relationship between meditation and possession orientation as well as possession based success is sequentially mediated via mindfulness and stress, mindfulness, stress and life satisfaction function as sequential mediators for the effect of meditation on possession based happiness.

The findings suggest a protective effect of means and goals of being (meditation) on goals of having (possession) and a positive relationship between meditation and other goals of being (e.g. mindfulness, self-esteem, ecological care). Causal relationships will be examined in future experiments.

Keywords: meditation, materialism, mindfulness, self, stress, well-being, life satisfaction, ecological care, food related attitudes

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SSII-03 SYMPOSIUM:

Room: +1.3

TRANSITION OF THE TRANSPORT SECTOR II

333 Changing trip behavior in a higher education institute: The role of parking fees

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Abstract:

Higher education institutions are major trip-generating locations that require appropriate infrastructure needed to support large volume of commuters. Traffic congestion, higher energy consumption, greenhouse gas emissions and environmental pollution are only a partial list of the negative consequences of commuting by private cars. Thus, there is a need to better understanding of why most students prefer to drive their own cars. This information is vital to discouraging commuters from using private vehicles and encouraging increased use of more sustainable mode of travel. In terms of promoting alternative modes of commute among higher education students, managing travel demands is perceived as a promising short-term intervention.

In this study, we tried to model choice behavior between two modes of transportation into a college. That is private transport or any other mode (e.g., carpool, public transportation etc.). We analyzed student's behavior according to a discrete choice model assuming that consumers (in this case the students) maximize their utility when making a decision choice between these two alternatives. We controlled for

variables known to predict the propensity of not using a private car mode such as time and social discomfort, pro-environmental attitudes; reduced vehicle maintenance expenses, and awareness for alternative commuting options. In addition we controlled for socio-demographic variables and also parking fee which included several levels. The econometric analysis allowed us to calculate the marginal contribution of each of these variables and especially the price effect.

Results show that adding parking fee influenced behavior, i.e., decreased the tendency to commute by private car. Interestingly, it also influenced the relative weight given to the considerations that determine carpooling. Specifically, after inclusion of parking fee, the previously significant impacts of pro-environmental attitudes and social discomfort on carpooling – weakened and became nonsignificant. On the other hand, the impacts of other predictors of carpooling, which were insignificant beforehand, became significant. Specifically, time discomfort, costs related to car ownership and maintenance, time wasted in searching for parking place and in traffic jams became the significant variables that determine carpooling.

We suggest that introducing a monetary cost increased the salience of the instrumental, on account of the non-instrumental considerations of the choice in commuting modes, leaving the former as the sole significant predictors of behavior. The implications for the design of urban transport politics that decreases scarcity of parking space in campus while helping in reducing traffic volume and its negative effects will be discussed.

054 Determinants of More Sustainable Modes of Transportation for the Commute

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Keywords: travel mode choice, environmental attitudes, conservation (ecological behavior), Campbell Paradigm

Abstract:

Individual mobility, especially car use, is associated with relatively high levels of CO₂ emissions, thereby also significantly contributing to climate change (Chapman, 2007). Thus, other more sustainable modes of transportation rather than cars are critical for mitigating climate change.

So far, little is known about how individual factors (e.g., environmental attitude) and the features of the transportation environment *jointly* determine the selection of more sustainable modes of transportation (Gehlert et al., 2013). If the relations between individual factors and the environment are considered, they are typically expected to interact conjunctively (Yang-Wallentin et al., 2004). By contrast and in line with the Campbell paradigm (Kaiser et al., 2010), we anticipate that two additive and thus compensatory effects—(a) individual environmental attitude and (b) the figurative costs of a specific transportation mode—jointly but independently determine the selection of the transportation mode. Any transportation environment is expected to manifest itself in behavior-specific, figurative costs [e.g., gusty conditions, rain, or topography reduce the probability to travel by bike; e.g., Børrestad et al., 2011]. Increasing levels of individual environmental attitude are thus necessary to compensate for these specific costs. In other words, we assume a higher likelihood of commuting by bike or public transportation rather than by car with increasing levels of environmental attitude. In addition, we expect behavioral costs to hinder the selection of more sustainable modes of transportation.

In two field experiments and based on (1) a sample of 387 employees of two German academic institutions (42% female, age: M = 37 years) and (2) a sample of 252 students from two German universities (60% female, age: M = 23 years), we examined three features of the transportation environment critical for the costs of commuting: (a) the length of the commute, (b) the weather conditions, and (c) the topography. Participants' environmental attitude was measured with a Rasch scale consisting of self-reports of behavior geared toward protecting the environment (Kaiser & Wilson, 2004).

In our first field experiment, we found that environmental attitude and the length of the commute significantly predicted the choice of a more sustainable travel mode; by contrast, weather had no

significant effect on people's choice of transportation mode. People obviously refrained from car use with increasing environmental attitude levels and with shorter commutes. In the second field experiment, we once more found that environmental attitude and topography jointly but independently determined the choice of a more sustainable travel mode. Bike riders compared with public transportation users, needed more pronounced environmental attitude levels to be willing to ride to a destination that was on a hill. As expected, in both quasi-experiments, no statistical interaction between environmental attitude and behavioral costs was found.

In line with our expectations, the selection of more sustainable travel modes became more likely with increasing levels of environmental attitude and with facilitating conditions—shorter commutes and flatter surfaces. Thus, to promote certain modes of transportation, one can either increase individuals' environmental attitude or remove barriers from the transportation environment that obstruct more sustainable modes of transportation.

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192 The barriers and drivers to active and sustainable travel in the state of São Paulo: A cross-cultural comparison and assessment of broad-scale investments in cycling infrastructure

Bösehans, G.

Gustav Bösehans, University of Bath, UK

Abstract:

Introduction: São Paulo, with its more than 12 million inhabitants (about 20 million including the metropolitan area) is one of the largest urban areas in the world. Due to a heavy reliance on motorized transport, commuters may find themselves stuck in up to 100 mile long traffic jams. Previous measures, including the replacement of parking minimums with parking maximums and the creation of 320km of exclusive bus lanes and 400km of cycle lanes, have helped to ameliorate the situation and has led to the city of São Paulo receiving the Sustainable Transport award in 2015. However, despite the ambitious efforts to boost the use of alternative modes of transportation, this has not entirely solved ongoing congestion and safety issues. To this day, the safety of non-car travelers remains a source of heated debate. More than seven thousand fatal traffic accidents are registered in São Paulo every year, among them more than one thousand deaths involving vulnerable road users (bicyclists, scooter-riders and motorcyclists). Yet, whereas cyclists and other vulnerable road users demand more safety on the road, drivers tend to perceive the most recent changes as an infringement on their freedom. Although the city aims to continue to boost the use of active and sustainable modes of travel, the current situation has not seen an in-depth evaluation of the most recent developments. The proposed project is intended to offer such an evaluation. In particular, the project will investigate the usage of the newly integrated cycling infrastructure and will monitor the behaviour of both cyclists and drivers in a field experiment with the goal to assess the success of past, and to identify the need for future, improvements. A comparison with cycling strategies in London will enable knowledge to be transferred both ways, improving the implementation of cycling strategies in both cultural environments.

Theoretical background: Recent evidence suggests that improvements in cycling infrastructure may lead to significantly higher levels of cycling and cyclist safety (Pucher & Buehler, 2016). However, while most of this research has focused on a European or North American context, there has been a lack of

similar research in Latin American countries, despite significant changes over the past few years. The present research thus takes this differing cultural context under scrutiny, using the example of São Paulo.

Methods: An observational field study in selected areas of São Paulo, that have greatly benefited from recent infrastructure developments promoting active and sustainable travel, will be conducted to investigate the behaviour of cyclists and drivers by using objective measurements of driving speed, overtake distance and risky behaviours, thereby assessing use of the newly built cycling infrastructure. Semi-structured interviews with volunteer drivers and cyclists, along with the application of attitude scales concerning the perceived characteristics of traffic in the city of São Paulo, will complement the observed measures by exploring the subjective experience of both road users. Key concerns and views regarding the most recent traffic developments in São Paulo will be captured and barriers and drivers of the switch to alternative modes of transportation (here: cycling) will be identified.

Results: Data collection and analysis will take place between February and July 2017.

Conclusion: Not available (pending).

Keywords: Cyclist safety, Environment, Transport Policy, Travel Behaviour

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058 The role of ambient light conditions in encouraging active travel

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Keywords: Active travel, daylight, after-dark, cycling, walking

Abstract:

Introduction: Encouraging active travel such as walking and cycling is a policy aim for many Governments. Active travel has a number of public health benefits, such as reducing obesity. Increasing levels of active travel can also reduce CO2 emissions and improve air quality as a result of reducing use of motorised transport.

Theoretical background: A key purpose of road lighting is to create acceptable conditions for people to walk or cycle after-dark, thus encouraging active travel. There is evidence that road lighting influences factors indirectly related to active travel, such as perceived safety¹ and visibility to other traffic², but little is known about the behavioural effect of light conditions on the decision to walk or cycle. We present such behavioural evidence, using a novel method to isolate the effect of ambient light conditions on the presence of active travellers. The biannual daylight saving clock changes that occur every Spring and Autumn in many Northern Hemisphere countries allow comparison of daylight and after-dark conditions during the same 1-hour period around sunset, before and after the clock change. This keeps confounding factors such as time of day and seasonal variation constant.

Method: Pedestrian and cyclist count data from a municipal district in the US was collated for two-week periods before and after ten clock changes between Autumn 2011 and Spring 2016. Frequencies were obtained during a 1-hour case period in which the ambient light condition varied before and after the clock change due to clock time moving forward or backward one hour. These were compared against frequencies during four 1-hour control periods in which the light condition did not change following the clock change. Odds ratios (OR) were calculated based on the relative changes between the weeks before and after the clock change. OR>1.0 indicates that the number of active travellers during daylight was higher than during darkness, relative to equivalent changes in the control periods.

Results: The data suggest $OR > 1.0$ ($p < 0.001$) for cyclists and pedestrians, and with all four control periods. Combined odds ratios across all control periods were 1.38 (1.37-1.39 95% CI) for cyclists and 1.62 (1.60-1.63 95% CI) for pedestrians. The numbers of pedestrians and cyclists were recorded in two types of locations – on-street bike lanes, and trails. Odds ratios were significantly higher at trail locations than bike lane locations, suggesting the daylight effect was larger at these trail locations. One possible explanation for this is that the on-street bike lanes were more likely to have road lighting compared with trail locations, which would highlight the role of road lighting in increasing active travel.

Conclusions: The daylight saving clock change method offers a useful way of investigating the impact of ambient light conditions on active travel behavior. Results from an extensive 5-year set of data show that daylight significantly increases active travel. This highlights the potential importance of providing adequate road lighting to limit any reductions in active travel when it turns dark.

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010 Pedestrian route taking behaviour at night and street lighting: A pilot study

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University College London, Institute for Environmental Design and Engineering, London, UK

Keywords: Street lighting, Behaviour change, Neighbourhood walkability,

Abstract:

Introduction: Pedestrian travel offers a wide range of benefits to both individuals and society. From a transportation standpoint, pedestrian travel results to less vehicle travel and thus less traffic, air pollution, and other environmental impacts. From a public health standpoint, pedestrian travel means increased physical activity and thus improved health and reduced healthcare costs. Planners and public health officials alike have been promoting policies that improve the quality of the built environment for pedestrians: mixed land uses, interconnected street networks, street lighting and other facilities. A growing number of empirical studies have provided evidence of a correlation between the built environment and pedestrian behaviour.

Theoretical background: Lighting known to be one of the environmental factors affecting perception of security and reassurance between pedestrians and could be one of the factors encouraging pedestrian travel at night. Most studies on the relationship between street lighting and perception of reassurance have gone no further than investigating pedestrians thoughts/cognitions and feelings/emotions in controlled conditions. Whether and when these thoughts and emotions will result in behaviour change such as street avoidance at night has not been explored. For example whether the feeling of insecurity caused by lack or ineffective street lighting will result to pedestrians avoid using certain streets (or avoid using streets altogether) at night. In other words what criteria should be met by street lighting quality/quantity before street avoidance at night happens.

Methods: This paper reports a pilot study exploring the changes in pedestrian use of streets at night compare to day and influential factors resulting this change. The pilot study explores the qualitative data from residents of two residential areas in Tehran, Iran. Semi-structured interviews were conducted and respondents were asked to indicate a walking route they usually take during the day on a map of the area. They were consequently asked whether they would take the same route at night for the same purpose as day time or an alternative route will be chosen and why. They had the choice to say they will use other means of transportations such as using their personal cars. The street survey of lighting conditions, land use and general characteristics of the routes used by participants has been conducted.

Results: The results show that among other factors average illuminance on the pavement/street affects pedestrian route taking decisions. Pedestrians avoid routes with average illuminance of less than 5 lux and prefer routes with the average illuminance of 8 lux and above. It also affects the choice of transport

means. 20% of the interviewed people tend to use their cars at night for the same destinations they walk during the day. This number rises to 50% among pedestrians age 50 and over. The results also show that risk taking behaviour in relation to possibility of fall and trip hazards is different in older adults compare to younger adults. The average illuminance on the routes older adults avoid at night are much higher than threshold level for obstacle detection considering the effect of aging on visual performance.

Conclusions: This study shows street lighting affects pedestrian route taking patterns and transport choice beyond visual performance needs. This effect is more prominent particularly among older adults. The results will serve as a base for future studies on the impact of street lighting on pedestrian travel.

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SSII-04 SYMPOSIUM:

Room: +1.4

**PERCEPTION OF CLIMATE CHANGE AND RELATED INNOVATIONS:
THE ROLE OF EMOTIONS AND AFFECT**

Contzen, N.^{1*}, Huijts, N.M.A.², Mahmoodi, J.³, Sütterlin, B.⁴ & Wang, S.Y.⁵

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- ² Delft University of Technology, Delft, The Netherlands
- ³ University of Geneva, Geneva, Switzerland
- ⁴ ETH Zurich, Zurich, Switzerland
- ⁵ University of Western Australia, Perth, Australia

Themes: 1) Energy transitions and consumption. The human factor.
2) Sustainability transitions

Abstract:

To mitigate climate change, we are in need of new technologies, products, and policies that help lower CO2 emissions. To successfully implement them, they have to be accepted by the public. This is more likely when the public acknowledges climate change and accepts to take according actions to fight it. This symposium will focus on a factor which has been found to have an important influence on the perceptions of climate change and evaluations of policies and innovations: emotions and affect.

First, Susie Wang will look on the psychological closeness to climate change. By means of qualitative and quantitative data she shows that psychological closeness is reflected in strong emotions towards climate change, which predicts climate change policy support.

Jasmine Mahmoodi will follow-up on policies and present research on energy tariffs that either apply financial penalty or financial reward to discourage electricity consumption. Her results emphasize the relevance of cognitive-affective factors (e.g. emotions, loss aversion, etc.) for tariff choice.

Next, Bernadette Sütterlin's presentation will focus on people's affective imagery of solar power, i.e. their free associations with solar power which they subsequently affectively valued. Her findings suggest that people almost unanimously hold strongly positive imagery of solar power, which results in high acceptability of this energy source.

Nicole Huijts' will present research on the acceptability of a hydrogen fuel station (HFS) in Arnhem, The Netherlands, showing that perceived fairness predicted anger and fear, which translated into a hypothetical vote about the technology.

Nadja Contzen will follow-up on the roots of emotions and discuss to what extent negative emotions towards innovative products emerge because people perceive their core values to be violated. She will argue that emotions are not irrational, volatile reactions but rooted in stable values, which has important implications for how to deal with emotional responses.

The panel will end with an audience discussion on implications and future research directions in which the panel of the symposium will provide input as well as answer questions.

165 How do you *feel* about climate change? A study of scientists, students and the general population

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Keywords: climate change; psychological distance; emotion; action

Abstract:

What does it mean to feel close to climate change? We present two studies that focus specifically on people who feel close to climate change, the emotions they feel, compared to those who do not feel close.

The notion of “feeling close” relates to psychological distance, a concept of growing importance to climate change research. Numerous national surveys indicate that people feel distant, physically, temporally and socially from climate change (e.g. Spence et al., 2012). These dimensions of distance are facets of the Construal Level Theory of psychological distance (Trope & Liberman, 2010). Emotion is an important part of psychological distance. Emotional intensity can lead to greater psychological closeness (Van Boven, Kane, McGraw, & Dale, 2010), and is a strong motivator of action (Bissing-Olson, Iyer, Fielding, & Zacher, 2012). The “Is This How You Feel” Project (ITHYF; Duggan, 2015) asked climate scientists to write letters about how they feel about climate change. Scientists are conventionally and philosophically dispassionate, removed from their work. The emotions conveyed by scientists in ITHYF suggest a closeness that defies their occupation, but also the CLT account of psychological distance.

Using grounded theory, study 1 was a thematic analysis of the ITHYF dataset and compared responses to those of students and the general population. Study 2 was quantitative, to assess types of emotional responses to climate change, and their impact on climate change action. Using hierarchical clustering, we identified four distinct “emotion profiles” relating to climate change policy support.

Scientists report the highest level of emotion, mostly hope and anger, the general public express lower emotion, but low arousal negative emotions such as worry and concern, and students express few or no emotions. The emotion profile most closely resembling that of scientists predicted climate change policy support.

Scientists seem to care about climate change because they feel a closeness and connection to things affected by climate change: the Earth, and future generations. Close connections are largely missing from student responses, where mostly there is an echo of the debate about climate change in media, and preoccupation with specifics (who should act?). The emotion profile most closely resembling that of scientists predicted climate change policy support.

The role of emotions is important for understanding what it means to feel close to climate change. Psychological closeness manifests in emotions that are felt on behalf of themselves, and those to be affected by climate change, and such emotions may be what drive climate change policy action.

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240 Tariff design and acceptance: Using insights from behavioural economics

Mahmoodi, J., Brosch, T, Hille, S.L. & Patel, M.

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Abstract:

Introduction: Private households largely contribute to climate change: In Europe, 26% of energy consumption is linked to the use of electricity and gas in households (Eurostat, 2014). Technological advancements alone will not curb climate change sufficiently. There is large potential in reducing CO₂-emissions by enhancing human energy-related decisions and behaviours (Dietz, Gardner, Gilligan, Stern, & Vandenberg, 2009; Stern, 2007). Effective tariff designs are a promising tool to mobilise consumers to save energy in their households.

Theoretical background: Tariff design is a deciding factor that impacts consumer choices. Two electricity tariffs are of particular interest to this research: Energy-Saving Feed-In tariffs (ESFIT) set a pre-defined energy-saving target for consumers and pay a financial incentive upon target fulfilment (Bertoldi, Rezessy, & Oikonomou, 2013). In contrast, Progressive tariffs (PT) penalise an increase in consumption. A review by Prasanna, Mahmoodi, Brosch, and Patel (submitted) found that, overall, PT were more effective in mobilising energy savings in residential consumers. Loss aversion, as formalised in prospect theory (Kahneman & Tversky, 1979), offers a theoretical framework to explain this finding. Loss aversion, however, also predicts that people are less likely to choose PT, as people show preference for gains over losses. Previous research shows that people are willing to subscribe to loss constructs (e.g. Fryer et al., 2012; Imas, Sadoff, & Samek, 2016). This research explores whether similar findings will be made in the context of voluntary PT subscriptions and tests further biases.

Methods: Consumers' acceptance of tariffs with differing incentive schemes (labelled Bonus and Malus tariffs) and the importance ascribed to different attributes of tariffs (e.g. incentive) were studied in a Swiss-representative choice experiment (choice-based conjoint) (N = 1,062). Additionally, cognitive-affective factors (e.g. biases, emotions, etc.) were assessed.

Results: The results show that, in line with prospect theory, consumers prefer Bonus tariffs to Malus tariffs. However, tariffs applying a Malus were perceived as more attractive and were chosen more often when offered in combination with a Bonus. Consumer clusters were identified based on preference structures revealed in the choice experiment and could be described in terms of cognitive-affective biases (e.g. biases, emotions, etc.).

Conclusions: This research tested the acceptance of tariff designs that are more effective in mobilising savings and more cost-effective for utility companies. This research can support endeavours to combat global climate change by changing environmental decisions and behaviours.

Keywords: Behavioural economics, Loss aversion, Incentives, Emotions, Tariff design, Consumer decisions

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170 The unanimous positive imagery of Solar Power

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Keywords: Solar power; Affective imagery; Public acceptance

Abstract:

Introduction: Public acceptance and perception of renewables are key factors for successfully achieving an energy transition. Developing effective policy and communication measures requires understanding how people perceive energy systems. A deeper understanding of people’s mental representation—their affective imagery—of a technology is necessary to reveal concerns, potential misconceptions, and one-sided thinking that could result in potentially biased judgments.

Theoretical background: Affective associations have been shown to be strongly predictive of judgments and behaviors related to several environmental issues and technologies (e.g., Keller et al., 2012; Leiserowitz, 2006). In Switzerland, photovoltaic is considered to have the greatest technical potential of the new renewable energy systems (Akademien der Wissenschaften Schweiz, 2012). Therefore, the present research sheds light on people’s affective imagery of solar power.

Methods: A telephone survey was conducted among 1,211 Swiss residents. To assess the affective imagery of solar power, participants were first asked to freely associate about the concept of “solar power.” Then, the affective value of the association was assessed.

Results: The data clearly demonstrates that the affective imagery of solar power is predominantly of a strong positive nature and that visual characteristics—such as associations related to description of solar power installation, and their location and placement—are especially prevalent. Interestingly, associations of a critical nature referring to weather-related disadvantages and the associated fluctuations in solar radiation, financial disadvantages, and the limited effectiveness of solar power (6% of the mentions) were nevertheless attributed rather neutral feelings by the participants. Only a very small minority (less than 3%) of the participants associated solar power with negatively evaluated associations related to, for example, the problem of waste or mistrust regarding this energy alternative and the true motivation underlying the promotion of solar power.

Conclusions: Findings suggest that people almost unanimously hold strongly positive imagery of solar power, which results in the high general acceptance of this energy source. These findings seem encouraging for the promotion of solar power and for the energy transition in general. They also raise concerns because they indicate that possible negative consequences that accompany solar power are not part of people’s mental representation of this energy source and thus, once confronted with information about related drawbacks, people’s acceptance may substantially decrease. The results on the positively evaluated visual characteristics related to solar power add further evidence that visibility and the positive symbolic character of energy-friendly measures play crucial roles in the adoption of energy-friendly behavior, such as the installation of solar panels on rooftops. The findings have important implications for policy and communication measures.

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087 Predictors of emotions about a hydrogen fuel station project: perceived outcomes, perceived fairness, trust and prior awareness

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Keywords: emotions; perceived outcomes; perceived fairness; trust; hydrogen

Abstract:

Emotional responses by citizens can hamper or support the implementation of new energy technology projects. In order to gain understanding into specific emotions that citizens experience in this context, a study has been performed around the opening of a hydrogen fuel station (HFS) in Arnhem, The Netherlands.

Four distinct emotions have been studied, being anger, fear, joy and pride. It is hypothesized that seven different factors can contribute to explaining the extent to which each emotion is rated by citizens living nearby the HFS project: perceived environmental outcomes, perceived risks, perceived usefulness of the hydrogen fuel for citizens living nearby, perceived procedural fairness, perceived distributive fairness, trust in industry, and prior awareness of the local project. It is expected that each emotion has a different set of significant predictors and each emotion is expected to influence a hypothetical vote against or in favor of the local HFS project.

Questionnaires were distributed among citizens living up to 1400 meters from the HFS project in a few weeks before and a few months after the fuel station was officially taken into operation. 271 questionnaires were included in the analyses.

The results show that both anger and fear were rated higher when people perceived the HFS project to have more procedural and distributive unfairness.

Fear was additionally higher among those that perceived more risk and those that had no prior awareness of the local HFS project. Prior awareness was also found to moderate the effect of perceived environmental outcomes on anger and fear: those that did not have prior awareness reported somewhat more anger when perceiving less environmental benefits, while those that did have prior awareness reported more anger when perceiving more positive environmental outcomes. Furthermore, both joy and pride were rated higher when people perceived more usefulness of the local HFS project for citizens living nearby. Additionally, joy was rated higher among those that perceived more positive environmental outcomes, while pride was rated higher among those that perceived more safety and had more trust in industry. Finally, fear, joy and pride each significantly predicted and anger not significantly predicted a hypothetical vote about the local HFS.

To conclude, each of the seven included predictors thus contributed to explaining the rating of at least one of the four included emotions, with different sets of predictors significantly explaining each emotion. The different emotions also explained behavioral intention. Overall, the study shows that it makes sense to go beyond the often studied concept of affect by focusing on specific emotions. The study shows that specific emotions can be understood and predicted, and can independently predict behavioral intention.

061 Emotions towards new technologies and products: A matter of value-compatibility

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University of Groningen, Groningen, The Netherlands

Keywords: values; emotions; acceptability of innovations

Abstract:

To reduce CO2 emissions new technologies and products have to be adopted. While some technologies and products are smoothly introduced, others encounter strong negative emotions and rejection by

the public (e.g. Lienert, Suetterlin, & Siegrist, 2015). These emotional responses are often perceived as irrational—if people had the according knowledge, they would recognise the innovation's benefits and thus support it. Yet, such communication efforts proved rarely to be effective in changing the initial emotional responses.

We argue that emotions towards new technologies and products, whether positive or negative, are not irrational. Rather, the emotions reflect which implications people expect the new technologies and products to have for their core values. More precisely, we assume that acceptability of a new technology or product is influenced by emotions that signal whether people's core values are violated or supported by the new technology or product. There is some initial evidence to suggest that violation of so-called sacred values, i.e. values which people refuse to trade-off with other values, provokes strong negative emotions (Tetlock, Kristel, Elson, Green, & Lerner, 2000). Further, the social intuitionist model (Haidt, 2001; Haidt & Joseph, 2004) assumes that moral judgements are primarily elicited by moral emotions, caused by violations of virtues. However, the model does not consider individual strength of virtue-endorsement and the related strength of emotional reactions. We extend the line of research (i) by experimentally testing whether violations of values which people strongly endorse lead to stronger negative emotions and whether these emotions indeed translate into (acceptability) judgements, and (ii) by applying it to a new field, acceptability of technologies and products.

We will present data based on an online experiment with a 2x2 mixed factorial design (N = 460; Fritz & MacKinnon, 2015). After measuring value strength via self-reports, participants are randomly presented with an innovation description (a new food product or an illumination product) that emphasises implications for (i) either biospheric or egoistic values that (ii) either support or violate the according values. Subsequently, for each product, we measure emotions towards and acceptability of the innovation through self-reports.

For both value types and both products we investigate by means of moderated mediation analyses (Preacher et al., 2007) (i) whether stronger value-endorsement leads to stronger positive/negative emotions, contingent on whether the product supports or violates the relevant values, and (ii) whether stronger value-endorsement leads, via stronger positive/negative emotions, to stronger acceptance/rejection of the product, again contingent on whether the product supports or violates the value.

We will discuss the implications of our study for the development of socially acceptable innovations.

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Thursday
31th August

09:00 - 10:30 h.

SSIII-01 SYMPOSIUM:

Room: +1.1

EXAMINING ENVIRONMENTAL BEHAVIOUR IN THE ORGANIZATIONAL CONTEXT

Ruepert, A.M.¹, Carrico, A.², Lans, A.³, Pahl, S.⁴ & Wells, V.⁵

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⁵Sheffield University Management School, Sheffield, UK

Themes:

Individual factors underlying environmental attitudes and behaviour · Social influence
Environmental influences on cognition and behaviour · Multi, inter and trans-disciplinary approaches and principles

Abstract:

Environmental problems can be reduced if people engaged in fewer behaviours that harm the environment or adopted more actions that benefit it. Until now, most academic studies have focused on factors influencing residential pro-environmental behaviour. Yet, within their lifetimes, people spend the majority of their time at work. While policy makers increasingly recognize that environmental problems can be reduced if organizations and their employees were to act more pro-environmentally, they struggle with the question of how to realise this. This symposium aims to present the results from recent research on ways to promote environmental behaviour in the organizational context delivering a flavour of this growing area of academic interest. First, we will present research evaluating the effect of group-level feedback and peer education on energy conservation in the workplace. Second, we will critically discuss the results of an energy visualisation intervention to encourage pro-environmental behaviour. Third, we will present research that investigates the influence of a corporate environmental responsibility initiative on employees' pro-environmental behaviour. Fourth, we will elaborate on the possibilities and limitations for companies to make their loyalty programmes more sustainable. Finally, we will discuss social marketing approaches to encourage employee pro-environmental behaviour. In all presentations, we will address the theoretical and practical challenges related with pro-environmental behaviour in the organizational context.

156 A social marketing perspective on employee pro-environmental behaviour

Wells, V.

Sheffield University Management School, Sheffield University, UK

Keywords: Employee Environmental Behaviour; Social Marketing

Abstract:

Employee pro-environmental behaviour, often studied within the context of Corporate Social Responsibility (CSR) has been studied from the perspective of a number of academic disciplines such as organisational behaviour (organisational greening) and HRM (Green HRM). Recently social marketers have also begun to show an increased interest in this area. Social marketing is "the systematic application of marketing alongside other concepts and techniques to achieve specific

behavioural goals, for a social good” (French and Blair-Stevens, 2006) and has been used to encourage positive behaviours such as blood donation, reducing littering, increasingly financial literacy, and healthy living amongst others. This presentation will focus on social marketing approaches to employee pro-environmental behaviour and their potential for future development. This will involve an assessment of employee pro-environmental behaviour, utilising the social marketing planning process (Lee & Kotler, 2016), and will emphasise the key role that social marketing could play in this growing area through utilisation of its communications and campaign expertise. Additionally, the presentation will highlight the overlooked but important area of monitoring and evaluation which is particularly hard to effectively develop in real world situations and where the motivations of employees, employers, shareholders and practitioners may differ. Finally, the presentation will present a future research agenda for a social marketing approach to understanding employee pro-environmental behaviour.

This paper is a conceptual paper built on a literature review of the employee pro-environmental and social marketing academic and practitioner literatures. No primary data collection or analysis has taken place.

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French, J and Blair-Stevens, C (2006) From snake oil salesmen to trusted policy advisors: The development of a strategic approach to the application of social marketing in England, *Social Marketing Quarterly*, 12(3), pp 29-40
Lee, N.R and Kotler, P (2011) *Social Marketing: Influencing Behaviors for Good* (Fourth Edition), Sage Publications.

208 Motivating workplace energy conservation using feedback and peer education

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Environmental Studies Program. University of Colorado at Boulder, USA

Keywords: pro-environmental behavior; workplace, feedback, peer education, energy conservation

Abstract:

Introduction: Reducing consumer demand for energy has the potential to play a significant role in mitigating greenhouse gas emissions and other negative environmental consequences of energy production (Dietz et al., 2009).

Theoretical background: The vast majority of demand-side management research has focused on energy conservation in residential settings where individuals have greater control over their energy-using behaviors and often bear the cost of these actions. Workplaces are a large and under-explored opportunity to reduce energy demand. There are significant knowledge gaps in our understanding of whether strategies that have successfully motivated energy conservation in residential settings can be used effectively in workplace contexts.

Methods: This study uses a quasi-experimental design to evaluate the impact of two behavior change strategies that have shown promise in residential settings—peer education and feedback—on energy consumption in a workplace environment. We evaluate the impacts of these interventions on actual energy consumption as well as self-reported attitudes, beliefs, and behavior. We also evaluate the feasibility of these approaches from an institutional point of view, examining the cost, ease of implementation, and reception from employees.

Results: Results suggest that that both peer education and feedback were more effective than an information-only campaign, leading to 7% and 4% reductions in energy consumption, respectively. These results were not replicated with the survey data, reinforcing concerns about inherent biases in self-report. The feedback campaign was also more feasible and cost-effective due to the logistical challenges of recruiting and coordinating effective peer educators.

Conclusions: These findings suggest that well-designed programs can successfully motivate energy conservation even when residents are not financially responsible for their energy use. Energy feedback, in particular, should be explored in future work.

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219 Using loyalty programmes to increase the adoption of sustainable innovations in households

Lans, A.¹, Ter Mors, E.¹, Staats, H.¹, Van Dijk Wesselius, E.J.¹, Van der Weiden, E.², & Van Suylekom, S.²

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²HIER Klimaatbureau, Utrecht, The Netherlands

Keywords: sustainable innovations; loyalty programmes; stakeholder interviews

Abstract:

Introduction: Energy-efficient appliances and renewable energy technologies can reduce household energy consumption significantly, yet relatively few people use them. Therefore, there is a need to find more effective ways of introducing such sustainable innovations to a broad audience. Because of their unique context and wide reach, loyalty programmes may be used to create awareness about the existence of sustainable innovations and to lower the financial investment necessary to adopt them. In the present research we examined what possibilities and limitations companies with a loyalty programme see to make their loyalty programmes more sustainable, and how they can be facilitated.

Theoretical background: There are various ways to explain the attitude-behaviour gap that is often observed in pro-environmental behaviour, dependent on the kind of behaviour involved (Kollmuss & Agyeman, 2002). In the case of sustainable innovations, the required financial investment is an important barrier in translating pro-environmental intentions to action (Beck & Martinot, 2004). Loyalty programmes have the unique opportunity to offer products at a highly reduced price, because members have already invested time, money and/or effort in the programme. In this way, loyalty programmes can reduce the financial barrier of purchasing sustainable innovations, thereby simultaneously inhibiting several cognitive biases that prevent people from making a pro-environmental decision (Frederiks, Stenner, & Hobman, 2015).

Methods: We conducted 15 semi-structured interviews with companies with a loyalty programme, to assess the feasibility and their willingness of including sustainable innovations in their loyalty reward assortment. Questions inquired about general considerations in managing a loyalty programme and choosing loyalty rewards, the perceived possibilities and limitations with regard to sustainable innovations, and the anticipated responses of loyalty members to those innovations.

Results: Most companies indicated that they value sustainability, but lack the time and expertise to actively implement it in their loyalty programmes. Also, many of the interviewed companies simply had not yet considered sustainability in the context of their loyalty programme. Overall, companies are willing to include sustainable innovations in their programme that meet their general product criteria. They need to be facilitated in objectively evaluating the eco-friendliness of products and finding the appropriate innovations for their target group. Practical implications and applications will be discussed.

Conclusions: Loyalty programmes are an unexplored way to speed up public adoption of sustainable innovations, by offering unique discounts on such innovations to their members. Companies are willing to cooperate with this, but should be unburdened by providing the criteria and ideas for sustainable products.

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- Kollmuss, A., & Agyeman, J. (2002). Mind the Gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research*, 8, 239–260.

246 The effects of Corporate Environmental Responsibility and biospheric values on pro-environmental behaviour at work

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Keywords: Organizational behavior; Biospheric values; Corporate environmental responsibility

Abstract:

Organizations increasingly profile themselves as environmentally responsible and aim to enhance their environmental performance. This has implications for organisational processes and procedures, but does it also promote pro-environmental behaviour of employees? Based on the integrated framework for encouraging pro-environmental behaviour (IFEP; Steg, Bolderdijk, Keizer, & Perlaviciute, 2014) we propose that people are more likely to engage in pro-environmental behaviour at work when they have stronger biospheric values, and when the organization they work in explicitly aims to realise corporate environmental responsibility (CER), as the latter increase the likelihood that employees consider the environmental consequences of behaviour, which will motivate them to behave pro-environmentally at work. In contrast, when employees see or believe that their organisation merely focuses on profit generation, they will be less likely to consider the environmental consequences of behaviour, thereby inhibiting pro-environmental behaviour at work. We further explore whether the effect of CER on pro-environmental behaviour at work is likely to depend on employees' biospheric value strength. Study 1, an experimental study in which we manipulated the organization's ambition to realise CER, revealed that both biospheric values and believing that the organization has the ambition to realise CER encourage pro-environmental behaviour at work. Interestingly, CER especially motivated people with weak biospheric values to act pro-environmentally at work. Study 2 replicated these findings in a questionnaire study among employees of a large public organisation. These findings suggest that weak biospheric values are less likely to inhibit pro-environmental behaviour at work when employees believe that their organisation has a clear ambition to realise CER.

References:

Steg, L., Bolderdijk, J. W., Keizer, K., & Perlaviciute, G. (2014a). An integrated framework for encouraging pro-environmental behaviour: The role of values, situational factors and goals. *Journal of Environmental Psychology*, 38, 104-115. doi:10.1016/j.jenvp.2014.01.002

331 How can we help people save energy in challenging organisational contexts? An exploratory feasibility study on energy visualisation in social services offices

Pahl, S., Wyles, K.L., Boomsma, C., Goodhew, J., & Jones, R.

University of Plymouth

Research in the context of energy saving so far has focused on households rather than workplaces. But in Europe increasing energy consumption beyond households is of concern, especially in the service sector (government, banking, tourism etc.). The workplace offers both opportunities and barriers for energy savings. Individuals in the workplace may feel less personally responsible for energy use through a lack of direct financial interest, compared to householders (Matthies et al., 2011). Shared appliances might reduce actual opportunities to save energy, as well as reduce perceived control, responsibility and impact of actions (Murtagh et al., 2013). Workplace behaviours are complex, and organisational roles and work objectives may work against energy saving, as may the attitudes and norms of colleagues. In addition, energy-related behaviours in the workplace is highly observable by colleagues. This paper explores the feasibility of introducing an energy visualisation intervention among social services staff in a local government office. These employees work in child and adult care under tight deadlines and in challenging contexts that place considerable demands on their time management and psychological resilience. The research explored the role of feedback design (simple graphs vs. more intuitive visualisation), using near real-time visual feedback presented on an internet-based web-site. We evaluated the process of implementation using qualitative and quantitative methods. The findings show that despite the demands placed on them, staff had positive beliefs towards energy saving, but these were bounded by low self-efficacy, weak social norms, and perceived barriers in the office. There was some evidence that feedback supported feelings of collective efficacy and encouraged staff to talk with colleagues about ways to save energy. But engagement with feedback – and energy use in general – was limited, and our intervention was hampered by practical constraints on our ability to make the feedback highly accessible. The

reactions to the different visualisations (graph vs. intuitive) also varied between staff and different people had different preferences. Energy use was embedded in other concerns and issues, such as a strong team culture and wider problems in the building. This research highlights the complexities of energy-related behaviours in the workplace and the role visualising energy could play in this context. Engagement will be a key challenge in achieving successful feedback initiatives; we provide recommendations to tackle this challenge and identify areas for future research, including those that are relevant for the smart meter rollout.

References

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SSIII-02 SYMPOSIUM:

Room: +1.2

PSYCHOLOGICAL DETERMINANTS, BARRIERS AND POTENTIALS RELATED TO (UN)SUSTAINABLE LIFESTYLE CHOICES AND WELLBEING IN EUROPEAN SOCIETIES

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³ The James Hutton Institute, Aberdeen, Scotland

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Themes: Individual factors underlying environmental attitudes and behaviour, Underlying motivations of individual's involvement in environmental behaviour, Sustainability Transitions, Sustainable lifestyles

Abstract:

Within the project GLAMURS (Green Lifestyles, Alternative Models and Upscaling Regional Sustainability), we developed a theoretically-based and empirically-grounded understanding of the main obstacles and prospects for transitions to sustainable lifestyles and a green economy in European countries. We proposed a new conceptualisation of lifestyles that shifts the focus of current thinking and research on what is needed to achieve significant transformations in our patterns of consumption, economic structures and prevailing social practices around work and leisure. Through using multi-scale, multi-region integrated research methods theories and models were developed, and evidence was found on barriers and possibilities for societal transitions towards sustainability.

In our research, we included both citizens from seven European countries as well as members from sustainability initiatives, who are key actors as early adopters of such sustainable lifestyles. Taking their expertise into account, the GLAMURS research suggests a need to move away from the existing additive conceptions of lifestyles (with a consequent focus on changing specific behaviours) and from sustainable consumption as a proxy for sustainable lifestyles. Instead, it proposes a definition of lifestyles as patterns of activities structured around the domains of work, home production and leisure, undertaken for a variety of goals and stemming from a wide range of motivations, which have associated consumption patterns. A special emphasis is placed on the relevance of dimensions of time and space for sustainable lifestyles. We offer a more comprehensive understanding of the factors influencing environmentally-relevant lifestyle choices and the motivations for joining sustainability initiatives.

We present results from the GLAMURS project on

- (1) how lifestyles in general and sustainable lifestyles in particular can be best conceptualized,
- (2) the psychological and social factors that have the highest influence on (un)sustainable lifestyle choices,
- (3) the role of time and space in the understanding of lifestyle choices,
- (4) the relationship between (un)sustainable lifestyle choices and wellbeing in different European regions,
- (5) the role of perceptions of time affluence and time scarcity for environmentally-relevant choices,
- (6) the main drivers and effects of joining sustainability initiatives,

[7] and finally, the effects of a membership in sustainability initiatives and how they influence lifestyle choices in different behavioral domains as well as levels of wellbeing.

028 Psychological determinants, barriers and potentials related to (un) sustainable lifestyle choices and wellbeing in European societies

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² FH Bielefeld University of Applied Sciences, Bielefeld, Germany

Keywords: sustainability initiatives; volunteer work; carbon footprint; environmentally significant behaviour

Abstract:

During December 2015, at the COP 21 (United Nations Framework Convention on Climate Change, 21st Conference of the Parties), the international community passed the Paris Agreement (c.f. United Nations Treaty Collection, 2016). A long-term reduction of the CO₂ Emission to nil was acknowledged internationally. For that reason, the development towards a “green” economy is justified by international law and is supposed to be accompanied by an increase of sustainable lifestyles to further support the aims of the agreement. As one part of the FP7 EU-funded project GLAMURS, we analysed sustainable lifestyle initiatives in seven regions across Europe to reach a better understanding on how and why such initiatives emerge. The overall objective refers to the determinants for the adoption and evolution of sustainable lifestyles on micro level. We focused on the main drivers for joining such sustainability initiatives as well as influences of a membership on lifestyle choices.

To be engaged in initiatives which focus on sustainable lifestyles and how to live and achieve them can be seen as environmentally significant behaviour, which could furthermore be defined as environmental activism (Stern, 2000). To understand which relevant factors have an influence in terms of if and how such engagement arises, we identified relevant predictors for environmentally significant behaviour in alignment to the thoughts found in the value-belief-norm model (Stern, Dietz, Abel, Guagnano & Kalof, 1999). For this presentation, we put a focus on the influence of values (Poortinga, Steg, & Vlek, 2004; Stern, 2000; Stern, Dietz, Abel, et al., 1999), social and personal norms (De Groot & Steg, 2010), self-efficacy (Taberner & Hernández, 2011) as well as people’s own environmental identity (van der Werff, Steg, & Keizer, 2013) on the engagement of people in sustainability initiatives in different European regions. Furthermore, we hypothesised to find significantly more sustainable behaviours carried out by the initiative members in comparison to people living in the same region.

We used a two-part standardised online questionnaire which was distributed across the population of different European regions. Sustainable initiative members were asked to fill in that same questionnaire as well as an additional second part. In this additional part, we included questions on topics such as motives for joining and changes in time use after joining the initiative. In comparison to the results from the regional survey, we analysed how members of initiatives differ from non-members, and how the above mentioned predictors relate to selected decisions and actions relevant for a sustainable lifestyle. Using multiple regression analysis, we investigated if for example pro-environmental values and social norms are strong predictors of becoming a member of a sustainable lifestyle initiative. We also investigated the strongest motives for joining said initiatives. Carbon footprint analysis results show the difference in carried out sustainable behaviours.

First results from the different analyses will be presented.

Based on our results, appropriate strategies to promote sustainable lifestyles in European societies are proposed.

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134 Social cognition and sustainable lifestyles

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Keywords: Sustainable lifestyles; dual process accounts; self-control

Abstract:

According to a shared assumption in the political and scientific domain, substantial reductions of greenhouse gases emissions are required in the short run, to adequately tackle the unsustainable trend of human impacts on climate and ecosystems (e.g., Intergovernmental Panel on Climate Change – IPCC, 2015). While there is a growing consensus that a substantial portion of global climate change is due to human activity, still relatively few individuals are willing to adapt their lifestyle and reduce their ecological footprint. According to studies in the psychological science domain, a consequence of the adequate perception of climate change is an increase in ecologically responsible behaviour. However, little is known about antecedents of this phenomenon. It is therefore relevant to explore the potential of psychological theories to understand how humans develop more accurate perceptions of climate change and consequent environmentally friendly behaviors. The potential of recent social cognitive psychological frameworks [i.e., “Dual Process Accounts” and “The Strength Model of Self-Control”) is relatively unexplored. These models cognitive-psychological frameworks shed light on mechanisms underlying humans bounded rationality, which is likely involved in the shaping of unsustainable habits. These models offer an interesting point of view on how people use their habits to restore physical and mental energy. We review these models to understand how they can drive choices when individuals are faced with a decision involving two options (i.e., an eco-friendly behaviour and an eco-damaging behaviour). Dual-process accounts show that human functioning is based on two systems, so-called cold and hot. While the hot system works automatically, effortlessly, by associations, and relatively fast, the cold system is slow and effortful. Moreover, the hot system is often prey of emotions, while the cold system is controlled. We may deduce that rationality of decision making resides on the cold system, and whenever agents use more of the hot system, they give place to manifestations of bounded rationality. The cold system is involved in deliberative decision-making processes, whereas the hot system occurs when emotional arousal is triggered and can lead to irrational choices. The strength model of self-control has been proposed in order to account for the determinants of hot and cold systems being at work. The main idea is that individuals have a limited resource of self-control, and when this runs out they progressively fall into the hot system, so that the individual becomes ego-depleted. A second aim of this work consists of showing how daily habits by which individuals restore their depleted self-control resources might often rely on unsustainable options. Fruitful insights and guidelines to use these frameworks in future studies and practical interventions are proposed.

References:

Intergovernmental Panel on Climate Change. (2015). Climate change 2014: mitigation of climate change (Vol. 3). Cambridge University Press.

328 Lowering time pressure and increasing well-being via flexible working policies

Craig, T.

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Keywords: time pressure; flexible working; life satisfaction; wellbeing; commuting

Abstract:

One common intervention aimed at reducing time-pressure and reducing energy consumption is that of employers allowing their staff to work from home. Schipper, et al. (1989) note that the practice of working from home “alters both commuting and home energy use patterns, while reducing occupancy in places of employment and services” (Schipper p.310).

If such practices are scaled up beyond small experiments, the impact on energy use patterns can potentially be quite dramatic. Corresponding shifts in flexible working policies (essentially resulting in an extended potential working day) can be useful in helping people to accommodate the various pressures on time, and the juggling of home and work.

This paper will present findings from two questionnaire surveys: a regional survey (N=908) and a survey within that region, concentrated on a large public sector organisation (N=300). The organisation surveyed had introduced a flexible working policy, and the combined surveys allowed a comparison to be made between the region and the organisation. The analysis presented here examines the relationships between time pressure, flexible working and wellbeing, with a particular focus on commuting between home and work.

Results show that there is negative correlation between reported levels of time pressure and both autonomy life satisfaction, and that there is a positive correlation between the level of work flexibility offered to staff and the extent to which the psychological need for autonomy is met – which in turn predicts life satisfaction.

Living far away from work was also found to significantly contribute to feelings of time pressure. These findings will be discussed in relation to measures related to flexible working arrangements and satisfaction with leisure time.

References:

Schipper, L., Bartlett, S., Hawk, D., & Vine, E. (1989). Linking Life-Styles and Energy Use: A Matter of Time? *Annual Review of Energy*, 14, 273-320.

366 Understanding dynamics of sustainability transitions in European societies: a multi-method, interdisciplinary approach

García-Mira, R. & Dumitru, A.

University of A Coruña (Spain)

Abstract:

The need for a societal transition towards sustainability requires the concerted action of a variety of stakeholders and a keen understanding of the factors supporting or hindering the processes composing it. Transformative social innovation, defined as innovation that aims to achieve broad societal change, can be a key element in achieving sustainability. Profound changes in lifestyles are required to achieve a sustainable, smart and inclusive society that Europe is striving for.

A wide range of pressures related to the domains of work and leisure have led to an increased experience of time scarcity and time pressure in contemporary societies. Together with increased complaints about wellbeing and the environmental crisis, such phenomena have led to a discourse and practice of alternative lifestyles. However, to date, a comprehensive understanding of the factors influencing environmentally-relevant lifestyle choices, patterns of lock-in into either sustainable or unsustainable trajectories or the motivations for joining sustainability initiatives has not been achieved. Furthermore, the relationship between certain environmentally-relevant lifestyle choices and wellbeing is not well understood either.

The GLAMURS project has adopted an innovative and systemic approach to lifestyles, considering them to be patterns of time use in daily life domains and contexts, that take place in given locations and have associated consumption patterns, rather than a simple sum of independent behavioral choices. How people structure their everyday life, how they make decisions regarding their work, home and leisure life, and what brings them happiness and wellbeing have important consequences for sustainable lifestyles. Instead of focusing on European citizens' consumption patterns and attempting to change them, a piecemeal approach that has not delivered expected results, we have inquired into how the ways in which everyday life is organized might actually create obstacles, but also possibilities for change.

In order to provide a comprehensive account of the conditions and dynamics for sustainable lifestyle and economic transformation in Europe, GLAMURS has:

- Explored the complex interactions and links among economic, social, cultural, political and technological factors influencing sustainable lifestyles and transformations to a green economy across societal levels (from individual to social, and from micro- to macro-economic levels).
- Developed and evaluated comprehensive models of lifestyle change at a European level in key sustainability domains, and
- Provided assessments of these models in terms of psychological, social, economic and environmental effects.

The project studied and *compared across seven European regions and six lifestyle domains that are relevant for sustainability*: the work-leisure balance, housing, food consumption, mobility, energy use, and the consumption of manufactured products. Diverse European regions were included as case studies, in order to understand their characteristics and their potential for transitions to sustainable lifestyles and green economies: Galicia (Spain), Aberdeenshire (Scotland), Banat Timis (Romania), Danube-Bohemian Forest (Austria), Rotterdam-Delft-The Hague (Netherlands), Lazio region (Italy) as well as Central Germany, and the project's focus was on both regular citizens as well as frontrunners of sustainability, by including sustainability initiatives in each region that have established as their objective to influence several or all of the above-mentioned domains: food and energy cooperatives, repair cafes, transitions towns, ecovillages, sustainable clothing cooperatives, a governmental work-smart programme and a whole bio-region have been among studied cases, and results provide insights into conditions for transitions to sustainable regions.

The present paper will show how a multi-method approach can work in shedding light on the dynamics of sustainable transformations in culturally-diverse regions. *Multi-method empirical research* advancing our understanding of the causal connections and feedback loops between patterns of time-use and engagement in sustainable initiatives was used and qualitative methods such as net-mapping (analysing the regional, local and individual networks) focus groups and in-depth interviews were mixed with quantitative ones such as large scale surveys. This systemic and integrative approach has also included *participatory visions of the future*. Back-casting scenario development was used to define a series of sustainable visions of the future in each region, as well as the pathways to reach those visions. Different scenarios of lifestyle changes, alternative economic approaches and sustainable transitions have been evaluated through a *combined modeling approach*. The three modeling approaches – micro-, macro-economic and agent-based modeling – bring specific strengths to meeting the objective of developing a comprehensive framework of lifestyle choice, dynamics, and interactions. The paper will also discuss how combining these methods has enabled the development of *models that describe feasible transitions to sustainable lifestyles and a green economy at individual, community and large societal levels*.

Keywords: time-use patterns, sustainable lifestyles, multi-method research, modeling approaches.

367 Promoting sustainable lifestyles choices: evidence from an interdisciplinary European project on four European regions

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Abstract:

The GLAMURS project has reconceptualised lifestyles as patterns of activities that take place in given locations and have associated consumption patterns, thus moving away from piecemeal or additive approaches that were common in health research, where the concept originated from. Starting from this, it has investigated the determinants and consequences of different lifestyle choices. Two research questions were particularly addressed in the present paper: 1) What changes do people actually desire in their everyday life and what is their environmental relevance? And 2) How can we shape lifestyle preferences and choices toward alternative and more sustainable options and what should these options be? We report on the results obtained for several European regions.

A combination of focus groups and survey research has been undertaken to answer these questions. Three focus groups were carried out, including an urban, rural and one with members of sustainability initiatives included in the case study region, with the objectives of analysing the relationships between lifestyle satisfaction and desire for change in patterns of time-use, perceptions of obstacles to sustainable choices and trade-offs, and motivations and effects of joining a sustainability initiative. Data was analysed using a modified version of grounded theory (Willig, 2008) and the support of Atlas.ti, a computer-assisted qualitative analysis software (Dumitru et al, 2016). Also an online questionnaire was used to explore determinants of sustainable lifestyle choices in different domains. Determinants such as aspirations, time affluence, social norms, pro-environmental identity and attitudes towards sustainability initiatives were explored, among others.

Results show that desired lifestyle changes focus on expanded meaningful social interaction, understood as part of an alternative, “healthier” lifestyle, which complements previous research on motivations of environmental activists, which showed a prevalence of social motivations, and a diversity of pathways to activism (Knippenberg et al., 2015). Food, mobility and spending more time in close contact with nature come out as promising entry points for sustainable lifestyle change and changes in these domains are predicated on a restructuring of everyday life.

Important predictors of sustainable lifestyle choices across domains include pro-environmental identity, both descriptive and injunctive social norms and the attitude towards and use of sustainable initiative services. Furthermore, our results show that in order to promote sustainable lifestyle changes, interventions should also focus on fostering intrinsic goals and personal norms. We conclude that interventions to promote sustainable lifestyles need to be shaped as more than environmentally-relevant choices, to include social and health-related dimensions; desired lifestyle changes include changes in the pace and demands of everyday life and socially connected and meaningful activities; and sustainability initiatives are key intermediaries for sustainable lifestyle change, as they facilitate meaningful connection, the experience of autonomy and value coherence, and access to sustainable products and services. Facilitating involvement in joint sustainable activities, especially at the level of neighbourhoods, while facilitating access to proximity natural spaces would support sustainable lifestyle change.

Keywords: patterns of time-use, sustainable lifestyles, desired lifestyle changes, intrinsic goals, personal norms, social norms, pro-environmental identity, sustainability initiatives.

368 Understanding motivations to join sustainability initiatives: a comparison of Romanian and Spanish cases

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Abstract:

Protecting common natural resources requires changes in individual behaviour. To be effective, these changes must be implemented at the collective level within different communities and sustainable initiatives. Gaining a better understanding of how members think about their motivation to join these initiatives can help to more effectively frame the issue of “green” initiatives in larger public debates.

The main objective of this study was to identify the individual drivers (internal and external) for joining the initiatives. The general research question we advanced was: *What motivates people to become a member of a sustainable initiative?* We used a qualitative research design and the in-depth interview as method for data collection. Eighteen in-depth interviews in total were conducted with members of sustainable initiatives with an activity in different domains of sustainability, from Romania (7 members) and Spain (11 members). We used thematic and discourse analysis as the main methods of data analysis and used a common analysis framework to compare the data across the two samples.

In terms of intrinsic motivation stimulating the membership, our study identified two main common themes: the need for relatedness (sense of community) and the pro-environmental beliefs. In terms of extrinsic motivation, the dominant theme of the participants’ discourse refers to the pressure to provide an alternative to traditional or conventional markets. There are some important differences between Spanish and Romanian samples, with motivational factors stimulating the membership for Romanian participants including financial accessibility of the initiatives, proximity to urban areas or employment difficulties.

As practical implication, raising awareness of what motivates people to join sustainable initiatives is likely to engage a broader segment of stakeholders who may then become more active in both changing aspects of their individual lifestyle, as well as joining in collective action to influence wider societal and policy change.

Keywords: sustainable initiative, pro-environmental motivations, in-depth interviews

SSIII-03 SYMPOSIUM:

Room: +1.3

FACTORS AND PROCESSES UNDERLYING PUBLIC PERCEPTIONS OF ENERGY SYSTEMS, TRANSITIONS, AND TECHNOLOGIES

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Theme: Energy transitions and consumption. The human factor.

Abstract:

In order to tackle environmental problems, a transition to more sustainable production and use of energy is inevitable. A key question here is how we can increase public support to realise sustainable energy transitions. This symposium will introduce and discuss important factors that influence people’s evaluations and acceptability of energy sources, technologies, and systems to realise a sustainable energy transition.

Lorraine Whitmarsh will present qualitative research on perceptions of risk, benefits and acceptance of a range of energy sources and technologies in the context of South Wales, the UK. She will explain

why additional information about energy technologies, especially newer alternatives, is needed to improve awareness. She proposes that communications should be tailored to the local 'energy contexts' through which new technologies and change are interpreted and understood.

Christina Demksi will discuss the role of trust in different energy system actors and related concepts, including procedural justice, in determining people's perceptions and willingness to accept responsibility and cost associated with a sustainable energy transitions. She suggests that decreased trust, and mistrust in the actions of energy companies and government, is likely to negatively affect the 'social license to operate' that industry and government will need to deliver long-term, low-carbon energy transitions.

Leonie Vrieling will discuss factors related to public perceptions of risks associated with energy systems and technologies and its relationship with acceptability of these energy developments. Particularly, she will focus on public perceptions of risks caused by energy production, the psychological implications of such risks (e.g., emotions), and how trust in responsible parties affects this relationship.

Gisela Böhm will focus on international differences in public preferences concerning different energy supply systems and the motivations underlying these preferences. Particularly, she will elaborate on whether energy preferences can be predicted from concerns. The results are placed in the cultural contexts of the countries with respect to attitudes, risk perceptions, and policies.

303 'Who pays for energy transitions?' Public acceptance of cost associated with energy system change in the UK

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Keywords: trust; cost acceptance, energy transitions

Abstract:

Introduction: The successful management of energy transitions will depend on multiple factors; social acceptance and public engagement being a core component. In addition, a particular uncertainty within energy transition processes is the question of cost and 'who pays' for desirable energy system change (including, for example, a move to low-carbon energy sources and increased energy efficiency). The question of how energy transitions are funded is intimately linked with public perspectives and social justice issues, particularly because the general public is likely to bear a large share of the associated costs. Therefore this paper begins to analyse public perceptions of cost sharing within energy transitions; and under what circumstances members of the public are willing to take on certain costs themselves.

Theoretical background: The analysis builds on previous research which has explored the range of values underlying societal preferences and attitudes towards sustainable energy transitions, highlighting how these preferences are also dependent upon trust in institutions and governance arrangements (Demski et al., 2015). For this paper we therefore draw on relevant psychological and risk perception literatures to examine the role of trust, and related concepts such as procedural justice, in determining people's perceptions and willingness to accept energy transition costs.

Methods: A mixed-method approach is employed. Specifically, the analysis is based on a UK national survey conducted in August 2016 (n=3150) as well as five follow-up focus groups conducted in four locations across England, Scotland and Wales using a diverse sample of the UK public (n=37). The focus groups were designed to provide a more in-depth understanding of the reasoning people engage in when considering who is responsible to pay for energy transitions as well as their own willingness to accept costs.

Results/Analysis: The analysis of the survey focuses on understanding two key aspects of public perceptions: (a) willingness to accept costs associated with energy system change and (b) perceptions of public responsibility for energy system change. Regression analysis and structural equation modelling

of the survey data reveals procedural justice beliefs as well as perceptions of energy companies as particularly important in shaping people's willingness to accept responsibility and cost. Specifically, negative beliefs about energy companies and their actions (e.g. profit-making) are highly predictive of people's acceptance of cost at the individual level. Other variables also show a significant relationship, such as values and direct measures of trust, but these are predictive of cost acceptance to a much lesser extent. Thematic analysis from the focus groups confirms that people's perception of other actors within the energy system are an important determinant of people's views on who should pay for energy transitions and their willingness to accept costs personally. We also examine the types of conditions people place on their acceptance of cost.

Conclusions: People's perceptions of other energy system actors, specifically energy companies, are influential in how much responsibility and cost people are willing to accept. Specifically, decreased trust, and mistrust, is likely to negatively affect industry and government's ability to deliver low-carbon energy transitions.

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Demski, C., Butler, C., Parkhill, K. A., Spence, A. and Pidgeon, N. F. (2015). Public values for energy system change. *Global Environmental Change*, 34, 59-69.

305 "Beyond a fuel" Context and relatedness in perceptions of nine energy sources and technologies in Wales, UK

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Keywords: trust; cost acceptance, energy transitions

Abstract:

Energy sector change, including economic pressures, increased energy demand and environmental targets, has important ramifications for the wider public and, in particular, the communities living in places where energy infrastructure is located. Fostering transformation in the UK's energy mix is therefore contingent on public support, which might otherwise prove a barrier to energy development (Lozano-Maya, 2016). Public perceptions of energy technologies are often complex and the risks and benefits of energy infrastructures are grounded in, and interpreted at different spatial levels of understanding (Evensen & Stedman, 2016). Perceptions are also better understood in relation to other technologies rather than in isolation (Visschers & Siegrist, 2014). We investigate perceptions of risk, benefits and acceptance across a range of energy technologies in South Wales, UK within a post-industrial context of coal extraction that has become indelibly inscribed in physical and cultural terms. We conducted 30 qualitative interviews and card sorting exercises with urban and rural residents living in South-East Wales, UK to elicit perceptions relating to nine energy sources and technologies (natural gas, coal, shale gas, underground coal gasification (UCG), carbon capture and storage (CCS), nuclear power, offshore wind power, solar energy, and bioenergy). Energy perceptions tapped into ambivalences between the global and the local; e.g. coal was linked to global climate change, while also viewed nostalgically and part of local heritage. Results also show nuances in perceptions of risks and benefits were made meaningful through comparisons to other energy technologies in dilemmatic ways, e.g. renewables as low risk/intermittent generation, and nuclear as high risk/consistent generation. Public perceptions of energy technologies are significantly influenced by different levels of understanding, especially the everyday contexts in which perceptions are grounded. These have important implications for energy policy, planning and siting issues. An element of policy and communications should be tailored to local 'energy contexts'.

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316 Public concerns and preferences regarding energy supply systems: A comparison across four European countries

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Keywords: Public perception; energy systems; cross-national comparison

Abstract:

The current paper presents an international comparison of public preferences concerning different energy supply systems and the motivations underlying these preferences. Different energy supply systems are perceived in different ways. For example, a UK study showed that fossil fuels are generally seen as polluting but reliable; nuclear energy as dangerous but relatively clean; and wind energy as clean and safe but somewhat less reliable (Parkhill, Demski, Butler, Spence, & Pidgeon, 2013). We therefore expect that the extent to which people favor different energy supply systems depends upon how much importance they assign to these features. Further, given large differences between countries with respect to national energy policies, infrastructures, and cultures, we expect cross-national variation in both concerns and preferences regarding energy supply systems.

We report findings from an international survey with representative samples from four European countries (Germany, Norway, France, United Kingdom; approx. N=1000 per country), which were selected specifically to contrast divergent national energy contexts. The measure for energy concerns was adapted from Engels, Hüther, Schäfer, and Held (2013), covering the reliability of the energy system to provide a stable supply of energy, the affordability of energy, dependency on energy imports, and impacts of the energy system on environment and climate as well as on economic development. Energy systems were selected so that they could be expected to vary concerning public attitudes and preferences (Whitmarsh et al., 2011) and covered the relevant options for the four countries (Arnold et al., 2016).

In France, Germany, and UK, economic development and import dependency are less important concerns than stable supply, affordability, and environmental impacts. Norwegians show a unique pattern of concerns in that they are more concerned about import dependency and less concerned about economic development than the other countries. Preferences for energy systems show little variation across countries, with renewable energy sources being generally preferred over fossil fuels. The least preferred supply systems are coal and fracking. Nuclear power is the system that shows the strongest cross-country variation, being most favored in UK, and least favored in Germany and Norway. Regression analyses show that each energy supply system is predicted from a unique profile of concerns. For example, preference for coal and oil goes together with concern for economic development and affordability. All renewable energy systems increase in favorability with increasing concern about the environment and climate, each system with specific additional significant predictors. For example, concern for stable energy supply is positively related to preferences for biomass and hydro but negatively to preferences for onshore wind.

The results are placed in the cultural contexts of the four countries with respect to attitudes, risk perceptions, and policies (Arnold et al., 2016). The implications for the formation of public preferences concerning energy supply systems are discussed.

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324 Perception of externally controlled manmade risks associated with energy production

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Keywords: risk perception; trust; manmade risks

Abstract:

In order to tackle environmental problems, a transition to more sustainable production and use of energy is inevitable. However, producing energy poses serious risks on society. Exposure to risks can have negative psychological implications, especially when people think they cannot control the risks. Particularly with regard to energy production, people typically have little or no control over the occurrence and severity of the risks. This study zooms in on factors related to public perceptions of risks associated with energy systems and technologies and its relationship with psychological implications. Particularly, it will focus on public perceptions of risks caused by energy production, the psychological implications of such risks (e.g., emotions), and how trust in responsible parties affects this relationship.

Theories on coping with risks (e.g. theory of psychological stress (Lazarus, 1966), The Transactional Model of stress and coping theory (Lazarus & Folkman, 1984), and Protection Motivation Theory (Rogers, 1983) generally assume that negative psychological implications not only depend on risk perception (i.e. threat appraisal/primary appraisal), but also on perceived efficacy (i.e. coping appraisal/secondary appraisal). So far, most evidence comes from studies on personally controlled manmade risks, where individuals own ability to prevent, reduce and mitigate risks is important for risk perception and protection. But what about externally controlled manmade risks? We propose that, with respect to externally controlled manmade risks caused by energy production, trust plays an important role, because individuals have little or no control over the occurrence and severity of the risks and have to rely on the responsible parties (e.g., the government) for that.

By means of a questionnaire study and an experimental study we test our model and study the extent to which psychological implications are predicted by risk perception and trust in responsible parties. We test our model with several energy sources and technologies (including natural gas). As expected, we found that a high risk perception and low trust leads to more negative psychological implications (e.g. feelings of powerlessness), compared to a low risk perception and high trust, which could lead to more protective behaviour to effectively reduce the risks. These findings are compatible with theories on coping with risks.

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THE ROLE OF AFFECT AND EMOTION IN SUSTAINABLE BEHAVIOR

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Abstract:

Human behavior has for a long time been understood as being driven exclusively by rational considerations. In the environmental domain, attempts at understanding and changing human behavior have often focused on cognitive factors such as utility computations, attitudes, values, or norms. Recent years, however, have seen an increase of research investigating the role of affective factors and emotions in sustainable behavior. In this symposium, we bring together five presentations illustrating recent developments in this line of research.

Ulf Hahnel will present a series of experiments investigating the impact of different types of emotions on environmental decision-making, illustrating that positive emotions are linked to a higher willingness to invest and donate for the common good, while negative emotions can predict an increased willingness to reduce one's resource consumption.

Goda Perlaviciute will present results from a longitudinal study, which tracked the experience of emotions towards earthquakes caused by gas production. Results illustrate a stark contrast between the presentation of emotions in the coverage by the media and the actual emotions reported by the population.

Aurélien Graton will present research investigating the influence of guilt on compliance to persuasive pro-environmental communication. Results show that guilt may indeed promote pro-environmental behavior, but only if suggestions for reparation are presented. Guilt moreover increases attention toward positive and reparation-oriented cues and makes attitudes toward reparation-oriented primes more positive.

Tobias Brosch will present neuroimaging data illustrating mental representation of the consequences of change consequences and their impact on climate change concern. Results show that individuals who are able to create affectively rich mental simulations of climate change consequences in the far future express more concern about these events, overriding the tendency to discount the future.

Themes:

- Energy transitions and consumption: The human factor.
- Individual factors underlying environmental attitudes and behavior
- Underlying motivations of individual involvement in environmental behavior

036 Not my future: The neural representation of climate change consequences

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Abstract:

Introduction: Global climate change is one of the most urgent challenges facing our planet, threatening the economic and health-related prospects of current as well as future generations (1). Due to the intergenerational nature of climate change, serious efforts to reduce greenhouse gas emissions are required today, but will mainly benefit future generations.

Theoretical background: While the scientific evidence for climate change is robust, individuals fundamentally differ in the extent to which they feel concerned by its consequences. One factor that may contribute to a person's willingness to act to mitigate climate change is their perception of climate change consequences in relation to themselves. Humans possess the ability to mentally simulate episodes that might happen in the future. This capacity is thought to enable individuals to mentally

represent the affective element of future costs and benefits, promoting more far-sighted decisions. Neuroscientific evidence indicates that simulations of future states rely on neural systems involved in episodic memory (2).

Methods: Here we investigate to what extent these mechanisms are involved in people's perception of and concern about climate change. We address the intergenerational nature of climate change by comparing neural representations of consequences occurring in the near future, i.e., during a person's lifetime, to consequences occurring in the far future, i.e., a time by which the person will most likely no longer be around. Using functional magnetic resonance imaging (fMRI), we measured changes in our participants' BOLD response while they were reading and evaluating a series of 36 potential consequences of climate change, which were indicated as occurring either in the near or in the far future. Participants were asked to read each consequence and to indicate (i) to what extent they perceive each consequence as a serious problem and (ii) to what extent they are worried by it.

Results: We observed increased activation in VMPFC, a region involved in encoding the personal relevance of future events, when participants were envisioning consequences occurring in the far future, but only in participants whose core values emphasize the need to transcend self-interest. Moreover, these participants showed equal concern for climate change consequences occurring in the near and far future. Participants who emphasize self-interest values were more concerned about events in the near future.

Conclusions: The observed activation may reflect the fact that participants with self-transcending core values perceive far future consequences of climate change to be more personally significant, given that their "sphere of concern" extends to other people and future generations. They may be able to simulate the affective component of these future consequences to a larger extent, overriding the tendency for temporal discounting (3). Our findings open up new avenues for intervention strategies promoting sustainable behavior. Moreover, they illustrate the potential of neuroscientific approaches for psychological sustainability research.

Keywords: Climate change, future projection, core values, temporal distance, neuroimaging

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051 Feeling guilty and seeing green: Understanding guilt's influence on pro-environmental behavior through mediating cognitive processes

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Keywords: guilt, pro-environmental behavior, attention, motivation, persuasion

Abstract:

Guilt arises from a personal transgression which has breached one's personal moral standards and hurt another person (Ortony, Clore, & Collins, 1988). Then, guilt is typically thought to encourage reparative actions and has long been seen as an emotion promoting socialization processes (e.g., Ausubel, 1955). It has for example been shown that guilt increased feelings of responsibility toward others as well as pro-social behaviors (Ketelaar & Au, 2003). For these reasons, guilt appeals are frequently used in the field of persuasion, especially in the pro-environmental domain, where guilt is supposed to promote compliance to a message's demand (e.g., Chang, 2012). However, even though this guilt-reparation association has received strong empirical support (e.g., Cryder, Springer, & Morewedge, 2012), the processes underlying these effects remain in need for further specifications (De Hooge, Nelissen, Breugelmans, & Zeelenberg, 2011). Moreover, guilt was sometimes found to produce backlash and reactance-like effects (see O'Keefe, 2002). Our research was then aimed at exploring more thoroughly the influence of guilt on compliance to persuasive pro-environmental

communication through a better understanding of the cognitive processes involved with guilt. A first series of experiments showed that guilt may indeed promote general pro-environmental behavior, but that it requires the presence of reparation suggestions in order to trigger prosocial behavior (Graton, Ric, & Gonzalez, 2016). This link is fragile and can be reversed when reparatory means are blatantly offered by the guilt inducer. In a second series of experiments, we planned to test more directly several cognitive processes potentially involved in the guilt-reparation link. We relied for these studies on several cognitive paradigms, like the dot-probe task (attention bias) or implicit motivation (see Ferguson, 2008). Results suggest that guilt, compared with shame and a control group, increases attention toward positive and reparation-oriented cues and makes attitudes toward reparation-oriented primes more positive. Implications for a better knowledge of guilt's behavioral consequences and for the role of guilt in persuasive pro-environmental communication are discussed.

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062 The distinct impact of emotions on environmental decision-making

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Keywords: Emotions; values; decision framing; decision-making

Abstract:

Introduction: The pathways to an environmentally friendly lifestyle are manifold. In order to act in an environmentally friendly manner, we can invest resources, for instance, by choosing an energy tariff based on renewable energy. Additionally, we can curtail consumption of natural resources by reducing energy consumption in various fields. In the present research, we tested our tenet that emotions exert distinct influences on these central types of actions.

Theoretical background: From a theoretical perspective, investment and curtailment decisions can be discriminated in terms of gain and loss frames (Tversky & Kahneman, 1981). Investments are associated with short-term (financial) losses, while consumption is characterized by immediate gains (Samuelson, 1990). In line with literature on the impact of emotions on decision-making (Lerner, et al., 2015), we hypothesized that emotions shape these different types of environmental decisions. Crucially, we expected that the assumed impact of emotions on decision-making is subject to the characteristics of the decision at hand – that is, the decision's framing in terms of gains or losses.

Methods: We conducted a series of studies to confirm our hypotheses. In a first step (Studies 1–2; N = 160; N = 2867), we conducted exploratory and confirmatory factor analyses to identify and map emotions relevant in the environmental domain. Further, we analyzed the emotion factors' predictive power over and above established antecedents of environmental decision-making (i.e. biospheric, hedonic, egoistic, and altruistic values). In a second step (Study 3; N = 530), we applied an experimental paradigm to examine the interaction of the emotion facets with decision framing.

Results: In Studies 1–2, we identified five distinguishable emotion factors, which successfully predicted

decisions in various domains. Effects of emotions were robust, even when controlling for participants' values. In Study 3, we tested our hypothesis of a modulated impact of emotions that is subject to the decision's framing (gain/loss framing). To this end, we experimentally varied whether the target decision (i.e. donation task) was framed either as a gain or a loss. Results supported our hypothesis. In the loss framing condition, dispositional positive emotions (e.g. pride) predicted the amount donated to an environmental organization in that stronger emotions resulted in higher donations. In the gain framing condition, however, more pronounced dispositional negative emotions (e.g. guilt) rendered participants to take less money for themselves, eventually resulting in higher amounts assigned to the environmental organization.

Conclusions: Our findings illustrates how and under which circumstances specific emotions exert their influence on environmental decisions. Specifically, the decision's loss/gain framing constitutes a crucial component that gives rise to distinct effects of emotions. Considering that core environmental decisions in everyday life are inherently composed of gain/loss frames, the results also implicate strong practical relevance.

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124 Risk perceptions and emotions towards earthquakes caused by gas production

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Abstract:

Energy production may pose serious risks, for example, nuclear accidents, oil spills, and earthquakes caused by gas production. To secure socially responsible energy production, decision makers need to know how the public perceives such risks.

Decision makers often rely on media reports on risk perceptions. Yet, the media may particularly focus on the highest perceived risks. If the media suggest that people are much more concerned about the risks of energy production than most of them actually are, decision makers may overestimate the likelihood that people are motivated to take or accept actions to protect themselves against these risks. On the other hand, one should be cautious to simply rely on self-reported risk perceptions too. Studies have found that people who are exposed to high risks may downplay these risks for themselves, a result of so-called optimism-bias. This may lead decision makers to underestimate the perceived risks.

This paper demonstrates the importance of social sciences research for evaluation of and decision making on risks caused by energy production. As a case in point, we studied perceived risks and emotions towards earthquakes cause by gas production in the province of Groningen, the Netherlands. We conducted a longitudinal questionnaire study among residents in the province of Groningen from three regions varying in exposure to earthquakes. To gauge potential optimism bias, we asked people to evaluate the risks not only for themselves but also for people in the province of Groningen in general, and we compared these evaluations across regions that vary in exposure to earthquakes. We studied (changes in) perceived risks and emotions over time.

Our study revealed that people were particularly concerned about the risks for properties and for the image of the province of Groningen, whereas other risks, including physical and mental health, were seen as lower. Perceived risks were highest among those most exposed to risks, which does not support an optimism bias. In contrast to media images, the earthquakes only elicited moderate negative emotions. Yet, people felt powerless when thinking about the earthquakes and, despite various mitigation measures that were implemented, the perceived risks and negative emotions did not reduce over time.

The study demonstrates that social sciences research is needed for evaluation and decision making on risks of energy production. Studying discrete perceived risks and emotions can enhance priority setting in decision making.

SSIV-02 SYMPOSIUM:

Room: +1.2

PUBLIC PERCEPTIONS OF CLIMATE CHANGE: INSIGHTS FROM INTERNATIONAL COMPARISONS

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Theme: Risks and hazards: Perception and Management

Abstract:

Climate change is arguably one of the most serious challenges the world is facing today. Preventing dangerous levels of climate change has become a major policy objective, both nationally and internationally. The social transformations necessary for achieving this objective require widespread and sustained public support, with public perceptions of climate change playing a critical role in understanding people's willingness to both change their own behaviors and support policies to tackle climate change.

While a considerable body of national studies exists on public climate risk perceptions, systematic and detailed international comparisons are scarce yet greatly needed given the globality of the climate change problem. This symposium provides such a comparative analysis. Three of the four contributions (Böhm, Poortinga, Steentjes) present results from a collaborative project on European Perceptions of Climate Change (EPCC), in which an international survey of climate perceptions was conducted in four European countries: Great Britain, Germany, Norway and France. Nationally representative samples of approximately 1000 respondents per country participated in the survey. In addition, an in-depth socio-political analysis of each country's national and cultural context was conducted as part of the EPCC project (Arnold et al., 2016). The fifth contribution (Brügger) complements the European perspective with that of the Global South by presenting a large-scale survey (N = 1040) among respondents from Peru which used in part the same items as the EPCC survey.

Together, the contributions to this symposium provide a comprehensive picture of various facets of climate risk perceptions from a cross-cultural perspective: Poortinga focuses on climate skepticism and analyses beliefs about the reality, anthropogenic nature, and seriousness of climate change. Böhm deals with emotional reactions to climate change and investigates which cognitive appraisals underlie concrete emotions such as fear or anger. Steentjes looks at social influences on climate perceptions. She investigates how social norms and social identity affect individual climate beliefs and interpersonal activism. All three contributions from the EPCC project present differences between the four participating European countries and relate their findings to socio-demographic, attitudinal, and socio-political variables. Brügger broadens the cross-cultural perspective by studying climate perceptions in Peru. He looks at risk perceptions, emotional reactions, and moral judgments in the mountainous Cusco Region and contrasts his findings with European results. All contributions discuss the implications of their findings for engaging the public with the issue of climate change in varying socio-political and cultural contexts.

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Arnold, A., Böhm, G., Corner, A., Mays, C., Pidgeon, N., Poortinga, W., Poumadère, M., Scheer, D., Sonnberger, M., Steentjes, K., Tinnereim, E. (2016). *European Perceptions of Climate Change. Socio-political profiles to inform a crossnational survey in France, Germany, Norway and the UK*. Oxford: Climate Outreach.

179 The role of social norms in shaping individual and national responses to climate change: A comparison across four European countries

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Keywords: Social norms, interpersonal activism, climate change,

Abstract:

Introduction: The European Perception of Climate Change (EPCC) project offers a unique opportunity to gain insights into the social processes that shape public perceptions of climate change, support for related policies and personal action. The cross-national survey, conducted in Germany, France, Norway and the United Kingdom allows us to examine social constructs as individual level predictors and as predictors of between-country differences.

Theoretical background: A vast body of literature established that individual beliefs and actions are influenced by what the social environment approves of (injunctive norms) and by what others are doing (descriptive norms). In addition to using these two traditional measures of social norms (Cialdini, 1990), we ask respondents about their willingness to enforce these norms (interpersonal activism). This willingness to confront others is a reflection of underlying norms and also a process of change. Confrontation has been extensively researched in other domains but only few researchers considered this process in relation to environmental issues (Swim, 2013). The additional measure of interpersonal activism will help us to capture multiple facets of social norms and thereby broaden our understanding of how norms shape public perceptions of climate change.

Method: The survey was conducted in June 2016 in the UK (n=1033), Germany (n=1001), France (n=1010), and Norway (n=1004). The interviews were administered by a survey company who used quota sampling to recruit respondents for the face to face in Germany, UK and France and random sampling for the phone interviews in Norway. The questionnaire consisted of 71 closed and three open questions to measure climate change belief, energy preferences, policy support and related psychological constructs.

Results: Stepwise regression analysis for each of the four countries show that injunctive and descriptive norms predict individuals' willingness to reduce energy (to help mitigate climate change); when tested alongside other predictors such as political values, environmental identity and concern about climate change. The analyses of peoples' willingness to engage in acts of interpersonal activism reveal that concern about climate change, environmental identity and injunctive norms directly predict respondents willingness to act, while descriptive norms have an indirect effect on interpersonal activism by increasing feelings of collective efficacy (for UK, Germany and Norway). Furthermore, multiple mediation analyses demonstrate that different levels of perceived social norms associated with climate change, also (partly) explain the higher support for mitigation policies and the Paris Climate agreement in France and Norway compared to Germany and the UK.

Conclusions: The results of the cross national EPCC survey provide evidence for the relevance of social norms shaping individual responses to climate change as well as being able to explain national differences in policy support between four major European countries. Theoretical and practical implications of these findings will be discussed.

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185 Public perceptions of climate change in Peru

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Keywords: Climate change; public risk perception; emotions; morality; behavioural tendencies

Abstract:

Introduction and theoretical background: Most research on public perceptions of climate change is done in relatively rich, industrialized countries. Historically, many of these countries have emitted disproportionately much to climate change but have relatively little to fear in terms of its consequences (Althor, Watson, & Fuller, 2016). By contrast, there is far less research available on how people in the Global South, who have contributed relatively little to climate change, yet are much more vulnerable to its negative impacts (Althor et al., 2016), perceive the phenomenon of climate change. We aim to reduce this knowledge gap by focusing on public perceptions of climate change in Peru. More specifically, our research focuses on whether and how intensely Peruvians feel emotions with regard to climate change (e.g., Böhm & Pfister, 2015; Smith & Leiserowitz, 2014), to what extent they think it a moral issue (e.g., Böhm & Pfister, 2015), to what extent they believe that climate change is a risk to them personally and to society and nature more generally, and how positively or negatively they evaluate these risks.

Methods: After thorough piloting with members from the public, trained interviewers conducted tablet-assisted structured face-to-face interviews. Most questions were presented in a closed-ended format. Participants (N > 1,000) were adults from the general public in the mountainous region of Cusco in Peru. They were selected by a random route procedure and interviews lasted between 50 and 90 minutes.

Results: Participants' expectations about future risks from climate change were consistent with scientific model predictions and almost exclusively evaluated as negative. Consistent with this, participants most strongly felt the emotions of fear, indignation, and sadness when thinking about climate change. The emotions that were least intense were shame, guilt, and regret. Participants saw climate change as a moral issue, supporting statements such as that "contributing to climate change is blameworthy" and that "people should avoid behaviours that contribute to climate change". Although most participants believed that "climate change is mainly caused by rich countries" and that they "should compensate groups that are victims of climate change", participants also acknowledged their own country's contribution to causing climate change and their responsibility for taking action on this issue.

Conclusions: Relationships between different concepts are mostly as anticipated and similar to those observed in industrialized countries. This study contributes to better understanding public perceptions of climate change in Peru and corroborates the important role of emotions and moral considerations in the context of risk perceptions.

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226 Prevalence and distribution of climate scepticism in four European countries

Poortinga, W.¹, Steentjes, K.¹, Pidgeon, N.¹, Böhm, G.², Arnold, A.³, Tvinnereim, E.⁴, Mays, C.⁵, Poumadere, M.⁵ & Corner, A.⁶

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Keywords: Climate change; public attitudes; scepticism.

Abstract:

Introduction: Ambitious climate change mitigation targets require fundamental shifts in the way energy is used and produced. These ambitious targets can only be met with sustained and widespread public support. A public that doubts the reality, anthropogenic nature or seriousness of climate change is unlikely to change their behaviour or support policies that are needed for a transformation to a low-carbon economy.

Theoretical Background: The research uses the climate scepticism framework proposed by Rahmstorf (2004), by making a distinction between trend (doubt about the reality of climate change), attribution (doubt about its anthropogenic nature), and impact (doubt about its seriousness) scepticism. Previous research has shown that scepticism in the media is a predominantly 'Anglophone' phenomenon (Painter 2011). While impact scepticism is widespread among the general public in Britain, trend and attribution scepticism are far less prevalent, with climate scepticism being predominantly found among older, politically conservative individuals (Poortinga et al., 2011). Little is known however about the prevalence and distribution of climate scepticism in other European countries.

Methods: This study comprised four nationally representative surveys conducted in June 2016 in the UK (n=1,033), Germany (n=1,001), France (n=1,010), and Norway (n=1,004). Face-to-face interviews were conducted in the UK, Germany, and France; and a bespoke telephone survey was conducted in Norway (as face-to-face interviews are uncommon in Norway due to a highly dispersed population). The 'European Perceptions of Climate Change' questionnaire was designed in English and doubly translated into the other languages. The questionnaire contained question on the topics of climate change perceptions, energy preferences, and policy support.

Results: Results show that climate change is to many a less relevant issue than other, more topical concerns, such as unemployment, immigration, and the refugee crisis. Trend scepticism is relatively uncommon in the four countries, but is the highest in Germany and the UK. Attribution scepticism appeared low: in all four countries, a clear majority thought that climate change is at least partly caused by human activity. While in all four countries a majority thought we are already feeling the effects of climate change, a small but significant minority though it would not have a big impact on them and/or thought that the impacts would be positive. Climate sceptical beliefs were differentially associated with gender, age socio-economic status, and political orientation across the four countries.

Conclusions: In contrast to our expectations, trend climate scepticism was highest in Germany. Climate scepticism is therefore not only an 'Anglophone' phenomenon. Climate scepticism was distributed across different social groups within the four European countries, suggesting that climate scepticism can only be understood by talking cultural and socio-political context into account.

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230 Emotional reactions to climate change: A comparison across four European countries

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Keywords: Climate change; emotions; cross-national comparison

Abstract:

The current paper presents an international comparison of emotional reactions to climate change. Emotions are a strong motivational force and influence both judgments and behaviors in manifold ways. The present paper draws on appraisal theories of emotion according to which emotions are based on specific cognitive appraisals of the situation. The present study compares the following four specific emotions that we have shown in our previous research to be important in the context of environmental risks (e.g., Böhm, 2003; Böhm & Pfister, 2000, 2005, 2015): hope, fear, outrage, and guilt. We expect the following relationships between emotions and underlying cognitive appraisals: Both hope and fear are assumed to indicate that a person focuses on potential future consequences. While hope implies that negative consequences appear avoidable or positive consequences achievable, fear anticipates exclusively negative consequences. Outrage and guilt are hypothesized to be based on moral evaluations; outrage implying that others are seen as culprits whereas guilt results from self-blame.

This paper uses survey data collected in the 'European Perceptions of Climate Change' project using representative national samples (each approximately N = 1000) from Great Britain, Germany, Norway, and France. All measures were taken using a multi-item survey instrument. Face-to-face interviews were conducted in three of the four countries (UK, Germany, France). In Norway, telephone interviews were conducted; face-to-face interviews are uncommon in Norway due to its population being highly dispersed across a large area.

Results show that Norway and UK on the one hand and Germany and France on the other hand show similar profiles of emotional responses. While in Norway and UK hope is the most intense emotional response to climate change, fear and outrage dominate in France and Germany. Across all countries, outrage is the most and guilt the least intense reported emotion. Germany is the country where respondents report on average the most intense emotional reactions across all types of emotion. With respect to underlying cognitive appraisals we largely find the expected relationships. Hope decreases with increasing severity of anticipated climate change impacts. Hope increases with beliefs that imply that the problem may be solved, such as perceived collective efficacy in tackling climate change, trust in institutions to implement sustainable energy systems, and perceived climate engagement in one's social environment. Fear is mainly related to the severity of anticipated climate change impacts and the personal relevance of these impacts. Outrage and guilt are most strongly predicted from having moral concerns with respect to climate change.

Results document the important role and cultural diversity of emotional responses to climate change and support appraisal theoretical approaches to explaining emotional reactions. The implications of the findings for engaging the public with the issue of climate change in varying socio-political and cultural contexts will be discussed.

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THEORETICAL ADVANCES IN RESTORATIVE ENVIRONMENT RESEARCHStaats, H.¹, Hartig, T.², Collado, S.³ & Von Lindern, E.⁴¹Leiden University²Uppsala University³University of Zaragoza, Teruel, Spain⁴University of Zurich, Zurich, Switzerland**Theme:** restorative environments.**Abstract:**

Restorative environments research is productive in the sense that much research is being executed and published. Nevertheless, it seems that theoretical developments are lagging behind. We see a need for reflection on the state of existing theory, with the goal of further developing the concept of restoration and relating it to a broader range of person-environment transactions. This symposium aims to contribute to this goal. Four presentations are scheduled.

First, Silvia Collado will expand on the links between restoration and the development of children's pro-environmental behavior. Based on recent studies she will present a view on how to understand children's restorative processes as these are related to natural environments and in what way involvement with natural environments may lead to pro-environmental action.

Second, Eike von Lindern will present ideas and findings on how behavior setting theory, this classical theory in environmental psychology, can fruitfully be combined with notions of restoration. He will expand on the idea of setting interdependency and its consequences for restoration.

Third, Terry Hartig will consider implications of psychophysiological research on non-visual effects of light for the study of restorative environments. They will address the historical neglect in restorative environments research of the biological programming of rest and activity within circadian cycles and the implications of biological timing for the study of restorative experience.

Finally Henk Staats will propose ideas about restoration that depart from the way attention restoration theory and stress reduction theory have so far been interpreted and used to measure circumstances or devise manipulations that create a need for restoration. Going back to old ideas, just like Eike von Lindern, he will present an analysis of the need for restoration as resulting from a substantial deviation from the optimal degree of stimulation, but with a focus on the low end of this continuum and on the consequences of adaptation processes.

139 Children's restorative experiences and pro-environmentalism: How are they linked?Collado, S.¹ & Staats, H.²¹ University of Zaragoza, Teruel, Spain² Leiden University, Leiden, The Netherlands**Keywords:** Children; restoration; pro-environmentalism**Abstract:**

Introduction: The underlying mechanisms responsible for promoting children's pro-environmentalism through nature exposure are fairly unknown. Results from both correlational and experimental studies suggest that exposure to nature is associated with more favorable pro-environmental attitudes and behaviors (Chawla & Derr, 2012), even in the absence of environmental education (Collado, Staats & Corraliza, 2013). These findings suggest that other factors, apart from the content of outdoor environmental education programs, enhance pro-environmentalism in children. Psychological restoration may be a key factor.

Theoretical background: Psychological restoration refers to the renewal of adaptive resources that have become depleted in meeting the demands of everyday life. Results from studies examining restoration in children suggest that nature exposure positively affects children's emotional and cognitive domains. However, little is known about the factors and processes that lead children to consider nature a restorative resource, and the circumstances under which such learning occurs. Equally unknown are the consequences that experiencing restoration may have for different aspects of children's development, such as the development of children's pro-environmentalism. Our aim is to broaden the restorative research scope by proposing that restoration has a unique effect in explaining why nature experiences motivate pro-environmental behavior in children.

Method: In order to achieve our objectives, we propose two main research lines to be discussed in the symposium: 1. An examination of the physical, contextual and behavioral characteristics of nature that foster restoration during childhood; and 2. the study of the unique effect that restoration through contact with nature may have on children's pro-environmentalism.

Results: We propose that by conducting research along the lines described above we will obtain a comprehensive understanding of what makes an environment restorative for children. Ultimately, we will focus on evaluating the possible unique causal effect that restoration has on children's pro-ecological behaviors.

Conclusions: We consider the symposium to be a perfect occasion to discuss the three lines of research proposed above. We expect to end up with a research agenda regarding children's restorative experiences in nature and pro-environmentalism.

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Collado, S., Staats, H., & Corraliza, J. A. (2013). Experiencing nature in children's summer camps: Affective, cognitive, and behavioural consequences. *Journal of Environmental Psychology*, 33, 37-44.

119 Joining attention restoration theory with behavior setting theory: The role of perceived interdependencies for restorative processes

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Keywords: attention restoration; behavior settings; constrained restoration

Abstract:

Introduction: Psychological distance to everyday demands and perceiving fascination are considered important in attention restoration theory for supporting restoration of depleted cognitive resources (Kaplan & Kaplan, 1989). Although measures exist to assess if people experience psychological distance and fascination, only little is known about the why of this perception. This research gap will be addressed by joining assumptions from attention restoration theory (Kaplan & Kaplan, 1989) and behavior setting theory (Barker, 1978).

Theoretical background: The account of behavior settings and their characteristics encourages consideration of restorative environments as behavior settings with particular properties that support particular behaviors, and it particularly directs attention to the degree to which settings meant or expected to support restoration are free from interdependencies with settings where stressful demands usually are experienced. When strong behavior setting interdependencies with demanding settings are experienced while spending time in a setting ordinarily relied on for restoration, the restoration process is likely to be constrained.

Methods: Two studies will be presented. In the first study, a measure of perceived setting interdependencies has been developed and applied in a cross-sectional sample of the German population (N = 726). In a second cross-sectional survey study among a Swiss sample (N = 677) it was additionally tested whether perceived setting interdependencies impact restorative outcomes mediated not only through the sense of being away, but also

through perceived fascination. It was differentiated between fascination and being away based on the perceived degree of naturalness of the environment and the respondents' self-reported level of physical activity.

Results: Results of both studies indicate that perceiving weak or strong setting interdependencies significantly impacts the sense of being away and outcomes associated with attention restoration. The first study shows that the stronger the perceived setting interdependencies were, the weaker was the sense of being away and self-perceived health and wellbeing. Results from the second study suggest that the sense of being away was more vulnerable for setting interdependencies compared to fascination, and that being away and fascination related to the level of physical activity impact self-reported restorative outcomes stronger than fascination and being away related to the degree of naturalness of the environment used during leisure time.

Conclusions: Combining attention restoration theory with behavior setting theory provides a more sophisticated understanding of why people experience psychological distance (and fascination) during leisure time. This approach complements research and practice concerned with attention restoration, human health and wellbeing by depicting a theory-based pathway that allows to enhance perceived restoration during leisure time activities, and, consequently, health and wellbeing through interventions that weaken perceived setting interdependencies.

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334 The Environmental Psychophysiology of Light: Lessons for Research on Restorative Environments

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Keywords: circadian timing; light; psychophysiology; restoration

Abstract:

Introduction: Environmental psychophysiology has been defined as the study of relationships between organism-place transactions and physiological events. In this presentation we will consider implications of psychophysiological research on effects of light for the study of restorative environments.

Methods: After introducing concepts from environmental psychophysiology, we will selectively review several areas of research on the non-visual effects of light. We will also selectively review research on lighting in everyday settings, such as workplaces. With our review we seek to extract insights regarding restorative experience and the characteristics of environments in which restoration takes place.

Results: Relevant non-visual effects of light are described by research on seasonal affective disorder, jet lag, and maladaptation to night work. The psychophysiological research describing the role of non-visual effects of light in circadian timing speaks to the extent to which resting behavior is biologically programmed, the extent to which regularly initiated restorative experiences are driven by variations in the natural environment, and the negative consequences for well-being and effective performance of disturbances in biological timing.

Conclusions: The study of restorative environments has to date largely ignored the biological programming of rest and activity within circadian cycles and the implications of biological timing for the study of environmental effects on human behavior. Recognition of non-visual effects of light has implications for a variety of issues in restorative environments research, including evolutionary assumptions about adaptedness to the natural environment, relations between affective and cognitive outcomes of restorative processes, and methodological requirements and strategies for tests for restorative effects of different environments.

270 Stress and fatigue while understimulated: The other end of restoration needs

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Keywords: optimal stimulation, stress, fatigue, sensory deprivation, adaptation level

Abstract:

Introduction: This contribution is based on two specific observations, (1) the fact that psychological research on restorative environments is mostly based on two theories, Attention restoration theory (ART, Kaplan, 1995) or Stress reduction theory (SRT, Ulrich, 1983); (2) that these theories depart from an overload situation, a situation where obligatory information processing has been too intense and for too long, or in which an emotionally threatening situation has occurred. This positioning of the theories regarding the situations that evoke a need for restoration may be too limited, keeping in mind that rather universal models of human information processing are based on a model of an optimal level of stimulation, implying that stimulation may not only be too intense, in various ways, but also too poor, limited, simple and uninvolved. Moreover, processes of adaptation that may seriously affect responses have not been given much attention either in the two theories on restoration. In agreement with this optimal level perspective we find that people actively look for stimulation that enhances curiosity, risk or even fear. This has a functional quality: Experiencing these can improve individuals' resilience and coping strategies (Collado & Staats, 2016; Suedfeld, 2012)..

Theoretical background: A classic paper by Wohlwill (1974) forms the basis for analyzing the stimulus situation as implied by ART and SRT. Wohlwill argues that men is motivated to create a situation of optimal stimulation, not too much but also not too little. Stimulation is distinguished in three separate dimensions: sensory/cognitive, social and behavioral. For each of these an optimum exists while compensation across dimensions is not discussed in the paper but seems possible, up to a point.

Ironically, in this paper Wohlwill considers the dangers of understimulation as more serious and more prevalent than conditions of overstimulation. Indeed, behavioral confinement in combination with sensory deprivation created conditions that were considered punishing and have been applied as torture. (for an illustration see Bexton, Heron and Scott (1954).

Method: An analysis of mainstream experiments based on attention restoration of stress reduction theory will demonstrate to what extent conditions of overload or underload have been created to test the basic hypotheses of both theories.

Results: The report given during the conference will be based on an overview of current approaches to situations that create the need for restoration. It is hypothesized that underload situations have rarely been created and that we therefore miss out on knowledge of vital, everyday experiences that create a need for restoration. The review is currently under way, the preliminary results confirm the expectation of the emphasis on overload situations. Final results will be presented at the conference.

Conclusions: The outcomes of this guided review of research on restoration will be used to discuss current limitations in use and development of theory. Outcomes will expectedly point to specific societal and research situations in which understimulation should be operationalized in more detail, and along different dimensions.

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CARBON CAPTURE, UTILISATION AND STORAGE (CCUS): PERCEPTIONS AND ACCEPTANCEXenias, D.^{1*}, Sala, S.², Jones, C.R.³, Arning, K.⁴ & De Vries, G.⁵¹ Cardiff University, Cardiff, UK * Symposium organiser² CISOT, CIEMAT, Barcelona, Spain³ University of Sheffield, Sheffield, UK⁴ Aachen University, Aachen, Germany⁵ Delft University of Technology, Delft, the Netherlands**Theme:** 1) Acceptability of environmental policies [or 2) Sustainability transitions or 3) Risks and hazards: Perception and Management]**Abstract:**

This symposium presents developments in carbon capture storage and utilisation from the UK, Spain, Germany and the Netherlands, focusing on the factors that affect perceptions and acceptance of these technologies.

First, Xenias presents on key barriers in public engagement with carbon capture and storage (CCS), common issues with engagement, and possible solutions. Expert interviews (N=13) identified (a) lack of political leadership on CCS; (b) lack of public knowledge on relevant technologies and (c) difficulty communicating why CCS is necessary. Emphasis on these barriers varied with the level of experts' public engagement. A subsequent expert survey (N=99) reinforced interview findings: public support was seen as important for CCS roll-out (72%), though lower than political support and funding; and local public was expected to experience most risks, while global public will experience most benefits. In the second paper, Sala reports on CCS acceptance in Spain. A public survey (N=963) found positive initial attitude towards CCS which remained positive after providing information. Nevertheless, respondents did not trust industry and government to make good decisions on CCS. Participants qualified as supporters (38%), neutral (34%) and opponents (28%). Their attitudes were determined by positive and negative emotions and the perception of risks and benefits of CCS – which were influenced by confidence in industry and government, personal relevance attributed to technology, and pro-environmental and pro-technology beliefs.

Next, Jones presents on lay perceptions of CO₂ utilisation (CDU). In 28 interviews with participants from the UK (N = 18) and Germany (N = 10) perceptions of CDU were compared and contrasted. Failures in siting, public engagement and communication around CCS in Germany have rendered public opinion less favourable than in the UK. Bearing in mind the similarities of CDU and CCS, perceptions of CCS might also affect CDU differently in each country. Perceptions of the techno-economic and societal risks and benefits also relate to the acceptance or rejection of these technologies.

In the fourth paper, Arning compares public perceptions of CCS and CDU (or CCU). In a large online survey, general acceptance was higher for CCU, with higher benefit- and lower risk perception. CO₂ storage was perceived riskier. Environmental behavior was associated with a lower CCU acceptance and higher risk perceptions, whereas technical self-efficacy, domain knowledge and technical innovativeness were related to a more positive perception of CCU compared to CCS. Individual user factors (e.g. domain knowledge, technical innovation), also affected perception of CCU.

Finally, in two experiments (N=259), de Vries tested the effects of green framing on perceived manipulation of information about low-carbon technologies (including CCS). Framed information was perceived as more manipulative than balanced information – especially when done by industry. Manipulation was unacceptable when done by an expected unbiased source (media); however, people accept this because industry is expected to frame their information. Results were confirmed by a follow up survey (N=845) which provided external validity to the experimental research.

Discussions from all presenters include ways forward for public engagement and improving perceptions and acceptance of carbon capture technologies with important implications for policy and industry.

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004 Green framing in low-carbon technology communication; How emphasis on environmental benefits can feel like manipulation

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Keywords: climate technologies; framing; greenwashing

Abstract:

Introduction: Low-carbon technologies such as shalegas or CCS are necessary to combat global warming. However, implementation often meets opposition, causing costly delays and cancellations. To prevent opposition, project owners tend to emphasize environmental benefits while downplaying safety risks. But how effective is this "green" framing?

Theoretical background: Framing can shape attitudes (Druckman & Bolsen, 2011). However, this effect is mainly demonstrated by one-shot experiments. Research is not conclusive on the long-term effects of framing. Green framing triggers scepticism (de Vries, et al., 2015) but it is unclear if this leads to resistance to low-carbon technologies. It is suggested that green framing leads to resistance over time when it is perceived as manipulative (de Vries, 2017). Therefore, it is relevant to investigate the causal effect of green framing on perceptions of manipulation.

Methods: Two experiments tested the effects of green framing on perceptions of manipulation in information about a low-carbon technology (Ntotal = 259). The impact of these perceptions was also assessed because only when manipulation is found unacceptable, the predicted long-term negative effects might come off. Acceptance can depend on who is framing (Rabinovich et al., 2012). Therefore, the source was varied (media vs. industrial project owner). A survey was conducted to provide external validity to the experimental research (N = 845).

Results: Framed information was perceived as significantly more manipulative than balanced information. Manipulation was unacceptable when done by a source who is expected to be unbiased (media). Framing is perceived as very manipulative when done by an industrial project owner. However, people accept this because industrial firms are expected to frame their information. The results of the experiments are published (de Vries et al., 2016), the results of the survey not yet.

Conclusions: Placing an emphasis on the environmental benefits of a low-carbon technology is perceived as manipulative but might only lead to negative effects when framing is not expected from the source.

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323 Determinants of public acceptance of CCS technology: Results from a survey study in Spain

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Keywords: CCS; public acceptance; public profiles

Abstract:

Introduction: This paper presents the results of a study aimed at characterizing public attitudes towards CCS technologies in Spain. Based on survey data from a representative sample of the Spanish population, we examine levels of awareness and familiarity with CCS technologies, emotional reactions and beliefs about CCS potential costs and benefits as well as overall evaluation, acceptance and support to CCS technologies. We also examine the factors influencing public acceptance of the technology.

Theoretical background: Understanding social reactions to CCS technologies has been the subject of social research for more than a decade (Seigo, Dohle, and Siegrist, 2014; Pietzner et al., 2011). Different studies have attempted to characterize the different dimensions of the public perception of CCS technology to understand and anticipate local reactions projects underground storage of CO2.

Method: The study is based on a cross-sectional survey with a sample of the general population in Spain (n = 963). The implementation was carried out via an online panel from a market research company. The questionnaire is based on the analytical model of "acceptance of technologies" (Huijts, Molin and Steg, 2012), with elements of the Information Choice Questionnaire and a review of international studies on public perception of CCS.

Results: The data show the existence of a low level of familiarity by the public with technology, but also the existence of a high interest in it. The initial attitude towards CCS is positive and, after receiving information, it receives a quite positive general evaluation. Nevertheless, respondents expressed a low level of confidence in the ability of the various actors, primarily industry and government, to make good decisions regarding CCS. According to his attitude towards CCS, it is possible to classify individuals into supporters (38%), neutral (34%) and opponents (28%). The attitude of individuals towards CCS is determined primarily by the positive and negative emotions as well as the perception of risks and benefits associated with CCS. In turn, emotions and perceptions of benefits and risks are influenced by confidence in industry and government, personal relevance attributed to technology and, to a lesser extent, pro-environmental and pro-technology beliefs individuals.

Conclusions: Understanding the concerns and beliefs of individuals regarding CCS technology is a first step in any active public involvement strategy in relation to this technology. Future strategies of public involvement in the field of CCS should aim to foster a greater cognitive, emotional and behavioural immersion of the general public in technology, as well as potentially communities hosting CO2 storages.

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330 Public engagement with CCS: barriers, key issues and ways forward

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Keywords: Carbon Capture and Storage; Expert perceptions; Public engagement

Abstract:

Introduction: Although Carbon Capture and Storage (CCS) is recognised as a crucial transition technology to a low-carbon world, it has not been popular with the public or some governments (e.g. the UK). Also, despite its use in industrial processes for decades, CCS remains an unfamiliar technology for most publics. It is therefore important to foster top-down and bottom-up acceptance of large scale CCS.

Theoretical background: Low awareness, public concerns (e.g., long-term viability, safety) as well as favourability (greenhouse gas reduction); differences between CCS in principle and at proposed sites, are factors influencing acceptance of these technologies. Ambivalence is still prevalent amongst the public, while clear opposition or support only account for a minority of views (Whitmarsh et al., 2015).

However, experts are expected to have better understanding of CCS and its risks and benefits; e.g. one study (Shackley et al., 2007) explored views of European energy stakeholders (industry, government, environmental NGOs, researchers, academicians and parliamentarians who all showed broad support for CCS and identified few risks. At the same time, Weber (2010) argues that such disparities are due to different processing styles between public and experts.

Methods: In an exploratory round of interviews we canvassed the views of British, Dutch, German and Norwegian experts (N=13) with previous experience in public engagement with CCS. In a subsequent expert survey (N=99) we collected quantitative and qualitative data from experts in the UK and internationally.

Results: Expert interviews identified a small number of recurrent issues, including: (a) lack of political leadership on CCS; (b) lack of public knowledge on relevant technologies and (c) difficulty communicating why CCS is necessary. Although most experts agreed on the importance of public engagement, their views divided between 'why' engage and 'how' to do this.

Expert survey findings reinforced the interviews findings: public support was seen as important for CCS roll-out (72%), though lower than political support and funding. The survey also showed that local public was expected to experience most risks, while global public will experience most benefits; whereas local business is seen to benefit more than global. Experts were overwhelmingly positive that CCS benefits outweigh risks, and were confident that CCS will play a major role in climate change mitigation.

Conclusions: These findings will be expanded on and triangulated in a follow-up public survey which will benefit those involved with public engagement with CCS. We expect that the comparison of expert and public views and contrasts on comparable aspects of CCS perceptions will identify discrepancies between the two audiences, and inform communications and engagement strategies targeted to address the shortcomings of current approaches.

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365 Lay perceptions of Carbon Dioxide Utilization (CDU) technologies in the UK and Germany: A qualitative interview study

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Keywords: Carbon Dioxide Utilization (CDU); Public perception; Attitudes

Abstract:

Introduction: Carbon Dioxide Utilization (CDU) technologies capture and convert Carbon Dioxide (CO₂) into carbon-based products (e.g. plastics, cement). CDU technologies are seen as a means of helping to address climate change while creating saleable commodities, which can help to offset the cost of the capture processes. While technical research and development into the feasibility of these options is accelerating, at present there is little research into the public (and broader social) acceptability of the technologies and related product options.

Theoretical Background: The importance of research into the public acceptability of CDU should not be understated, especially considering the noted impact that public opinion can have on the commercial success of technological innovation (see Wüstenhagen et al., 2007). The rationale for the current study was to conduct a series of exploratory, qualitative interviews to investigate emerging perceptions of CDU in a convenience sample of the lay UK and German public. The international comparison is pertinent bearing in mind the extant differences in public perceptions of Carbon Capture and Storage (CCS) in these countries (e.g. Pietzner et al., 2011).

Method: A total of 28 semi-structured interviews were conducted with lay people in Sheffield, UK (n=18) and Potsdam/Berlin, Germany (n=10) between July 2014 and December 2015. Questions were principally focused on elucidating more about the anticipated direct and indirect risks and benefits of the technology.

Results: The interview transcripts were analyzed in accordance with three key themes identified in prior research (see Jones et al., 2015): (1) conceptual comments (“*Should we invest in CDU?*”); (2) techno-economic comments (“*Is CDU feasible?*”); and (3) societal consequences (“*What will happen if we invest in CDU?*”). Participants spoke both positively and negatively of CDU in relation to each theme. For example, *conceptually* many interviewees questioned the extent to which CDU was a logical and viable means of tackling climate change; however, some interviewees did view CDU as a ‘bridging option’ (i.e. a technology that could be of value in the short-term as ‘better’ options are developed). Equally, in terms of *societal consequence*, while some interviewees saw CDU as something that might motivate public interest in CO₂ mitigation, others questioned whether CDU might encourage complacency around the need to mitigate CO₂. The thematic content of the responses provided by the UK and German participants was similar; however, there was more skepticism among the German interviewees and a greater focus on the need for regulation.

Conclusions: The results of this research add to the currently sparse literature on the nature and antecedents of public perceptions of CDU technologies. The findings hold relevance for future communication and public-engagement activities relating to the technology.

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364 Unequal brothers - Comparing public perceptions of CCS and CCU

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Keywords: Carbon capture and storage (CCS); Carbon capture and utilization (CCU); survey; technology acceptance; benefits; barriers; user factors

Abstract:

Introduction: Global climate change mitigation efforts have led to the development of innovative technologies to reduce CO₂ emissions and fossil resource use. Carbon Dioxide Capture and Storage (CCS) and Carbon Dioxide Capture and Utilization (CCU) are technical solutions to capture and store CO₂ (Global Carbon Capture and Storage Institute, 2015) and to use it as feedstock for the manufacturing of plastic products (Assen & Bardow, 2014). Since both technologies differ with regard to their underlying technical procedures and product outcomes and – even more important – their diffusion rate, their level of public awareness and related public perception, existing knowledge about CCS acceptance cannot be simply transferred to the CCU context (Bruhn, Naims & Olfe-Kräutlein et al., 2016).

Background: The example of CCS shows that misconceptions, misinformation, or inadequate mental models lead to overrated risk perceptions and reduced acceptance in the public (Wallquist, Visschers, & Siegrist, 2010), which can decelerate or even impede the successful implementation of a technology (e.g., LÖorange Seigo, Dohle, & Siegrist, 2014). Since CCU is a comparatively young technology with a low diffusion rate so far, research has just begun to investigate its public perception (e.g., Jones, Radford, Armstrong, & Styring, 2014, Arning, van Heek & Ziefle, 2016) mainly based on qualitative research approaches. Following on that, the present study aimed for a quantification of CCU acceptance in comparison to CCS acceptance and the identification of individual user factors, which affect CCU- and CCS-perceptions.

Methods: For the comparative analysis of CCS und CCU perception, we used data from an online survey, which was conducted in August 2016 in Germany (n = 512). We assessed general acceptance of CCS and CCU, perceived benefits and barriers as well as evaluations of different CCS and CCU technology process steps (for CCS and CCU: capture, transport, storage; for CCU additionally: product manufacturing, usage, disposal). As individual user factors we assessed socio-demographic variables, domain-knowledge as well as attitudinal variables (risk attitude, environmental behavior, technical self-efficacy, and technical innovativeness).

Results: General acceptance was higher for CCU, with a higher benefit- and a lower barrier and risk perception. The evaluation of the respective technology process steps revealed that CO₂ storage was perceived to be the riskiest. Even though the storage duration is permanent in CCS and temporary in CCU, the risk perception of the storage process did not differ significantly. Environmental behavior was associated with a lower CCU acceptance and higher risk perceptions, whereas technical self-efficacy, domain knowledge and technical innovativeness were related to a more positive perception of CCU compared to CCS.

Conclusions: The public perception of CCU and CCS, both CO₂-related technologies, was found to be different: CCU was more positively perceived, whereas CCS raised higher risk perceptions. We also identified individual user factors (domain knowledge, technical innovativeness), which led to a more positive or negative (environmental behavior) perception of CCU. The findings can contribute to a transparent and individually tailored public information about CCU and CCS, as well as communal policy strategies.

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SSV-02 SYMPOSIUM:

Room: +1.2

SYMPOSIUM ON SOCIAL ACCEPTANCE OF LARGE SCALE ENERGY INFRASTRUCTURE

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Theme: Sustainability and social conflict; Energy transitions and consumption. The human factor

Abstract:

The European Union, their member states and Governments, are fostering the deployment of large-scale low carbon renewable energy infrastructure (RET) and associated energy infrastructures (EIs), such as power lines, to mitigate climate change. However, when infrastructures are to be deployed, opposition is often found. Environmental justice-involving issues of distributive and procedural justice and recognition-and associated inter-group relations, have been identified as key aspects for local opposition. Further, the grid extension entails significant changes in landscape, property values, tourism as well as in the perceived health impacts. Controversies about the balance between national and local benefits and costs exist.

In this symposium, contributors from Portugal, UK and Germany will present empirical findings and theoretical considerations concerning different aspects of the acceptance of large scale energy infrastructure with a focus on the grid extension. One presentation focusses on the gap between the national and the local level: using multiple datasets to investigate the influence of local and national identities upon the social acceptance of energy infrastructure. A second presentation investigates different-level identities and responses to energy infrastructures at different scales: A post-Brexit reflection on responses to grid extension in the UK. Another presentation focuses on participation issues in the planning process of high voltage power line planning on the national level in Germany by evaluating the consultation process referring to the Network Development Plan (NEP) and Environmental assessment (UVP) of the German Network Agency BNetzA.

259 Different-level identities and responses to energy infrastructures at different scales: A post-Brexit reflection on responses to grid extension in the UK

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Keywords: social acceptance of energy infrastructures; intergroup relations; place identity; scale

Abstract:

Introduction: The EU has been fostering an integrated European 'energy union', through interconnected grid systems backed up by European level institutions and policies. An example of this is the Renewables Directive (2009), which has been fostering the deployment of renewable energy generation and associated technologies, such as high voltage power lines, to tackle climate change and guarantee security of supply in the EU (Sataoen et al., 2015). However, whereas the public tends to agree with renewable energy in general, when specific and associated infrastructures are to be deployed, local opposition is often found.

Theoretical background: A large body of research has developed in order to understand opposition and, mainly, to overcome it (Aitken, 2010). Nevertheless, recent events – such as Brexit – suggest that these energy transitions might not only become more difficult, but also that opposing, accepting or

supporting RET and other measures to tackle climate change, might not only be related with procedural and distributive justice in between developers and community members, but also with the role played by non-local identities (Devine-Wright, Price & Levinston, 2015) and associated intergroup-relations (Batel & Devine-Wright, 2016). However, not much research has yet, on one hand, explored the relationship between place attachments at other scales beyond the local and beliefs about RET, namely within the European context; and, on the other hand, by paying specific attention into how different types of intergroup relations impact on responses to RET and climate change. More importantly, and despite recent calls (Batel & Devine-Wright, 2015), not much research has explicitly explored people's contradictory beliefs and feelings regarding RET and how these relate with different identity and political projects.

Methods: In this paper, we explore these ideas by examining the results of two different representative surveys of all UK adults, conducted in different points in time (2007 and 2012). This allowed us to explore similarities and differences during this time span – when changes in the political European background started to happen (European financial crisis, 2008; Renewables Directive, 2009; increase in asylum-seekers in the UK from 2010) – regarding attitudes towards high voltage power lines and other energy and climate change related issues at different levels – local, national, European –, and distinct identities – British, English, Scottish, Welsh, Northern Irish, Irish, European.

Results: Results reveal, adding up to previous suggestions (Batel & Devine-Wright, 2016) how feelings of belongingness to different imaginary communities (Anderson, 2006) play out existent and historical intergroup relations and dynamics, and how these impact on participants' responses regarding energy issues at a national and European level.

Conclusions: The impacts of this for energy transitions towards more environmental and social sustainability will be discussed.

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267 Evaluating the consultation of the German grid development plan (NEP) and to what extend the participation influences acceptance of the grid development

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Keywords: social acceptance, participation, consultation, evaluation, grid development

Abstract:

Introduction: In the course of energy transition in Germany, grid expansion plays a central role for integrating renewable energies into the system. During the formal planning procedure of grid development, the Federal Network Agency (BNetzA) is responsible for integrating all stakeholders by implementing a nationwide consultation process, whereas the public consultation of the "Network Development Plan" (NEP) and the "Environmental Assessment" (UB) are the main components.

Theoretical background: Public participation is seen as a critical driver of acceptance and can be categorized with the ladder of participation by Arnstein from Information (low participation), Consultation and Cooperation (high participation - see Rau et al., 2012). Thus, a high priority of participation is to foster procedural justice by accomplishing transparency and fairness (see Keppler et al., 2011, Hildebrand et al., 2013) with fulfilling the relevant criteria of participation (Rau et al., 2012).

Methods: In this study we evaluated the consultation process for the NEP and the UB 2024 in the year 2015. The BNetzA collected 34.211 statements from different stakeholder groups during consultation of NEP and UB 2024, sorted all arguments and considered them in their decision making. Most of the statements were related to concrete transmission line projects.

The aim was to examine the quality and effectiveness of the consultation process, identify acceptance factors and to generate recommendations for further planning processes with focus on procedural justice criteria. First the structure and effectivity of the information and communication was examined, second, the quality and usage of all published materials and documents. Finally, the acceptance of the consultation process and the effects of the participation was analyzed.

The study consisted of three standardized surveys, by implementing a quasi-experimental design with matching samples. The first survey in August 2015. a second online survey was sent in November 2015. As a control group for matching, persons that did not participate in the consultation but from the same regions like the other two samples were interviewed by phone. Comparisons between affected and non-affected people were possible via matching. From 3000 invitations. 630 persons responded in the first data collection, 259 during the second time and 607 participants for the third panel.

Results: On base of the analyzed data, concrete recommendations for the planning process were derived. In this context, procedural justice criteria like transparency and comprehensibility during the formal planning process are of particular importance and show significant interdependencies with psychological factors such as trust and acceptance.

The following crucial factors were identified as influencing the consultation process and the planning process of grid extension:

- the perceived extent of being affected by the grid extension,
- the perceived need of the grid extension
- the perceived personal and negative effects from transmission line projects compared to the perceived benefit
- the acceptance of the grid extension within the social environment (social norms),
- the confidence in the political system in principle and trust in relevant authorities related to grid expansion.

References

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317 The importance of place meanings for understanding the social acceptance of tidal and offshore wind energy

Devine-Wright, P.¹ Wiersma B. & O'Neill, S.^{1,2}

¹University of Exeter, UK.

²University Institute of Lisbon, Portugal.

Conference theme: Individual factors underlying environmental attitudes and behaviour

Abstract:

Introduction: Understanding social acceptance of controversial energy projects at both societal and local community levels is an important agenda for energy social science, yet these levels are rarely integrated within a single analysis due to the use of contrasting research designs (i.e. national opinion polls vs. local case studies).

Theoretical background: While past research has indicated the importance of local place attachments and identities, the role of non-local (e.g. national) identities has been neglected in the study of social acceptance of energy projects, which is problematic since controversial large-scale energy infrastructure projects (e.g. high voltage power lines) are both locally and nationally significant.

Methods: This study draws on two UK datasets about high voltage power lines: a national survey with a representative sample (n = 1519); and a local survey of residents directly affected by nearby siting proposals (n = 502) with both datasets collected simultaneously in Spring 2012. In each dataset, similar items to capture issues arising in the literature including familiarity, trust, perceived impacts, general and local attitudes, and willingness to take action in support or against local proposals.

Results: Findings revealed significant differences between the datasets, suggesting that electricity grid issues become more salient in geographical contexts where new lines are proposed. The study also suggests that this salience is moderated by place attachments and identities, specifically the relative strength of national versus local belonging. Using a relative measure, 'Local first' and 'Country first' individuals were identified in each dataset, reflecting individuals with strong local belonging and weak national belonging (i.e. 'Local first'), and strong national belonging and weak local belonging (i.e. 'Country first'). Analysis revealed that 'Local first' individuals showed greater system and project familiarity, less trust in the grid operator, greater perceived impacts and willingness to protest, in comparison to 'Country first' individuals, who held more positive general attitudes to power lines, and were less likely to perceive harm from power lines at the national level.

Conclusions: Findings illustrate the importance of crossing the so-called national-local 'gap', and taking account of local and non-local attachments and identities in seeking to understand social acceptance.

Keywords: social acceptance; national-local; place attachment.

325 Using a narrative approach to understand place attachments and responses to power line proposals: The importance of life-place trajectories

Bailey, E.¹, Devine-Wright, P.¹ & Batel, S.²

¹University of Exeter, Exeter, United Kingdom

²Instituto Universitário de Lisboa (ISCTE-IUL), Cis-IUL, Lisboa, Portugal

Abstract:

Introduction: Research on people-place relations, incorporating place attachment and place identity, has tended to adopt a structural approach, overlooking the dynamic nature of those relations over time. Research that has adopted a more process-oriented approach has tended to investigate the impacts of single moments or events, neglecting a broader focus upon people's life course. To address this gap, this study investigated patterns of residential place attachments ('life-place trajectories') and used these to better understand current place relations and responses to place change (a power line proposal, SW England).

Theoretical Background: The research is informed by an epistemological approach combining insights from phenomenological (e.g. Manzo, 2005) and social constructivist (e.g. Batel and Devine-Wright, 2015) perspectives. This arises from a primary interest in how individuals make sense of their relationship with the places that they have lived or are currently living in, whilst also taking account of broader socio-cultural discourses about dwelling, mobility and landscape.

Methods: The study utilised semi-structured narrative interviews (n=25) amongst a stratified random sample of Nailsea residents, South-West England, where active opposition to a transmission line proposal (the Hinckley Point C project) arose. Narrative interviews were deemed well suited to exploring the changing nature of people's place relations over time and to investigating individuals' experiences of and responses to the proposed transmission line.

Results: Three notable findings emerged. First, the study revealed five novel life-place trajectories characterised by diverse configurations of residential mobility and continuity of settlement type. Second, the study extends our understanding of varieties of relationship with the current residence place, including identifying a novel variety of 'traditional-active attachment'. Finally, the study indicates the relevance of the trajectories for understanding responses to place change proposals, including acceptance and opposition.

Conclusions: This research contributes to the literature in four ways: by showing the value of the narrative interview method; by revealing novel 'life-place trajectories' characterised by diverse configurations of residential mobility and continuity of settlement type; by extending our understanding of varieties of relationship with the current residence place, including identifying a novel variety of 'traditional-active attachment'; and finally by indicating the relevance of the trajectories for understanding responses to place change proposals (a power line proposal).

Keywords: Place attachment; life-place trajectories; narrative interviews; power lines.

References:

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SSV-03 SYMPOSIUM:

Room: +1.3

THE ROLE OF CONNECTION TO NATURE IN PREDICTING SUPPORT FOR PRO-ENVIRONMENTAL BEHAVIOR

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² Psychology Department, The College of Wooster, USA

Theme: Underlying motivations of individual's involvement in environmental behavior.

Abstract:

There is now a strong body of evidence of the psychological and physical health benefits of the contact with nature. Living near green spaces or the sea, spending time in the nature, or even looking at natural landscapes has a positive impact on the health and wellbeing of human beings. However, there is little research connecting these evidence to pro-environmental behavior. Will the salience of the connection to nature promote more environmental friendly types of behavior? What is the role of the integration of nature on the self narratives (environmental identity, natural dimensions of place identity) in understanding the involvement in pro-environmental behavior?

In this symposium we would like to explore the associations between contact with nature with pro-environmental behavior, and understand the role of identity (Clayton, 2012) in these processes. Some authors (e.g., McGuire 2015) claim that identity relevant interventions are cost effective as they stably address a whole range of behavior that are usually targeted by different educational campaigns (e.g., florescent bulb use, recycling, change transport habits). We believe that these are important points for intervention that has not been fully addressed in research and this symposium will be an opportunity to develop them. We managed to put together researchers in the USA, Portugal, Spain and China that have addressed this topic from different perspectives.

The first paper (Loureiro & Olivos) will address the relationships between environmental identity, experience of nature and sustainable behavior in Portuguese and Spanish samples. The second paper (Arroz, Amorim,, Gabriel, Ferreira & Rego) investigates whether the commitment to Azorean nature mediates the relationship between social values and pro-environmental behaviours. The third paper (Amorim Arroz, Gabriel, Rego, Borges, Lima & Clayton) analyses the association between connection to nature and conservation of local biodiversity in a sample of Azorean adolescents. The next paper (Hernández, Muiños, Suárez e Ruiz) studies the role of place identity, place attachment and the beliefs on how to manage natural resources on the participation in protest activities against petrol exploitation in the canary islands. Finally, the last paper (Clayton, Bexell and Ping) focuses on the impact of an educational intervention among visitors of Chinese Zoos on the support for wildlife protection.

As different contexts are considered (from small islands in Europe to China) and different types of pro-environmental behavior are approached (participation in protests, protection of wild life and bio-diversity), we believe that this symposium can provide a wide picture of the psychological processes involved.

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- McGuire, N. (2015). Environmental education and behavioral change: An identity-based environmental education model. *International Journal of Environmental & Science Education*, 10(5), 695-715.

355 Connection to animals and support for wildlife protection among zoo visitors in Chengdu, China

Clayton, S.D.¹, Bexell, S.^{2,3} & Ping, X.²

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³Institute for Human-Animal Connection, University of Denver, Denver, CO USA

Abstract:

The threat to endangered species represented by the wildlife trade is significant in China, where many indigenous species are endangered and the demand for products made from wildlife is high. Zoo visitors represent a promising audience for education about the wildlife trade and the need to avoid purchasing products made from wild animals. Not only do people learn about environmental issues at zoos (Moss, Jensen, & Gusset, 2014), they also have emotionally rich experiences that can increase a sense of connection to animals (Clayton, Fraser, & Saunders, 2009; Myers, Saunders, & Birjulin, 2004) and thus attention to and concern about animal conservation. Finally, these experiences occur in a social context that may be able to create and reinforce social norms in support of conservation. In the present paper, we report on a two-wave survey of visitors to two institutions in Chengdu, China: the Research Base of Giant Panda Breeding (Panda Base) and the Chengdu Zoo (Zoo). In the first wave of 524 respondents, we explored predictors of concern about the wildlife trade. Following an educational intervention, the second wave of 533 respondents assessed some of the same variables to look for changes, particularly changes associated with the educational exhibit. In the first wave, a sense of connection to animals was the strongest predictor of concern, followed by knowledge, perceived efficacy, and national identity. These variables were also significant predictors of concern in the second wave of participants. Most people saw the educational exhibit, but at the Zoo, those who did not see the exhibit were less likely to say that other people were concerned about the wildlife trade. Overall, people who not only saw the exhibit but also reported talking to others about it showed higher levels of concern. These results are discussed in terms of implications for building concern about endangered species.

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356 The role of environmental values, environmental identity, and contact with nature, in predicting support for pro-environmental behaviours

Loureiro, A.¹ & Olivos, P.²

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²Universidad de Castilla-La Mancha

Abstract

Introduction: Environmental values motivate people to act for sustainability (e.g. Steg & Nordlund, 2013; Stern, 2000). In addition, a sense of identity, attachment and relation to nature also predicts the intentions to act in favour of the environment (Olivos, Talayero, Aragonés, & Moyano, 2014).

It is recognized that people who had more experiences in natural environments during their childhood tend to value more the environment, be more attached and identified to nature and act more environmentally when adults (Hinds & Sparks, 2008; Tam, 2013). Moreover, it is important to analyse if these experiences and activities in adulthood also contribute in similar ways for adults values, environmental identity and attachment to nature, and lead them to act more sustainably (Kiesling & Manning, 2010). It is also important to analyse these processes for different kinds of contact with nature such as gardening and agriculture, physical activity, or leisure.

Theoretical background: Most of the times, proenvironmental behaviour is viewed as a single factor or a group of behaviours taken together as an indicator of the behavioural dimension of a sustainable orientation. It is important to differentiate different types of sustainable behaviour when trying to identify its psychological predictors (Loureiro, 2011; Olivos et al, 2014). The associations between values and connection to nature with sustainable behaviour is better understood if different types of behaviour are distinguished. Not all proenvironmental behaviours have the same impact for environment or suppose the same level of individual implication. Understanding how these different behaviours are psychologically rooted may give light to the processes involved in people's choices and decisions towards environment.

This study has two objectives. One is to analyse the predictive role of environmental identity, together with environmental values to explain different kinds of sustainable behaviours. The study also aims to observe how these different dimensions of the way people relate to nature operate in relation to the amount and the type of contact with nature people reveal.

Methods: We developed a questionnaire in which different measures for the studied variables (values, environmental identity, sustainable behaviours, and contact with nature in different forms) and socio-demographic questions are presented to individuals having different types of contact with nature levels and experiences.

Results: Results will be discussed according to the study objectives.

Conclusions: This study tries to clarify the specific roles of environmental identity and forms of contact with nature in the prediction of specific sustainable behaviours.

Keywords: Values, environmental identity, contact with nature, pro-environmental behaviours

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357 How to promote "green" behavior in the Azores: exploring the relationship "personal values - connection to nature" for clues

Arroz, A.M.¹, Amorim, I.R.², Gabriel, R.², Cordeiro Ferreira, T.³ & Rego, I.E.⁴

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²cE3c- Centre for Ecology, Evolution and Environmental Changes / Azorean Biodiversity Group and Universidade dos Açores - Departamento de Ciências e Engenharia do Ambiente, Rua Capitão João d'Ávila, 9700-042 Angra do Heroísmo, Açores, Portugal

³cE3c- Centre for Ecology, Evolution and Environmental Changes/ Azorean Biodiversity Group

⁴IVAR- Institute for Volcanology and Risk Assessment and Universidade dos Açores - FCSH- Departamento de Psicologia, Universidade dos Açores, Rua da Mãe de Deus, 9500- 801 Ponta Delgada, Açores, Portugal

Abstract:

Biodiversity loss is probably one of the least understood major risks related to global change. Notwithstanding, nature is extremely important in a number of social and individual values among the population.

In the Azores, previous studies have shown that Nature plays a central role in place attachment and pro-environmental behaviour. Not only is Nature the main Azorean icon, a feature supported by its virginal, untouched and pure character (natural), its uniqueness and distinctiveness (specificity) and stunning beauty, but also “Connectedness to nature” is the second most relevant component concerning the reasons why people live in the Azores (roots, connectedness to nature, and instrumental reasons). Besides, valuing the emblematic nature of the Azores is associated to various types of pro-environmental behaviour intentions and self-reported behaviours.

However, attachment to nature has not yet been fully explored with respect to its potential to promote conservation behaviour in the Azores, namely towards the conservation of the rich, unique and exquisite biodiversity of the Region. In order to achieve such a goal, some research is needed to further understand local conservation behaviour, including identifying other behavioural predictors.

Finding the individual values’ profiles associated to “green” behaviours along with their potential to predict those behaviours are the main purpose of this research. Furthermore, it is particularly important to investigate whether the commitment to Azorean nature mediates the relationship between values and behaviours.

Data from two surveys applied to the general adult Azorean population were analysed to address these questions: a convenience sample of 199 residents of Terceira Island and a stratified representative sample of 999 Azorean residents, taken in 2012 and 2010, respectively.

Values were assessed with different measures in the two studies – the Inglehart Index of Materialism and Postmaterialism and the Schwartz Value Survey – and the correlations were statistically tested with the frequency of occurrence of diverse pro-environmental behaviours.

Results will be discussed in the light of designing risk communication devices to address biodiversity loss.

358 Connection to nature and conservation of biodiversity in the Azores

Amorim, I.R.¹, Arrozo, A.M.², Gabriel, R.¹, Rego, I.E.³, Borges, P.A.V.¹, Lima, M.L.⁴ & Clayton, S.D.⁵

¹ cE3c- Centre for Ecology, Evolution and Environmental Changes / Azorean Biodiversity Group and Universidade dos Açores – FCAA- Departamento de Ciências e Engenharia do Ambiente, Angra do Heroísmo, Azores, Portugal.

² cE3c- Centre for Ecology, Evolution and Environmental Changes / Azorean Biodiversity Group and FCSH- Departamento de Psicologia, Universidade dos Açores, Angra do Heroísmo, Azores, Portugal.

³ CVARG- Centro de Vulcanologia e Avaliação de Riscos Geológicos and FCSH- Departamento de Psicologia, Universidade dos Açores, Ponta Delgada, Azores, Portugal.

⁴ CIS-IUL- Centro de Investigação e Intervenção Social Instituto Universitário de Lisboa (ISCTE-IUL), Lisbon, Portugal.

⁵ The College of Wooster, Wooster, Ohio, USA

Keywords: pro-environmental behavior, communication intervention, survey

Abstract:

Introduction: The Azorean Islands, colonized in the XV century, are currently home to approximately 246,000 people. Over 600 years of human presence has led to dramatic changes, including the clearing of about 97% of the native forest that once covered most of the archipelago (1). This resulted in species extinction, contributing to the trend of biodiversity loss across the planet. Nonetheless, the Azores still house many species that cannot be found elsewhere (endemics), and their conservation is a policy priority and an ethic imperative.

Theoretical background: Many governments’ agendas include halting biodiversity loss and efforts taken worldwide show that the success of conservation measures greatly depends on the involvement of locals (2), which in turn may be mobilized by communication interventions. Our goal is therefore to design interventions that will ultimately lead to the conservation of the endemic biodiversity of the Azores, i.e., that will be effective in promoting pro-conservation behaviors. Several pro-environmental behavior models have been proposed (3 and references there in, 4) and there is growing interest in the factors

that influence engagement in such behaviors. Exploring these factors in the particular setting of the Azores will be crucial for the design of successful conservation interventions. Previous studies show that Nature is central to place identity in the Azores (our team, unpublished data), and given the positive correlation between connectedness to nature and conservation behavior found elsewhere [5, 6], we propose to investigate whether connection to nature predicts conservation behavior in the Azores.

Methods: A survey by questionnaire was applied to Azorean high school students. We will assess connection to nature at different levels: i) biodiversity - awareness of biodiversity as a component of natural heritage, ii) protected areas - knowledge of protected areas in the region, and iii) Nature - level of nature concern in the Azores. We will explore, using the software SPSS, whether the nature connection items are correlated among themselves and if, together or individually, can predict intention to perform conservation behaviors, namely: i) preferentially protect biodiversity, among the things they wish to protect; ii) allocate resources to species conservation over other environmental issues; and iii) preferentially protect endemic species from a pool of species that only occur in the Azores, naturally occur in the Azores and elsewhere, and that were introduced to the Azores.

Results: A total of 1,528 valid questionnaires were collected (21 schools, 9 islands) and data is currently being analyzed.

Conclusions: Results will be discussed in the light of pro-environmental behavior models and will guide the strategies in future communication interventions towards the conservation of Azorean endemics.

References:

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359 Bonds with the place, beliefs about the relationship with the environment and protest against petrol exploration

Hernández, B., Muiños, G., Suárez, E., & Ruiz, C.

Universidad de La Laguna, La Laguna, Spain

Keywords: Oil exploration, environmental beliefs, acceptance

Abstract:

Introduction: Several works have tested the hypothesis that bonds with places are related to awareness on protecting and preserving such locations, however they have obtained unequal results. When the variables gathered are related to natural surroundings, the bonds with those surroundings seem to enhance responsible behaviors. This paper focus on the association between bonds with places and the environment and the attitudes towards petrol exploitation.

Theoretical background: Stedman [2002] found that place identity of natural setting residents has a positive effect on their involvement in activities that protect that setting. Furthermore, Carrus, Bonaiuto, and Bonnes (2005) confirmed that both pro-environmental attitudes and regional identity are predictors of supporting protected natural areas; also, higher levels of cooperation in water conservation have been found among people with high local identity. Besides, there is evidence regarding the influence of place attachment and place identity on social perception of large-scale infrastructures, laws and other environmental related interventions (Devine-Wright, 2007). In this sense, Devine-Wright points out that place attachment is involved in public responses to low carbon technologies. The author noted that high levels of place attachment can motivate both public support and public opposition to new technology developments, depending on the positive or negative evaluation of each person. A similar conclusion was obtained in a study that showed how support for a hydropower development was positively explained by place attachment (Vorkinn and Riese, 2001).

We present results of a research on the relationship of place identity and attachment with the rejection of a sea oil exploration near an island area. We also analyze the rejection of the local community, by connecting environmental beliefs and distributive justice beliefs.

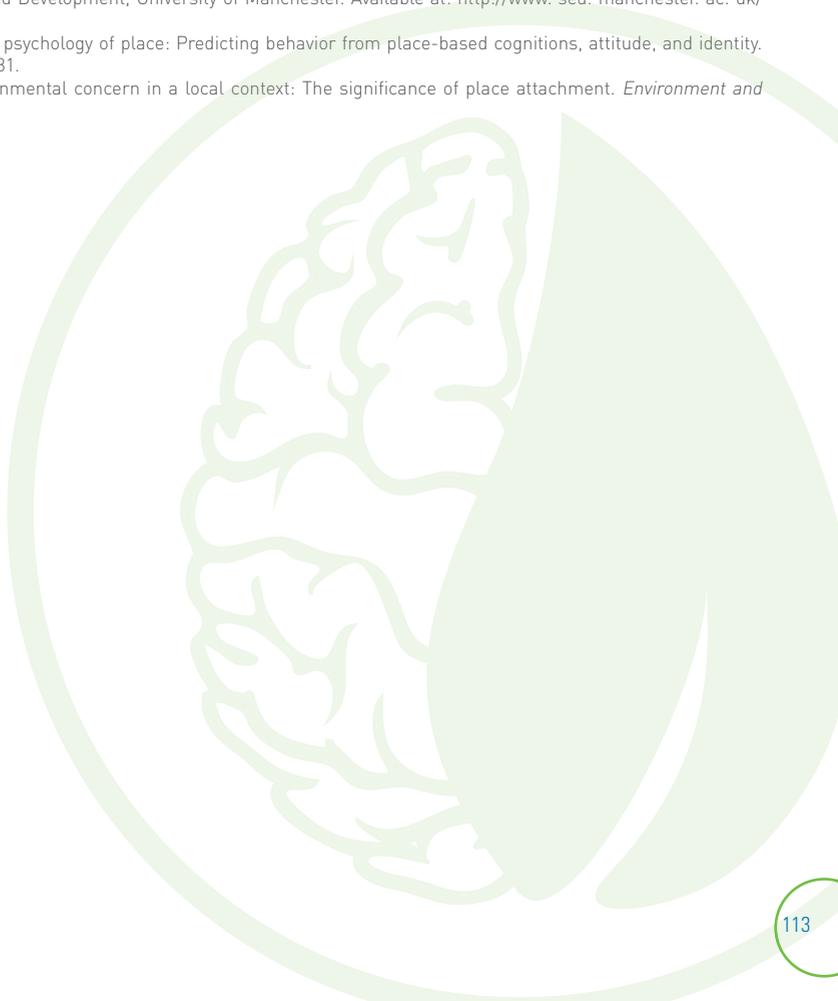
Method: A non-randomized sample of 635 residents (54% females) from the seven Canary Islands (Spain) participated in the study. Participants were contacted through psychology students who voluntarily administered the assessment protocol, by using it as a guide to carry out a semi-structured interview with participants. 1000 questionnaires were distributed to 75 students throughout seven islands and finally we obtained the sample of 635 participants. At the end of the questionnaire, a contact telephone number was requested for data-checking purposes.

Results: The results indicated that most participants clearly rejected oil exploration. Also, participants disagreed with the legal procedure carried out, considering that they had received limited information about the project. The results obtained indicate that people who have participated in public demonstrations against oil exploration scored significantly higher in place identity than those who have not participated, however no difference in place attachment was found. Moderate negative correlations were obtained between agreement with exploration and place identity.

Discussion: The beliefs on close relationship between people and the natural environment and the beliefs on how to manage natural resources (public or private) have a significant predictive power on disagreement with exploration.

References:

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Friday
1st September

09:00 – 10:30 h.

SSVI-01 SYMPOSIUM:

Room: +1.1

PERSON-CENTRED APPROACHES TO RESTORATIVE ENVIRONMENTS

Ratcliffe, E.¹ & Hartig, T.²

¹University of Tampere, Tampere, Finland (symposium chair)

²Uppsala University, Uppsala, Sweden (symposium discussant)

Theme: Restorative environments

Abstract:

Certain settings, and especially those in nature, can facilitate restoration and recovery from cognitive fatigue and stressful experiences (Hartig et al., 2014). Theoretical explanations for these effects focus on physical properties of the environments, such as complexity, structure, and presence of green and blue space; psycho-evolutionary associations with natural settings; and the cognitive and affective appraisals generated by such factors (Kaplan & Kaplan, 1989; Ulrich, 1983). However, the role of top-down processing in the form of the person themselves in such restorative experiences remains understudied (cf. Ratcliffe & Korpela, 2016). How do an individual's own memories, attachments, associations, and perceptions of or preference towards environments contribute to psychological benefits achievable there? Such questions are important in order to understand not only if, but why and for whom, particular settings can afford psychological restoration.

This symposium comprises four presentations of empirical research and a plenary discussion, linked by their focus on the role of the individual, and their relationships with and assessments of place, in restorative experiences. In so doing this symposium also bridges the divide between natural and urban environments often found in this field, and offers perspectives on the restorative potential of both types of setting. Presentation titles and first author names are provided below.

- The restorative potential of walking in urban settings: the role of sense of place and personal experiences (Anna Bornioli, University of the West of England, UK)
- Feeling safe in restorative environments (Birgitta Gatersleben, University of Surrey, UK)
- Memories of seasons and the self in restorative perceptions of favourite places (Eleanor Ratcliffe, University of Tampere, Finland)
- Examining the relationship between individual associations with naturalness and perceived restorative value (Emma White, University of Surrey, UK)

The plenary discussion session included as part of the symposium provides an important space to explore how these top-down and person-centred topics can be further included in theoretical approaches to restorative environments. Points for discussion may include the construct of compatibility within attention restoration theory (Kaplan & Kaplan, 1989) and how it relates to memories, attachments, and associations; scope for further crossover between place studies and restorative environments topics; the roles of time and repeated experiences in restorative environments; cultural differences in restorative experiences of nature; and definitions of naturalness within restorative environments literature. Professor Terry Hartig (Uppsala University, Sweden) will act a discussant during this plenary session, along with the symposium chair, speakers, and attendees.

References

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065 The restorative potential of walking in urban settings: a person-centred approach

Bornioli, A.

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Coldharbour Lane, Bristol, BS16 1QY

Abstract:

Introduction: The field of environmental psychology has given extensive relevance to the study of affect and restoration during walking in natural spaces, suggesting that individuals recover from stress more effectively in green rather than in built settings. However, not many studies addressed the outcomes of walking in attractive urban settings, as current literatures focus on unattractive built settings such as commercial areas, urban outskirts and traffic-congested streets. In doing so, the potential for some urban environments also to offer restoration was downplayed, despite the fact that according to Attention Restoration Theory any environment that possesses one or more restorative properties can potentially promote restoration from stress.

Theoretical background: This paper builds on Attention Restoration Theory and Stress Recovery Theory and hypothesises that the interaction with some urban settings while walking can promote positive affect.

Methods: An experiment with residents of Bristol (UK) (n=385) was conducted, followed by photo-elicited interviews. The study examined restoration in an historic setting; a modern setting; a mixed built/green; a commercial street with traffic and an urban park. A sub-sample of 14 individuals were interviewed.

Results: Results from the experiment showed that the mixed built-green area and the pedestrianised setting were restorative. The qualitative phase showed that personal preferences and experiences, and historic and artistic urban elements triggered a connection with place, which in turn led to restoration.

Conclusions: This paper brings together research from geography, urban planning and mobilities in order to inform restorativeness literatures. It is proposed that personal preferences and experiences can represent an additional trigger of restoration, beyond innate preferences for nature.

Keywords: restorative environments, urban settings, experimental design, photo-elicited interviews, person-centred approach

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159 Examining the relationship between individual associations with naturalness and perceived restorative value

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Abstract:

There is general agreement within environmental psychology research that natural places play a key role in improving well-being. Natural places and their components, such as water and vegetation, have been shown to be highly effective in providing both restoration from both stress (e.g. Ulrich et al., 1991) and attention fatigue (e.g. Felsten, 2009; Staats, Kievet & Hartig, 2003). They have also been shown to be significantly more restorative (e.g. Parsons et al., 1998) and preferred (e.g. Kaplan, Kaplan & Brown, 1989;

White & Gatersleben, 2011) than urban or less natural environments. But within this general trend for a high preference and restorative potential in natural places and their constituents, there appear to be clear individual differences. For example, Strumse (1996) found clear demographic differences in preferences for various agrarian landscapes and Morton, van der Bles & Haslam (2016) found that the salient identities of participants affected restoration in natural environments. Indeed, Ozguner and Kendle (2006) aptly conclude that “nature means different things to different categories of people”.

We were interested in exploring further the individual associations participants had with the idea of “naturalness”, and how this related to the restorative value that they placed on natural places. In order to do this, a large mixed methods study was first carried out to identify a set of features which participants perceived as defining the concept of naturalness. A survey was completed by 942 participants from both the UK (n = 744) and US (n = 198), with open-ended questions encouraging participants to think in some detail about the features which they believed make a place natural. The comments were analysed using an inductive content analysis, in order to develop a set of themes and sub-themes which represented participant views of naturalness.

The data was then quantified into SPSS, in order to sum up and statistically analyse the number of participants who mentioned each theme and sub-theme. The presence of “trees” and “water” were frequently mentioned across the sample as being natural, but there were clear individual differences in certain themes. Most notably, in whether humans and their interventions were perceived as being natural or non-natural. Further analyses were carried out to examine the associations between the themes occurring for each participant and the perceived level of restoration which they reported as experiencing in natural places. The influence of demographic variables was also examined. We will discuss these individual associations in more detail and look at how this impacted perceived restorative value, something which can help us to further unpick how different aspects of the varied concept of naturalness affect the general trend for high restoration in natural places.

Keywords: Individual differences; Restoration; Perceived naturalness

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214 Risk and Restoration in Nature

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Keywords: environmental restoration, danger, risk, nature

Abstract:

Introduction: Exposure to non-threatening natural environments has benefits for human wellbeing. But threats are not uncommon in natural environments. Understanding how such threats affect the restorative potential of nature can help develop and manage restorative environments, encourage engagement with those environments and promote restorative experiences.

Theoretical background: In line with the Attention Restoration Theory (Kaplan & Kaplan, 1989) and the Stress Reduction Theory (Ulrich et al. 1991) there is significant support for the restorative benefits of nature (Bowler et al., 2010). But both theories suggest that restoration is not likely when the environment harbours a threat because dangers evoke negative emotions and demand attention. But a danger may not always result into fear. Fear responses result from perceptions of likelihood of a danger, perceptions of severity of consequences (Menziés & Clarke, 1995) as well as perceptions of control over the situation (Rapee, 1997). The effect of dangers on restoration is also likely to vary with the type of danger: social dangers, physical dangers and the danger of getting lost (Coble et al., 2003).

Methods: We present two studies (n = 269 and n = 300) to examine how danger may affect restoration in nature. In the first study participants were asked to rate the restorative potential of different natural environments as well as perceptions of danger likelihood, severity and control. In the second study respondents were asked to rate the same variables but under different danger conditions.

Results: Without a specific threat perceptions of control did not affect perceptions of restoration, but perceptions of likelihood and severity did. However, control played an important role in explaining the influence of social threats and the threat of getting lost on ratings of restorative potential. Social dangers and the danger of getting lost were the most feared. Tripping over and encountering a wild animal were perceived more likely but were feared less and respondents felt more control over those threats.

Conclusion: Perceptions of danger have significant impact on perceived restorative potential of an environment but that this varies with types of dangers. The most likely dangers are feared less and have the least negative impact. The most feared dangers are perceived less likely but have a strong negative impact on potential restorative experiences due to a perceived lack of control over those dangers. This is in line with restoration theory which suggests that a control is important for restorative experiences.

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235 Memories of seasons and the self in restorative perceptions of favourite places

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Keywords: Restorative environments; place memory; place attachment

Abstract:

Introduction: Natural environments relate positively to wellbeing outcomes, including psychological restoration from stress and mental fatigue (Hartig, Mitchell, de Vries, & Frumkin, 2014). To date, study of contextual, top-down, or person-centred factors within the field of restorative environments, such as person-place bonds and past experiences in place, remains limited.

Theoretical background: In a recent quantitative paper Ratcliffe and Korpela (2016) observed significant predictive relationships between positive, autobiographical place memories and restorative perceptions of favourite places. However, exactly what it is that individuals recall of past experiences in place, and how this relates to restorative perceptions, is understudied. This paper focuses on such qualitative content and links with perceived restorative potential.

Methods: We report on qualitative analysis of data from Ratcliffe & Korpela (2016), which were provided online by 234 adult participants resident in Finland. First, participants' free-text responses regarding a positive memory of their favourite place in Finland were subjected to a version of thematic content

analysis. Second, these themes were converted to categorical data (present versus absent) and integrated, via multiple regression, with participants' quantitative ratings of the perceived restorative potential of these places.

Results: Seven themes underpinned place memories: the environment itself, activities within it, cognitive responses, emotional responses, social context, self, and time. The presence of memories of time, and of the self, significantly and positively predicted quantitative ratings of the restorative potential of these places. Within memories relating to time, seasons were the most commonly mentioned subtheme. These predominantly related to summer, but a minority of participants related memories of autumn and winter to restorative evaluations of place, as well as memories of places in multiple seasons. Memories relating to self encompassed recollection of self-actualisation and self-development whilst experiencing favourite places as restorative, such as mastery, passing from childhood into adulthood, and forming bonds with both place and other individuals in place.

Conclusions: These findings indicate the value of thinking "beyond green space" in the study of links between nature and wellbeing (cf. Wheeler et al., 2015, p. 1). We show that environments in different seasons, and those that support individuals' self-identity and expression, can have perceived restorative value, especially in places with which individuals develop relationships. Together, our findings highlight the role of not only spatial but temporal environmental characteristics in restorative perceptions of nature, as well as the role of top-down processing that facilitates experience of this passage of time via long-term relationships with place.

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PRO-ENVIRONMENTAL BEHAVIOUR ANTECEDENTS IN DIFFERENT CULTURAL CONTEXT: THE ROLE OF VALUES

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Theme: Individual factors underlying environmental attitudes and behaviour

Abstract:

Many of today's environmental problems are caused by human activity. Therefore, it is important to disclose the antecedents of unsustainable behaviour. Importantly, to create effective policies to promote pro-environmental behavior across countries, specific focus should be directed to explaining to what extent those antecedents differ cross-culturally. To date, researchers have focused on factors predicting the possibility of pro-environmental behaviour based on studies conducted in Western countries. Therefore, it is crucial to reveal the factors relevant to pro-environmental behavior in particular cultures. The specific differences should be taken in to account, when behavioural change measures are going to be implemented. Current symposium combines research and theoretical suggestions that focuses on pro-environmental behaviour antecedents in different cultural context. First, Balundė, Poškus, Perlaviciute, and Steg will discuss the predictive power of environmental self-identity and values to four types of pro-environmental behaviour in Lithuania. Second, Poškus will present data from Lithuania that aims to reveal the clusters of participants in terms of their perceived descriptive and injunctive social norms, their perceived self-oriented and society-oriented consequences of their actions, and four value orientations: altruistic, hedonistic, biospheric, and egoistic. Third, Uhl, Jonas, and Hansen will present data that shows cultural differences in threat perceptions and reactions to climate change information in Austria and Argentina. Fourth, Liu, Steg,

Perlavičiute, and Bouman will discuss the sustainable energy transition policies acceptability barriers in China and Netherlands, including cultural differences, values, public participation strategies, public involvement level, and etc. (theoretical presentation). Finally, Međugorac, Šverko, and Babarović will present data from Croatia that analyses the willingness for pursuing careers which could lead to enhancement of environmental, social and economic sustainability as a form of pro-environmental behaviour, and how it is related with environmental values. To sum up, aforementioned presenters will discuss the practical implications of their research within particular cultural context.

082 The relationship between values, environmental self-identity, and pro-environmental behaviour in Lithuania

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Keywords: pro-environmental behavior, values, environmental self-identity, cultural context

Abstract:

Many of today's environmental problems are caused by human activity. Therefore, it is important to disclose the antecedents of unsustainable behaviour. Importantly, to create effective policies to promote pro-environmental behaviour across countries, a specific focus should be directed to explaining to what extent those antecedents differ cross-culturally (Morren & Grinstein, 2016). A study in Lithuania was conducted, based on well-researched factors affecting environmental behaviour, namely values and environmental self-identity. The total of 334 participants were recruited. We aimed to reveal whether the distinct biospheric, altruistic, egoistic, and hedonic values structure can be found in Lithuania. Further, we seek to analyse to what extent four types of behaviours, precisely, eco-driving, use of sustainable transportation, environmental activism, and recycling, can be associated with and explained by these different values, directly and via environmental self-identity. Taken into account that promotion of aforementioned behaviours in the local context is fragmented and mainly based on informational strategies, we hypothesized, that different types of behaviours will be predicted by values to a different extent. Therefore, relations patterns may differ from those of other countries. The results indicated that four values are distinct from each other, and biospheric values are the strongest predictor of four different behaviours. However, the relationship strength has differed across behaviours when environmental self-identity was included into the model. This suggests that differences in relations across behaviours could be due to fragmented communication or lack of large-scale intervention programs. Practical implications and recommendations for future research will be discussed.

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088 Healthy values for a healthy environment? The case of Lithuanian high-school students

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Keywords: values; person-oriented approach; perceived consequences; social norms

Abstract:

The role value orientations play in pro-environmental behavior has been explored quite extensively in the past and this line of research still remains popular and relevant (Steg, Bolderdijk, Keizer, & Perlavičiute, 2014). However, most prior research is focused on the linear relationships between values and pro-environmental behaviors or related constructs. It must be reminded that values are considered to be trait-like constructs that do not change as rapidly as, for example, attitudes (Schwartz, 1992). We propose that understanding the person that holds certain values is more important than just simply showing the linear relationships between values and other constructs. Therefore, a person-oriented approach was adopted to investigate whether young people, clustered by their value orientations, differ in their pro-environmental behaviors, their perceived consequences of their actions and their perceived social norms.

A total of 869 high-school students whose mean age was 15.71 years (SD = 1.1), of which 405 were male and 464 were female, participated in the study. Participants filled in measures of their past pro-environmental behaviors (conserving water, conserving electricity, and recycling), their perceived descriptive and injunctive social norms, their perceived self-oriented and society-oriented consequences of their actions, and four value orientations: altruistic, hedonistic, biospheric, and egoistic.

Analysis revealed that the participants could be meaningfully clustered into three groups that are substantially different in terms of their values and that these groups differ in their self-reported pro-environmental behaviors, perceived consequences of their actions and their perceived social norms. A regression analysis was conducted to investigate whether self-reported pro-environmental behaviors are affected by perceived social norms and future consequences differently among clusters. The analysis revealed substantial differences in the regression models among clusters.

Young people that differ in their value profiles perform pro-environmental behaviors for different reasons. The types of social norms and perceived consequences that predict behavior are different among clusters, but fairly consistent between the investigated behaviors. This indicates that different people could be more effectively influenced to adopt pro-environmental behaviors if they are approached in a way that is targeted specifically at them. The results also show that certain social norms consistently influence self-reported behavior in all clusters, therefore a general approach in promoting pro-environmental behaviors is viable as well.

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093 When threatening climate change information inhibits pro-environmental behavior: A cultural comparison between Austria and Argentina

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Keywords: climate change communication, pro-environmental behavior, threat responses

Abstract:

Environmental campaigns try to promote pro-environmental behavior by giving threatening information about the devastating consequences of climate change. However, according to the General model of threat and defense (Jonas et al., 2014), psychological threats initially lead to anxiety, and a motivation to overcome these negative states by engaging in approach-related behavior. That behavior can either be directly related to the problem (i.e., pro-environmental), or symbolic, with no connection to climate change at all (e.g., ethnocentrism). We present research focusing on how people living in a more collectivistic culture (Argentina) respond to climate change threats compared to people living in a more individualistic culture (Austria). In a 2 (Argentina versus Austria) x 2 (climate change information versus control information) experiment we tested the impact on threat reactions (pro-environmental behavior, ethnocentrism) within both cultures (N= 243). Study materials were carefully developed and tested on both cultures. Reading threatening climate change information increased ethnocentrism (i.e. symbolic response) and reduced pro-environmental behavior intention (i.e. direct response) in both countries. However, the effects were stronger among Austrians. We will discuss theoretical and practical implications for optimizing international climate change communication.

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143 Public participation and public acceptability of energy transition - a comparative research in the Netherlands and China

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Keywords: participation, acceptability, energy transition, cultural factors

Abstract: There is a need for a sustainable energy transition, but public acceptability of concrete policies and technologies can be a serious barrier. It is important to understand which factors influence public acceptability of a sustainable energy transition. It is commonly assumed that people are more likely to accept energy policies and technologies if they participate in the decision making process, and more specifically, if people feel that they have been sufficiently involved, their interests are considered and the decision-making process is fair (Perlaviciute & Steg, 2014). Yet, little is known about how different characteristics of public participation affect the acceptability of policies and technologies that promote a sustainable energy transition. This research aims to develop and test a conceptual framework to understand how different characteristics of public participation affect acceptability of energy policies and technologies. We argue that cultural factors influence preferences for different participation processes, as well as the effects of participation on acceptability of a sustainable energy transition. The Netherlands and China offer a great opportunity to test this. First, the two countries are likely to have different public participation practices. Bottom-up initiatives, in which the public is actively involved, occur more frequently in the Netherlands than in China. In China, a top-down decision making process is more common and public involvement is low. Second, both countries have different cultural backgrounds: the Netherlands is an individualistic society and China is a collectivistic society (Hofstede, 1980). This may influence how people evaluate public participation and acceptability of a sustainable energy transition. Our main research questions are how the public evaluates different characteristics of participation in decisions about sustainable energy transition in different cultures, and how different types of participation in turn affects public acceptability of a sustainable energy transition. We expect getting people actively involved in the decision-making process is more likely to increase public acceptability, irrespective of differences in cultural backgrounds. We further expect that in China, acceptability is more likely to be shaped by opinions of the group people belong to; while in the Netherlands, the group influence on acceptability may be smaller. We conduct scenario studies in which we systematically vary different characteristics of participation, and study to what extent the importance people attach to different characteristics of participation differs across the Netherlands and China, and which individual, group and cultural factors can explain these differences. Also, we examine how different characteristics of participation affect acceptability. We expect that acceptability is higher when the characteristics of participation in decision-making that people value most are provided.

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190 Values and intention of pursuing a career in sustainability

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Keywords: values; career choice; sustainability

Abstract:

Introduction: The role of values as general determinants of sustainability related behaviours has been well researched. However, most of the studies up to date have focused on behaviours which have direct consequences for the enhancement of sustainable development goals, while Stern (2000) notices that individuals can influence environment through various indirect behaviours and in that way have even greater impact. In this paper we are exploring the role of values in intentions of pursuing a career path which could lead to enhancement of environmental, social and economic sustainability. We claim that choosing a career can have a significant indirect impact on the promotion of the sustainability goals. In

addition, we will explore the validity of proposed value typology among secondary school graduates in Croatia.

Theoretical background: We are using the typology of values developed by Steg et al. (2012) which distinguishes altruistic, biospheric, hedonic and egoistic values. Following a three-dimensional approach to sustainable development we are exploring the role of these values in predicting intentions for pursuing career enhancing environmental, social and economic sustainability.

Methods: Respondents were 582 secondary school graduates (413 females and 169 males) enrolled in different schools in the city of Zagreb, Croatia. Data was collected on-line in two time points separated by a period of one year. Values were measured in the first time point, while intentions of pursuing a career in three domains of sustainability were measured afterwards.

Results: A multiple group method of confirmatory factor analysis supported the grouping of value items into four value clusters of altruistic, biospheric, hedonic and egoistic values, with two minor discrepancies. First, item 'a world at peace', originally belonging to a set of altruistic values, had stronger correlation with biospheric than with altruistic scale. Second, the egoistic item 'ambition' correlated slightly stronger with both altruistic and hedonic scale than with egoistic scale, which resembles the results obtained in similar cultural contexts [De Groot et al., 2007, 2012]. Further, intentions for pursuing a career that can primarily contribute to enhancing environmental sustainability was most strongly predicted by biospheric values, while hedonic values were negatively related to that outcome. Altruistic values were the only significant predictor of intention for pursuing a career in the domain of social sustainability. Finally, intentions for pursuing a career that can contribute to enhancing economic sustainability were most strongly predicted by altruistic values, followed by egoistic values which had positive and hedonic values which had negative relationship with that outcome.

Conclusions: This study confirmed that altruistic, biospheric, hedonic and egoistic values can be empirically distinguished among secondary school graduates in Croatia, and explores their relationship with intentions of pursuing career in environmental, social, economic domains of sustainability.

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THE ORIGINS AND CONSEQUENCES OF CHILDREN'S AND ADOLESCENTS' ECOLOGICAL BEHAVIOR

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Theme: Individual factors underlying environmental attitudes and behavior, Quality of life and well-being, Restorative environments

Abstract:

Human behavior has detrimental impacts on the environment, thus, understanding the origins of peoples' ecological behavior is key in fostering it. Therefore, knowledge on how and why children and adolescents behave ecologically and develop sustainable citizenship as adults is essential. This symposium will investigate the trajectory of ecological behavior (a) generally in teenage years, and (b) its dependency on parent behavior on the example of energy use. Furthermore we will present findings that offer a promising avenue for increasing the proclivity for ecological behaviors to occur. We will look into the positive effects of nature experiences or environmental education in childhood and adolescence onto (c) wellbeing and pro-sustainable behavior, (d) ecological behavior, and (e) sustainable citizenship.

a) Findings from a cross-sectional study with 325 Canadian adolescents are presented using indicators of pro-environmentalism. All measures indicate an age-related decline in adolescence with no evidence for a rebound. Findings are consistent with research on age-related trends in civic engagement and social responsibility, and call for a systematic investigation into factors that suppress pro-environmentalism in the adolescent years.

b) Research repeatedly argued that especially family and peers influence consumption behaviors of adolescents. However, little is known about sustainable energy use. 264 dyads of adolescents and parents participated in a survey study. Adolescents primarily seemed to behave in a more energy-saving fashion when they perceived that their parents did so as well. Also, adolescents' pro-environmental identity was associated with their energy saving behavior.

c) A follow up study of tree planting undertaken by primary pupils (5-11years) explored the recalled value of this experience in teenage years. It found that young people experienced interdependencies between personal and planetary well-being. In the context of environmental problems their tree planting was remembered as an act of altruism and valued as a pro-sustainability behavior that could provide these young people with a sense of control, purpose and wellbeing.

d) Combining the acquisition of environmental knowledge with an intrinsic motivation (i.e., connectedness to nature) is proposed as a holistic approach to effectively increase ecological behavior in children. As predicted, increased participation in nature-based environmental education in 4th to 6th grade children was related to increased ecological behavior, mediated by increases in both environmental knowledge and connectedness to nature.

e) Sustainability citizenship as the most frequent goal of informal educational initiatives is thought to portray an individual's perspective to attain ecological ways of living. The psychometric frame contains ecological behavior, environmental knowledge, and attitude toward nature. As an educational example to intervene with, a half-day module about climate change for 10th graders completed within a botanical garden is presented with its effect on this psychometric frame.

011 Nature-based environmental education of children: Fostering ecological behavior through intellectual and motivational aptitudes

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Keywords: environmental education, children, connectedness to nature, ecological behavior

Abstract:

Human behavior is widely agreed to have detrimental impacts on the planet's environment and avenues for understanding and ultimately increasing the ecological behavior – which is formed already in childhood (e.g., Evans, Juen, Corral-Verdugo, Corraliza, & Kaiser, 2007) – are needed.

Environmental education offers a promising avenue for increasing such behaviors and, indeed, the ultimate goal of environmental education is to increase the proclivity for such behaviors to occur (Roczen, Kaiser, Bogner, & Wilson, 2014). However, knowledge alone rarely motivates people to really act, which is expressed by the rather small effect of environmental knowledge on ecological behavior. In contrast, connectedness to nature has a strong effect on ecological behavior. Thus, the promising avenue to more ecological behavior is environmental education that not just promotes environmental knowledge, but that increases the connectedness to nature leading to an overall environmental competence. Educational settings within nature or close to nature, such as forest schools or conservation centers, combine these two components of environmental education successfully. We will be the first to show that the frequency of children's visits to nature-based environmental education institutions affects ecological behavior through both environmental knowledge and connectedness to nature.

The responses of 255 4th to 6th graders of 5 selected schools, were used in the analysis. The data were collected via a questionnaire completed by the students during class hours. Based on the frequency of visits to nature-based educational institutions, and the person scores of the three scales (i.e., environmental knowledge, connectedness to nature, and ecological behavior) we tested our theoretically-derived structural equation model using a maximum-likelihood approach.

The test of our structural equation model revealed a good match of our unaltered theoretical model-implied figures with the observed figures ($\Delta 2 = 2.4$, $df = 2$, $p = .31$). All three model fit indices unanimously indicated a good fit: RMSEA = .03, SRMR = .03, and CFI = .99. All four theoretically-anticipated paths were significant and increased participation in nature-based environmental education led to greater ecological behavior, mediated by increases in environmental knowledge and connectedness to nature.

Overall, nature-based environmental education seems to be one of the most promising approaches to increasing intrinsically motivated ecological behavior that does not need extrinsic drivers such as material enticements. Especially with respect to the side effects associated with extrinsic drivers for ecological behavior, such as rebound and high financial costs, the promotion of intrinsic motivation in children through nature-based environmental education is a promising solution in the long run.

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013 The role of parents, peers and environmental self-identity for adolescents' energy saving behaviour

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Abstract:

There is a consensus that sustainable energy use has to be spread among all generations (De Vries, 2015). However, little is known about sustainable energy use of adolescents. Research repeatedly argued that especially family and peers influence environmental behavior of adolescents (Grønhøj & Thøgersen, 2009; 2012). Therefore, we drew among others from the Theory of Normative Conduct (Cialdini, Reno & Kallgren, 1990) and Social Learning Theory (Bandura, 1971). In addition, we investigated the role of environmental self-identity (Van der Werff, Steg & Keizer, 2013) for adolescents' energy saving behaviour. 264 dyads of adolescents and parents participated in a survey study. A structural model and a two-level path model were calculated in Mplus.

Adolescents primarily seemed to behave in a more energy-saving fashion when they perceived that their parents did so as well. Also, adolescents' environmental self-identity was associated with their energy saving behavior.

Future research should focus on the role of behavioural models (e.g. parents/school/media) for sustainable energy use. Intervention studies should investigate ways to promote adolescents' environmental self-identity.

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014 The Origins and Educational intervening with environmental competence

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Abstract:

Intro: Environmental citizenship as the most frequent goal of informal educational initiatives is regarded to portray an individual's perspective to attain ecological, sustainable ways of living. Two challenges apply: to appropriately intervene via education as well as to proof efficacies for reaching that goal.

Theory: The psychometric frame contains an umbrella model which combines knowledge, attitudes, values and behavior. For the first mentioned, three forms of environmental knowledge were distinguished but attitudinal preferences toward nature was expected to represent the driving forces behind individuals' ecological behavioral engagement (Roczen et al. 2013).

Method: The sample basis consisted of 255 tenth graders who responded thrice to the questionnaire. By using path modeling the previously established instruments for ecological behavior (Kaiser 1999), environmental knowledge and attitude toward nature (Bogner & Wiseman 1999) were again calibrated, corroborating the theoretically anticipated competence structure. The study design comprised three reference points (Table 1): Two weeks prior to our intervention all students responded to the pre-test (T0) in their classrooms. The educational intervention itself was conducted in a botanical garden and lasted 3.5 hours (excluding breaks). Directly after the intervention, the participants completed the post-test (T1). The test-retest group responded to the questionnaire without any learning program participation. After a further six to eight weeks, all students completed the retention test (T2).

Results: Knowledge acquisition and GEB comparison were fitted using linear mixed effects models (LMM). Previously, for reasons of comparison, the 5-digit Likert response patterns of GEB and 2-MEV were collapsed to trichotomous scales. In the knowledge dimensions, knowledge was set as a command variable and knowledge type and measurement-point (T0-T2) as effect factors, whereas student and age were handled as random factor. The three knowledge dimension were no even identified again, they showed even a modest behavior effect. However, attitude toward nature turned out to be, as expected, the stronger determinant of behavior.

Conclusions: Overall, we propose a competence model that has the potential to guide into more evidence-based ways of promoting the overall ecological engagement of individuals. As an educational example a half-day module about climate change competed within a botanical garden is presented with its effect of the different variables of the construct.

Some encouraging conclusions were extracted: Botanical gardens are shown as suitable learning environments for successful knowledge acquisition aligned with positive shifts in attitudes and ultimately behavioral intentions. Student-centered approaches paired with self-dependent learning opportunities and authentic learning environments present a suitable approach to stimulate environmental literacy. Outreach environments such as botanical gardens offer the ground for supporting to reach literacy improvements. But they need to be used.

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018 The downturn of pro-environmentalism in adolescence: Dive or dip?

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Abstract:

Research on pro-environmentalism up to date mostly focused either on children or adults but largely neglected the age period in-between: adolescence. As a consequence, very little is known about age-related trends in the adolescent years. Do emotions, judgments and behaviors that related to pro-environmentalism, increase or decrease in adolescence or do they evidence non-linear trends? While a recent study suggests a steep drop in pro-environmentalism during the adolescent years (Wray-Lake, Metzger, & Syvertsen, 2016), others reported that pro-environmentalism declines from early to middle adolescence but increases thereafter, thus, suggesting a dip (Olsson & Gericke, 2016).

Conceptually, the study addresses age-related changes in pro-environmentalism from the perspective of moral development. It has been repeatedly shown that children take a strong moral stance towards protecting the environment (Kahn, 2006). Correspondingly, studies in Environmental Psychology regularly rely on normative-evaluative concepts to explain adults' pro-environmental behavior. In the present study, moral judgments about environmental issues, self- and other-evaluative moral emotions when engaging in pro-environmental behavior or failing to do so (guilt, pride, anger, admiration) as well as affinity to nature were considered important indicators of pro-environmentalism. It was investigated whether these judgments and emotions account for age-related differences in adolescents' pro-environmental behavior.

The study was based on a cross-sectional sample of 325 Canadian adolescents from early, middle, and late adolescence ($M = 15.8$ years, $SD = 3.68$). Well-validated measures for various indicators of pro-environmentalism were used (e.g., self-reported pro-environmental behavior, judgments and emotions about (un)ecological behavior, affinity to nature).

Findings demonstrated that pro-environmental behavior, emotional affinity for nature, moral judgments about environmental issues as well as negatively charged other-evaluative emotions significantly declined from early to late adolescence, with no evidence for a rebound. Age-related

differences in pro-environmental behavior were mediated by prescriptiveness of moral judgment, other-evaluative moral emotions (outrage, anger) as well as affinity for nature.

The study calls for a systematic longitudinal investigation of factors that suppress pro-environmentalism in adolescence.

Keywords: pro-environmental behavior, adolescence, development, moral judgment, moral emotions, affinity to nature

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363 Normative considerations and pro-environmental behaviour in primary school children

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Keywords: normative considerations; value-belief-personal norm model; pro-environmental behaviour; children

Abstract:

Environmental problems could be reduced if individuals act pro-environmentally. Previous research suggests that normative considerations predict engagement in a range of pro-environmental behaviours. For example, the Value-Identity-Personal norm (VIP) model (Ruepert et al., 2016; Van der Werff, Steg & Keizer, 2013; Van der Werff & Steg, 2016) proposes that people are more likely to engage in pro-environmental behaviour when they have strong personal norms, that is, when they feel morally obliged to engage in pro-environmental behaviours. Personal norms are stronger when people strongly endorse biospheric values, and when they see themselves as an environmentally friendly person. As yet, studies have mostly examined these factors explaining pro-environmental behaviour among adults, not among children. As children are the future generations that must meet the targets set by the 2015 climate deal, explaining their engagement in pro-environmental may be potent to mitigate environmental problems. In two studies with primary school children, we aimed to gain initial insights into children's normative considerations with respect to the environment, and whether such factors explain their pro-environmental behaviours. Our results revealed that in line with previous research among adults, children's biospheric values predicted their environmental self-identity, in turn predicting their personal norms to conserve energy and water. Furthermore, we found that biospheric values and environmental self-identity significantly predicted a range of pro-environmental behaviours. However, children's pro-environmental behaviour was not predicted by their personal norms to engage in such behaviours. These results suggest that primary school children may not have internalized this moral responsibility to engage in environmentally friendly behaviours. Implications and directions for future research are discussed.

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WE' CAN DO WHAT' I' CANNOT': A SOCIAL IDENTITY PERSPECTIVE ON REACTIONS TO CLIMATE CHANGE

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Theme: Underlying motivations of individual's involvement in environmental behaviour; Social Influence; Individual and collective agency and empowerment

Abstract:

Climate change is one of the most challenging issues facing our world. As climate change is a global phenomenon and human activity is a major contributor to climate change it requires a collective effort to mitigate its consequences. Previous psychological research, however, has only started to acknowledge the collective (or group) dimension of a successful transition toward more ecologically sustainable behavior. A social identity (SIT) perspective offers important insights into how group processes can facilitate or interfere with individual pro-environmental behavior. Recently, Fritsche, Barth, Jugert, Masson, & Reese have developed a heuristic social identity model of pro-environmental action that proposes different appraisal and response processes to large-scale environmental crises. The model covers central social identity variables, including ingroup identification, collective efficacy and ingroup norms. Building on this framework, this symposium brings together recent research that applied the SIT approach to the realm of climate change and climate change threat. Barth et al. examined the interplay of salient climate change threat and ingroup norms linked to acceptance of non-normative protest. They found that under salient climate change threat participants tended to respond more in line with the presented ingroup norms. Their results highlight that climate change threat does not necessarily lead to a 'conservative shift' but that it increases norm compliance. Masson et al. investigated how climate change threat might increase or decrease ascribed ingroup efficacy. According to their results, high-identified group members ascribed more collective efficacy to fight climate change to their ingroup (i.e. motivated perception of control) when climate change consequences were presented as very severe. The reverse pattern was found for low-identifiers. Reese and colleagues found evidence from experimental lab studies as well as correlational studies that reveal a positive influence of common human identity (i.e. a form of global social identity) on pro-environmental behaviors (e.g., eco-friendly action intentions, support for pro-environmental policies). Finally, Carrus and Panno investigated how identification processes facilitate support for nature-conservation policies. In a scenario experiment, they found that a salient regional identity led to more support proposed by regional authorities compared to proposals made by national authorities. This shows that depending on the salient identity, perspectives on who is part of the outgroup and who is part of the ingroup will change and with that, willingness to support pro-environmental policies. Immo Fritsche will serve as the discussant of this symposium.

301 Group reactions to nature conservation policies

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Keywords: Climate change; nature conservation; social identity

Abstract:

Introduction: Ecosystems are under pressure worldwide, due to globalized changes such as global warming and biodiversity loss. Understanding individual and group reactions to environmental change and conservation policies is therefore crucial for the current political agenda (e.g., Intergovernmental Panel on Climate Change – IPCC, 2015).

Theoretical background: In current human societies, a consequence of the adequate perception of global warming, and acceptance of related environmental policies, is an increase in ecologically

responsible behaviour. However, still more social psychological research is needed to understand the antecedents of this relationship: i.e., what leads individuals and groups to better understand and perceive the ongoing global environmental changes, such as climate change, global warming, or biodiversity loss. And, most importantly, what leads individuals to accept and comply with relevant policies that single countries and inter-governmental bodies design in order to adequately tackle with these changes.

Previous studies have contributed to understand some of the individual-level predictors of climate change perceptions, and how these predictors are in turn drivers of individual pro-environmental actions. It has been suggested, for example, that emotion regulation strategies (e.g., cognitive reappraisal) could predict global warming perception and, how these, in turn, predict pro-environmental behaviour (Panno et al., 2015). Indeed, such study showed that individual cognitive reappraisal is linked to increased global warming perception and higher pro-environmental behaviour, and that global warming perception mediates the relationship between cognitive reappraisal and pro-environmental behaviour.

However, group-based reactions to environmental global changes and to environmental conservation policies are also an interesting issue for environmental psychological research.

Methods: In this paper we present the results of a study testing the moderating effect of group identity salience upon individual support for nature-conservation policies. In a scenario experiment, participants (N = 180) were assigned to one of three experimental conditions of identity salience (personal, regional, or national identity salient), and then evaluated two scenarios describing a protected area proposed by either the national government or by participants' regional government.

Results: As predicted, regional identity salience leads to higher support for the park scenario proposed by a regional authority (described as an ingroup) compared the park scenario proposed by a national authority (described as an outgroup).

Conclusions: These findings show the importance of considering group-level psychological processes in evaluating the impact and acceptance of relevant environmental policies. The implications for future studies and policy implementation are discussed.

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304 Authoritarianism as a Group-Based Reaction to Climate Change Threat

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Keywords: climate change threat, authoritarianism, social norms

Abstract:

Climate Change has become one of the most challenging issues of our time. Previous literature investigated how threatening information about the consequences of climate change might motivate pro-environmental behavior and sustainable action. We propose that climate change threat will not only have effects on closely related reactions but also on the way a person behaves in completely unrelated contexts. Building on a social identity perspective, we believe that threatening information increases group-oriented behavior and appraisal. Under threat, groups can offer safety and stability to the individual. As a consequence, threatened individuals should pay more attention to ingroup norms and should be more motivated to punish non-normative ingroup members. In two studies (N = 250), we investigated the effects of climate change threat on evaluation of non-normative ingroup members (Studies 1 & 2) and willingness to engage in non-normative behavior (Study 2). Participants who were experiencing strong climate change threat evaluated non-normative ingroup members more negatively than participants experiencing only moderate threat (Studies 1 & 2). In addition, strong threat led to more willingness to engage in non-normative behavior, but only if a salient ingroup norm supported such behavior (Study 2). When the norm was unsupportive, the

result pattern was reversed. Our results were in line with the assumption that climate change threat can lead to more group oriented behavior and appraisal. The societal consequences of our findings will be discussed.

308 Motivated Control Perceptions as a Response to Climate Change Threat

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Keywords: climate change threat, collective efficacy, group identification

Abstract:

Introduction: Previous research shows that collective or group efficacy beliefs are a central determinant of intentions to engage in collective action. If individuals perceive their ingroup to possess a sense of collective power to tackle existing challenges, they are more likely to engage in collective (i.e., group-based) action to fight these problems.

Theoretical background:

While the link between group efficacy and collective action has been studied extensively, less is known about what shapes people's group-related efficacy beliefs. For example, Hornsey et al. (2015) showed that participants who read a high-threat message reported more collective efficacy (e.g., government efficacy). However, these studies did not investigate whether collective or group efficacy beliefs are a joint function of ingroup identification and threat. Although groups may be a valuable psychological resource when personal efficacy is threatened (e.g., climate change threat), this compensatory mechanism should best work in case of highly valued groups. We suggest that the effect of threat on perceived group efficacy is moderated by a certain facet of ingroup identification, so called group-level self investment (i.e., affective attachment to the group and centrality of the group for self; Leach et al., 2008).

Methods: Two experimental studies (N = 270) were conducted to investigate our assumptions. Regression analysis with interaction tests and mediation models were applied.

Results: Across two experimental studies, we found that level of climate change threat was positively associated with perceived ingroup efficacy for high-identifiers but not when identification with the ingroup was low. That is, high levels of climate change threat led to higher group efficacy beliefs, albeit only for people strongly self-invested in the group. In contrast, those less self-invested reported significantly lower group efficacy beliefs, indicating that salient climate change threat led to a polarization of group perceptions. In Study 2, we also show that group efficacy beliefs were positively correlated with collective action intentions to fight climate change, thus hinting at a possible mediation model.

Conclusions: In sum, our findings indicate that climate change threat may foster or decrease collective action intentions to fight climate change (through collective efficacy beliefs) depending on the identification with social groups.

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THE SOCIAL SIDE OF ENVIRONMENTAL ISSUES, ATTITUDES AND BEHAVIORSPearson, A.R.¹, Fielding, K.S.², Jans, L.³ & Bouman, T.³¹ Pomona College, Pomona, U.S.A.² The University of Queensland, Queensland, Australia³ University of Groningen, Groningen, The Netherlands**Theme:** Sustainability and social conflict; Social Influence**Abstract:**

Environmental issues occur in a wider social context, and many environmental behaviors and cognitions originate, at least partly, from the social context individuals are living in. Yet, psychological approaches to environmental issues heavily rely on a rather individualized understanding of human behavior and cognition. This symposium highlights the social nature of environmental issues, and the interplay between environmental issues, attitudes and behaviors, and group processes and intergroup relations. We show the added value of a more social perspective, and particularly the social identity approach, for understanding and addressing environmental issues. A better understanding of the social underpinnings of environmental issues can stimulate new questions and advance theory within environmental psychology. Furthermore, these insights provide new strategies to promote pro-environmental behaviour of individuals and the sustainability of society at large.

This symposium focuses on the key role of intergroup relations and group processes in individual and collective responses to environmental issues. We move from the relation between environmental attitudes and hierarchical relationships between groups in society, to the role of specific intergroup comparisons and social identity in predicting environmental attitudes and behaviors. Next, we zoom into the dynamics within groups, and the emergence of new groups encouraging pro-environmental behavior. We end with a direct comparison of group values and individual values in predicting and promoting pro-environmental attitudes and behaviors.

The social features of environmental issues give rise to social psychological processes (such as identity, ideology, and power and status) that, in turn shape how people individually and collectively respond to these issues, which can further impact relations between individuals and groups (Pearson).

The social identity approach offers a lens through which to understand the role that the intergroup context plays in influencing climate change and environmental attitudes and behaviour. When people categorise in terms of a social identity, they are guided by the norms of that group and strive to positively distinguish the in-group from the out-group, and this can strongly influence environmental attitudes and behaviour (Fielding, Hornsey, & Lauren).

Yet, also in the apparent absence of an out-group, social identities can be formed out of intragroup interaction. Interaction within a community can foster identification with community energy initiatives, which in turn strengthens individual and collective pro-environmental intentions (Jans, Steg, & Sloot).

These group-level factors can promote environmental attitudes and behaviours over and above individual factors typically considered within environmental psychology. Perceived biospheric values of the group interact with one's individual values, and can strategically be used to promote pro-environmental attitudes and behaviors (Bouman & Steg).

Together these presentations show the social underpinnings of environmental issues, and the added value of the social identity approach for understanding environmental issues and developing strategies to promote a more environmentally sustainable world. They highlight how the interplay between individuals, groups, and the wider social context they are embedded in, can further our understanding of human attitudes and behavior in the environmental domain.

285 A Social Perspective: How Identity, Ideology, and Power Shape How Groups Perceive and Respond to Environmental Challenges

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Keywords: climate change; intragroup processes; intergroup relations; social psychology

Abstract:

Introduction: Environmental challenges like climate change are increasingly recognized by scientists and policymakers as social problems requiring social solutions. Indeed, as each new round of international climate negotiations demonstrates, how people understand and engage with a problem like climate change is powerfully influenced by how others respond to the issue – processes that psychologists are well-positioned to study. Moreover, when it comes to formulating policy, most environmental decision-making occurs on behalf of others, including both ingroups and outgroups (e.g., international negotiations). Thus, group dynamics play a central role in shaping how people respond to environmental issues.

Theoretical Background: This talk will present an integrated framework for exploring understudied group and intergroup dimensions of pro-environmental engagement that distinguishes between phenomenological features of environmental problems (e.g., differential impacts of climate change on the wealthy and the poor) and core social psychological processes that these features implicate (e.g., group hierarchies and power relations), focusing on global climate change as a case issue. Climate change is a uniquely multilevel problem that affects and is affected by relationships at every level of social interaction, from neighborhoods to nations; yet, psychology lacks an integrated framework for understanding these unique social dimensions (see Pearson, Schuldt, & Romero-Canyas, 2016). I will first describe key phenomenological social features of climate change and then highlight emerging empirical findings that illustrate how these features can shape intra- and intergroup responses to climate change.

Method and Results: A qualitative review of interdisciplinary social science perspectives on climate change identified four distinct social features– its collective, differential, destabilizing, and diffuse social causes and social impacts – that are fundamentally social and, together, characterize anthropogenic climate change as a unique social phenomenon. A synthesis of empirical findings within psychology suggests that each of these features, in turn, implicates social psychological processes, which can affect how people respond to one another, and the problem. Specifically, I identify three core social psychological processes that these features evoke – identity, power, and ideological processes – that influence how people collectively respond to climate change. Whereas its collective features highlight shared identities, its differential impacts expose inequities and status differences between groups. The destabilizing effects of climate change implicate ideological processes that may paradoxically serve to buffer against threats to self, group, and society. Finally, diffuse geographic and temporal features of climate change can not only impact how concerned people feel about climate change, but also influence how they respond to those most vulnerable to its effects.

Conclusion: I will conclude by discussing how understanding linkages between unique phenomenological features of environmental problems and social psychological processes they implicate can stimulate new questions and advance theory within environmental psychology.

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Pearson, A. R., Schuldt, J. P., & Romero-Canyas, R. (2016). Social climate science: A new vista for psychological science. *Perspectives on Psychological Science, 11*, 632-650.

197 Using social identity to understand and promote climate change and environmental attitudes and behaviour

Fielding, K.S., Hornsey, M. & Lauren, N.
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Keywords: social identity, climate change attitudes, environmental behaviour

Abstract:

Introduction and theoretical background: Environmental issues are often marked by an intergroup context. Political partisans differ markedly on climate change beliefs, environmentalists and farmers clash on environmental protection policy, and community members oppose government's approval of mining that could negatively impact the environment. The social identity approach offers a lens through which to understand the role that the group context plays in influencing climate change and environmental attitudes and behaviour. When people categorise in terms of a social identity, they are guided by the norms of that group and strive to positively distinguish the ingroup from the outgroup. In this talk we draw on the social identity approach to analyse environmental attitudes and behaviour and to outline social identity strategies that could help to promote more positive environmental outcomes.

Methods: To illustrate the social identity approach we report two experimental studies that test social identity hypotheses. Study 1 recruited a sample of Americans (N = 384) who identified as Democrats or Republicans. Participants were presented with a media article that described a renewable energy target that was supported by either Democrat or Republican political party members on the basis of benefits that were aligned with either Democrat or Republican values. The second study involved Australian University students (N = 106) who were presented with information that the norms of their group were either aligned (ingroup members supported energy conservation and the majority engaged in this behaviour) or in conflict (the ingroup supported energy conservation but a majority were not engaging in energy conservation) and either received information that outgroup member norms were aligned or did not receive this information.

Results and conclusions: Results from Study 1 were consistent with the social identity hypothesis that ingroup leaders are more likely to influence ingroup members than outgroup leaders. Although Democrat participants were always more supportive of a renewable energy target than Republican participants, there was less difference between Democrats' and Republicans' support when this policy was advocated by political leaders from participants' ingroup. Study 2 showed that when ingroup members received information that the norms of their group were misaligned they were more likely to turn off computers when presented with aligned outgroup norms than when they did not receive this information. We reason that this is because the outgroup information threatened the positive distinctiveness of the ingroup. These findings contribute to the burgeoning literature applying a social identity analysis to the environmental domain. We highlight the need for future research to further test the social identity analysis and especially the solutions that are suggested by a social identity analysis.

148 The Power of Communities: How Community Energy initiatives promote Sustainability

Jans, L., Steg, L. & Sloot, D.
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Keywords: Community Energy Initiatives; Social Identity; Sustainable Energy Behaviour

Abstract:

Introduction and Theoretical Background: Community initiatives seem to rise in popularity in Europe. Especially in the domain of energy the general assumption is that these community initiatives can strongly contribute to the transition towards a sustainable society. However, evidence for the potential contribution of these initiatives is scattered and an integrated perspective on why community energy initiatives may be effective is missing. We use the social identity approach, and new research on the bottom-up formation of social identity out of the input of individual group members; to argue why the group context provided by these initiatives can foster the transition towards a sustainable energy system. We propose that community energy initiatives can attract people beyond those already motivated

to engage in sustainable energy behaviour, change members' attitudes and behaviours regarding sustainable energy and change community norms regarding sustainable energy behaviour, hereby affecting non-members as well.

Methods and Results: We conducted a large longitudinal survey (N = 673), among both members and non-members of 30 community energy initiatives across the Netherlands, measuring among others individuals' sustainable energy motivations, social motivations, identification and interaction with the community, identification with the community initiative, and sustainable energy intentions. As predicted both the motivation to engage in sustainable energy behaviour and the motivation to engage in social behaviour and to have contact with neighbours were related to community initiative membership. Furthermore, identification with a community energy initiative fostered sustainable energy intentions, over and above the individual motivation to engage in sustainable energy behaviour.

Conclusions: These results provide initial support for the catalysing potential these community initiatives can have in the transition towards a sustainable energy system, because of the social context they provide. Our research highlights the key role of social identity processes for understanding and promoting sustainable energy behaviour. Furthermore, our research supports the idea that social identity may also be formed in the apparent absence of an out-group, and highlights the need to better understand why these community energy initiatives emerge, and how and when they further the transition towards an environmentally sustainable future.

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169 The value of what others value: How personal and group values relate to pro-environmental attitudes and behaviours

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Keywords: values; group; identity

Abstract:

Personal values are considered stable predictors of environmental attitudes and behaviours (e.g., Steg et al., 2014). In addition, group values are often used to characterize groups and compare them with each other (e.g., Schwartz & Bardi, 2001). However, only little is known about the influence of group values on individuals' environmental attitudes and behaviours, and how personal and group values interact.

Nonetheless, group values might have a key role in understanding and promoting pro-environmental attitudes and behaviours. Group memberships are considered to have a strong influence on individuals' thoughts, feelings and behaviours, provide grounds for personally relevant self-other comparisons, offer ways to distinguish oneself from others, and form an important part of individuals' self-concept (e.g., Turner et al., 1987). In addition, whereas it is hard to alter personal values, it might be easier to change individuals' perceptions of what the group values. Thereby, group values offer opportunities to intervene and motivate pro-environmental behaviours.

Importantly, these implications seem to rely on individuals' perceptions of what the group values are, rather than the more objective measure typically applied by group-value researchers (i.e., the aggregate of group members' personal values; e.g., Schwartz & Bardi, 2001). Therefore, in our research, we focus on the role of perceived group values, personal values and their interaction in predicting pro-environmental attitudes and behaviours.

In a correlational study (N = 269, Dutch students) we hypothesized and found that participants typically endorse biospheric values (i.e., caring about the environment) more than they think fellow group members would do. In addition, our results indicated that the larger this difference was perceived to be, the stronger someone's environmental self-identity (i.e., seeing oneself as a typical person who engages in pro-environmental behaviours) and engagement in pro-environmental energy behaviours.

This study provides support for the relevance of considering both individual and perceived group values in environmental research. Importantly, as individuals seem to underestimate the importance group members attach to the environment, it would be interesting for future research to investigate whether interventions could reduce this misperception and, if successful, whether this will influence individuals' pro-environmental attitudes and behaviours. In our presentation, we will first discuss the correlational study presented in this abstract; thereafter, we will reflect on how interventions could alter perceived group values, present pilot data on such interventions, and discuss future study ideas.

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BEYOND THE STANDARDS: THE PSYCHOLOGY OF THERMAL COMFORTHuebner, G.M.^{1*}, Hellwig, R.², Schweiker, M.³ & Yang, B.⁴¹ University College London, London, UK² University of Applied Sciences Augsburg, Augsburg, Germany³ Karlsruhe Institute of Technology, Karlsruhe, Germany⁴ University of Umeå, Umeå, Sweden

Theme: Energy transitions and consumption. The human factor. AND / OR Multi, inter and trans-disciplinary approaches and principles.

Abstract:

Buildings are responsible for about 40% of all energy consumption, making buildings an important target for energy reduction. Within buildings, space heating and space cooling (the latter particularly in non-domestic buildings) are the main drivers of energy consumption, and this will likely increase over the next few decades because of climate change (EU Commission 2016). Thermal comfort (TC) is a key concept for energy demand in buildings because space heating and cooling are used to confine ambient temperatures to a narrow band to ensure occupant comfort at high energy costs.

This symposium will present novel research on additional drivers of thermal comfort which broadens understanding of thermal comfort and opens up scope for new interventions to reduce energy demand for heating and cooling by varying ambient temperatures over a wider range, resulting in less use of space heating and cooling. For decades, research on thermal comfort has come overwhelmingly from an engineering/technical perspective. In the heat-balance models, six factors predict the occupants' overall satisfaction with the thermal environment as expressed by the Predicted Mean Vote (PMV): (1) ambient air temperature, (2) mean radiant temperature, (3) relative humidity, (4) air velocity, (5) metabolic rate, and (6) clothing level (ISO 2005). Numerous studies found that participants were satisfied with thermal conditions outside the range as predicted by heat-balance models which fed into the evolution of adaptive models of thermal comfort in which factors beyond the heat balance of a body are of importance, such as contextual factors and past thermal history (Nicol & Humphreys 1973). This symposium will present findings of additional impact factors on thermal comfort, coming from a psychological perspective. The presentations will show novel findings on the impact of personal control on perceived TC, on the link between emotions and TC, on the role of temporal expectations for TC, and the relationship between personality traits (big5 and self-efficacy) on TC.

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ISO, 2005. Ergonomics of the Thermal Environment—Analytical Determination and Interpretation of Thermal Comfort Using Calculation of the PMV and PPD Indices and Local Thermal Comfort Criteria., London: BSI.

Nicol, J.F. & Humphreys, M.A., 1973. Thermal comfort as part of a self-regulating system. *Building Research and Practice*, 1(3), pp.174–179.**091 Emotions and thermal comfort - feeling warmer when feeling happier**

Huebner, G.M. & Shipworth, D.

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Keywords: thermal comfort, emotions, experiment**Abstract:**

Providing thermal comfort (TC) in buildings typically uses around 30% of developed nations' energy and carbon emissions. Thermal comfort is provided by constraining ambient temperatures to within narrowly defined 'comfortable' ranges traditionally based on physiological heat balance models of the human body. Our understanding of what drives thermal comfort perception is still limited however, and while physiological parameters have been identified for decades, research on psychological parameters of comfort is still rather limited. The basic emotions have not been studied

in relationship to thermal comfort, so in this study, we investigated the relationship between emotional state, i.e. feeling happy or sad, and thermal comfort perception.

A recent study has shown that the various basic emotions are associated with specific perceived activation state of the body (Nummenmaa, Glerean, Hari, & Hietanen, 2014) which we hypothesized would translate in different comfort states. Feeling happy would, through higher perceived bodily activation, translate to feeling warmer or more thermally comfortable - whereas feeling sad would lead to feeling colder or less thermally comfortable, because of the associated perceived lower bodily activation.

We designed an experimental study using Amazon Mechanical Turk (Paolacci, Chandler, & Ipeirotis, 2010). N = 300 Turkers were recruited and randomly assigned to recall either a happy autobiographical episode or a sad one to induce a happy or sad emotional state (Briñol, Petty, & Barden, 2007). The valid sample encompassed N = 273. A manipulation check revealed that the emotional manipulation worked.

There was a significant effect of emotional state on the standard ASHRAE comfort survey question "How are you feeling in this moment from 1 [cold] to 7 [hot]?" Those feeling happy reported feeling significantly warmer than those feeling sad [$t(269) = 3.66, p < .001$]. However, there was no difference in the two other outcomes variables, estimate of room temperature and rating of how thermally comfortable one felt - the latter also being a standard thermal comfort survey question.

We conclude that there is some evidence for a relationship between emotional state and thermal perception in feeling of warm or cold that warrants further research on this topic. The data also indicate a dissociation between various thermal comfort related outcomes measures, posing a methodological challenge that needs addressing.

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162 Personal Control and its Impact on Thermal Comfort and Satisfaction

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Keywords: Personality and environmental psychology, energy consumption, inter- and trans-disciplinary approaches

Abstract:

Introduction: For decades, research on energy efficiency as well as research on thermal comfort (TC) has come predominantly from an engineering perspective. Standards define TC as a function of physical and physiological parameters. TC requirements are based on measurable parameters, which form the basis for design processes and the application of building automation systems controlling these parameters.

Theoretical background: From investigations of building related symptoms it is known that satisfaction with the thermal environment also relates to extra-physical parameters. The adaptive model of TC, findings from post occupancy evaluations and surveys in real buildings point out the importance of high perceived control for occupants. Personality and environmental psychology emphasise the importance of personal control to human beings (see literature review in Hellwig, 2015). A newly developed conceptual model of personal control in indoor environments is presented. The aim is to inter-connect concepts, models and findings from personality and environmental psychology and from TC research.

Methods: Based on a literature review on perceived control and on models/ constructs from personality, behavioural and environmental psychology a conceptual model was developed (Hellwig, 2015).

Results: The new conceptual model presents personal control as a key factor for satisfaction with the indoor environment. The model's basis are new definitions of satisfaction with the indoor environment and of perceived control. Perceived control over the indoor environment is defined by applying concepts from personality psychology (locus of control and self-efficacy) specifically to individual indoor environment evaluation in buildings. These personality traits are linked to the experiences of a person with indoor environments, their capabilities, skills or knowledge to exercise behaviour with the control opportunities provided. In addition, a person's expectation and actual preferences, constraints from the social or built environment as well as previous success of failure in behavioural control actions form the concept of perceived control (Hellwig, 2015).

Conclusions: The model broadens understanding of: the evaluation process of a stimulus in buildings, how a certain control action will be chosen, the steps of a behavioural action, what perceived control is, and the important role of perceived control for indoor environmental satisfaction. The newly developed conceptual model can be seen as a contribution to research on additional drivers of TC and satisfaction. It opens up scope for new interventions to reduce energy demand for heating and cooling by e.g. developing strategies for user information resulting in more responsible occupants, developing context-depending design approaches for personal control of the indoor environment, varying ambient temperatures over a wider range, resulting in less use of space heating and cooling.

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280 The influence of personality traits on perceived thermal sensation, preference, and comfort

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Keywords: thermal comfort; self-efficacy; big-five personality traits

Abstract:

Introduction: Thermal discomfort is one of the main drivers for occupants' interactions with their thermal built environment such as opening windows or adjusting thermostat settings. As such it influences the energy use of the building. Research on thermal comfort is dominated by approaches that relate differences in thermal perception to objective measures such as air temperature, relative humidity, or activity level of the individual. However, under the same objective thermal conditions, there is a high variance in the reported thermal sensation, preference, and comfort votes.

Theoretical background: Studies in other areas such as pain research found influences of personality traits, such as the Big Five-personality traits based on the Big Five theory, on human perception. In addition, research suggests that thermal perception is influenced by perceived behavioural control and self-efficacy, both elements of the theory of planned behaviour.

Methods: Within a controlled thermal indoor environment, 64 subjects spend up to 3 days of 8 hrs each, and reported their thermal sensation, preference, and comfort level together with their perceived level of control 6 times a day under a variety of thermal conditions. In addition, a self-efficacy scale and three scales of the Big Five personality traits (neuroticism, extraversion, and openness to new experiences) were applied. The conditions were binned according to the objective thermal strain estimated by means of the predicted mean vote, a standard measure used within the field of thermal comfort research. As dependent variables, the thermal sensation, preference, and comfort votes obtained under the two main prevailing objective conditions – thermally neutral and slightly warm – were analysed, leading to 6 analysed cases. Ordinal mixed effect logistic regression

analysis was used in order to analyse their variance explained by the independent variables perceived control, self-efficacy, and the three additional Big Five personality traits.

Results: The results showed that around 11%, 8%, and 13% of the variance in thermal sensation, preference and comfort votes could be explained by the five independent variables. Perceived behavioural control was in 4 out of 6 cases (thermally neutral and thermally slightly warm conditions by the three types of votes) significant at $p < .05$ and in the other two cases showing a tendency with $p < .1$. Self-efficacy and the three personality traits were in 1 case each significant at $p < .05$.

Conclusions: This paper gives first insights into additional factors influencing individual thermal perception and shows that the perception of thermal conditions partly depends on individual personal characteristics. These findings together with further aspects likely to be found in other concepts of the field of psychology can lead to a better understanding of individual thermal perception and support the design of thermally comfortable buildings.

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SSVIII-02 SYMPOSIUM:

Room: +1.2

ENERGY SYSTEMS INTEGRATION: AN INNOVATIVE HUMAN FACTORS APPROACH

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Theme: Energy transitions and consumption. The human factor.

Abstract: Energy Systems Integration (ESI) is a decentralized, holistic approach to meeting society's energy needs (Kroposki, et al., 2012). Successful ESI is crucial to environmental sustainability and requires an integration of both technical and social perspectives. Psychologists are poised to play a key role in the success of ESI.

For example, a sustainable energy system must account for the multiple roles individuals will actively play in their local energy grid (i.e. consumer and producer). It requires incentives that target factors which increase long-term end-user sustainable energy behaviors (e.g., adoption and use of energy efficient technologies and changing user behavior to reduce demand or adapt demand to supply). Additionally, successful ESI requires an understanding of which factors boost social acceptance and desirability of ESI and ESI-related policies.

The purpose of our symposium will be to discuss ESI and the unique challenges of designing and implementing sustainable energy systems. Successful implementation of ESI needs interdisciplinary, long-term, multi-faceted and mixed-method approaches.

S. J. Zawadzki's presentation will define ESI and its unique social psychological challenges. Her interdisciplinary qualitative research reveals practically impactful directions and key leverage variables to investigate in future ESI-related research.

Dr. D. Taufik will present on the role of positive feelings to conserve energy. His work demonstrates the importance of utilizing emotional incentives to encourage sustainable energy behaviors.

S. Mertens's presentation will shed light on implicit social and psychological drivers of adopting energy efficient technologies and how different attributes of the technology are weighed in the decision-making process.

Dr. A. Spence's research focuses on empowering people in their energy systems. She will discuss acceptance of smart energy technologies and how support may differ between individual acceptance, workplace acceptance and policy acceptance.

N. H. Lemmen's presentation will discuss what cues are most effective in stimulating environmentally friendly behavior in such a way that people act accordingly. She will focus on the importance of engaging people when prompting them to make socially desirable choices, such as sustainable energy use. Her field research shows that encouraging people to think about the normative aspects of socially desirable behaviors will increase normative behavior and the extent to which people value this behavior.

Successful integration of our multi-faceted energy systems will be vital for adequately addressing climate change and securing a sustainable energy future (Kroposki, et al., 2012). By engaging in research that promotes ESI, psychologists will help foster sustainable energy systems that empower end-users as active participants in these new systems.

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160 Energy systems integration and psychology: Where do we start?

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Keywords: energy transition; end-user engagement; qualitative methods; interdisciplinary research

Abstract:

In order to adequately address climate change while simultaneously meeting society's energy needs, sustainable energy systems can account for the changing energy landscape and increasingly overlapping roles of energy consumers and producers. Energy Systems Integration (ESI) is an innovative, holistic approach to designing and engineering sustainable energy systems that optimizes the modern diverse and multifaceted energy landscape [1].

The purpose of the proposed presentation is threefold: 1) define ESI for an audience that will be critical to its success but may be unfamiliar with this approach to sustainable energy systems (environmental psychologists); 2) present interdisciplinary qualitative research which identifies key dependent variables vital to ESI and how different key groups of people conceptualize and verbalize these outcomes; 3) identify avenues for future research potentially most crucial to implementing efficient and acceptable ESI.

Successful ESI requires an integration of the macro and micro perspectives, taking into account not just the technical constraints of the power grid and the availability of conventional and renewable energy sources, but also embracing consumers as active contributors towards ESI. This requires a wide variety of changes for end-users; for example, the usage of energy sources in the form of solar panels transforms consumers into prosumers, who both produce and consume energy [2], altering end-user responsibilities. Effective and long-lasting incentive structures may be needed to encourage long-term engagement across multiple behaviors, such as changing energy carriers or the adoption of renewable energy sources and energy efficient use, monitoring and controlling energy supply and demand, and storage technologies. Moreover, end-users need to change patterns of their existing behaviors to adapt energy demand to supply (e.g., adjusting time of use to avoid peak usage hours or to match available renewable supply). Furthermore, ESI requires social acceptance and desirability of ESI-related infrastructure and policies [3].

However, end-users are typically under-informed about the energy system and do not know the various ways their energy behaviors impact the environment [3]. In order to understand how individuals perceive and conceptualize ESI and effectively research the myriad of ESI-related outcomes, psychologists will need to understand the language with which individuals conceptualize and judge their role in the energy system. Additionally, in order to ensure ESI-related research is practically impactful, researchers must ensure that measures are constructed in ways that adjust to and complement the design of ESI.

The proposed presentation will detail a series of interdisciplinary, qualitative interviews with local academic and practicing technical experts, policy experts, environmental activists, and end users in the Netherlands. Key aspects of making precise and valid ESI-related measures include careful consideration to levels of abstraction, both in the geographic scale discussed and the wording used to describe the intended target measures. Additionally, we will explore differences in stakeholder and community member interpretations of ESI terminology as well as the perceived relative importance of the various factors in achieving sustainable ESI. Key avenues for future ESI psychological research will be discussed.

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172 How much persuasion do you need to do the right thing? A field study on self-persuasion and socially desirable behavior.

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University of Groningen, Groningen, Netherlands

Keywords: Self-persuasion; Self-perception; Energy Systems Integration (ESI); Sustainable energy use

Abstract:

Promoting a sustainable environment through the use of Energy Systems Integration (ESI) requires energy users to make sustainable energy choices within the system. Making sustainable energy choices is generally not very comfortable or pleasurable. For example, lowering the thermostat implies for many a reduction in comfort. What strategies are most effective in promoting sustainable energy behavior in such situations, in that people are more likely to act sustainably? Two approaches that are rather common are: making salient what the sustainable behavior is and providing people with information explaining why this is the appropriate behavior. In this talk I'll discuss the effectiveness of both approaches and introduce a third type: simply asking people why the sustainable behavior is the appropriate behavior. In a field study, conducted in a zoo in the Netherlands, the animal caring behavior of 2438 visitors was observed. Observations were made on four similar days during the park's morning peak hours. After being provided with either: a sign stating that visitors should not lure the monkeys, signs providing information on why this desirable behavior is important, or a sign asking visitors why this behavior is desirable, the percentage of visitors showing the appropriate behavior (i.e. not luring the monkeys) was defined in each condition. In an additional study, 358 visitors were asked in a questionnaire how important they think conducting the specific behavior is. The results show that both providing reasons and asking people why the desired behavior is appropriate are significantly more effective in promoting the appropriate behavior than only making the environmental behavior salient. However, asking people why the desired behavior is appropriate resulted in people caring more about this behavior. In this talk I will explain the theoretical reasoning behind this effect that is rooted in Aronson's (1999) research on self-persuasion and Bem's (1967) theory on self-perception. I will discuss how this finding can be used to promote sustainable energy behavior that is needed to optimize energy systems integration.

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174 How social role impacts support for Smart Energy Technologies: Do you think differently as a householder, an employee, or a citizen?

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University of Nottingham, Nottingham, UK.

Keywords: Smart energy technologies (SETs); Energy futures; Demand side response (DSR); policy support; social role

Abstract:

Introduction: Smart energy technologies (SETs) are a key aspect of most future energy system scenarios. SETs are technologies that can be automated or remotely controlled in order to make them more efficient in their energy use. Research into public acceptance of SETs to date has primarily been undertaken at a residential level, which may differ from support at a workplace or national policy level. We explore these differences from both a public and expert perspective.

Theory: Lines of research relating to surrogate decision making and from construal level theory respectively indicate that policy support at a workplace or national level may differ from support at a residential level. Research within surrogate decision-making literature indicates that people making decisions for the benefit of others are less spontaneous and less affect driven, the more distant those 'others' are socially from themselves (Ziegler and Tunney, 2012). Construal level theory (Lieberman, & Trope, 2008) finds that decisions that are more abstract or distant from an individual are more likely to be made on the basis of an individual's moral values than in terms of concrete, contextualised considerations.

Methods: We used a mixed methods approach to examine both expert and public views of how public acceptance feeds into the viability of SETs and how this differs between residential, workplace and policy contexts. Semi-structured interviews (N = 20) with experts on SETs within the public sector, non-government organisations, private companies, and academia allowed us to explore the perceived role of the public in SETs acceptance across contexts. We converged this data with an online survey (N=200) utilising a student sample and comprising scenario questions around support for SETs in different contexts, and perceptions of energy and climate change.

Results: Data collection is ongoing. We propose that experts are likely to consider the role of the public as more important within a residential context compared to a workplace or policy context and as qualitatively different within each context. We also predict that support of SETs at a policy level (workplace and national) is likely to be less driven by affect (Ziegler and Tunney, 2012) and more driven by moral norms (Lieberman, & Trope, 2008) than support of SETs at a residential level. We propose that differences in support will be moderated by the degree to which respondents feel socially distant from their workplace or the rest of the UK.

Conclusions: Findings have empirical value in feeding into energy policy decisions. Our data will highlight the extent, and in what ways, policy support and engagement may diverge from residential engagement. This will allow extrapolation from current data and highlight where further research may be needed into policy support. Data will also feed into theoretical ideas regarding differences between individual engagement and policy acceptance.

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183 Going green: a matter of feelings or calculations?

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Keywords: pro-environmental behaviour, energy conservation, feelings, calculations

Abstract:

Environmental campaigns often communicate the benefits of acting environmentally-friendly, such as benefits in the form of reductions in CO2 emissions or monetary savings. The assumption is that larger benefits will translate into stronger intentions to act environmentally-friendly– a mechanism known as “valuation by calculation” (Hsee & Rottenstreich, 2004). As such, these campaigns have neglected the possibility that decisions to act environmentally-friendly can also be preceded by “valuation by feeling” (Hsee & Rottenstreich, 2004); a mechanism through which anticipated positive feelings drive people’s actions. Contributing to the good cause often is not based on reasoned and calculating considerations, but rather on how people will feel about it (Haidt, 2001). We hypothesized that acting environmentally-friendly can be driven by anticipated positive feelings about the behaviour, because it can be intrinsically rewarding to contribute to the good cause by doing something good for the environment (Taufik, Bolderdijk, & Steg, 2015; Van der Linden, 2015).

We tested our hypothesis in the domain of household energy conservation. Two studies were conducted where we used scenarios in which participants received a hypothetical energy bill that communicated their household energy consumption. Potential savings that can be achieved by conserving energy were also communicated.

Across both studies we found that the stronger people anticipated to feel good about acting environmentally-friendly, the stronger their intention was to act environmentally-friendly in the form of conserving energy at home. Importantly, anticipated positive feelings were a much stronger predictor of peoples’ intention to act environmentally-friendly compared to how large people perceived the benefits of energy conservation (e.g. monetary savings) to be. Therefore, emotional incentives weighed more heavily in driving peoples’ intention to conserve energy compared to more calculating incentives.

Many pro-environmental behaviors such as energy-conserving measures generate relatively small savings (Bolderdijk & Steg, 2015). Our results suggest that this does not have to be a barrier for people to act in a pro-environmental manner, as long as people anticipate to feel good when acting environmentally-friendly. Overall, the results indicate that environmental campaigns that resonate with peoples’ feelings, instead of exclusively appealing to their calculations, may be an important unexploited route to encourage people to go green.

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194 The Effects of Attribute Translations on Purchase Decisions in the Energy Domain

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Keywords: sustainable consumer behavior; purchase decisions; nudges

Abstract:

The mitigation of climate change undeniably requires a decline in our overall energy demands. In this respect, the adoption of energy efficient technologies plays an important role as it lowers individuals’ energy

consumption without significant changes in their daily behavior. Research on sustainable consumer behavior, however, has largely focused on non-consumption and post-purchase behaviors, such as recycling (Follows & Jobber, 2000). As a result, there is still a substantial knowledge gap concerning the factors and processes driving the purchase of energy efficient technologies. The aim of the current study was to address this knowledge gap and investigate information acquisition processes and purchase decisions in the energy domain. In particular, the study focused on the effects of attribute translations, which are defined as varying expressions of the same attribute (Ungemach, Camilleri, Johnson, Larrick, & Weber, in press). Attribute translations may help to guide consumers towards more energy efficient technologies by highlighting different aspects of energy consumption, such as operating costs or CO2 emissions. To investigate the effects of attribute translations on information acquisition processes and purchase decisions, we conducted a computerized experiment in which 181 university students engaged in a series of choices between two washing machines. Using the process tracing tool MouselabWEB (Willemsen & Johnson, 2011), we recorded participants' choices along with how long and how often they inspected each of the presented product attributes. This additional process information served as a proxy measure for the amount of attention participants directed towards each attribute. Our initial analyses show that washing machines with a relatively low energy consumption were chosen more often when the mere physical information of energy consumption (i.e., kW/h) was complemented by additional 'translations', such as operating costs and CO2 emissions. The results of the current study suggest that expressing energy consumption in terms of multiple translations can increase consumers' preference for energy efficient technologies.

In addition to our initial findings, the presentation will discuss the extent to which values, emotions, and implicit associations towards environmentally responsible behavior affect information acquisition processes and purchase decisions in the energy domain.

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SS-VIII-03 SYMPOSIUM:

Room: +1.3

NATURE EXPERIENCE AND WELL-BEING

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Abstract:

Introduction: The symposium focuses on nature experiences and well-being. The first two studies of this symposium are based on a questionnaire survey conducted among 784 employees in Finland. In the first study, the participants' responses to an open-ended question were thematically coded to investigate the ways in which employees utilise nature as a resource for their occupational well-being. The thematic categories of nature experiences are discussed in relation to the frequency and duration of outdoor activities in nature among employees.

The second study examines the different profiles of outdoor activities in nature among employees. The profiles are formed on the basis of the frequency and duration of outdoor activities. The profiles of outdoor activities in nature are found to relate to employees' occupational well-being.

The third study investigated experimentally whether psychological tasks carried out on a forest trail walk can aid attention restoration, i.e., performance in an attention-demanding task. A sample of 127 adult participants were randomly assigned to four walking conditions: A circular 6 km walk with the tasks and without the tasks, both walks in two different directions.

The fourth study describes the development of a new measure – based on the Perceived Restorativeness Scale and Connectedness to Nature Scale – to capture a “Comprehensive Nature Experience” combining feelings, self-experience and physical characteristics of the landscape. Several samples, altogether 881 participants, were used in the validation study.

A fifth potential presentation from the open call can be accepted if it fits the theme of the symposium and the time allocated for this symposium.

Theoretical background: The presentations will draw from theories and empirical findings of work stress and employee well-being (Bakker & Demerouti, 2008; Sahlin et al., 2012), Attention restoration theory (ART) (Kaplan, 1995), Cognitive engagement strategies (Duvall, 2011), Favourite place studies (Korpela & Ylén, 2009), and Nature connectedness (Mayer & Frantz, 2004).

Methods: The studies use e.g. content analysis, latent profile analysis, multigroup regression analysis, multitrait-multimethod analysis.

Keywords: physical activity in nature, Attention restoration theory, Cognitive engagement, Nature connectedness,

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341 Forest walk with and without psychological tasks to enhance restoration: Results for sustained attention

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Keywords: restoration; natural environments; cognitive engagement

Abstract:

Introduction: Exposure to natural environments have been found to improve performance especially in attention-demanding tasks (Berto, 2005). Furthermore, nature walks combined with cognitive engagement were found to improve self-reported attentional functioning compared with regular nature walks (Duvall, 2011). The present study shows preliminary results from a forest walk experiment, conducted on a trail with psychological tasks designed to enhance restoration.

Theoretical background: The signposts were designed with integrative approach from three theoretical perspectives related to benefits of contact with nature: 1) Kaplan and Kaplan's attention restoration theory (ART; 1989), 2) stress reduction theory (SRT, Ulrich et al., 1991), and 3) favourite place studies (Korpela & Ylén, 2009). Integrating these theories, a restorative experience has been suggested to start with physiological relaxation followed by affective responses, and advance to building an affective relationship with the place and reflection on the current situation in life.

Methods: The psychological tasks along the trail followed the phases in which a restorative experience is suggested to develop. The participants (n=127) completed the Sustained Attention to Response Task (SART) before and after the walk. In SART, the participants respond to rapidly changing stimulus on a screen except for a target. The participants were randomly assigned to four conditions: walk with the tasks either in the correct (clockwise route) or the reverse order (anticlockwise route), and walk without the tasks following either route. We compared the change between before and after measurements with multigroup regression analysis using Mplus version 7.4.

Results: The preliminary results showed no differences in the number of incorrect responses to the target between the conditions. Results regarding average response time and reaction time variability, indicating attentional lapses, were contradictory. Walking the clockwise route with tasks resulted in increase in average response time and greater reaction time variability compared with walking the same route without the tasks. In the anticlockwise route, completing the tasks reduced reaction time and its variability compared with a walk without the tasks.

Conclusions: The preliminary results suggest that the psychological tasks along nature trail can aid performance in an attention-demanding task in some but not all cases. Further analysis on environmental conditions and individual factors are needed to verify these results.

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348 Nature as a resource for occupational well-being

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Abstract:

Introduction: This study investigates the ways in which employees utilise outdoor activities as a resource for their occupational well-being. Employees were asked how their outdoor activities impact their well-being at work with an open-ended question. The employees' responses were thematically coded into content categories of outdoor activities as a resource.

Theoretical background: The study is based on research and theory on attention restoration in nature (e.g., Kaplan, 1995), psychological recovery (e.g., De Bloom et al., 2014), occupational well-being (e.g., Bakker & Demerouti, 2008), and self-regulation and favourite place studies (Korpela & Ylén, 2009). The study proposes that employees use outdoor activities as a strategy to maintain and/or improve their well-being and performance at work.

Methods: The study was conducted as an online survey in spring 2016. The survey link was emailed to employees working in 13 different organisations in Finland. In total, 784 employees responded to the survey and the response rate was 24 %. The majority of participants were female (78 %) and on average 47 years old (21 years – 70 years; SD = 10.2 years). Multi-method analyses were conducted on participants' responses to the open-ended question on impact of outdoor activities on occupational well-being. Firstly, the content analysis of responses was data driven and the responses were thematically coded into content categories of outdoor activities as an occupational well-being resource. Secondly, the content categories were investigated in relation to the frequency and duration of outdoor activities and occupational well-being reported by the participants by means of ANCOVA.

Results and conclusions: The participants differed in ways in which they utilise outdoor activities as a resource. The majority of participants observe the benefits of outdoor activities in terms of restoration, recovery, work performance, and health. However, there were also participants who felt that outdoor activities did not impact their occupational well-being. The content categories identified on the basis of thematic coding of participants' responses on outdoor activities as an occupational well-being resource will be described and presented. These findings are discussed in the context of the frequency and duration of outdoor activities and reported occupational well-being.

Keywords: Outdoor activity, occupational well-being and employees.

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352 Profiles of outdoor activities in nature and occupational well-being

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Abstract:

Introduction: Studies linking different types of nature activities to employee well-being are scarce. This study examines the different profiles of outdoor activities in nature among employees. The profiles of outdoor activities in nature are investigated in relation to employees' occupational well-being.

Theoretical background: Experimental studies have consistently found short-term positive effects of physical activity in nature on mood (Barton & Pretty, 2010), on attentional performance and physiological processes (e.g., blood pressure) (Hartig et al., 2014). According to self-report surveys, physical activity in nature has more positive effects on emotional well-being (e.g., happiness, calmness) than activity indoors or outdoors in built environments (Pasanen et al., 2014). Regarding employees, there is a link between physical activity in nature and less need for recovery from work (Korpela & Kinnunen, 2011).

Methods: The study was conducted as an online survey in spring 2016. The survey link was emailed to employees working in 13 different organisations in Finland. In total, 784 employees responded to the survey and the response rate was 24 %. The majority of participants were female (78 %) and on average 47 years old (21 years – 70 years; SD = 10.2 years). The aim of the Latent Profile Analysis was to identify employee groups characterized by different ways of being active in nature (e.g., frequency of activities in summer and winter, types of activities, work-related nature exposure). Secondly, the relationship between the identified profiles of outdoor activities and occupational well-being was investigated by means of ANOVA.

Results and conclusions: Five profiles were identified. The profiles differed not only in the mean frequency of activities but also in the types of activities. We found profiles with similar levels of nature exposure but consisting of very different types of nature activities. For example, one profile having a large variety of nature activities from walking to cycling, swimming and berrypicking whereas the other including only two types (walking and enjoying nature) of nature activities. ANOVA showed that the five profiles differed in terms of work engagement (Bakker & Demerouti, 2008) so that the profile with the lowest frequency of nature exposure was lowest in work engagement. The results support the notion of nature exposure being related to employee well-being.

Keywords: Outdoor activity, occupational well-being, employee, work engagement.

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374 Towards measuring comprehensive nature experience

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Abstract:

Introduction: The aim of this study was to develop a new measure for comprehensive nature experience (CNE) which consists of emotions, self-experience and characteristics of the nature. In addition to the structure and reliability of the measure, also the structural, criterion, and known group validity of the CNE measure were evaluated.

Theoretical background: The study is based on research and theory on attention restoration in nature (e.g., Kaplan, 1995), stress recovery theory (Ulrich, et al., 1983), self-regulation and favourite place studies (Korpela & Ylén, 2009), and so-called comprehensive views of nature experience (e.g., Brymer et al., 2010; Sahlin et al., 2012). The CNE measure is based on the Perceived Restorativeness Scale (Hartig et al., 1997) and Connectedness to Nature Scale (Mayer & Frantz, 2004).

Methods: The data consisted of mainly Finnish adults who visited a health portal (n = 485) or participated in a nature-based intervention (n = 49). In order to evaluate the validity of the CNE measure, a secondary data were collected among university students (n = 347). Factor analysis was used to evaluate the structure of the CNE. The reliability of the CNE was assessed with Cronbach's alphas. The structural and criterion validity were evaluated with Pearson correlation coefficients. In order to assess the known group validity, the dimensions of the CNE were compared with analysis of variance among three groups of nature experience identified in an earlier quantitative study (i.e., restoration, health experiences, and ambivalent experiences).

Results and conclusions: The CNE measure consisted of four dimension (i.e., connectedness with nature, feelings of impasse, feelings of space, and feelings of being accepted), which mostly showed good reliability. Moreover, the structural, criterion, and known group validity turned out to be moderate.

Keywords: comprehensive nature experience, the CNE measure, connectedness with nature, feelings of impasse, feelings of space, feelings of being accepted.

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BEHAVIOURAL SPILLOVER: EMPIRICAL EVIDENCE FROM MULTI-METHOD RESEARCH

Thomas, G.O., Nash, N., Sautkina, E., Capstick, S., Poortinga, W. & Whitmarsh, L.
Cardiff University, Cardiff, Wales, UK.

Theme: Underlying motivations of individuals' involvement in environmental behaviour; Environmental action and sustainability; Research methods.

Abstract:

Behavioural spillover is a phenomenon where engagement in one pro-environmental behaviour changes the likelihood of engagement in other pro-environmental behaviours. There is good theoretical support for behavioural spillover from psychology (e.g., cognitive dissonance and self-perception theories) and other disciplines (e.g., social practice theory), suggesting that environmental values, self-identity, skills and knowledge, and self-efficacy processes may produce spillover effects (Thøgersen & Crompton, 2009). Engagement in pro-environmental behaviours may lead to further positive changes (known as 'positive spillover') through motivational reinforcement and changes in environmental identity (Truelove et al., 2014), but also to 'negative spillover' through moral licensing (e.g. Mazar & Zhong, 2010). The empirical evidence for spillover is however mixed, with a range of positive and negative results, and a lack of detailed investigation into the psychological mechanisms behind potential spillover effects (e.g. Jacobsen et al., 2012; Thomas et al., 2013). Furthermore, there is a lack of high-quality longitudinal and field-experimental research to explore spillover effects over time. This symposium consists of four presentations that together will present an interdisciplinary conceptual framework of lifestyle and behaviour change, using both quantitative and qualitative research methods, and examining spillover processes in 'real life' field experiments and cross-cultural studies. The first presentation consists of a secondary analysis of Understanding Society dataset, a longitudinal survey representative of the UK population, to find longitudinal evidence of behavioural spillover as a result of the Welsh carrier bag charge (Thomas). The second presentation focuses on spillover from a qualitative cross-cultural perspective (Nash). Based on interviews conducted in seven countries (UK, Brazil, Poland, South Africa, Denmark, Nepal, China), the presentation explores how various 'pro-environmental behaviours' are conceptualised and inter-related across cultures. The study highlights potential limitations to the generalisability of spillover effects based on contrasting understandings of pro-environmental behaviour. The third presentation (Sautkina) combines a longitudinal survey and diary-interview study to examine behavioural and policy spillover resulting from the English plastic bag charge. Quantitative evidence from the longitudinal survey will be supported by qualitative evidence regarding the underlying behavioural change processes. The fourth presentation presents the results of a multi-wave, cross-cultural survey conducted in the UK and Brazil (Capstick). The multi-wave survey was designed to reflect test central to spillover, including moral licensing, compensatory beliefs, and motivational reinforcement. The symposium will be concluded by a combined discussion providing an up-to-date assessment of the available evidence for behavioural spillover, a presentation of a unifying conceptual framework, and a research agenda for future research.

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016 Behavioural and policy spillover of the English Plastic Bag Charge: Findings from a longitudinal mixed-methods research

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Abstract:

Introduction: Plastic Bag Charges are popular and easy-to-implement policy instruments that can successfully reduce plastic bag use, a common waste-related habit (Poortinga et al., 2013).

Theoretical background: Based on the behaviour spillover theory (Thøgersen & Crompton 2009), it can be expected that the benefits of a plastic bag charge may go even further, in that changes to this behaviour may lead to other behavioural changes where non-targeted environmental behaviours and attitudes also increase (Poortinga et al., 2013).

This paper examines spillover effects of the English plastic bag charge, a mandatory 5p charge introduced in October 2015 for customers to use single-use plastic bags in large stores. It presents findings from a large longitudinal mixed-methods research looking at two types of spillover effects of the English plastic bag charge: behavioural spillover and spillover in attitudes to other similar environmental policies ('policy spillover').

Methods: In the first study, using nationally-representative samples in England, Scotland and Wales (n = 2,005), we measured the frequency of carrier bag use, sustainable behaviours and support for environmental policies 4 weeks prior to, and 4 weeks post-introduction of the charge. In the second study, participants in England, Scotland and Wales (n = 45) kept electronic diaries to report their carrier bag use and environmental behaviours, and took part in follow-up in-depth interviews that helped to understand the processes of behaviour and attitude change. The study was conducted 4 weeks prior to and 4 weeks post-introduction of the charge.

Results:

Results show that in England, the use of single-use plastic bags fell dramatically, and the frequency of taking own shopping bags increased. However, the increased use of own shopping bags did not predict changes in other sustainable behaviours, suggesting that behavioural spillover effects did not occur. Research participants articulated the lack of further changes as an impossibility to 'become eco-warriors overnight' following the introduction of the charge.

Results also show that support for the plastic bag charge increased in England after its introduction, and this increase was also predictive of increased support for other pro-environmental policies: a 5p charge on plastic water bottles, and 5p charge on excessive packaging, and a deposit return scheme on plastic bottles. The increased support for these waste-reduction policies could be explained by the plastic bag charge acting as a catalyst to raise waste and environmental awareness.

Conclusions: We conclude that while the English plastic bag charge did not produce behavioural spillover, it promoted attitudinal spillover and increase in public support for similar charges, i.e. 'policy spillover'. This study provides a useful extension of the spillover theory. Research should further explore the potential of targeted policy interventions to 'nudge' the support for related policies.

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037 The Welsh Single-Use Carrier Bag Charge and behavioural spillover

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Keywords: spillover; behaviour; longitudinal

Abstract:

Introduction: Every year, billions of Single-Use Carrier Bags (SUCBs) are distributed and thrown away, wasting resources and causing damage to marine wildlife and natural environments. To reduce SUCB use, several countries have enacted mandatory charges to customers for each SUCB used. In 2011, Wales was the first country in the UK to introduce a £0.05 charge (€0.06) for each SUCB.

Theoretical Background: Bag charges are also suggested as a way to promote behavioural spillover, where an increase in one behaviour encourages a change in other unrelated behaviours (Poortinga, Whitmarsh, & Suffolk, 2013). Several mechanisms behind behavioural spillover have been proposed, including cognitive dissonance (acting sustainably in one area and not in others), self-perception theory (acting sustainably changes one's view as a sustainable person), or that greater self-efficacy and knowledge to act sustainably then spillover to other behaviours (Thøgersen, 2012).

Methods: We investigated the Welsh SUCB charge using the 'Understanding Society' dataset: a longitudinal and representative survey of the UK population. Using respondents from Wales, England and Scotland (n = 17,636) we analysed changes in perceptions of living a sustainable lifestyle and sustainable behaviours, including taking own shopping bags, as measured in 2010/11 and again in 2012/13, ideally suited to evaluate the Welsh SUCB charge in 2011.

Results: We found a clear increase in the frequency of taking own bags in Wales, with small decreases in England and Scotland, indicating the effectiveness of the SUCB charge. We then analysed whether increased bag re-use predicted increases in other behaviours or sustainable views, which would indicate spillover. Overall, an increase in bag re-use predicted very small increases in six other sustainable behaviours, although interaction effects found three of these increases to be significantly weaker in Wales than in England and Scotland. We also find that increased bag re-use predicted very small increases in three measures of sustainable lifestyles, but two of these were significantly weaker in Wales.

Conclusions: We conclude that the Welsh SUCB charge had a positive effect on the use of own shopping bags. However, changes in bag re-use in Wales do not appear to be strongly linked to changes in other behaviours or sustainable views, indicating a lack of spillover effect. We believe that the SUCB charge increased use of own bags, but the extrinsic motivation to change behaviour did not induce cognitive dissonance, self-perception evaluations, or enhance sustainable self-efficacy: the theorised pathways of behavioural spillover. We argue that SUCB charges influence bag re-use behaviour but are not likely to encourage behavioural spillover.

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112 Behavioural spillover in the UK and Brazil: findings from two large-scale longitudinal surveys

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Keywords: Sustainable lifestyles; Individual factors underlying environmental attitudes and behaviour; Environmental action and sustainability

Abstract:

Spillover occurs in circumstances where engagement in one pro-environmental behaviour affects the likelihood of undertaking a second, pro-environmental behaviour. This phenomenon has attracted interest from researchers and policy-makers, due to the prospect that interventions might be used in which more widespread lifestyle change is triggered, rather than this being limited to single actions. A substantial evidence base now exists for spillover in the environmental domain, primarily derived from experimental interventions or quasi-experimental approaches (Truelove et al., 2014). Various theoretical bases have been utilised to account for spillover in the health and environmental domains. A unifying feature across many of these is explanation in terms of identity or 'self-perception': for spillover, identity may motivate consistency across several behaviours; or, alternatively, represent a factor which is itself influenced by undertaking an action and thereafter exerts influence upon future behaviours (Thøgersen, 2004).

The present research considers identity processes in relation to spillover between two time points (two months apart) using survey panel data (n=1,070 across the UK and Brazil). Unlike the majority of previous research, this enables an examination of spillover in both a general public sample, and using longitudinal techniques able to assess 'naturally occurring' behavioural change and correspondences between different types. Moderation analyses are applied to draw cautious inferences about the direction of causality between behaviours and in light of identity and motivational processes. The results of the study indicate that pro-environmental behaviours vary in the degree to which they are associated with others over the time period: whereas some appear to move 'in tandem', in other cases change in one behaviour occurs independently of others. Evidence is found to suggest that identity moderates the behavioural relationship over time in some cases, although the effects we observe are not pronounced.

A conclusion of the research is that where a change in certain pro-environmental behaviours occurs over time, this has the potential to spill over to other actions. We consider our findings in light of theory pertinent to identity processes (including self-perception theory: Bem, 1972); we also point to alternative processes of relevance to our findings, including the importance of non-psychological factors. In light of findings obtained in two different cultural and socioeconomic settings (UK and Brazil) we also offer reflections on the conditions that might enable or inhibit spillover in these locations.

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199 Pro-environmental actions and behavioural spillover effects across cultures: When (and where) does one thing lead to another?

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Abstract:

Fostering changes to peoples' lifestyles commensurate with the scale of environmental problems is a pressing concern for social science. We investigate the prospect of whether performing one pro-environmental behaviour can catalyse other pro-environmental actions leading to sustainable lifestyles (Truelove, Carrico, Weber, Raimi & Vandenbergh, 2014). Previous research has found mixed results for behavioural spillover effects. Evidence suggests both that performing one pro-

environmental action can lead to others (Lanzini&Thøgersen, 2014), and that behaviour can decrease following an initial pro-environmental action (Truelove, Yeung, Carrico, Gillis & Raimi, 2016). We take a cross-cultural, qualitative psychological perspective to behavioural spillover, examining the results of fieldwork in seven different countries (Brazil, China, Denmark, Nepal, Poland, South Africa, and the UK-n=219) with distinct cultural values (Schwartz, 1992) and level of human development. As such, this constitutes some of the first cross-cultural empirical research into behavioural spillover in social psychology. Qualitative interviews and card-sorting exercises were conducted with environmentally-committed and non-committed citizens in each country.

Very few people reported spillover effects across all countries, especially where the amount of pro-environmental behaviour was low. The majority of participants experienced different pathways to pro-environmental actions including family background, education, experiences in nature and at points of transition (e.g. when moving home or changing jobs). While settings and issues varied, narratives transcended their cultural contexts; most participants did only a limited range of pro-environmental behaviours, expressing environmental concern and felt that they should be doing more, but constraints (e.g. work and family responsibilities, lack of resources, lack of knowledge and awareness) limited what could practically be achieved. Card sort results suggest that people generally do not conceptualise pro-environmental behaviours in terms of an overarching 'environmental' concept but through more practical understandings grounded in the everyday. Participants commonly rated the limited things they did for the environment as more impactful than the more committed actions they did not do. A crucial step in understanding spillover lies in the context in which behaviours are performed as part of wider everyday lifestyles, which constrains the possibility of spillover occurring. Card sort results suggest that spillover processes may be limited by perceptual relatedness and the belief that existing contributions are sufficient. Engaging citizens with behavioural impacts of lifestyles should be a priority.

Keywords: Behavioural spillover, Culture, Qualitative research

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PAPER SESSIONS





Wednesday
30th August

11:30 - 13:00 h.

PSI-01 PLACE, IDENTITY AND BEHAVIOR

Room: -1.1

002 Territory, community-based tourism and environmental protection in two Brazilian quilombos

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Keywords: Quilombos; Community-based tourism; Place attachment

Abstract:

Introduction: Quilombos in Brazil are traditional black communities that arose at the time of slavery. Many quilombos are in protected areas with touristic potential (dos Santos, Massola, Galeão-da-Silva, & Svartman, 2016). Some communities located in tourist areas in Brazil have developed community-based tourism projects as a way to generate income and to counter the negative impacts of tourism business. This study aims to investigate the relation between place attachment and participation in collective projects of community-based tourism in two quilombos located at the state of São Paulo, which articulate their economic activities around community-based tourism activities.

Theoretical background: Research suggests that higher place attachment relates to increased social participation. Other research has found an inverse relation (Lewicka, 2010). Further empirical research may be necessary to deepen the understanding of this relation.

Methods: 56 residents of quilombos of different age groups and both genders were interviewed in various situations. Young students of local technical schools who participated in the scientific pre-initiation program at the University of São Paulo conducted the interviews. The instruments used, inspired by instruments consolidated in environmental psychology (Hernández, Hidalgo, Salazar-Laplace, & Hess, 2007), were developed by these young students, who analyzed the interviews by empirical derivation of categories.

Results: A relation was found, although variable, between place attachment and participation in community-based tourism initiatives. In one of the quilombos, known for the strong political organization of its residents, the participation in community-based tourism projects is clearly associated with higher place attachment evidence. Place attachment also varies among generations. Young residents show strong intention of leaving for big cities, while older people typically report the desire to preserve the quilombola culture and to transmit them to younger generations. Other obstacles, such as difficulties to assume leadership positions in the group, seem to oppose the participation of young people in community life in some situations, which may serve to also explain their desire to leave their communities.

Conclusions: The active participation in projects of great collective importance - such as community-based tourism - seems to be related to higher levels of place attachment in the communities studied. This relation depends, however, on other variables, such as age and the status of the person in the group. Increased place attachment is associated with less desire to leave the community towards urban centers, a wish that when expressed, especially among adolescents participating in tourism activities, indicates a quest to qualify professionally and then return to the community. Thus, the world outside the community poses no threat to the cultural life of the group, performing instead the function of enriching

it. This relation to alterity is one of the conditions indicated by the French philosopher Simone Weil (2001) as fundamental to the rooting of a people.

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260 Sense of place and eucalyptus trees: an interdisciplinary approach to the state of Galician woodlands

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Keywords: sense of place; sustainability; forestry

Abstract:

Sense of place has been proved by the literature to be one robust predictor of pro-environmental behaviour as well as an indicator of community sustainability. In a context of rural abandonment resulting from a drastic process of disestablishment of traditional farming systems in Galicia, this paper examines the impacts of the expansion of fast growth forestry plantations; focusing on the variations in sense of place levels among the population and assessing then possibilities for promoting measures towards more sustainable woodlands in the future. In order to so, this paper builds upon Stedman’s work, and considers sense of place as an attitude resulting from the symbolic meanings people associate to a certain place, entailing both identity (place attachment) and place satisfaction. Besides, a multidisciplinary approach is taken to examine the dimension, causes and implications of the expansion of industrial forests in Galicia, until covering over 50% of the regional surface nowadays; and to review alternative models and good practices applied in sustainable forestry management. Ten in depth semi-structured interviews were carried out on a sample of residents from A Mariña County (Lugo, Galicia) the area in Galicia with the largest industrial plantations. The interviews were transcribed and content analyzed. Results show that the expansion of industrial forests have changed the contents within their sense of place among the population, but not its strength. The state of forests matters; sense of place is not independent of the type of features on which sense of place is based. Moreover, while symbolic meanings regarding the forest might be shared, it does not necessarily imply that the contents these are based on are also the same. The development of meanings associated to the forests was not only based on the interviewees’ own experience and memories; for some of them meanings were a result of declarative memory, related to a volunteer and more active sort of attachment. Overall, places (and forests) still play a key role in people’s self-identification processes but results point to a progressive loss of community attachment among our interviewees, which in turn reduces the importance of the first. Conclusions reveal that despite the frequently assumed idea that the expansion of industrial tree plantations occurred in Galicia due to the abandonment of farm work and its stigmatization, according to our results, in many cases tree planting is the only economically viable option to continue working the land. Thus, in the light of this work the spread of tree plantation does not breach the main activity that has traditionally tied people with forests; it’s more a continuation of it under a reduced number of options. Related to this, demands placed on forests for more multifunctionality are regarded as an imposition of urban interests over the interests of rural population. These results are discussed in terms of transition management studies, identifying key findings that could ease the transition towards more sustainable forests in Galicia.

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047 The house space appropriation in one community in Rio de Janeiro

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Keywords: space appropriation; community; social psychology.

Abstract:

Introduction: The psychosocial appropriation of house space phenomenon could be considered a way to elaborate subjectively and to act socially towards empowerment. That is, before to become an exchange value, a lived house is incorporated to the subjective universe as something with use value, in functional and symbolic terms. Accomplishing this activity, one subject becomes able to overcome an important part of survival challenges. Despite the material precariousness and marginality of many Brazilian communities, we could say that very little is known about the experience of building and keeping a house in these subjective conditions (Valladares, 2003).

Theoretical background: We suppose the existence of symbolic struggles to enhance value of housing areas in communities, according to freely chosen criteria by their own inhabitants (Souza Filho, 1998). In Rio de Janeiro, after the end of slavery, in 1888, occurred a mass arrival of African-Brazilians who lacked the support of public programs of reception, bringing them to settle in abandoned areas surrounding the city, which eventually became historical communities. These places turned out objects of dispute and real estate speculation, and the situation of these territories residence for generations has been threatened. In spite of social exchange in other areas of the city, at school, in work environments and leisure, these communities kept its social image as associated to crime, poverty, disease, low schooling, among others. We undertook an action-research on house experience with children, through drawings and texts that expressed in a spontaneous and indirect way this appropriation phenomenon (Graumann 1978).

Methods: 113 children, of 6 to 12 years old, inhabitants of one community in Rio de Janeiro were contacted in a Municipal School nearby. Institution and parent consent was obtained for a research in the interval activities, to study their experience at school and housing realms. Besides, this work was part of an initiative of a group of professors and students of the UFRJ, with the support of the Inhabitant's Association and School Public Network.

We required them to draw their house and to verbally say what they wanted to convey in each part of their drawing. The task of drawing was collectively made, while the verbal one was individual. We adopted a semiology analysis of data as a main method.

Results: In general, the house was drawn conveying information to describe, evaluate and imagine it, attempting to reach their eyes beyond it, including community and, even, the city at large. So the natural and physical environment, as flora, fauna, geography, were highlighted, showing strong integration with it in psychosocial terms. Besides, the house – as tridimensional architectural space –, was elaborated showing sensitivity and an esthetic imagination that suits the lived environment.

Conclusions: We may state that the analyzed children drawings could be included among other sociocultural political resistance manifestations seeking to accomplish their project to remain living within that community.

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268 Consumers' goal frames and rebound behavior in car purchase decisionsBecker, S.¹ & Mack, B.²¹Institute for Advanced Sustainability Studies, Potsdam, Germany²University of Stuttgart, Stuttgart, Germany**Subtheme:** "Energy transitions and consumption. The human factor."**Keywords:** rebound; goal framing theory; mobility**Abstract:**

Technical efficiency improvements are a popular strategy for sustainability transitions among political decisions makers. However, consumer demand is suspected to increase in reaction to those efficiency gains, leading to an interaction phenomenon called "rebound effect": A consumer might buy a more fuel-efficient car, but a bigger and more powerful one. So far, this research field is dominated by macro-economic estimations and lacks in-depth empirical evidence on individual rebound behavior. Furthermore, theoretical explanations other than homo economicus are missing. Therefore, we adopted Goal-Framing-Theory (GFT) by Lindenberg & Steg (2007) to approach the complex issue of car buying decisions. We chose a qualitative design, using both interviews and actual consumption data. We interviewed N= 32 German car-buyers and analyzed the transcribed data by qualitative content analysis, giving special attention to potential indicators for different goal frames. We identified two hedonic goal frames: *everyday travel comfort* and *driving fun*. For the gain oriented goal frames, two frames emerged from our analysis: *financial costs* and *adequacy of status*. Finally, we also found a normative goal frame that we call *environmental concerns*. Referring to the principle of decreasing abstraction (Lindenberg, 1992), we understand these five goal frames as an empirical specification of GFT in the context of car buying behavior. Relating these goal frames to the issue of purchase rebound behavior, we find that consumers in a goal frame of *environmental concerns* tend to buy more efficient cars while keeping their demand level stable. Consumers in a *financial costs* goal frame often have a low income and try to reduce the purchase price by all means. They have a tendency to reduce their demand level (smaller car, less horse power) while increasing the efficiency level. Families with young children mostly show a goal frame of *everyday travel comfort* and tend to increase the size of their car, regardless of the efficiency level. Both *status adequacy* and *driving fun* goal frames are associated with the purchase of bigger and more powerful cars. The simultaneous efficiency improvement produces rebound effects, except for saturated consumers who already had a very high consumption level. In conclusion, goal frames have a good explanatory power for car purchase decisions. The most comprehensive picture of rebound behavior can be achieved if goal frames, life situation, budget constraints and previous consumption level are considered together. Our results can be used to design tailored interventions to reduce rebound and foster sustainable mobility decisions.

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080 Collaborative Consumption: Behavioral predictors and energy balanceBachmann, F.¹, Artho, J.¹, Haefeli, U.², Hanimann, A.², Jonas, K.¹ & Matti, D.²¹University of Zurich, Department of Psychology, Switzerland²Interface Politikstudien Forschung Beratung GmbH, Lucerne, Switzerland**Keywords:** collaborative consumption; sharing behavior; energy balance**Abstract:**

The concept of collaborative consumption is considered to be a promising approach for resource-saving behavior, facilitated through modern networking opportunities. This includes services such as blablacar.de, airbnb.com or sharely.ch, which are prominent examples for this fairly new form of consumption and are seemingly promising in terms of energy saving potentials. However, it is still unclear (a) why people

engage in sharing behavior and (b) if it does in fact save energy considering the influence of rebound and other side effects such as spillover. Hence our main research questions are: What are people's motives behind sharing behavior and can energy be saved by engaging in such behavior?

Drawing from literature and a qualitative prestudy (N = 43), a comprehensive behavioral model was developed using concepts of the theory of planned behavior and the norm-activation model (Ajzen, 2014; Bamberg, Hunecke, & Blöbaum, 2007). It was further complemented by the concepts of implementation intention (Gollwitzer, 1993) and trust. In addition to the theoretical foundation for testing the motivational side of sharing behavior, a framework of questions was developed in order to be able to calculate the energy balance of sharing behavior.

For examining our research questions, we focused on two specific types of sharing behavior which were rated by experts (N = 12) as two of the most promising in terms of energy saving potential: Carpooling and room sharing. To conduct an online survey, two samples were recruited: One for testing the behavioral model which was a representative sample from the German and French speaking parts of Switzerland (N = 808). A separate sample for calculating the energy balance which consisted of users from different carpooling platforms and users of a prominent room-sharing platform in Switzerland (N = 479).

Results from a structural equation modelling analysis (Rosseel, 2014) as well as calculations of energy balances for the investigated sharing behaviors on the basis of kilowatt hour (Firnkorner, 2012) will be presented. Furthermore, implications for practice and future research will be discussed.

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187 Nudging consumers towards sustainable choices in out-of-home catering

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Keywords: sustainable food choices; away-from-home; interventions

Abstract:

Introduction: The NAHGAST project focuses on the development, provision and dissemination of concepts for sustainable production and consumption in the out-of-home catering sector. The goal is to stimulate, facilitate and encourage the sector's transformation towards a more sustainable development, with special focus on consumers' food choices.

In this paper we first present the results of an extensive literature review identifying personal and situational factors influencing food choices in away-from-home catering settings. Additionally, the identified factors are investigated empirically by implementing selected interventions in various settings in the field. The results of these ongoing empirical investigations will be discussed in the second part of the paper.

Theoretical background: Human nutrition plays an essential role in the sustainability discussion due to the impact caused by production, processing, distribution, consumption, and disposal of food and food waste. Consumers' food choices play a significant role in shaping these processes by generating demands for products with complex sustainability characteristics (German advisory council on global change, 2014; Goebel et al. 2015). As eating out-of-home is a rapidly growing market (Rückert-John et al., 2005; Nestlé, 2011) with 11.5 billion guests per year in Germany alone

(BVE, 2016), a growing body of research coming from various fields like environmental psychology, economics and sustainability sciences focusses on mitigating the effects of this sector on sustainability issues (e.g. Honkanen et al., 2006; Goebel et al., 2015; Wahlen et al., 2012; Lorenz et al., 2016). Different approaches to shift consumers' food choices in away-from-home settings towards sustainable choices can be applied: provide information, nudge consumers, and participation.

Methods: While within the entire project the effectiveness of these three approaches is tested and compared, this paper concentrates on nudging. The interventions are examined in five different out-of-home settings in four German cities between autumn 2016 and spring 2017. The settings include two workplace canteens, one clinical canteen, a university canteen, and a school canteen. The interventions include changes in the choice architecture, e.g. improved visibility and accessibility of the most sustainable meals on the menu and at the counter (Campbell-Arvai et al., 2014; Just & Wansink, 2009; Levy et al., 2012; Rozin et al., 2011), as well as changing the names of offered dishes (Morizet et al., 2012). Interventions will be evaluated using objective sales data as well as questionnaires for subjective factors and additional food waste observations.

Results: We will examine the collected data to find connections between personal determinants, characteristics of various settings, and effects of the different interventions. We anticipate to find slightly different effects of different (types of) interventions and also between the different settings: guests of the two workplace canteens might react differently than students, pupils, and patients. Overall we expect to find effects of interventions which will help foster demand for sustainable dishes regardless of settings or personal factors.

Conclusions: The upcoming results will be used to generate recommendations for a sustainability transformation in the out-of-home catering sector through a) practical intervention methods targeting the consumers as well as b) theoretical implications for further research activities in this field.

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078 Heterogeneity in the Effect of Green Energy Defaults

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Keywords: Individual factors underlying environmental attitudes and behavior; Energy transitions and consumption. The human factor; Acceptability of environmental policies

Abstract:

This natural default experiment is part of a 4-year governmental funded project that investigates soft (i.e. non-monetary) incentives for promoting green electricity and encouraging energy saving.

Theories of loss aversion and status-quo bias help understand the mechanism of default rules. Default rules is the pre-setting of one particular choice, which is chosen unless the participant actively changes the default setting to another choice. For the majority, default setting will mark the decision chosen in the end and thus define the outcome of the decision-making. The default setting is framing the decision from the beginning therefore a changing of the default setting can result in loss aversion and status-quo bias. Many decision-maker understand the default as a guideline and general recommendation which even heightens the involvement and certainty needed on part of the decision-maker to change the default.

Default rules is a well-established soft incentive that has great potential as an environmental policy instrument either alone or in combination with other soft policy instruments. One major detail that is less established is a description of the parameters of this praised tool. When does default setting work and for who? Until now no convincing answer could be given.

In this natural experiment, one major Swiss electricity provider changed their default setting from grey electricity to green electricity on the 1st January 2016. Not only do we have data of real decision making in a natural context but this exclusive data set is also combined with the electricity usage of every unit before and after the change. Furthermore, social descriptive data includes private household vs. business, electricity usage of unit, gender and number of people living in the household.

This unique data set is shedding light on the determinants of default setting, providing an unhindered look into the social determinants that determine the success and fail of default rules in the sphere of energy choice. It is crucial for the future of default rules as a soft environmental policy instrument to learn more about its possible hindrances and fortifiers.

Data analyses so far have shown that we find a substantial green default effect for households and businesses. But there also seems to be remarkable heterogeneity in the green default effect, for example regarding electricity consumption levels. More details will be available at the conference.

This study shows that the effectiveness of green energy defaults depend on household and business characteristics. This provides valuable insights for research on pro-environmental behavior and policy making.

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This research project is part of the National Research Programme "Managing Energy Consumption" (NRP 71) of the Swiss National Science Foundation (SNSF). Further information on the National Research Programme can be found at www.nrp71.ch.

113 Waste behaviours at home, at work and on holiday: what influences behavioural consistency across contexts?

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Conference themes: Sustainable lifestyles; Individual factors underlying environmental attitudes and behaviour

Keywords: recycling; theory of planned behaviour; habits

Abstract:

Introduction: Demand for materials is increasing, along with the environmental damage associated with material extraction, processing transport and waste management (Allwood et al., 2011). While recycling rates are increasing in many countries, much waste continues to be generated and is often sent for landfill or incineration (e.g., DEFRA, 2016). Furthermore, while many people state they recycle at home, adoption of sustainable waste practices in the workplace and other contexts (particularly, on holiday) is often lower (Tudor et al., 2008; Barr et al., 2010). Understanding how to promote more sustainable behaviours (including, but also going beyond, recycling) across a range of contexts remains a key challenge for policy-makers and researchers.

Theoretical background: The Theory of Planned Behaviour (TPB; Ajzen, 1991) has been applied to a range of environmentally-friendly behaviours (Kaiser et al., 2015), but the relative importance of the model's predictors (social norms, attitudes, perceived behavioural control) has not yet been explored across a range of contexts. However, we know from habit research (e.g. Holland et al., 2006) that context cues much of our behaviour, meaning that many of our actions are inconsistent across different times and places (Littleford et al., 2014). Consistency across pro-environmental behaviours and contexts appears to be, at least in part, a function of pro-environmental identity (Whitmarsh & O'Neill, 2010), so we examine whether identity predicts cross-context consistency in waste behaviours. The present study examines three contexts - workplace, home and holiday - and compares the influence on waste behaviours (primarily, recycling) of TPB variables, pro-environmental identity and relevant situational variables (e.g., recycling facilities, organisational waste policy) in each of these contexts.

Methods: A mixed-methods study comprised interviews (N=10) with laboratory workers and thematic analysis to elicit motivations and barriers to recycling in the workplace. Following this, an online survey was undertaken with laboratory workers (primarily in the UK; N=213) to examine the predictors of recycling and waste reduction habits across the three contexts.

Results: Interview findings indicate a range of motivations and barriers to recycling in the workplace, and inconsistency across home and work behaviours. Survey analysis shows that the proportion of waste recycled in the home is higher (67%) than in the workplace (39%) and on holiday (38%), and that different, but overlapping, predictors are relevant in each situation. Across contexts, availability of recycling facilities was a key driver of recycling behaviour. Habit strength was strongly correlated with proportion of waste recycled. The survey also revealed that different materials are recycled in different locations, including within the workplace (laboratory versus office).

Conclusions: The study highlights the importance of context in shaping individuals' waste behaviours, while individual factors (e.g., attitudes) appear to be less significant predictors. This suggests providing facilities to enable sustainable waste behaviours is more important than changing attitudes (which are already largely positive about recycling). However, moving individuals up the 'waste hierarchy' to consider product reuse and reduced consumption requires a broader range of interventions.

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118 I am therefore I do? An investigation of spillover effects from work to home through the lens of environmental identity

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Keywords: spillover; environmental self-identity; behaviour change intervention

Abstract:

Introduction: Designing effective behaviour change interventions to promote pro-environmental behaviours (PEBs) is important to promote sustainable lifestyles. Emerging research has focused on the ‘spillover’ influence that an intervention targeting one PEB can have on other ‘non-target’ PEBs (Truelove et al., 2014). People spend a large amount of their time within the work and home settings, thus understanding the potential for contextual spillover is important to promote sustainable lifestyles (Klade et al., 2013). This study aims to shed light on the potential for spillover from the work to the home setting, with a particular focus on the mediating role of environmental self-identity.

Theoretical background: Although a number of studies have investigated positive and negative spillover effects, empirical evidence is mixed and factors that influence spillover are under-researched. Environmental self-identity is an influential factor likely to drive or inhibit spillover (e.g. Whitmarsh & O’Neil, 2010), therefore developing a better understanding of identity processes (e.g. integration and compartmentalisation of environmental self-identity at work and home) may help to explain positive, negative, or a lack of spillover between settings. H1: A behaviour change intervention at work influences PEB at home. H2: Environmental self-identity mediates spillover effects between work and home. H3: Compartmentalisation of self-identity at work and home mediates contextual spillover.

Methods: A quasi-experimental field study was conducted with university employees. The experimental group participated in a PEB intervention that consisted of an online recyclable and non-recyclable waste sorting task designed to increase recycling behaviour at work. Both experimental (n~100) and control (n~100) groups completed a pre- and post-intervention survey including measures of environmental self-identity, recycling and energy saving behaviours at home and work. Objective data was collected by monitoring the waste bins in the offices.

Results: The analyses tests 1) the influence a workplace intervention has on PEBs at home; and 2) how the integration or compartmentalisation of environmental self-identity at work and at home can explain the positive, negative, and lack of spillover between these settings. MANOVA and mediation analyses are conducted. Results and implications will be presented at the conference.

Conclusions: This research sheds light on spillover between the work and home settings and the role of environmental self-identity. The research also provides insight into whether and how workplace interventions affect employees’ PEB at home.

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155 Time is wealth: Part-time work as a means to foster sustainable lifestyles?

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Keywords: environmentally significant behavior; well-being; part-time work

Abstract:

Introduction: In the ongoing discussions on how to foster societal transformation towards sustainability, the reduction of working hours has been gaining increased scientific and public interest. It has been argued that in our affluent societies, well-being is no longer limited by a lack of money but by a lack of time to use consumer goods in a meaningful way. In this situation, a shift to lower incomes coupled with more time to spend in self-determined ways might foster lifestyles that are less material-intensive and thus more sustainable, without impairing individual well-being. In our study, we aim to investigate whether self-determined reduction of working hours can foster more sustainable lifestyles.

Theoretical Background: Macroeconomic studies have shown in different countries that shorter working hours are associated with lower environmental impacts (e.g. Knight, Rosa, & Schor, 2013). At the individual level, studies have found positive correlations between income and environmental impact of consumer decisions (e.g. Druckman & Jackson, 2016). However, little empirical research so far has examined the wider relationships between full- or part-time work, income, environmentally significant behaviour, and individual well-being (exceptions include the studies by Kasser & Sheldon, 2009).

Methods: In a preliminary study, we are conducting qualitative interviews with employees who have recently reduced their working hours. Our aim is to reconstruct how this decision affects their daily use of time, their consumption decisions, and their subjective well-being, as well as whether it has caused changes in relevant value-based variables such as environmental concerns or materialism.

(Expected) Results: The results of this preliminary study will be used to design a standardized longitudinal survey of employees who have opted for a self-determined reduction of their working hours. Employees will be surveyed before, immediately after, and one year after reducing their working hours, and their answers will be contrasted with those of full-time employees. With this procedure, we aim to detect the influence of various intervening factors on how a change in working hours affects time use and consumption decisions. The empirical research will be accompanied by a transdisciplinary project component consisting of a dialogue among experts, including representatives of employees, employers, NGOs, and the political-administrative sector.

Conclusion: A synthesis of the project results will enable us to derive recommendations on whether and how working-hour reductions might be a promising strategy to foster more sustainable lifestyles. At ICEP 2017 we will present first insights from our qualitative preliminary study and outline the next research steps in our project.

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015 Parenthood and environmental concern: A longitudinal investigation of the legacy hypothesis

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Keywords: Parenthood; Environmental concern; Environmental behaviours Legacy hypothesis.

Abstract:

Introduction: Willingness to engage in sustainable actions may be limited by the psychological distance of environmental issues, which could be considered as a distant problem in the future that does not require immediate action. It has been suggested that having children could be one way of creating a link to the perceived threat of climate change's future impacts, and thus increase concern for the environment: we term this concept the "legacy hypothesis".

Theoretical Background: The "legacy hypothesis" can be linked to few theoretical arguments. Erikson (1963) conceptualised generativity as a developmental phase of later life related to parenthood and the desire to both leave a social legacy and provide positive guidance for others via intergenerational continuity. Other theories such as the "Parental Roles Hypothesis" and the "Parenthood Status" hypothesis posit that gender differences drive changes in environmental concern as a consequence of parenthood (Davidson & Freudenburg, 1996; Blocker & Eckberg, 1997).

Methods: This study uses Wave 1 and Wave 4 of the Understanding Society dataset, a longitudinal survey representative of the UK population (N = 18,176), to assess how having a new child may impact the strength of views on environmental lifestyles and frequency of sustainable behaviours. We analyse four subgroups: people reporting a newborn child, people reporting the birth of their first child, people with strong environmental views experiencing their firstborn child, and first-time mothers. Four sets of linear regression models were constructed, with the change in strength of views on environmental lifestyle, and change in sustainable behaviours between Wave 1 and 4 for use as dependent variables.

Results: Results indicate that having a new child is predictive of a very small decrease in the frequency of several sustainable behaviours. Only those with strong environmental views reported an increased desire to act more sustainably after the birth of their firstborn child, but also of an extremely small effect. Overall we do not find evidence supporting that having a new child generally increases sustainable views, and may actually reduce the frequency of general sustainable behaviours due to constraints imposed by parenthood.

Conclusions: We argue that the transition to parenthood is a time where concern is prioritised on the immediate wellbeing and comfort of the child, and not on the future threats such as climate change. Future work may establish whether behaviours centred on the new-born child may demonstrate potential for increased sustainability, such as reusable nappies, and if interventions can support parents during this time of transition to improve their sustainability.

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345 Understanding intergenerational relationship in car ownership desire: The influence of parents on young people

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Keywords: Car ownership; Motives; Young people; Environmental concern; Eco-friendly car;

Abstract:

Introduction: Problems related to motorization such as air pollution, congestion, health impacts, accident risks and negative community effects are well known. Therefore policy measures targeted on managing travel demand considering car ownership are urgently required. Furthermore, we should seek a way to promote the purchase of eco-friendly cars i.e. electric and hybrid car. Though literature on motives for car ownership has been increasing recently, we suggest there is still a gap in understanding the role of social influence, particularly parents.

Theoretical background: There are some studies which focus on car ownership motives and attitudes. Steg (2005) indicated that three psychological attitudes related to motives (i.e. Symbolic, Instrumental, and Independence) influence on car ownership. Related to influence of attitudes toward car ownership, Belgiawan et al. (2015) identified the influence of the close community (friends, parents, family). They model the effect of "subjective social norms" SSN on car ownership desire, but do not look in detail into car type desire nor do they characterize attitudes of the influencing person directly. We hypothesize that the impact of parents can be better defined if their attitudes are measured.

Methods: A survey is conducted among 300 parents-child pairs in Japan. We investigate Japanese young people's (18-25 years) psychological attitudes to car (to have cars and to choose specific car types), their environmental concern and personality traits. Moreover, we ask the same questionnaire to their parents to verify whether there is intergenerational association in car ownership desire or not. Besides, we also hypothesize that with better family relationship with much communication, the intergenerational influences on car attitudes would increase. To verify our hypothesis, structure equation models are estimated with statistical descriptive analysis.

Expected Results and Conclusions: Our study will contribute to the literature on car ownership motives as well as general understanding on the role of parental influence. At least in the field of studies on car motives we believe we are one of few studies that measure attitudes of both the influencing and influenced person. Furthermore attitudes and personality have not been studied together in this field. Taken together, this will help us understanding in how far personalities need to be controlled for, when studying the effect of perceived norms. We believe that our study has further potential practical implications. We expect to contribute to understanding more effective mobility management schemes. By understanding the parental influence we can better understand which car attitudinal factors are based on which person group's influence. This knowledge can also help promoting the acceptance of eco-friendly cars.

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023 Values and environmentalism: A cross-cultural meta-analysis across 58 countries

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Keywords: values; environmentalism; cross-cultural

Abstract:

While climate change will impact individuals globally, a substantial amount of the world population remains unengaged in pro-environmental behaviour that could mitigate climate change threats. A possible reason for individuals not engaging in mitigating actions is the politicization of climate change, and indeed a recent meta-analysis showed that the strongest determinants of climate change beliefs are political affiliation and ideology (Hornsey, Harris, Bain, & Fielding, 2016). This suggests that some individuals are less likely to engage in pro-environmental behaviours and accept climate change reality because these actions and beliefs are in conflict with the values they hold dear. In fact, a number of previous studies have shown that personal values are important in understanding individuals' willingness to engage in pro-environmental behaviours (for reviews, see Milfont & Markowitz, 2016; Fischer & Boer, 2016). In his model of universal human values, Schwartz (1992) identifies ten motivational types of values grouped into two higher-order dimensions: self-transcendence vs. self-enhancement and conservation vs. openness to change. Environmental psychology research has shown that self-transcendence and openness values are positive related to pro-environmental attitudes and behaviours, and self-enhancement and conservation values are negatively related (e.g., Schultz et al., 2005). The current study extends previous research examining the role of individuals' values on environmental behaviour and attitudes by reporting a cross-cultural meta-analysis. We used data from the World Value Survey (Wave 6) involving 88,060 respondents from 58 countries, with a mean age of 42 (SD = 16.5) and with balanced gender distribution (52% female). The survey included the 10-item version of Schwartz' Portrait Value Questionnaire (PVQ10) used to create mean centred scores for the four-higher order value dimensions. We meta-analysed the correlations between each value dimension with four environmentalism questions (two attitudinal and two assessing self-report behaviour) across countries. While self-transcendence values showed the stronger positive associations with the attitudes questions (weighted mean correlations = .06 and .01), conservation values showed the stronger negative associations with behavioural questions (weighted mean correlations of -.07 for both). The results also showed that the associations between values and environmentalism varied across cultures, which will be explored with multilevel analysis. We confirm the role of values in predicting environmentalism across a large number of countries. This is the first study to show that values differentially predict pro-environmental attitudes and behaviours.

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138 Can Middle Class Environmentalism Develop from Environmentalism of the Poor?

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Keywords: Environmentalism of the poor; Nature experience; New middle class

Abstract:

Introduction: In the Global South, value-based environmental concern is mostly found absent within the emerging middle classes (Mawdsley 2004). This contrasts with an often alleged environmentalism of the poor in these societies – a concern based on dependence of livelihoods upon natural resources (Martinez-Alier 2002). But in how far can the former develop from the latter directly? Psychologically reexamining the chances of ‘tunnelling’ the Environmental Kuznet’s Curve seems overdue, as hundreds of millions of ‘poor’ are to enter the middle classes.

Theoretical Background: We study the hypothesized link within individuals’ life courses. Therein, livelihood dependence on nature can be conceptualized as a form of nature experience. Correspondence to peoples’ psycho-logical needs, concurrent motivations and cognitive processes permitting, this may result in more abstract environmental concern later on (Bögeholz 2006). Only such generalization of localized affect to e.g. endorsing the New Environmental Paradigm (NEP) would support pro-environmental behavior (PEB) once contact with nature decreases.

Methods: We survey 240 middle-class household-heads at the rural-urban interface of Bangalore (India); live-lihood-dependence on nature has decreased for many individuals within their live courses due to urbanization here. Temporal antecedence thereby allows for interpreting correlations as causal relationships. We employ standard scales for the NEP as well as for mentioned moderators. Moreover, we augment tested nature experience measures to suit the Southern context.

Results: Nature experience significantly influences not only localized concern, but also abstract endorsement of NEP even in our Southern (preliminary) sample. The link is only moderated by affect. However, for those abandoning farming, the predominant nature experience of agriculture is associated with negative feelings.

Conclusions:

Past livelihood environmentalism is thus unlikely to directly increase NEP-endorsement – or PEB.

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203 The values of sustainable development in rural Gabon

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Keywords: Values, Sustainable Development, rural traditions, Gabon

Abstract:

The fundamental values of sustainable development (freedom, equality, solidarity, tolerance, respect for nature and shared responsibilities) were identified in September 2000 in the United Nations’ Millenium Declaration. There has been considerable research in environmental and occupational psychology on the values that aid or hinder the adoption of pro-environmental behaviour (e.g. Becker & Félonneau 2011; Milfont & Duckitt 2010), but little on the values of sustainable development (Weiss, Moser, & Germann, 2006), defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland Report, 1987), and more particularly in African traditions, although these are largely based on practices that can be defined as sustainable (Gosselin, 1963).

The aim of this paper is to show that the traditional sustainable practices of the Gabonese are based on ancestral values that do not necessarily have the same name or exactly the same content as those recommended by the UN. In other words, it involves a much broader way of supporting the general hypothesis that a rural worker in Africa is familiar with sustainable development values and unwittingly puts some into practice.

To that end, we conducted two studies to examine past and present lifestyles of rural Gabonese that can be described as sustainable. The first consisted of documentary analysis of historical Gabonese works (Avaro, 1981; Métégué N’Nah, 2006). Analysis of the traditional practices of Gabonese people (Myenes) shows that not only were these sustainable, but they also contained the values of sustainable development identified by the UN, as well as other values such as Respect, Love and Fraternity.

The second study involved a photographic documentary analysis of the current rural environment. This revealed that certain sustainable practices of the past are still common in rural areas in Gabon, and that present-day Gabonese in rural areas continue these sustainable ancestral traditions, thereby upholding the values of sustainable development, including those of the UN.

The discussion examines the importance for Gabonese organisations of linking the sustainable development values recommended by the UN with the ancestral values to which the Gabonese have subscribed for generations and which should thus be taken into account in all sustainable development measures.

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168 Agroecological beliefs in agrarian sciences

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Keywords: beliefs; agroecology; agrarian sciences

Abstract:

We need to rethink our way of producing food globally. According to the report of the Food and Agriculture Organization of the United Nations (FAO), the question of reinvesting in agriculture after the crisis of 2008 no longer concerns how much will be invested but how to do it. Agroecology is then said to be a means of agricultural development that has proven results in realizing the right to food for many vulnerable groups (CAISAN, 2012). Agroecology is a new science that supports the transition from conventional agriculture to more sustainable agriculture (CAPORAL, 2009). In this research, we verified beliefs about Agroecology of education professionals and students related to agrarian sciences. In this “field” it is more than justified to understand the relationship between beliefs about how best to lead food production and its consequences for education, society and the environment. The concept of beliefs is expressed by thoughts, and together with feelings, emotions and actions or intentions to act constitute the attitude and are directed towards the object of attitude (EAGLY & CHAIKEN, 1998). Agroecological beliefs are, therefore, statements about the object of Agroecology attitude. Two focus groups were carried out to investigate them. One with 12 students of Agronomy courses. The mean age was 22 years (7 females; 5 males). The second group consisted of 8 professors from a senior course in Technology in Agroecology. The mean age was 45,5 years (2 males; 6 females). The groups responded to a script of five questions, such as: what they understood by Agroecology, if they could agree a concept, if the concept could identify the dimensions that constituted it, what the characteristics of these dimensions and if could consise such characteristics. According to the first group, agroecology would be “a science that would be concerned with several aspects, such as the different relationships: from people to people, from

people to the environment, including all living beings, and the relation of people to forms of production, which go beyond the means of agriculturally production.” This group identified three dimensions of Agroecology: economic, social and environmental. For the second group agroecology is “a new science of counter-hegemony, a political movement and a practice that uses popular knowledge and science to design and redesign agroecosystems and that respects the economic, social, environmental, ethical, political and cultural dimensions in a vision with a systemic focus within the paradigm of complexity.” Given these different conceptualizations, it is considered important to investigate this vision on a large scale, in order to contribute to the training of professionals who can work sustainably with agriculture. These results may be used in the future to build a scale that investigates agroecological beliefs.

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276 In what ways are socio-cultural variables connected to climate attitudes and behaviors? The Czech Republic divided by value orientation

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Keywords: Climate change; Public attitudes and behaviours; PVQ; NEP

Abstract:

Introduction: The perception of climate change could be connected to various social factors, such as socio-demographic variables, but also to various cultural factors, such as value orientations, political attitudes, and environmental beliefs. We aim to explore these connections and to find out whether the link between any of these variables is strong enough to function as a dividing line that splits the public into groups with differing attitudes and behaviors related to climate change.

Theoretical background: Recent representative studies in the United States (e.g. McCright et al., 2013), Great Britain (e.g. Clements, 2012; Whitmarsh, 2011) and in the European Union (e.g. McCright et al., 2016) suggest that people’s climate attitudes and behaviors are connected to various socio-cultural variables.

Methods: The representative survey of the Czech population in 2015 measured socio-cultural variables (socio-demographic variables, value orientations, political attitudes and environmental beliefs) and attitudes and behaviours related to climate change. Correlation analysis described the distribution of climate attitudes and behaviors in the society by using socio-cultural variables. To find out which of the socio-cultural variables function as a dividing line we used a factor analysis, which determined two factors of climate attitudes and behaviors. We located the socio-cultural variable that most strongly correlates with each of these factors. Then we tested the validity of two-dimensional division of the Czech public into four quadrants by using the Kruskal-Wallis test and the Chi-Square test.

Results: The results confirm a correlation between climate attitudes and behaviors with attained level of education, gender, trust in NGOs, trust in scientific and research institutions, and value variables. Further analysis has shown that the socio-cultural variables that most strongly divide the public are the value variables, the factor of altruism and the factor of ego-motivation that emerged from a factor analysis of Schwartz’s Portrait Values Questionnaire. These values can be used to describe four different groups of the Czech public that significantly differ in their climate attitudes and behaviors.

Conclusions: Comparison with other representative studies indicates, that the attitudes and behaviors of the Czech public are connected to similar socio-cultural variables as is the case abroad (e.g. NEP, education, gender, altruism, liberal voter preferences, and trust in scientific and research institutions). It would be interesting to find out whether climate attitudes and behaviors correspond as strongly with

value variables also in other countries. This could be helpful for the preparation of activities that aim to gain support for climate protection among the general public.

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PSI-05 EMOTIONAL DIMENSIONS OF SUSTAINABILITY I

Room: 0.2

332 Emotional Patterns in Environmentally-relevant Stimuli

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Keywords: sustainability; emotion; affect

Abstract:

Introduction: Contemporary research on decision-making has embraced emotion; the idea that our behavior is based solely on cognitive reasoning is no longer considered valid (Loewenstein & Lerner, 2003). It is no surprise then, that emotion has been found to influence pro-environmental behavior (e.g. Rees, Klug, & Bamberg, 2015). For this reason, the development of normed environmentally-salient stimuli would aid research into the influence of emotion on pro-environmental behavior. The current study is not focused on the development of these stimuli, but on the interesting patterns which emerged in the norming process.

Theoretical background: Osgood, Suci, and Tanenbaum (1957) conducted seminal research on emotion, proposing that emotion can be distinguished based on where they lie on certain dimensions. Although terminology varies between researchers, the two most commonly used dimensions are valence (i.e. pleasant versus unpleasant) and arousal (i.e. stimulating versus relaxing). This concept of emotion was used in the current study. Valence and arousal were then compared to perceptions of sustainability.

Methods: Stimuli (95 x words and 109 x images) were rated by participants (n = 340) on the dimensions of valence and arousal, as well as sustainability (using 7-point Likert scales). Mean ratings of each stimulus were then analyzed to assess patterns in the data.

Results: As would perhaps be expected, valence and sustainability were positively correlated ($r_s = .929$, $p < .001$). What was not predicted was the strong negative correlation between sustainability and arousal ($r_s = -.833$, $p < .001$). Further analysis revealed the valence and arousal were not only significantly different between upper and lower quartiles of sustainability ratings, but significance was even maintained with a median split of sustainability ratings ($p < .001$). Stimuli type (i.e. words versus images) were not significantly different on valence, arousal, or sustainability; both sharing the same patterns.

Conclusions: The strong patterns that emerged in both word stimuli and image stimuli may identify an overall perception of sustainability. Specifically, while sustainable stimuli are rated as pleasant, they were found to be largely relaxing. On the other hand, unsustainable stimuli were found to be unpleasant and also significantly more stimulating. Although not assessed in the current study, it stands to reason that this could be having differing effects on different people. Some may find this unpleasant stimulation to be so uncomfortable that they are spurred into mitigating action. However, others might find the unpleasant stimulation to be mentally draining; leading to green fatigue. If emotion is as important in decision-making as has been proposed (Loewenstein & Lerner, 2003), understanding the patterns identified in this study is of particular import when communicating environmental messages.

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273 Proud to give, too guilty to take: Decision frame moderates the impact of incidental emotions on energy consumption

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Keywords: emotions; economic framing; social dilemma

Abstract:

Introduction: Overconsumption of energy resources is largely responsible for the threatening augmentation of global temperatures. A better understanding of individual factors driving energy consumption is thus necessary. The present research examines psychological determinants underlying these mechanisms in a social dilemma scenario.

Theoretical background: Consuming energy may be described as a conflict between self and collective interests. The experimental paradigm of social dilemmas reflects this through two different games. They present objectively identical options but frame them as either a potential gain or a potential loss: In the common resource dilemma, people decide how much they want to take for themselves. In the public good game people decide how much they want to contribute. Behavioral economics has shown that the potential losses inherent to a decision loom larger than gains (Tversky & Kahneman, 1981). Thus, the way energy-relevant decisions are framed (i.e. in terms of gains and losses) can have a decisive impact on individual's energy consumption.

Contemporary emotion theories emphasize the adaptive function of emotional responses. Brosch, Patel & Sander (2014), have argued that the study of emotional processes may increase our understanding of mechanisms underlying energy consumption. As different emotions are associated with different tendencies to act in the face of challenging situations (Frijda, 2007), the pattern of an individual's emotional reactivity in environmental contexts may be a predictor of energy consumption. Moreover, action tendencies of specific self-conscious emotions (such as guilt and pride) may be important drivers of pro-social behavior (Tracy, Tangney & Robins, 2007). In the contribution here we link research on emotions with behavioral economics, hypothesizing that emotions are potential moderators of the impact of a choice framing in terms of gains and losses.

Methods: 89 students participated to this experiment. We developed a social dilemma task focused on the allocation of energy resources. We used a 2 (emotion induction: Guilt /Pride) x 2 (economic framing: loss/gain) between-subjects design. First, we induced self-consciousness emotions (guilt or pride). Afterwards, participants were engaged in a social dilemma task framed in terms of gains and losses, respectively.

Results: We observed a significant interaction of emotions and framing. In the gain frame, participants reduced their energy consumption after induction of guilt. In the loss frame, participants reduced their consumption after pride induction. This effect was evident when individual trait emotional reactivity to environmental contexts was high.

Conclusions: Our results emphasize the importance of the interaction between emotions and characteristics of the decision at hand. In individual energy-related decision-making, economic framing, incidental emotions and individual emotional reactivity play important roles and may be potential levers in new interventions to reduce energy consumption.

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083 Feelings are important: Tangible and intangible cues used in environmental evaluation

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Keywords: affect; environmental cognition; cues; dual-processing; values

Abstract:

Environmental cognition is shaped by complex interactions between the physical attributes of a setting and factors internal to the individual, including values, affect, experience, memory, knowledge, and motivation (Meyfroidt, 2013). Consistent with 'affect as information' frameworks (Greifeneder, Bless, & Pham, 2011), affective states are an important determinant of environmental experience. However, the relationship between cognition and affect in the context of environmental response continues to be the subject of debate. In particular, the internal cues people use to subjectively evaluate the environment remain under-examined. Using native forests as a case study, this paper explores the range of tangible and intangible cues individuals use to evaluate natural forests.

Drawing on values theory and dual-processing theories of information processing, it is proposed that individuals use both external environmental cues and subjective feeling based cues to evaluate a natural environment, and that the type of cues or method of processing used in the process of evaluation is associated with beliefs about what is of value, and the individual's underlying value system.

Thirty-six semi-structured interviews were conducted with members of the public and forest interest groups in Victoria, Australia. A modified cognitive mapping task was used to identify the ways individual's valued natural forests. A laddering interview technique was used to identify more abstract values underlying and motivating these beliefs, and to identify cues the individual would use to know if what was valued about forests was present or had changed in some way. Using a variant of the Means End Chain (MEC) approach, ninety-four ladders linking cues, valued attributes of forests, and more abstract values were constructed and analysed using thematic analysis. Associations between cues and values were identified using a multiple correspondence analysis.

Results indicate that the range and type of cues use to know about forests is much broader than the way cues are typically operationalised in landscape evaluation studies. Participants used both external objective and internal subjective cues to know about and evaluate forests. Four cue types were identified: tangible physical characteristics of the environment; less tangible cues internal to the individual including cognitive and affective feelings; cues relating to forest planning and management; and cues associated with socio-economic indicators.

A key finding was that internal subjective cues, including a 'feeling of knowing', are an important source of information used to evaluate forests, and that the choice of cue or information type is related to the persons underlying value systems. These findings highlight the importance of affect or feelings in the way individuals subjectively evaluate a natural environment.

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056 Sustainable consumer choice: The discrepancy between common research practices and reality

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Keywords: consumer decisions; product choice, hypothetical scenarios

Abstract:

Every day, people face countless decisions that have an impact on themselves, others, and the environment. These decisions often involve sustainable and non-sustainable options, for instance when making consumer choices. Hence, it is important to understand how consumers decide in everyday situations and substantial research efforts have been directed towards this goal. However, as we show in a detailed review, research relies almost exclusively on hypothetical paradigms: Out of all studies on consumer decisions published in two recent volumes of the *Journal of Consumer Research* (2012 and 2013), more than two thirds used hypothetical decision tasks whereas only a fourth of the studies used decision tasks with actual consequences for the decision maker. More problematically yet, no more than 5% of studies used decision tasks that actually resemble real-life consumer choices, that is, decisions with both actual consequences and costs to the decision maker. To investigate the potential discrepancy between the common research practices in the field of consumer behavior and consequential decisions, we compared hypothetical, actual, and realistic consumer decisions in an experimental design. Participants (N = 344) chose between one sustainable (i.e., fair trade and biologically produced) chocolate bar, two non-sustainable chocolate bars, and keeping their money. The monetary value was equivalent across options. Participants were randomly assigned to one out of three conditions: In the hypothetical decision condition, participants had to decide which option they would choose (thus mirroring the most common set-up of studies on consumer behavior). In the actual decision condition, participants had to choose and actually received the item(s) of their choice. In the realistic decision condition, participants first had to earn money in a task and then decide whether to keep it or "buy" one of the chocolate options. Results showed notable discrepancies both in terms of how often participants preferred money over goods and, in the latter case, in terms of the relative frequency of pro-sustainable choices. Thus, hypothetical and even actual decision situations without costs to the decision maker will lead to different findings than consumer choices incorporating both consequences and costs. These findings highlight the importance of designing experiments in a way that structurally resembles real life situations as closely as possible and imply that an unknown but arguably substantial proportion of prior research findings on consumer behavior may not hold in such situations.

266 The impact of carsharing on consumers' quality of life

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Keywords: Quality of life; mobility; carsharing

Subtheme: Quality of Life and well-being

Abstract:

Mobility options and accessibility are said to have a significant impact on consumers' quality of life (QoL) and residential well-being (Perlaviciute & Steg, 2012). However, we currently do not have many empirical investigations about the long-term perceived impact of mobility innovations such as carsharing on users' QoL. Several previous studies operated with hypothetical scenarios, asking respondents to imagine how their QoL might change if they were to adopt more sustainable consumption behaviors (e.g. De Groot & Steg, 2006). Building on this knowledge, we used an adapted version of the multidimensional measure for subjective QoL related to sustainable development (Vlek, Skolnik, & Gatersleben, 1998) to ask respondents how the adoption of carsharing had actual-ly changed their QoL. Together with a large station-based carsharing operator we collected responses from n= 9,019 users who are students at

universities in the US and Canada. We reduced the QoL scale to 13 indicators and added three new indicators that we assumed to be especially relevant in the context of mobility options, car ownership and carsharing services: "Flexibility", "Financial control and predictability", and "Serenity". A 7-point Likert answering scale was used to ask re-spondents how the carsharing service had impacted their QoL, ranging from "has made much worse" (1) over the neutral option "has not changed it" (4) to "has made very much better" (7).

Results show that users perceive a clear positive impact of carsharing on their overall quality of life, with a mean score of 4.95 (SD= 1.00). The highest impact score was found on the QoL aspect variability in experiences ($\mu = 5.16$, SD= 1.14). Moreover, those users who sold their own vehicle because of the new carsharing service, even express a significantly higher positive impact on all QoL indicators than the rest of the sample. Whereas we expected them to express a negative impact on the specific QoL dimensions privacy, freedom and flexibility, the opposite occurred: this group shows a higher positive QoL impact on those three aspects, traditionally associated with private car ownership. A similar result occurred for users that postponed a vehicle purchase because of carsharing. In conclusion, our results show that mobility options and social innovations can have a visible impact on consumers' quality of life and well-being. In the case of carsharing, this impact is clearly positive. In general, we deduce that sustainable mobility innovations such as carsharing and less private car ownership do not necessarily present a threat to consumers' QoL. On the contrary, more sustainable consumer behavior can also result in an improved quality of life. Therefore, policy makers should further support carsharing services because of their benefits for both ecological and social sustainability.

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300 Integrating multi-disciplinary perspectives in sustainable energy consumption research: Findings from a swiss household energy survey

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Keywords: Sustainable energy consumption, multi-disciplinary research, interdisciplinary framework, household energy behaviour

Abstract:

The currently weak success story on reducing overall energy consumption indicates that our understanding of the determining factors of individual energy consumption, as well as of its change, is far from being conclusive. Against this backdrop, our aim is twofold: (1) To establish an integrated multi-disciplinary framework that offers a systematic basis for linking the different aspects in research on energy related consumption behavior. This may pave the way for establishing a better evidence base to inform societal actions. (2) To develop structural equation models (SEMs) on the basis of this proposed framework, with data from the Swiss Household Energy Demand Survey to understand the interplay between socio-economic, psychological and social determinants of household energy consumption. This presentation will introduce the interdisciplinary framework developed by the SCCER CREST group Switzerland (Burger et al., 2015) and will present the findings in relation to one SEM. The framework is based on existing state of the art approaches from different disciplines within the social sciences in the field of household energy consumption, including factors and relationships based on theoretical foundations from Economy (i.e. micro and macro socio-economic factors, e.g. location, price or efficiency) Psychology (i.e. predictors of behaviour, e.g. norms, habits, control, values and emotions), and Sociology (i.e. social context, e.g. lifestyles, milieus). The SEM, built on data from 5014 swiss households will explore the interplay of the identified factors in the framework for one household energy consumption field; electricity, heating or mobility. The relationships, between economic, psychological and sociological factors, modelled in the SEM, are based on fused theoretical and empirical knowledge in the respective

fields (e.g. meta-analytic SEM of psychological predictor of environmental behaviour by Klöckner, 2013) and newly tested theoretical links (e.g. the relationships between socio-economic micro and macro-factors and (perceived behavioural) control). The overall aim of the framework and SEM is to guide and advance multi-disciplinary empirical research in household energy consumption.

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361 The role of grassroots innovations in promoting local sustainable consumption. Motivations, values and learning outcomes within the “Galician network of conscious and responsible consumption”

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Keywords: sustainable consumption; grassroots social innovations; motivations;

Abstract:

Introduction and theoretical background:

Environmental psychology has deeply studied the psychological, social and structural factors that enable (or discourage) sustainable consumption patterns, highlighting the ‘value-action gap’ between people’s attitudes and their unsustainable consumption practices (Jackson, 2005). Self-reported intentionality does not translate to objective pro-environmental behaviour, at least in those complex issues like climate change as some authors have pointed out (Gifford, Kormos & McIntyre, 2011). Individual behaviours are deeply embedded in social and organizational contexts -like workplace or social groups- that condition or influence their environmental behaviour (Uzzell et al, 2016; García-Mira et al, 2016). Recent studies have investigated interactions between personal, contextual and structural factors influencing lifestyles patterns, focusing on actual consumption behaviour conducted by members engaged in sustainable local grassroots initiatives (Oman et al, 2016; Carrus 2015; Dumitru, et. al, 2016). Grounded on the principles of the self-determination theory (Ryan & Deci, 2000), other authors have focused on intrinsic motivations and personal drivers for committed action, finding positive relationships between perceiving autonomy, relatedness and competence and having internalised in various environmental behavioural domains (Cooke, Fielding & Louis, 2015; De Groot et al, 2015; Knippenberg, 2015). Besides, committed citizens are relevant active agents against climate change effects when assume ethical responsibilities in their consumption decisions as food activists do in sustainable consumption organizations (Riutort, 2011; Seyfang, Hielscher & Hargreaves, 2013; Dumitru et. al., 2015, 2016; Lema-Blanco et al, 2015).

Methods: This research aims to deep in environmental education and psychology research, examining the personal and social factors that influence sustainable consumption practices (limited research exists in Spain addressing grassroots social innovations). A multi-method approach will be used to obtain responses to the research questions proposed, using both qualitative and quantitative techniques for collecting the information about the relevant variables. The research will be carried out in two phases. First, empirical data will be collected through qualitative methodologies: in-depth interviews, participant observation and document review. For the purposes of this paper, we will present the results of the qualitative analysis. A total of 12 in-depth interviews have been conducted with participants actively engaged in a local sustainable consumption cooperative belonging to the “Galician network of conscious and responsible consumption”. Interviews will follow a semi-structured questionnaire (Madill & Gough, 2008), using non-leading open questions (Flick, 2009), focused on the personal experiences and reflections of interviewees regarding the topics of this study.

Results: The results contribute to the understanding of the role that grassroots sustainable initiatives play in terms of maintaining responsible consumption behaviour. The study analyses personal factors and (intrinsic and extrinsic) motivations that lead people to engage in low-impact lifestyles. Second, this study demonstrates how the internal context of such grassroots initiatives - as voluntary-based initiatives based on active participation- enables empowering and learning processes that lead to pro-

environmental behaviour in a wider context. Finally, we will analyse the educative role of sustainable consumption initiatives.

Conclusions: Grassroots social innovations demonstrate that individuals are able to deal with barriers and unsustainable habits fostering transitions to low carbon societies. The studied community-based initiatives are (still) minority networks that may play a notable role as creators of new cultural frames that turn into social referents for the rest of the society.

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PSII-07 HEALTH AND ENVIRONMENTAL BEHAVIOR

Room: -1.2

126 An ecosystems approach to indigenous mental health: Psychological resilience in the traditional cree food system

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Keywords: ecological psychology; resilience; indigenous food systems; land-based healing

Abstract:

Introduction: Remote indigenous communities of northern Canada have disproportionately higher incidences of mental health struggles¹ derived from abusive practices in the colonial residential schooling system.^{2, 3, 4} They also underwent an abrupt transition from an autonomous and communal subsistence in the ecological environment, to an externally imposed and import-based commercial food system.^{5, 6} I work with the indigenous Cree of the James Bay region whose subjective well-being is synonymous with the health of the land and is enhanced by an ability to participate in traditional food

practices.3,7,8 With the Cree, I am developing a culturally-competent mental health framework that is compatible with indigenous notions of well-being: Ecosystems Psychology.

Theoretical Background: The dominant Western mental-health paradigm can be fragmented and symptomatic, and tends to pathologize indigenous peoples while excluding non-Western psycho-social identities and values.^{9, 10, 11} Western psychological tools are often deemed incompatible with indigenous identity.^{12; 13} While ecological theory is increasingly applied to human health, it is particularly relevant to indigenous communities like the Cree who traditionally have a metapersonal self-construct, including all humanity and nature.^{14, 15} The literal setting of recent traditional indigenous food systems is the ecological environment.⁸ The indigenous knowledge system created from this environment¹² is considered a “living entity”¹⁶ and metaphorically compatible with ecological theory which emphasizes complexity, change and interdependence.¹⁷

Methods: I reviewed research disciplines that apply ecological theory to human health and psyche: Evolutionary Psychology, Environmental Psychology, Ecopsychology Native Science, and Ecohealth. I conducted interviews in a Cree community, Fort Albany First Nation, during the harvest seasons with harvesters (n=24) or professionals of traditional or western mental health care (n=17). Interviews focused on current mental health challenges and services, land-based therapies, and personal experiences of healing on the land.

Results: To date, I have developed several characteristics of an Ecosystems Psychology approach to indigenous mental health. It views the human individual and collective psyche as a nested system in which: (1) The individual psyche has direct and indirect reciprocal relations with other entities of the system and the environment, (2) The environmental impact is both social and biophysical, and includes immediate and distant scales of time and space, (3) Bicultural ideologies, measures and services are valid, including: social values, biomedical evidence, narrative and phenomenological knowledge, (4) The psyche is an adaptive and changing system; the well-being of this system is represented by resiliency to adversity rather than absolute and unchanging states, (5) The degree of resiliency is dependent on the relationship to, and frequency of, disturbance, and the nature of relationships between entities in the system.

Conclusions: Ecosystems Psychology is a novel and integrative ecological systems approach to mental health. It has discernable potential to act as a culturally-competent tool for healing in indigenous communities like the Cree, and facilitate mutually beneficial relations between the human psyche and the environment. Psychological resiliency represents an indicator of well-being in Ecosystems Psychology that, in contrast to Western disorder, bridges western and indigenous knowledge systems presently practiced in modern Cree culture, and encompasses the adaptive systems approach to well-being.

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182 Nature walks versus medication: A randomized, double-blind, placebo-controlled treatment comparison for attention problems in Attention Deficit/Hyperactivity Disorder

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Keywords: methylphenidate, attention network task, randomised clinical trial

Abstract:

The development of new interventions for mental health issues should include a direct test against gold standard treatments for a given disorder. In 2009, Taylor and Kuo noted that improvements shown by children with Attention Deficit/Hyperactivity Disorder (ADHD) after a walk in a natural environment were comparable to improvements expected with pharmacological treatment. While these comparisons were based only on effect sizes, it suggested potential for natural environments to be used in the management of attention problems. Aspects of Attention Restoration Theory suggest that time in a natural environment should be particularly beneficial for children with ADHD due to deficits in directed attention that characterise the disorder (Taylor, Kuo, & Sullivan, 2001). However, research investigating this effect is sparse. Taking inspiration from clinical trials, we conducted the first randomised, double-blinded, placebo-controlled treatment comparison study to directly measure the efficacy of nature walks against medication, for treating attention problems in children with ADHD. We used a within-subjects two-by-two factorial design in order to investigate the effects of nature walks and medication separately, as well as the combined effects to explore interaction effects of both treatments. Upon arrival, participants were given a pill capsule containing either their regular dose of medication or a placebo. After completing a fatigue-inducing task they performed the Attention Network Task (ANT) for baseline measures before walking in small groups for 30 minutes in one of two environments. Participants walked twice in an area containing native New Zealand forest, and twice in a quiet residential area predominantly occupied by student housing. Upon returning from the walk, participants performed the ANT a second time. We hypothesized that ANT performance will be improved after three of the four treatment combinations (*medication + nature walk; medication + neighbourhood walk; placebo + nature walk*). Further, we hypothesized that gains in ANT performance will be greatest during the '*medication + nature walk*' condition, reflecting a positive interaction of the two treatment types believed to act on directed attention. Finally, we directly examined Taylor and Kuo's (2009) suggestion that natural environments and medication may improve cognitive performance to a similar degree by comparing performance between the '*medication + neighbourhood walk*' and '*placebo + nature walk*' conditions. To date, 18 participants have completed the entire protocol. Recruitment is still currently active with a cessation date of 31 March 2017. Analyses will be performed during April 2017. The results will contribute to the dialogue surrounding the true potential of natural environments to be used within mental health and education settings. Teachers and parents purport benefits of natural environments in children with ADHD; however, strong evidence of this effect is currently missing.

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335 Environmental stress model with cancer patients

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Keywords: hospital, women, environmental quality.

Abstract:

Introduction: Recent research emphasizes a strong association between health outcomes and the physical environment in which patients are housed or receive medical care (Ulrich, et al 2004).

Theoretical background: Hospitalization creates several stressors which go beyond those related to illness, from environmental factors like unfamiliar surroundings to lack of privacy, orientation, and positive environments. In turn, Ortega et al. (2016) have proven the relevance physical environment plays in preventing and reducing users' psychological problems from three perspectives: evaluation of the effects of hospital design on social interaction, stressors generated in the hospital environment, and capacity for personal control over the environment.

Method: With the aim of determining the impact of psycho-environmental factors on the emotional state of cancer patients, we conducted a study in a waiting room of the Outpatient Service and in two wards in the Oncology Service of a hospital specialized in women's care.

The sample was made up by 116 patients diagnosed with cancer, 51% were interviewed in their rooms and 49% in waiting rooms. Their age varied from 14 to 82 years.

Psycho-environmental factors were measured using the "Environmental Assessment Scale" (Ortega & cols., 2000). The scale consisted of 34 items, with a Likert-type response scale. It evaluates five factors: 1. Spatial perception and outfitting, 2. Physical assessment, 3. Functionality, 4. Confidence in medical service and perception of security in the place, 5. Human quality of care.

To evaluate patients' stress, we used the Version Adapted by Ortega (2002) for Mexican Population of the "Stress Arousal Checklist" developed by King, Burrows and Stanley (1993), which consists of 12 items, and evaluates three factors: Stress, Arousal, and Exhaustion.

Results: The results allowed us to obtain a path analysis model which identified functionality and negative physical assessment of environment as predictive variables of stress, as well as an indirect effect between spatial perception and human quality of care, both with a negative impact on stress; also, arousal has an indirect negative effect on stress through functionality. The model adjusts suitably and in agreement with the indices $\chi^2=61.956$, $RMSEA=.072$, $CFI=.926$, $DF=39$.

Conclusions: The relevance of the model shows the influence of environmental aspects which interfere both with the patient's assessment of confidence in medical service and the human quality of care in generating the situational stress patients perceive during both their time in waiting rooms before consultation and hospitalization in hospital rooms. Finally, it underscores the vulnerability of cancer patients, whose condition identifies them as susceptible to a greater negative impact from inadequately stimulating or environmentally enriched settings, which diminishes their quality of hospital life.

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354 Motivational Interviewing (MI) in environmental inspections and enforcement conversations and quality assurance of MI

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Abstract:

Introduction: Motivational Interviewing (MI) is a counseling method with scientific support for various health behaviour changes. The present work evaluates inspectors learning of MI and how they value MI in environmental inspections and enforcement conversations.

Theoretical background: MI is operationalized and assessed in frequency counts and global variables, according to Motivational Interviewing Treatment Code (MITI). Trained coders assess audio-recorded conversations according to MITI with good reliability as well as discriminant validity regarding counselors' in-session behavior before and after MI-training. MITI has been found to have predictive validity.

Methods: Inspectors (n=32) in four Swedish municipalities received training in MI over a yearlong period and their experience of using MI in routine inspections were monitored over the year. Over the year routine live inspections were audio recorded and a 20 minutes segment was selected from each recording and was coded according to the MITI.

Results: The MITI coding results showed that the inspectors' MI competency significantly had increased over the year and the inspectors judged MI to be useful in inspections, approximately 5 on the 6-point scale.

Conclusions: MI has, to our knowledge, for the first time been tested in environmental inspections and enforcement conversations. Inspectors improved their competence in MI and found MI useful.

353 Food safety inspectors trained in Motivational Interviewing increased compliance with waste sorting legislation in restaurants

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Abstract:

Introduction: The present study investigates if training in the counseling method Motivational Interviewing (MI) is experienced as useful by inspectors and enhances the effect of inspections on compliance with waste sorting legislation in restaurants.

Theoretical background: MI competency has been found to predict better health behaviour outcomes. Training food safety inspectors in MI has improved their MI competency and inspectors have judged MI to be useful in inspections. To our knowledge, no outcome study of MI in relation to pro-environmental behaviour has been made.

Methods: Food safety inspectors (n=6) working in a collaboration of five Swedish municipalities received a 5-day training in MI over a period of three months and their experience of using MI in promoting waste sorting during inspections were monitored over a period of eleven months. Live inspections were audio recorded and coded according to the Motivational Interviewing Treatment Integrity Manual (MITI). The compliance with waste sorting legislation was monitored.

Results: Restaurants, which had been inspected by inspectors with MI-training had a significantly higher compliance to waste sorting regulations than had restaurants, which had been inspected by inspectors without MI-training. The MITI coding results showed that the inspectors' MI competency significantly had increased over the study period and the inspectors judged MI to be useful in waste sorting inspections.

Conclusions: MI has, to our knowledge, for the first time been shown to promote environmentally sustainable behaviours. Food safety inspectors trained in MI increased compliance with waste sorting legislation in restaurants

294 Mothers' environment stress and association with household chaos and density

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Keywords: environmental stress, household chaos, crowding.

Abstract:

Introduction: There is a growing literature that implicates the environmental factors as important correlated of human behavior. Home constitute the most important site to understand human behavior, it provides support to human develop and identity (Gunter, 2000), in addition it would appear an important predictor of maternal behaviors as higher levels of stress. Research on environment and behavior has attempted to uncover relations between higher levels of interior residential density (people per room), household chaos and elevated levels of psychological distress among adults (Evans, Lercher & Kofler).

Theoretical background: The home is the most important setting in which human processes occur (Bronfenbrenner & Morris, 2006), for that reason, studies are needed to look at impact of environmental conditions of the home on a broader range of outcomes. This study investigated the influence of density and household chaos (i.e. order, confusion, lack of family routines) on environmental stress in a mexican sample.

Method: Participants. Data were gathered from 85 mothers of young children. The average age of the participants was 32.08 years (SD = 6.34, range: 19 – 49 years), predominately were married (43.8%) and housewife (31.5%).

Measures. Mothers completed a mexican version of Chaos, Hubbub and Order Scale (CHAOS, Matheny et al., 1995). This version include nine items from the Matheny et al. scale and utilized a 4-point Likert-type scale rather than original instrument (yes-not) ($\alpha = .72$). Also completed the Environmental Stress Scale for parents (Escala de Estrés Residencial en Padres de Familia (Flores et al., 2015) that include 23 items with 5-point Likert-type scale ($\alpha = .94$). In addition, additional items were assessed to measure the physical quality of home (structure, number of rooms, etc.), residential instability, and number of people.

Results: Results show that high levels of environmental stress reported by mothers was associated with high levels of density ($r = .26, p < .05$) and order ($r = -.241, p < .05$), not found relation with confusion, lack of family routines or residential instability.

Conclusions: The overcrowding of people in the rooms increases the levels of stress that mothers reported, while confusion and lack of family routines no shows effects. On the other hand, the organization of objects and family interactions is negatively related to stress.

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252 Acceptability of sustainable policies

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Keywords: policy acceptability; environmental appeal; policy characteristics**Abstract:**

To promote sustainable behaviour, policies are needed that help to promote the desired actions. However, such policies will only be effective in promoting sustainable actions if people find the policy acceptable. We tested which characteristics of the policy and which individual characteristics influence policy acceptability. We propose and test if policies aiming to promote sustainable actions are more acceptable when they include an environmental appeal.

We first tested among a sample of 205 car users if transport pricing policies are perceived to be more acceptable when they include an environmental appeal. That is, we tested if policies are more acceptable when they include CO2 differentiation. We indeed found that transport pricing policies with CO2 differentiation are more acceptable than policies without CO2 differentiation. However, when it was mentioned that policy will have a big environmental impact, acceptability did not increase. In fact, our findings suggest that information on the expected environmental impact may even backfire. For policies with CO2 differentiation, information on the expected environmental benefits seems to increase perceived effectiveness. While for transport pricing policies without CO2 differentiation, information on the environmental benefits seems to reduce perceived effectiveness. Our findings suggest that people do not believe information on the environmental impact when the policy does not clearly target environmental problems (by including CO2 differentiation).

Our findings suggest that policies are more acceptable when they include an environmental appeal. Research has shown that people find pull measures more acceptable than push measures (Steg, Dreijerink, & Abrahamse, 2006). However, push measures are usually more effective in promoting the desired behaviour. Furthermore, research has shown that policies that aim to promote changes in efficiency behaviour are generally found to be more acceptable compared to policies promoting curtailment behaviour (Poortinga et al., 2003). In a follow-up study on policies promoting sustainable energy behaviour, we tested if people find policies targeting curtailment behaviour and push measures more acceptable when the policies include an environmental appeal. We tested this among a sample of the general public using a conjoint analysis.

The findings and implications will be discussed.

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238 Energy security in Greece and Turkey: The importance of pro-environmental and pro-cultural orientations in shaping public concernJones, C.R.¹, Kaklamanou, D.² & Lazuras, L.²¹University of Sheffield, Sheffield, United Kingdom²Sheffield Hallam University, Sheffield, United Kingdom**Keywords:** Energy security; Attitudes; Environmental worldview; Cultural worldview**Abstract:**

Introduction: Historically, energy security has been assessed in relation to the availability, reliability and affordability of energy; however, more recently definitions have evolved to include considerations of social acceptability (Knox-Hayes et al. 2013). The incorporation of social acceptability recognises the influence that myriad social stakeholders can have on energy and environmental policy. Publics

are a key group of stakeholders and so a full understanding of energy security can only come with an understanding of public opinion. To date, though, only a handful of studies have investigated the nature of public attitudes towards energy security (Corner et al., 2011).

Theoretical Background: Pro-environmental and pro-cultural orientations should, theoretically, share relationships with public concerns about energy security. Deterioration in energy security is related to the destabilization of the world climate through human activity, meaning that greater concern for the environment should map to greater concern for energy security. Terror Management Theory, on the other hand, indicates that cultural worldviews can foster self-esteem and provide a buffer against existential and other anxieties (Pyszczynski & Kesebir, 2011). As such, it can be predicted that higher levels of pro-culturalism should map to lower concerns with energy security.

Method: This study used an online survey to research public perceptions of energy security in two countries with a historical reliance on energy imports (Greece N=71 & Turkey N=104). The aim was to profile energy security concerns in each country and analyse the relationships between pro-environmental and pro-cultural orientations with concern for 6 facets of energy security (i.e. import dependence, sustainability, affordability, reliability, sufficiency and terrorism) (Corner et al., 2011).

Results: Both subsamples were concerned with energy security but Greeks more so than the Turkish participants ($p=.006$). This difference was due to greater concerns about the affordability of energy ($p=.003$), import dependence ($p=.002$) and fossil fuel depletion ($p=.010$). In both subsamples, import dependence was of most concern with terrorism of least concern. The Turkish subsample were more pro-cultural than the Greek subsample ($p<-.001$); while the Greek subsample were more pro-environmental than the Turkish subsample ($p<-.001$). Regression analyses revealed that pro-environmental orientation was a good predictor of energy security concerns in both subsamples but pro-culturalism was not. Conclusions. The results shed light on the nature of public opinions of energy security in two import-dependent countries. It is clear that pro-environmental orientation is an important predictor of concerns about energy security. It is also evident that the nature and extent of concerns about energy security differ in different nations.

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282 Acceptability of wilderness conservation policies in Czech Republic

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Keywords: wilderness; attitudes; perception; expansion; conflict; Czech Republic

Abstract:

Introduction: Re-establishing wilderness areas to protect natural processes is major European nature conservation goal (Korn and Piechocki 2004; Parviainen and Frank 2003). We focus on one of two related social issues (Bastmeijer 2016): the problem of the society's understanding of what wilderness is.

Theoretical background: We use dimensions of the scale that was adopted from Bauer et al. (2009) - on perception of wilderness and recognition of nature's capacity for self-renewal. Apart from these scales, the analysis included the scale of perceived risks for wilderness and the scale of the level of human presence in wilderness (McFarlane 2005), NEP Scale (Dunlap 2008) and Perceived responsibility of political institutions.

Methods: The PAPI survey with 88 questions, including information on personal attitudes and wilderness related behavior took place in 2015. Total 2023 respondents corresponded to the quota of adult population in the four main socio-demographical variables. Our interpretation and comparison of the data were

based mainly on descriptive statistics, correlation analyses, evaluation of the scales using the Cronbach alpha, and regression linear analysis.

Results: According to correlation analysis, there is a strong relation between support for wilderness expansion, sympathy with environmentalism and the degree of environmental concern. The regression analysis has revealed that support for expanding wilderness areas is most strongly related to the recognition of nature's capacity for self-renewal, aesthetic appreciation of nature, the average frequency of wilderness trips, the perceived necessity of human intervention, and the perception of the size of wilderness. The resulting model of five variables explains 25.2 % variability.

Conclusions: Based on our research, an increase in the number of people who support wilderness expansion would be achieved by weakening the perception of the wilderness as something neglected that poses a threat to its surroundings, by constructing a definition of wilderness as an aesthetically valuable element, and mainly, by weakening the anthropocentric view of nature. Therefore, to expand wilderness areas, people's belief in the autonomy of wilderness might be developed.

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373 A review to the willingness to pay (WTP) - willingness to accept (WTA) disparities in environmental evaluation: Experimental results of the endowment effect

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Keywords: WTP/WTA disparity, endowment effect, environmental psychology, environmental evaluation

Abstract:

This paper reviews the results obtained by experimental analysis and meta analysis that focuses on the willingness to pay (WTP) and willingness to accept (WTA) disparity in environmental valuation studies. These papers provide experimental evidence that, contrary to theoretical expectations, measures of willingness to accept greatly exceed measures of willingness to pay in contingent valuation studies and in non market goods monetary valuation (see, for example, Horowitz and McConnell, 2002; Koetse and Brouwer, 2016). The WTP/WTA disparity constitutes a strong evidence of the endowment effect and the prospect theory of Kahneman, Tversky and Thaler, theoretical references of the behavioral economics and the psychological aspects of Economics (see Kahneman, 2011, and Thaler, 2015, for a complete review of the endowment effect and the prospect theory). In addition to the review of experimental studies, in this paper we also provide a statistical analysis of the empirical results, estimating, in percentage, the differences between WTP and WTA in environmental resources valuation. Our results shows that the WTP/WTA disparity is a relevant issue in the Cost Benefit Analysis (CBA) of environmental projects, because both WTP and WTA can be used like shadow prices in this kind of decision analysis method.

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136 Determinants of intention to donate for the landscape of night view towards eco-friendly lights: A case of study of implementations of energy saving lights in Hakodate, Japan

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Keywords: Willing to Pay; public goods; replacement of the light facilities to LED

Abstract:

Introduction: Hakodate is famous for possessing one of the 'Three Major Night Views of Japan'. Over a million tourists visit the area every year. For energy saving it would be preferable if the existing older lights could be changed to LEDs (light-emitting diode). However, due to the high initial cost, it has proven difficult to replace the relevant light facilities that constitute the night view. Therefore, the municipality proposed that donations collected from tourists could be used to contribute to the replacement of the older light facilities.

Theoretical background: This scenario can be conceived of as a public goods game (PGG); there is a public benefit to donate for the environment, but individuals have no reason to donate if they prioritize their personal economic gain. Previous studies have shown that cooperation rates in PGGs are lower in one shot than in repeated scenarios. Given that tourists are usually in a one-shot scenario, it can be anticipated that few people will make a donation. Nevertheless, many people do make public goods donations, in support of environmental conservation and cultural heritages, even when they may never visit a location again. If individuals recognize the value in energy saving, they will be more willing to pay for the replacement of the light facilities. WTP (Willing to Pay) is often measured through economic means (Mitchell, et al., 1989). However, since the donation is a pro-environmental behavior, intention to donate could be better accounted for by psychological variables, such as social norms and perceived behavioral control. This study aims a) to measure the WTP for the replacement of the light facilities, and b) to explore the psychological factors determining WTP.

Methods: We distributed questionnaires to tourists at the top of Hakodate Mountain, and obtained 981 valid responses. WTP, psychological variables, and demographics were measured.

Results: WTP was calculated by a log linear logit model according to orthodox methods and returned a result of 1,580 yen/person (approx. 13 euros), which seemed an overestimation. Therefore, we conducted curve fitting to quadratic function using the least square method with a logarithm scale, which resulted in 818 yen/person (approx. 7 euros). Indicated determinants of WTP were found to be reputation, perceived behavioral control, subjective norm, cost estimation and personal norms. Cultural differences were also found, including that reputation was the strongest determinant for foreign tourists, but not significant for domestic tourists.

Conclusions: This study involved a survey conducted in a real setting and calculated a plausible estimation for willingness to donate for energy saving. The findings also suggest that previous results from pro-environmental behavior studies can be extended to WTP related to public goods issues.

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035 The green road taken: Sustainable travel behavior of individuals within the Campbell Paradigm

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Keywords: environmental attitudes, ecological (conservation) behavior, car use, nudging, Campbell Paradigm

Abstract:

Introduction Both psychological factors and the specifics of the context in which people travel (i.e., the transportation environment) are most likely relevant in jointly shaping the sustainable travel behavior of individuals. However, there is some uncertainty about their specific interplay.

Theoretical background In contrast to most behavioral models in transportation research, the Campbell Paradigm accounts for the constraining or facilitating effects of the transportation environment and suggests an additive and compensatory—rather than an interactive and conjunctive—interplay with people's attitudes toward environmental protection (environmental attitude: see e.g., Kaiser, Byrka, & Hartig, 2010).

Methods Our research consists of three studies (N = 987) that draw on (a) participants' self-reports, (b) an online scenario, and (c) behavioral observation, and it provides both quasi-experimental and experimental tests of the additive, compensatory function of people's environmental attitude and the specifics of the transportation environment.

Results In all three studies and as anticipated by the Campbell Paradigm, we found that the two main effects—the specifics of the transportation environment and participants' attitude toward environmental protection—compensatorily explained a person's sustainable travel behavior. Across all three studies, the mean statistical interaction ($r_p = .04$) was not significantly different from zero but was significantly smaller than a conventional small effect.

Conclusions Our findings support the Campbell Paradigm as a valid theoretical account of people's travel behavior and, thus, as a useful framework for environmental policy planning.

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121 A Repertory Grid Analysis of Perceptions of Travel Modes

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Keywords: repertory grid; mixed method; travel mode

Abstract:

Car use accounts for 23% of overall greenhouse gas emissions in the UK and despite raising concerns about air quality, lack of physical activity and fossil fuel consumption, over 60% of UK commutes are driven. Reducing private car use has potential to improve human health through higher levels of physical activity and a decrease in CO₂ emissions can contribute to targets of lowering greenhouse gas emissions. Quantitative, survey-based work has been the dominant approach to research on travel mode choice. To date, research has mainly explored underlying motives for the use of a single transport mode among a certain group of participants. The aim of this study was to explore how travelers evaluate transport choices. We also compared the evaluative spaces of two different

transport users: non-car users and above-average car users. We conducted a Repertory Grid analysis to investigate complex systems of perceptions of car users and non-car users. We applied qualitative and quantitative methods to map and compare cognitive constructions of seven different modes of travel (car, bicycle, walking, tram, train, bus and coach). Semi-structured interviews elicited a total of 448 bipolar constructs from 30 participants (15 car users, 15 non-car users). Thematic analysis summarised those to 28 categories of constructs and highlighted that both groups apply similar constructs to evaluate travel modes. Content analysis revealed that functional constructs related to time and route flexibility are an important part in both groups' construal which were associated with car, walking and cycling. Physical activity and environmental friendliness were important for non-car users but not for car users. Principal component analysis identified that car users' construct systems were less complex than non-car users' and consequently perceived transport modes less differentiated. Findings implied that walking and cycling have great potential to replace some of the journeys currently undertaken by car. Policy makers and intervention designer should aim at raising car users' awareness of distinct functional characteristics of those travel modes. Results also suggested that car users may not be susceptible to interventions promoting related benefits of physical activity and environmental friendliness of non-car transport modes.

130 Energy-efficient business travel: motivation in behavior intervention programs

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Keywords: Energy-efficiency; business travel; motivation

Abstract:

Introduction: The Theory of Planned Behavior (TPB) is a well-known theory explaining factors (attitudes, social norms, and perceived behavioral control) influencing the intention to engage in various behaviors (Ajzen, 1991). Although TPB has proven useful to explain specific behaviors, the underlying factors differ in impact and is sometimes even non-significant (e.g., Eriksson & Forward, 2011). In general, intentions explain 30% of a behavior (e.g., Armitage & Conner, 2001), which imply that there are other factors of importance. Thus, there is still a need to understand the processes underlying behavioral changes. A review of soft policy measures shows that in general they are effective in triggering a change. Yet, the variety of the results (5-15%) makes it difficult to infer why the measures are effective (Richter et al., 2011). A possible explanation is that people is prone to change depending on their degree of motivation. This study analyzes if and how intervention programs could be adopted to peoples' degree of motivation, type of motivation, and motivational process.

Theoretical background: An alternative to TPB is the Trans Theoretical Model (TTM; Prochaska & DiClemente, 1983) claiming that changes occurs in a process rather than in a one-step approach. TTM has its origin in health intervention research where it is successfully applied to explain smoking cessation, substance abuse, and sexual behavior, but it has also been applied in transport research (e.g., Bamberg, 2013) mainly with the aim to explain existing travel behavior. Few studies have so far been conducted to predict a travel behavior change.

Method: Three workplaces were included in this study. A survey was distributed at each workplace with the aim to identify travel habits and stage of change. In total 240 respondents participated in a baseline survey. During spring 2017 several interventions will be implemented with the aim to change travel habits to and from work and in business travel. Interventions implemented will be adjusted according to stage of change. Results: The result showed that 19% of the respondents are in the precontemplation stage (not ready), 25% in the contemplation stage (getting ready), 10% in the preparation stage (ready), 11% in the action stage, and 16% in the maintenance stage (strive to keep the behavior). The remaining 19% do not go by car. We use social and moral norms, attitude toward alternatives, and perceived behavioral control to explain stage of change.

Conclusion: Employees have different degree of motivation for changing their commute and business travel as this study bear witness to. We show how stage of change are effected by different types of interventions which is of importance when designing future travel change programs.

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321 The role of individual determinants and socio-cultural context in shaping car travel: comparing cases of Sweden and Estonia

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Keywords: car travel frequency, cross-cultural analysis, social stratification, Sweden, Estonia

Abstract:

Introduction: The study explores cross-cultural differences in car travel behaviour in Northern and Eastern European countries. Sweden and Estonia present compelling cases for comparative analysis, as they share much of the cultural realm and face similar environmental problems. However, the stark market-liberal developments in Estonia contrast Sweden's social-democratic traditions and may have important repercussions on intentions and opportunities for travel.

Theoretical background: The context in which a person lives, the physical infrastructures, social and societal norms, regulations and monetary incentives and costs present in a country may be more or less facilitating or hindering for various pro-environmental behaviours (Cass & Faulconbridge, 2016). The willingness to decrease car use is related to self-transcendent values, the effect of which on actual behaviour is mediated by specific beliefs (e.g. negative effects of car use) and personal norms. Furthermore, the individuals' position in societal structures (age, gender) may shape his desires and needs, but also opportunities, of travel (Dijst et al., 2013).

Methods: We combined survey data gathered in Sweden (2014) and in Estonia (2015). For historical reference on car trip frequency, we used data gathered in these countries in 2000s. We assessed the role of socio-structural setting, individual social values and beliefs on need for traffic exhaust mitigation, intentions for car travel change, in shaping the frequency of car travel.

Results: Over time, the average frequency of car trips has increased in Sweden and decreased in Estonia, yet Estonians are still more dependent on cars in their everyday travel. The intention to decrease car travel and the socio-demographic background play a key role in shaping the car travel frequency in both countries. Stronger disparities in travel behaviour among different social groups and on different settlement hierarchy levels appear in Estonia, but not in Sweden.

Conclusions: The study highlights that next to the country-specific infrastructural circumstances, the societally specific beliefs and norms over travel but also the levels of social stratification, may shape car-travel.

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343 Development and Evaluation of BLAZE Information System

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Keywords: behavior change support system; sustainable travel behavior; mobility management

Abstract:

Promoting sustainable travel through mobility management (MM) has been implemented with success in many developed countries. MM programs have been introduced as, for example, Travel Feedback Programs (TFP) in Japan. Nonetheless, MM is not yet widely implemented in developing countries. Moreover, few MMs, even in developed countries, leverage advanced ICT platforms in delivering large-scale interventions. In Japan, for example, TFPs have relied so far mostly on traditional technologies, namely regular mail, telephone and email (Fujii and Taniguchi, 2006). This severely limits the potential of classical TFPs for scaling up. Furthermore, current MM programs are based on static behavior change models such as the Theory of Planned Behavior, which may partly explain their small, albeit significant, intervention effect sizes (cf. Bamberg et al, 2015).

In this paper, we describe how the Stage Model of Self-Regulated Behavioral Change (SSBC) (Bamberg 2013) is used for the first time in the development of a theory-driven MM called BLAZE. SSBC posits that behavioral change is achieved by a transition through a temporal sequence of different stages. BLAZE is implemented in Manila, Philippines, as a behavior change support system, leveraging advanced technologies such as the Smartphone and the web.

SSBC is used to systematically design theory-based stage-specific interventions in our BLAZE system. Since we are still in the early stage of design development, we only conducted a usability testing among the students of the Ateneo de Manila University. The main objective of the system evaluation is to address usability concerns, and not yet the intervention-induced behavior change. Eighty students used BLAZE for three weeks in November 2016. They were first profiled, and depending on their current stage membership in the behavioral change process as posited by SSBC, were given appropriate interventions aimed at influencing their attitudes and behavior for three weeks. Trip and stage membership data were gathered through the BLAZE.

We report results of initial Blaze tests. Our current usability testing shows that, except for the trip logging function, BLAZE in general is user-friendly. Moreover, the participants self-reported that the system is at least 90% data accurate. Nonetheless, although some students report progression in their stage membership in the change process and a positive shift towards sustainability in their mode use, no conclusion yet can be derived on the effectiveness of our system in changing behavior since a methodologically robust study design is not used in our initial evaluation.

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009 Emotional responses to climate change related artwork and identification with the artist as drivers of motivation to act – a multilevel study of audience responses at the ARTCOP21

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Keywords: Climate change related visual art, psychological effects of art, motivation to act against climate change, multi-level analysis

Abstract:

Climate change is a topic that engages artists of many art forms. In their practice, artists respond to climate change and confront us with their personal interpretation of the topic. The climate art scene is evolving quickly (Buckland, 2013; Dunaway, 2009; Nurmis, 2016); however, very little is known about how being confronted with artwork inspired by climate change affects the audience. It is also unclear what specific features of art differentiate this form of communication from standard climate change communication. Inaction towards climate change has been linked to the lack of emotional involvement of the audience (Weber, 2006). The paper presented here as part of the CLIMArt project (www.climart.info) is based on a large data collection at the art event ArtCOP21 that accompanied the Paris climate summit in November 2015 and consisted of 163 artistic around the world. At 37 of these events the research team collected 883 quantitative audience responses with a brief paper-pencil questionnaire. This questionnaire contained questions about the art experience, the emotional reaction to the artwork, climate change perception, motivation to act against climate change and policy priorities. The data was analysed in a multilevel-structural equation modelling approach with the main focus on the individual reactions to the artwork (person level), but also modelling the relations between variance between different artworks and artwork features judged by the research team (artwork level). The analysis shows that the response to the artwork could be divided into three components: (1) identification with the artist, (2) feeling activated by the art experience, and (3) perceived quality of the artwork. All three impacted the emotional experience triggered by the artwork (perceived high quality related to positive emotional responses; high activation mostly related to negative emotional responses). Both positive and negative emotions and identification with the artist impacted the degree of climate change denial, perceived severity of climate change and motivation to act against, which then in turn impacted policy priorities. Policy priorities were related to a real behaviour choice (choosing a standard smart phone, a fairphone or a donation to an environmental organization as a potential lottery price as reward for participation in the study). Finally, it was also found that artwork features like displaying destruction, references to famous landmarks, etc. had a significant relation to the artwork level differences in emotional activation and climate change perception. The study shows that being confronted with climate change related artwork has an impact on people's motivations to act and shows at least short-term behavioural effects, which are mostly channelled through an emotional activation. Features of the artwork decide about its effectiveness.

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198 Using Twitter to measure opinions and sentiments about environmental issues during the 2016 US presidential election

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Keywords: Social media; Environment; 2016 US presidential election

Abstract:

Over the last few years, social media platforms have had an increasing role in social movements, political campaigns and everyday life around the world. Millions of people broadcast their thoughts and opinions allowing social scientists to study individual voluntary reactions and sentiments on a wide range of topics. Twitter remained at the social media centre of the 2016 US presidential election mostly because of the devotion that the Republican presidential candidate exhibited for this service. A large part of the presidential campaign has played out on Twitter providing a powerful tool to measure and explore polarization of opinions and sentiments towards environmental issues (e.g., climate change) of Democrats and Republicans supporters.

Social identity theory provides a compelling framework to investigate how self-perceived membership in a political party affects social perception and attitudes. In numerous studies, party identification serves as the basis for group comparisons, such as comparing demographic variables or policy opinions between Democrats and Republicans (see Green, 2002). A few years ago, the Pew Research Center revealed that the partisan gap over environmental laws and regulations double over the past two decades (2012). Twitter provides two different kind of data that can be used to analyse this social behaviour. Non-textual information that has the potential to reveal cultural characteristics of users by analysing the structure of their social network, and the content of the message that provides affective and semantic information. Several studies had investigated the use of this information in a variety of political contexts, such as predicting election outcomes based on social media content (see Gayo-Avello, 2013) or observing difference in language usage between liberals and conservatives (Sylwester et al., 2015). Our study takes advantage of both type of information provided by twitter, to investigate the polarization of opinions and sentiments towards environmental issues of Democrat and Republican supporters before, during and after the 2016 US presidential election. We expected a polarisation of their opinions on environmental issues after the outcome of the elections.

A social network analysis of the official Twitter accounts of the Republican and Democratic US Congressional Parties, and both official party candidates revealed a sample of approximately 130,000 Twitter accounts susceptible of representing persons with strong Democrats or Republicans values. For this sample, we collected timelines (all tweets) posted since July 1st, 2016 to January 31th, 2017 resulting in approximately 40 millions of tweets.

Preliminary results reveal that the numbers of tweets posted by the selected sample was influenced by specific events related to the 2016 US presidential election, increasing on the dates of the Democrat and Republican convention and during the three presidential debates, in comparison to a random sample. Further analyses will focus on applying a taxonomy of words and phrases to identify opinions about environmental issues and on analysing the sentiment expressed by each tweet.

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205 Using big data in restorative environments research: A case study analyzing urban twitter sentiment

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Keywords: Nature, mood, restoration, population wellbeing, social media

Subthemes:

- Multi, inter and trans-disciplinary approaches and principles
- Restorative environments

Abstract:

Introduction: Individual studies consistently demonstrate restorative benefits of urban greenspaces. The proliferation of digital devices and their close ties to our daily life provides new links to inner experience^{1,2} and opportunities for assessing population-level benefits. Explosions in the volume of publicly available 'big data' on individual experiences may provide new ways of measuring when, what, how, and for whom greenspace provides benefits. Twitter data provides insights into emotional reactions to events³, products⁴, and landmarks⁵⁻⁶, but may also be used for insights into emotional responses to greenspaces across local, citywide, and global scales.

Theoretical Background: Urban greenspace plays a critical role in shaping the health and wellbeing of city residents⁷. Decades of research shows it is associated with reduced stress, better mood, and greater social connectedness⁸. But this research is often conducted within disciplinary silos, at small-scales in the laboratory, or at neighborhood levels using intrusive measures like surveys, or with coarse spatial scales⁹ and greenspace measures. There are opportunities to build on this research by providing a fine-grained spatio-temporal picture of the association between greenspace and mood across a broad range of people, in a method that is fully scalable. Twitter provides a unique opportunity to explore sentiment² associated with urban greenspaces. Previous research has analyzed Tweets based on their emotional tone¹⁰ and used a place-based approach to understand emotions related to particular locations^{5,6,11}, but has yet to consider possible mood boosts from greenspaces.

Methods: To highlight the utility of this approach we conducted a case study examining sentiment across greenspaces in Melbourne, Australia. We identified a series of 18 parks within the City of Melbourne and created Twitter data collection points. We included geo-tagged tweets within a 400m radius of the park center. We used the same approach for 18 randomly selected areas in remaining (non-park) areas including residential and CBD areas. We collected a total of 7487 tweets from parks and 16768 tweets from non-park locations.

Results: A straightforward sentiment analysis of Twitter text was conducted using the polarity function in qdap¹², a text mining package developed for 'R'. Using this we determined the level of positive/negative sentiments in each tweet's text. This showed that the average polarity score in parks (mean=.09) was significantly higher than in built areas (mean=.01, $t=19.6$, $p<.001$), suggesting links between positive sentiments and greenspaces. Inspection of the density plots of sentiment reveals that this may be driven largely by reduced negative sentiment in tweets from parks versus built areas.

Conclusions: This highlights the power of using Twitter data to examine the benefits of urban greenspaces. It highlights differences in mood, particularly reduced negative mood, between people in parks and built areas. This approach opens the door for more detailed understandings of how greenspaces operates across a range of scales. It provides new ways for understanding greenspace features influencing sentiment, different users and their greenspace needs, and potentially, the spread of mood from greenspace through networks of users in online space. This has important implications for policy, planning, and management decisions related to urban greenspaces.

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094 Intergroup contact as a means to foster identification with humanity and pro-environmental behavior intentions

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Keywords: intergroup contact; identification with humanity; pro-environmental behavior

Abstract:

Introduction: When feeling threatened people’s willingness to act pro-environmentally to protect nature declines, whereas it remains stable provided that the motivation is to protect humans by that means (Fritsche & Häfner, 2012). So how to make environmental protection a human matter?

Theoretical background: We went about the combination of the research fields of international contact (Allport, 1954) and identification with humanity (McFarland, Webb & Brown, 2012) and investigated their impact on people’s pro-environmental intentions.

Methods: In four studies (N=774) we measured if the participants had higher intentions to exchange their global relevant daily live behaviors for more sustainable ones, when bringing them into contact with a student from another country within a simulated chat contact paradigm (study 1, 3 & 4) and an imagined contact task (study 2).

Results: We could show both, the proposed indirect effect from international contact to pro-environmental intentions, mediated by an increased identification with humanity (studies 1 & 3) and the correlative relationship between actual international contact and such behavior intentions, again mediated by identification with humanity (studies 1, 3 & 4) or by the identification subscale solidarity (study 2).

Conclusions: Notwithstanding that this model has been tested solely in an experimental setting so far, it could build up the basis for a new kind of interventions that are potentially reproducing themselves independent of teachers or investigators and ruling out the danger of reactant reactions, as staying in touch with a new friend is a pleasant and voluntary issue.

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052 A tale of two sticks: walking towards restoration

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Keywords: Urban Restoration; Nordic Walking; Well-being**Abstract:**

Introduction: Based on the classical texts on restoration (Kaplan & Kaplan, 1989; Ulrich, 1981), most research conducted in the last decades has been aimed at assessing the restorative potential of contemplation and walking in natural environments such as natural reserves, woods or parks (Morita et al., 2007; Park, Tsunetsugu, Kasetani, Kagawa, & Miyazaki, 2010; Tyrväinen et al., 2014). However little attention has been paid to restoration in urban contexts, and this may indeed be related to some theoretical and design biases (Karmanov & Hamel, 2008). Recent publications claim that the study of restoration in cities is an important challenge for Environmental Psychology and related sciences in their pursue of improving quality of life in modern cities (Lorenzo, Corraliza, Collado, & Sevillano, 2016; Staats, Jahncke, Herzog, & Hartig, 2016).

Theoretical Background: Due to the well-established finding that natural settings usually receive higher aesthetical and restorative scores than urban ones, the analysis of activities different from passive contemplation could be important to answer to such challenge and further develop this line of research. In this context sport and physical activity, that might result a restorative urban activity, deserve special attention even more when some previous research on running demonstrated its potential for affective restoration (Bodin & Hartig, 2003; Butryn & Furst, 2003; Kerr et al., 2006).

Available evidence presents Nordic Walking (NW) as a valuable tool for rehabilitation after injuries or medical interventions as well as for increasing physical performance and decreasing depression in clinical samples (Lee & Park, 2015; Morgulec-Adamowicz, Marszatek, & Jagustyn, 2011; Park & Yu, 2015; Skórkowska-Telichowska et al., 2016; Strömbeck, Theander, & Jacobsson, 2007). Conversely, less is known about the psychological benefits of this activity for normal population.

The present field study, addressing such gaps in restoration and NW literature, shows the analysis of the restoration outcomes obtained through the practice of NW in the city of Donostia-San Sebastián by a sample of normal population.

Method: Thanks to the collaboration of the Association that promotes NW in the Basque Country Euskadiko Nordic Walking Elkarte (ENWE), two NW sessions were assessed using a pretest-posttest design. The first session was a 60 minutes long walk along the streets of the city centre that took place on a Wednesday evening. The second was a 90 minutes long walk through the sea-side (combining streets and beaches) in a Sunday morning. 33 middle-aged adults took part in the first session and 28 in the second one. The questionnaire, which was filled up by participants just before and after the walk, included the Profile of Mood States (POMS), the Positive Affect Schedule (PAS) and two thermometers for Stress and Happiness. The posttest section also included the Restoration Outcome Scale (ROS).

Results: The comparison between pretest and posttest scores revealed significant differences in most of the variables included in the design with low to medium effect sizes, revealing the restorative value of NW.

Conclusions: These results reinforce the therapeutic and psychological effects of NW and expand the scope of the traditional studies on restoration. Studying the restorative potential of group open-air activities in urban environments can lead to important progresses within Environmental Psychology and also in related disciplines, contributing to the building and gathering of useful knowledge to improve the quality of urban life and to foster citizen's well-being.

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290 Human voice, natural threat, and restoration

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Abstract:

Introduction: Soundscapes, or the complex acoustic elements found within a physical space, are an emerging area of research on human environmental perception and the interplay between built and natural (or urban and rural) environments. Within this area of study, some perceptions of environmental quality, including scenic beauty and tranquility, can be negatively impacted by human voices or transportation noise, such as airplane or road traffic, when compared with the same scene under completely natural sound conditions (Benfield et al., 2010). Conversely, natural sounds such as birdsong have been shown to be restorative (Ratcliffe et al., 2013) while human voices or signals of potential danger do not have restorative benefit (Benfield et al., 2015). Put differently, human voices and transportation noise are often viewed or shown to be harmful or non-restorative while natural sounds are often viewed or shown to be helpful or restorative.

Theoretical Background: Drawing on the literature from restorative environments, especially stress recovery theory (Ulrich et al. 1991), as well as social psychological theory related to the need for affiliation displayed by humans in times of stress or fear (Baumeister & Leary, 1995; Schacter, 1959), the current study examines the contextual conditions that can alter the restorative potential of certain types of sounds. It is a follow-up to previous research which showed inconsistent, but partially supportive data for such a theory-based manipulation to existing paradigms within the restorative soundscape literature. It was predicted that human voices would be beneficial when presented immediately following sounds that indicate threat.

Method: An experimental laboratory simulation was carried out on participants (N=54 to date) who were exposed to a negative mood manipulation video and then assigned to one of four sound conditions (control, all natural, natural with voice only, natural with threat only, and natural and threat) lasting 3 minutes. Heart rate was monitored continuously with self-report measures of mood, restoration, and well-being collected prior to and immediately following both the mood manipulation and sound exposure recovery period.

Results: Preliminary analyses support expected outcomes. Both human voices and threatening natural sounds are non-restorative when presented in isolation. However, human sounds in the context of a natural threat perform more like purely natural sounds in that mood recovery from the manipulation is more evident.

Discussion: Testing the limitations, boundaries, and varied contexts in which natural sounds can be restorative is central to our understanding about theoretical cause-and-effect relationships and underlying processes. The current study highlights such an area of context and boundary condition which is valuable for future research. However, limitations including the preliminary nature of the data and the limited number of conditions tested, particularly related to the range of options within both “voices” and “natural threat” sounds, will also be discussed and highlighted.

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319 Effects of the Restoration Skills Training (ReST) Course on the Ability to Cope with and Attain Restoration from Stress and Fatigue

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Keywords: Restoration, Mindfulness, Nature

Abstract:

Introduction: The presentation will cover a study intended to extend knowledge about a restoration skills training (ReST) course for people with stress and concentration problems (Lymeus, et al., in prep).

Theoretical background: ReST integrates mindfulness theory (Bishop et al., 2004) and meditation practices (Kabat-Zinn, 1990) with theory about restorative environments (Von Lindern et al., 2017), building on previous work at the intersection of these areas of inquiry (Kaplan, 2001; Lymeus et al., 2016; Tang & Posner, 2009). The 5-week ReST course has weekly classes in nature settings. The classes and daily meditation assignments teach mindfulness of sensory impressions, including practice in curiosity and psychological distance. We reason that these mindfulness techniques can support the restorative processes of soft fascination and the sense of being away as described in attention restoration theory (Kaplan, 1995). The aim of ReST is to enhance participants’ ability to benefit from potentially restorative experiences, thereby reducing stress and improving attentional functioning and well-being in their everyday lives. Lymeus et al. (in prep.) could show that, compared with conventional mindfulness training, ReST training is less effortful for beginner meditators, more supportive of attentional restoration, and at least as effective in reducing self-reported cognitive failures and stress in everyday life up to six months after the course. One purpose of the study is to compare ReST participants to waiting-list controls with regard to attentional and emotional restoration in realistic rest sessions. Another purpose is to evaluate the effects of ReST on participants’ ability to cope with the demands of everyday life.

Methods: Before and after the course, participants will complete attention tests and affect ratings before and after 20 minutes ReST practice or rest without any specific practice (controls). They will also complete assessments of attentional functioning and stress. Participants will also complete assessments during the course of relevant mediating constructs, including homework exercise and experiences of state mindfulness and perceived restorativeness of the environment in connection with classes.

Results: We expect preliminary results by June 2017.

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242 Eye movements measured across images with a various level of fascination

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Keywords: eye-tracking; Attention Restoration Theory; fascination

Abstract:

Introduction: The present study used eye tracking methodology to compare perceived level of fascination of various types of outdoor scenes with corresponding eye movement activity while perceiving these scenes.

Theoretical background: According to the Attention Restoration Theory (ATR), fascination plays a crucial role in restoration. The attraction of involuntary attention makes an environment restorative. Although a natural setting is considered to be an ideal example of a restorative environment, also some studies have demonstrated restorative effects of urban and other artificial settings. However, to date the specific mechanisms underlying nature’s restorative effects are still not well understood. Typically, fascination is associated with intensive attention and exploration of objects situated within the environment. However, more recent research of eye movements while perceiving natural and urban scenes provided opposite view (Berto et al., 2008, Valtchanov and Ellard, 2015).

Methods: Sixty undergraduates viewed in a random order ordinary urban scenes, old city scenes, and natural scenes. Eye-movements were recorded by means of the eye-tracker Tobii X2-60. The mean number of fixations within an image and the total duration of all fixations within an image were measured. Prior the study restorative potentials of the images were rated by means of the Perceived Restorativeness Scale (Hartig et al., 1996).

Results: The rating of the images showed that natural scenes had the highest level of fascination and the scenes of old cities had higher level of fascination than ordinary urban scenes. The analysis of eye movements revealed that the mean number of fixations was the highest in ordinary urban scenes, the lower in old city scenes and the lowest in nature scenes. Significant differences in the mean number of fixations were between ordinary urban and natural scenes and between old city scenes and natural scenes. The mean fixation durations were the highest in nature scenes, the lower in old city scenes and the lowest in ordinary urban scenes. Significant differences in the mean number of fixations were between ordinary urban and natural scenes and between old city scenes and natural scenes. To sum, the results showed the lower activity of eye movements while perceiving the natural scenes compared to the old city and the ordinary urban scenes.

Conclusions: The study support recently discussed idea (Joye et al., 2013) that natural scenes are simply easy processing than urban scenes. Moreover, the study also showed that perception of images of old scenic cities required lower activity of eye movements than perception of ordinary urban images, which indicate that natural environment may not have an exclusive restorative potential in term of ATR.



Thursday
31th August

09:00 – 10:30 h.

PSIII-12 SUSTAINABILITY IN WORK SPACES

Room: -1.1

254 Knowledge workers' subjective experience of privacy in open office environments

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Keywords: Privacy regulation, office, work fatigue, cognitive appraisal theory

Abstract:

Privacy impairment is a frequently reported issue in open office environments, yet the psychological process behind this experience and its long-term consequences remain unclear. To investigate these points, this study builds on Altman's (1975) privacy regulation model and Lazarus cognitive appraisal theory (Folkman & Lazarus, 1988). It puts the incongruence between workers' desired and achieved levels of privacy and the appraisal process in focus. It is hypothesized that the experience of unmet privacy needs impact on the perception of work stress, elevate work fatigue and reduce workplace and job satisfaction. In addition, it is proposed that the relationship between unmet privacy needs and experienced distress is mediated by the assessment of coping resources (secondary appraisal). Furthermore, as optimum levels of privacy fluctuate dependent on different contextual variables, it was expected that these impact both, the level of achieved privacy and the assessment of coping resources. Regression analyses were performed on a data set of 239 survey responses from an office worker sample in the UK. Preliminary results showed that unmet privacy needs significantly predict an increase in stress and fatigue at work as well as reduction in satisfaction also when it was controlled for job demand and mood. Further, there is evidence that the assessment coping resources mediates the relationship between unmet privacy needs and perceived stress at work. Three contextual variables were found to significantly impact the experience of privacy in the office. It was found that effective privacy regulation is predicted by (1) the availability of a variety of office settings. Moreover, there is evidence that the appraisal of unmet privacy needs is positively influenced by (2) an autonomous workplace culture and (3) behavioural protocols on how office spaces should be used. These three contextual factors impact the level of achieved privacy (variety of settings) and the extent to which unmet privacy needs result into a negative experience (autonomy and protocols). These results need to be interpreted with caution as of their preliminary nature. Nonetheless, they indicate that workers' wellbeing is put at risk if their need for privacy in the office is not met. As contextual variables impact the privacy experience and the regulation proces, results could inform physical workplace design as well as cultural interventions in organisations. To the author's knowledge, this is the first study investigating the psychological process of privacy experience using a transactional model of stress.

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255 How culture can make or break design

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D/Science, Amsterdam, The Netherlands

Keywords: evidence-based design; work environment; healthy lifestyle

Abstract:

Introduction:

The importance of good physical working conditions for human health and well-being has long been recognized, whereas mental and social health have not been points of interest until only recently.

Theoretical background: The Healing Offices is an evidence-based design concept, that focuses on the happiness and health of office employees to restore work-life balance, reduce absenteeism and improve productivity. The concept distinguishes ten design qualities, that for example stimulate feelings of belonging, contact with nature, a sense of control or sustainable behaviour. Physical activity and healthy eating is supported and eventually can lead to long-term behavioural changes towards a healthier lifestyle.

Methods: As part of a before-after study, the presentation will focus on the pre design analysis of a case study (N=92). The purpose of the study was to learn about the effects of design elements and the influence of organisational culture. As the dependent variable the quality of the work environment was determined by the newly developed D/Science Interior Quality Index, that objectively evaluates the design qualities. The independent variables (comfort, mental, physical and social health, productivity) were assessed by an online questionnaire, interviews with employees and observations of the interaction between environment and users.

Results: The study shows that health and happiness are affected by the quality of the environment, but that the manner of how an environment is used, is also greatly affected by the organizational culture. It is therefore essential for an organization to think about what a design means for people's attitude, mentality and behaviour. If strategic/cultural changes are necessary, employees should be prepared and guided accordingly.

Conclusions: Human Resources and Facility Management should no longer be two separate entities, but need to work together to create an organizational culture that offers the right conditions for a work environment to become effective regarding health and work-life balance. Recommendations for design and organizational interventions will be presented.

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128 Activity-based workplaces: changes in cognitive performance among workers previously employed at cellular offices or open-plan offices

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Keywords: office design; flexible work; memory

Abstract:

Introduction: Recently, so-called activity-based workplaces (ABWs; van der Voordt, 2003) have got increasingly popular. At an ABW, workers do not have their own desk; rather they move between different spaces and workstations depending on the task to be performed. Empirical evidence on the consequences of implementing ABWs is limited due to a lack of intervention studies comparing performance in different office designs. Thus, effects over time on productivity in ABWs are undetermined.

Theoretical background: Previous studies have summarized subjective wellbeing and satisfaction among workers in cellular offices and open plan offices (e.g. Danielsson, 2010), as well as the effects of open-plan office noise on performance and stress hormone secretion (e.g. Jahncke, 2012). ABWs could represent a favorable compromise between cellular offices and open plan offices for several reasons. For example, the ABW may offer possibilities to work in sufficiently silent settings when concentration is required (Vos et al., 2001). The present field study aimed at determining the extent to which a transition from a cellular or open-plan office to an ABW influenced concentration among the workers. Performance can be expected to differ between different acoustic environments according to the theory of a duplex-mechanism account (Hughes et al., 2007).

Methods: Workers at four offices within the Swedish Transport Administration where cellular and open plan offices were changed to ABWs took part in the study. An office from the same organization where no change was implemented was included as a control. Among 900 workers in total, cognitive performance was monitored in 118 (13%; women, n=48) using direct measurements. At baseline, workers performed a memory test posing high requirements on concentration at their work station, either in a cellular office or in an open plan office, while sounds from their office were replayed through headphones. At follow-up, the employees now working at ABWs performed the test at each task specific space in the ABW, while the control group did the test again at their work station.

Results: At baseline, cognitive performance was significantly lower for workers in the open-plan office compared to the cell office ($p < 0.001$). Performance did not change in the cell office between baseline and follow up, neither for the intervention group nor for the control group ($F_s < 2$). Cognitive performance also remained the same in an open-plan setting over time ($F_s < 3.1$). However, we found a marked effect on performance among subjects in the intervention group for specific task spaces in the ABWs ($p < 0.001$). Performance was best in separated, insulated rooms for web meetings and projects, and worst in open-plan spaces where talking was allowed.

Conclusions: At the studied offices, cognitive performance in a memory based task was better in cell-offices compared to open-plan settings. In the ABWs performance was best in separated, insulated rooms. Further research need to better identify office concepts supporting productivity, and the types of tasks that would possibly benefit from being performed in specifically designed spaces and workstations.

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338 Organizational sustainable climate and practices as determinants of pro-environmental behaviours at work: the mediating role of personal norm

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Keywords: pro-environmental behaviours; organizational norms; personal norms

Abstract:

Pro-environmental behaviours in the work place, like resource saving, have a positive impact in the environmental, social and economic performance of organizations. This study aims to better understand the psychosocial factors that contribute for more sustainable work places. The study of these behaviours in the work place is recent and there still lacks research on the role of policies and practices at the organizational level over the adoption of such behaviours by the workers. This

study integrates contributions from both environmental and organizational psychology to examine how organizational level variables – climate perceptions and organizational sustainable practices (the injunctive and descriptive norms at the organizational level) – intervene in the pro-environmental behaviours reported by the workers. It is also tested, following the theoretical model of Thøgersen (2006), the mediating role of the personal norm as a pro-environmental worker in the relationship between organizational climate and the reported behaviours. 162 workers from different organizations responded to an online survey. Controlling the effect of age, education level and perceived pro-environmental organizational practices (descriptive norm), it was found that the pro-environmental organizational climate (injunctive norm) predicts the personal norm and the adoption of pro-environmental behaviours at work. This latter effect is partially mediated by the personal norm. The discussion focuses on the relevance of organizational level initiatives to promote change in individual level behaviours, with consequences for the sustainability of the work places.

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Thøgersen, J. (2006). Norms for environmentally responsible behaviour: An extended taxonomy. *Journal of Environmental Psychology*, 26(4), 247-261.

202 Interactions around energy use in the workplace: effects of legitimate and illegitimate overuse

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Keywords: Energy use; Organisational behaviour; Free riding

Abstract:

Introduction: It has been suggested that around 33% of greenhouse gas emissions in the UK and 17% in the US are released from shared buildings within the business sector (non-industrial). Increasing the efficiency of behaviour of employees in the workplace has enormous, and cost effective, potential in reducing greenhouse gas emissions.

Theoretical background: Energy in the workplace is shared between employees, so energy saving efforts need to be collective. We know from previous research that in this context, people can cooperate and reduce their energy use, and react negatively when people don't make any effort to save or free ride (FR) (Leygue, Ferguson, Skatova, & Spence, 2014). However, in the context of the workplace, as opposed to the home context, personal benefits to cooperate (i. e., to reduce one's energy use) are not financial but might be of reputation building or warm-glow feelings. With this study, we investigated what would be the emotional reactions to energy free riding in the workplace, and preference for institutional punishment to free riding. Importantly, in real life some people might have legitimate reasons to use more energy than others (e.g., for health reasons), so with the present research we also looked at the effects of varying the legitimacy of the free riding (Lotem, Fishman, & Stone, 1999).

Methods: Participants were recruited by a research company among an online panel (N = 1552). The sample represented a range of age, gender, and social grade. Participants were randomly assigned to one of 6 scenarios describing a workplace situation where a campaign to save energy is introduced, and where free riding (no FR vs legitimate FR vs illegitimate FR) and energy displays (average vs individual) were manipulated. Then they answered questions regarding their emotional reactions in the situation (PANAS), how they would react towards the free rider, and what would be their energy use in the future.

Results: Results show that legitimacy of free riding affected people's reactions: participants were happier and less angry when the free rider had a good reason to use more. Also, participants were more likely in this case not to react, less likely to want to punish the free rider (through a fine or confrontation), and more likely to want to reduce their own energy use in the future. Finally, preference for institutional punishment was affected by the type of display (preferred with named displays compared to average ones).

Conclusions: Energy saving campaigns in the workplace might affect interactions between employees. We observe that people can react negatively when somebody is using too much energy, and this even though employees are not expected to pay for their use. Implications will be discussed, including the importance of a clear policy regarding the legitimacy of energy use and reactions to energy waste, before the introduction of energy campaigns and monitoring in the workplace.

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PSIII-13 SUSTAINABILITY IN NEIGHBORHOOD SPACE: SOCIAL AND PSYCHOLOGICAL ASPECTS

Room:-1.2

227 Are neighborhoods social or environmental places? Social and environmental predictors of neighborhood maintenance

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Keywords: neighborhood maintenance; environmental bonds; social norms

Abstract:

There is evidence that perception of neighborhood maintenance, residential satisfaction, and community participation are related with neighborhood upkeep behaviors. However, studies have focused on their individual effects instead of the interaction among them. Furthermore, other variables, such as place attachment or social norms, have not received as much attention. We studied the influence of place attachment and social norms on the neighborhood upkeep behaviors of the residents. This work aligns with others proposing that bonds with the place encourage people to maintain the object of the link (Manzo & Perkins, 2006). That motivation comes from desires of protection and improvement that people have regarding places with meaning for them. Besides, we also included social norm due to the evidence that it has an important role explaining conservation behaviors (Hernández et al., 2010). We studied the contribution of all these variables as a set that could be able to predict individual behaviors regarding neighborhood upkeep. The instruments included were: neighborhood maintenance perception, neighborhood maintenance social norm, place attachment, residential satisfaction, community participation, and neighborhood upkeep behaviors. Each scale had acceptable levels of validity and reliability. The number of participants in this study was 407 (54.3% women) with an average of 38.7 (SD=14.4) year old; they belong to different neighborhoods with different economic status. We found that perception of neighborhood maintenance and social norm strongly predict individual behavior while residential satisfaction, place attachment, and community participation contribute to increase the explained variance. The observed relationship between social and environmental constructs, as well as their similar predictive capacity, points the need to develop new models that explicitly merge them. We discuss the relationship between social norm and maintenance perception as an explanation of the found results.

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318 Rehabilitation of deteriorated apartment housing through Community Space Reform in South Korea

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Keywords: Stock Apartment, Rehabilitation, Community Reform

Abstract:

Most apartments in South Korea have been built of 50 years, its stock accounted for 60% of total housing. Apartment building stock in excess 20 years, life reached 37.4%. Housing size and physical performance, and significantly lower apartment is to improve the environmental performance of the initial recovery, area expansion and enlargement of an apartment building. Some of improvement was accomplished by Physical aspects, and it contributed extending its use and life.

However, Korean people want more active remaking for the stock apartment, because most the stocks are excluded from the apartment complex designed in many aspects such as social space, residential community, has a fundamental limitation in improving the residential environment. The apartment has excellent physical performance to derive the composite model to reform and re-envision additional social functions and spaces were not built at the time, and try to ensure a variety of community space built in recent years, realizing social changes and desires.

In this point of view, this research deals the subjects and targets of the Korea Stock apartments, selects the type of typical mass-produced apartments. Research method to handle complex consists of a social space in a residential complex composed mainly housing units and extracting representative social space types in an apartment complex, architectural configuration of the composite type of building dynamic, complex place, and the regulations and proposed by the Building Act.

The results of this study suggest a model that combine functional performance improvement and social functions for typical apartment model. This model is an alternative to increase the satisfaction of the residents' social space and community pace. As a result, the social reform of the old housing can solve the dissatisfaction factors of the old apartment, extend house life cycle, and we can get sustainability.

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189 Environment-behaviour studies in Architecture & Urbanism: Integrating disciplines

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San José, Costa Rica

Keywords: Architecture & Urbanism; Environment-Behaviour Studies; Interdisciplinarity.

Abstract:

Introduction: The subject of study in this research is the possible disciplinary integration of Environment-Behaviour Studies (EBS) in Architecture & Urbanism (AU). Understanding that AU is a discipline in constant change and that it synthesizes and adapts to knowledge from other peripheral disciplines, one could argue that EBS should contribute to the development of the teachings and practices of AU as one of its fully integrated fundamental pillars, not as a partially unfamiliar and foreign research.

Theoretical background: Consequently, we will attempt to answer the following problem: how to recognize these two disciplines and organize their content to facilitate the incorporation of EBS into AU?

This effort can be considered valid due to the facts that EBS is still a young research field, and its interaction with AU is still timid; they still require consolidation on their own and, particularly, if combined. Additionally, the research in psychological criteria for design can contribute to the development of somewhat unachieved social sustainability levels and to the lack of a more comprehensive approach on ecological theories in AU.

Generally speaking, this research seeks to attract attention both from the architectural, and behavioural sciences communities. More directly, it represents a tool to facilitate the understanding of EBS and AU for each respective audience, to tentatively include EBS within the wide architectural practice and teachings of AU, and to suggest guidelines and strategies for the development of related, future researches.

Methods: Following a grounded theory methodology, this work collects and analyses related data from these two parallel disciplines with an inductive approach as a first phase. This will define both components of the synthesis (EBS and AU) according to their scales of application, their theoretical configuration, and their state of the art. A second phase determines a line-of-argument and critical interpretive synthesis to describe the outcome in terms of degrees of integration, ontological organization, and predictable practical consequences, producing a map of the new contents and their co-relations.

Results: The expected outcome is an organizational, unified diagram to illustrate, describe, and characterize this possible ontological model for disciplinary integration. It represents a graphic visualization of the merged components, the defined process, the role of multi-, cross-, inter-, and trans-disciplinarity in the synthesis, and the new possible internal dynamics.

Conclusion: This investigation culminates with idealistic considerations on the future of AU, its protagonism shaping human solutions for upcoming challenging environments, and the worth of reinforcing architectural theory with behavioural sciences contributions. A final debate is presented on the need to structure and organize human knowledge as a strategy to allow a more pertinent academic progress.

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PSIII-14 PREDICTING PRO-ENVIRONMENTAL BEHAVIOR: MOTIVATIONS, VALUES AND NORMS

Room: -1.3

298 Predicting eco-driving intentions: The role of a value versus knowledge-triggered norm-activation process to eco-drive

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Abstract:

Introduction: Car-driving has a negative impact on the environment due to increased CO2 emissions (Wengraf, 2012). One way for drivers to reduce CO2 emissions on the road is by eco-driving. But what are those factors that predict driver's intention to engage in eco-driving?

Theoretical background: In the current study, we employed the Value-Belief-Norm Theory (VBN, Stern, 2000) to investigate the antecedents of eco-driving intentions. We reason that personal norms are important predictors of eco-driving, and that personal norms are activated when people are aware of environmental problems caused by behaviour (problem awareness, PA) and believe that they can contribute to the solution of the problem by changing behaviour (outcome efficacy, OE) (Steg et al., 2014; Schwartz, 1977). Notably, we test two antecedents of this norm activation process: values (i.e., biospheric, altruistic and egoistic values) and environmental knowledge (i.e., general knowledge on causes of and consequences of global warming, and specific knowledge on CO2 emissions resulting from car use).

Method: Data were collected by going door-to-door in different neighbourhoods in the north of the Netherlands. Respondents (N= 83) filled in a questionnaire asking about their values, norms, environmental knowledge, and intention to eco-drive.

Results: Results revealed that in comparison to environmental knowledge, values, and –in particular biospheric values –better predicted intention to eco-drive. More specifically, biospheric values predicted a high problem awareness for environmental harm caused by car use, which then promoted outcome efficacy beliefs and personal norms for eco-driving. As such, biospheric values triggered a process of norm-activation to eco-drive. Environmental knowledge types were found not to predict problem awareness for car-use, meaning that knowledge did not facilitate a norm activation process to eco-drive.

Conclusions: Our findings have implications for both theory and practice. In terms of theory, our findings support the chain model in the VBN Theory, by showing that intentions are indeed predicted by a value-triggered norm-activation process. In terms of practice, our findings suggest that interventions aiming at enhancing environmental knowledge, for example via information campaigns, might not be sufficient to make people develop intentions to eco-drive. Based on our findings, we conclude that biospheric values, as general predictors of pro-environmental behaviours, are more effective in motivating people to eco-drive than providing knowledge. Interventions on eco-driving should therefore emphasize the environmental benefits of eco-driving, thereby speaking to people’s biospheric values.

Keywords: Eco-driving, Pro-environmental behaviour, Value-Belief-Norm Theory

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026 Beware the backfire effects: self-affirmation, information about the worst effects of climatechange being avoidable, and pro-environmental motivation

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Abstract:

Introduction: The likely severity of climate change effects in the future has been widely acknowledged. Individuals’ and governments’ inertia in the face of global climate change is subsequently often commented upon with exasperation. Interventions designed to change individuals’ attitudes and behaviour have attracted a good deal of enthusiastic attention while, at the same time, they have been criticised from other quarters as ineffective in proportion to the magnitude of the environmental problems that the planet faces.

Theoretical background: There is some limited evidence that self-affirmation manipulations (Steele, 1988) can have beneficial effects in terms of pro-environmental motivation (Sparks, Jessop, Chapman & Holmes, 2010), although the existence of backfire effects highlight the need to examine the boundary conditions of these manipulations (van Prooijen, Sparks & Jessop, 2013). There is also recent evidence in the system change motivation literature (Johnson & Fujita, 2012) that presenting people with information that a system is amenable to change can heighten motivation to be critical of that system. We drew upon both these lines of research in the studies reported in this paper. We focus on (i) the motivational effects of providing information to people about how the worst effects of climate change might be avoidable (or unavoidable), and (ii) the influence of a self-affirmation manipulation on the pattern of findings.

Methods: Two online questionnaire studies were conducted. The first study (N = 122) involved a 2 x 2 design with self-affirmation (self-affirmation, no affirmation) and information type (‘worst effects

are avoidable', 'worst effects are unavoidable') as the independent variables. The second study (N = 113) involved a one-way design with three levels of self-affirmation (all participants received the same 'worst effects are avoidable' information): morality affirmation, competence affirmation and control (following Jessop, Sparks, Jessop, Dodds & Lynch, 2016). In both studies, the key dependent measures were measures of pro-environmental behavioural intentions.

Results: In the first study we found that the self-affirmation manipulation had a detrimental effect on pro-environmental motivation (in the form of lower intentions) when participants were presented with information suggesting that the worst effects of climate change were avoidable. In the second study, when the same 'worst effects are avoidable' information was presented, the morality affirmation led to lower intentions to engage in pro-environmental action than did the competence affirmation.

Conclusions: While this programme of research is ongoing, the results of these studies draw attention to the dangers of employing self-affirmation manipulations under conditions of no threat, to the widely-discussed possibility that self-affirmations in the same domain as that of the threat may contribute to no effects or to backfire effects, and to the idea that under certain conditions self-affirmation manipulations may exacerbate licensing effects and serve to maintain the status quo (cf. Becker & Sparks, 2016). Implications for applications of self-affirmation interventions to promote pro-environmental action are discussed.

097 Why (should) I bother? Senior secondary school students' motivational profiles toward the environment

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Keywords: MTES, motivational profiles, students

Abstract:

Introduction: Worldwide, consensus has grown about the impact of climate change on human living conditions. Moreover, human activity is universally recognised as being one of the major factors that contribute to global warming. Consequently, the importance of scientific research on the causation of environmental behaviour of individual citizens and its impact on environmental education can hardly be overestimated. Growing insight into the mechanisms of motivation is attracting scholarly attention in an effort to find mechanisms with a potential for explaining environmental behaviour.

Theoretical background: Almost 20 years ago, Deci and Ryan's self-determination theory (SDT; 1985b) was applied to motivation toward environmental behaviour and one of the perspectives was to develop and validate a questionnaire which also resulted in a measuring instrument, the Motivation Toward the Environment Scale (MTES; Pelletier, Tuson, Green-Demers, Noels, & Beaton, 1998). Answering a call by Villacorta, Koestner, and Leke (2003) for further validation within secondary school students outside Canada, the current study's aim was to validate the MTES within a sample of senior secondary students in Belgium.

Methods: The MTES consists of 24 items tapping into the six types of motivation as distinguished by Deci and Ryan's SDT (1985b), with four items per motivational type all answering the core question of why people do things for the environment. Within a sample of 779 Dutch-speaking senior secondary school students, aged 17 to 19, in the north of Belgium, reliability and construct validity of a Dutch translation of the MTES were verified through calculation of Cronbach's alpha and confirmatory factor analysis, respectively. Furthermore, a person-centred approach for identifying motivational profiles was added. This innovative use of a variable-centred as well as a person-centred approach yielded complementary information.

Results and conclusion: For reasons of construct validity, identified motivation was excluded, since this type of motivation constituted a breach of the simplex pattern that was to be expected. However, reliability and validity of a five-scale Dutch version of the MTES, excluding identified motivation, were confirmed. Using cluster analysis, four meaningful motivational profiles emerged: a consistently motivated group (i.e. high on all types of motivation except amotivation), an inconsistently motivated group (i.e. high on all types of

motivation except externally regulated), a moderately motivated group (i.e. moderate scores on all five motivational types), and an unmotivated group (i.e. low on all types of motivation except amotivation). Amotivation scored medium to high in all but one of the profiles. Theoretical implications of these findings and suggestions for interventions such as education programmes, and further research are discussed.

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281 Exploring beliefs on sustainable transport choices: The case study of the metropolitan area of Cagliari (Sardinia, Italy)

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Keywords: focus group; design features; transport-mode choices

Abstract:

As stated by the European Commission, the transport sector accounts for almost a quarter of Europe's greenhouse gas emissions, thus representing one of the most important environmental issues of our age. Research literature on sustainable mobility has demonstrated the impact of psychological and instrumental factors in travel choices. However, studies comparing such impact among different types of transport users are still lacking.

In order to explore the different perceptions and experiences of users concerning different means of urban transport, a qualitative study was carried out in the city of Cagliari (Sardinia, Italy), in parallel with the development of the light-rail connecting various zones of its metropolitan area.

The aim of the study was to detect users' views about those attributes associated to different means of urban transport, with specific focus on the difference between less sustainable (i.e., private car use) and more sustainable (i.e., light-rail, bus, tram, etc.) travel choices. Design features (of both interiors and stops) and safety issues were also considered.

In order to detect which aspects are the most relevant in influencing the personal travel choice, four focus groups (from 6 to 10 participants each, all of them residents in the metropolitan area of Cagliari) were held. In the first two focus groups, focusing on general transport issues related to Cagliari, participants were private car users in the first group and public transport users in the second group. In the other two focus groups, focusing on the specific issue of the on-going development of the Cagliari light-rail "MetroCagliari", participants were light-rail users in the first group and not-users in the second group.

Each focus group was conducted by two experts, and each session was digitally recorded and then transcribed. Analysis of transcripts was effected on the basis of a conceptual grid including core themes and socio-psychological constructs emerged in literature. The type of procedure is close to the template analysis proposal (Brooks et al., 2015). The R software (RQDA package) was used for coding and decoding procedures.

An array of recurrent themes emerged across the focus groups. As expected, light-rail, bus, and car users have expressed similar opinions about which instrumental factors motivate different transport choices (e.g., ticket price and stress reduction for the public transport use; independence and rapidity for the car use). Specific socio-psychological patterns such as perceived behavioural control, habit, social norms, and awareness of consequences of car use were detected as underlying reasons of transport choices. Consistently with previous research (Steg, 2005), symbolic and affective drivers also emerged as essential aspects in the travel choices of both car and public transport users. Further outcomes of this study will be discussed in the light of its practical implication for the specific context under analysis.

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239 Improving estimations of interventions effects on sustainable behavior: The problem of highly biased samples and a way out

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Keywords: sustainable behavior, smart-meter based feedback, self-selection bias

Abstract:

Studies in environmental psychology that target behavior change come with some challenges regarding the generalizability of results (Kaiser & Henn, in press). We argue and show that most studies on behavioral and psychological aspects of sustainable consumer behavior draw an overly optimistic picture of the efficacy of interventions, and we propose a way to account for such distorted efficacy estimates.

Environmental psychological behavior research aims to change specific sustainable (consumer) behaviors, such as reducing household energy consumption or recycling electronic waste. This knowledge shall inform sustainable policy making to possibly be applied large-scale. However, pro-environmentalism, and thus, sustainable behavior are strongly related to the willingness to voluntarily answer surveys (McClintock & Allison, 1989; Van Lange, Schippers, & Balliet, 2011). In other words, people who behave more sustainably than others will more likely participate in studies in general and in studies on sustainable behavior in particular. Thus, in a study on sustainable behavior, the share of people who behave sustainably and who are willing to adopt even more sustainable behavior is much higher than in the general population. As a consequence of this self-selection bias, such studies must be presenting overestimations of the efficacy of a given intervention measure.

Using original data sets from policy intervention studies, we exemplarily quantify the self-selection bias that could lead to misinformed conclusions. One of these studies that dealt with the introduction of smart meters found that the common way of interpreting the results would have overestimated the efficacy of smart-meter based feedback by almost 50%. Furthermore, we show how to correct the efficacy estimate to represent a much more realistic evaluation.

In order to account for the overestimation of the efficacy of interventions, we show that only two components are necessary: a representative sample and a reliable and valid behavior-based item-response measure of people's pro-environmental motivation. In our examples, the representative sample is based on the highly renowned German Socio-Economic Panel (the SOEP) surveyed in 2012, and the motivational measure is the General Ecological Behavior scale (Kaiser & Wilson, 2004), a measure with high validity, that allows to easily and reliably compare samples across time and situations, with a substantially reduced social desirability bias.

Overall, we show the detrimental effect of overly optimistic evaluations of intervention studies which address individual sustainable behavior, and we present a way to account for this effect to responsibly inform policy making.

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272 Guided Brown Bear walks as an intervention to address human fear of brown bears

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Keywords: guided walks, fear, brown bear, transdisciplinarity

Abstract:

During the last decades wildlife populations have been increasing throughout Europe (Chapron et al., 2014). The increasing presence of certain species may to some people enhance the recreational qualities of local nature and so residential quality as well. To others, the same animal species would constrain recreational and residential quality, since they are concerned about or even fear an encounter (Kubo & Shoji, 2014).

In areas with brown bears (*Ursus arctos*) the local population may limit outdoor activities due to fear of an encounter. So far, such fears have largely been met by information about brown bear biology, with mixed outcomes. It has been proposed that habitat exposure and role-modeling may reduce animal fear beyond fear of snakes and spiders. In a previous study self-reported fear of brown bears was reduced after a guided walk close to brown bear in the wild, but not after a guided forest walk immediately after the walk (Johansson et al., 2016). Based on theory of emotional appraisal (Scherer, 2001) this study aimed to i) compare the effect on fear of brown bear of guided walks in three different types of habitat exposure and ii) assess the long-term effect on fear of the guided walks.

In collaboration with the Scandinavian Brown Bear Project and Orsa Rovdjurspark a quasi-experimental study with a between-subject design, was set-up. Seventy-five participants (79% female, 20-84 yrs) in small groups completed a guided walk either close to a radio collared brown bear, along old tracks of a radio collared brown bear or within the local large carnivore zoo.

The walks were highly appreciated by all participants and they also scored significantly higher on the knowledge test after the walk. In all three groups, ratings of experienced valence in relation to a brown bear encounter significantly increased, ratings of vulnerability decreased as well as self-reported fear of attacks of brown bears significantly decreased immediately after the walk. Moreover these effects were stable in a three month follow-up and the participants reported significantly less avoidance behaviour than before the walks. It is proposed that the guided walks in collaboration with local management should be further developed as a management tool to address the public's fear of brown bears.

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003 Relationships between people's feelings toward nature and their daily nature-related activities

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Keywords: nature connectedness; childhood experience; daily activities

Abstract:

Introduction: There is growing interest in people's nature connectedness when considering the human–nature relationship, and studies have shown that people with stronger nature connectedness experience higher levels of psychological well-being (e.g., more happiness). Although nature connectedness is often considered to be a sort of personality trait and a stable individual characteristic, it could also be facilitated through their experiences with nature.

Theoretical background: It is often said that people's nature connectedness is affected by their childhood experiences with nature; however, few studies have investigated the relationships between people's childhood or present daily nature experiences and their feelings toward it. Therefore, the author examined daily activities that include contact with nature and people's feelings toward nature, including their nature connectedness.

Methods: The author assessed people's positive and negative feelings toward nature and their daily activities, using questionnaires. To assess feelings toward nature, the Feelings toward Nature Scale (FNS; Shibata, 2016) was used. The FNS is a 20-item scale that assesses people's affective response to natural environments and consists of 5 subscales (Restorativeness, Oneness, Concern, Mystery, and Aversion; each subscale consists of four items). The daily activities assessed in the questionnaire were frequency of contact with nature, fishing or insect-catching during childhood, living in a green area, spending free time in a green space, and gardening. Each of these was assessed with one item.

The participants were male (282) and female (247) adults who reside in Japan. The mean age of the participants was 47.59 years ($SD=13.11$; range: 20–84). The data were collected through a web survey.

Results: The effects of daily activities on feelings toward nature were examined using SEM analyses. In the SEM model, FNS items were entered first into a five-factor confirmatory factor analysis model, and daily activities, gender, and age values were used as the exogenous variables. In the initial SEM model, regressions were hypothesized from all the variables to the FNS's latent factors. Then, the model was modified by removing non-significant regression paths. The fit indices of the final model indicated that the model has a moderate fit ($RMSEA=.077$, $CFI=.876$).

The results showed that activities that included active involvement with nature—i.e., insect-catching during childhood and gardening in the present—had a significant influence on all five feelings toward nature. Both activities showed negative influences on “aversion” and positive influences on the other four feelings toward nature. The effect on the feeling of restorativeness was highest among the childhood activities, and that of oneness was highest among the present activities.

Conclusion: The results of this study showed that childhood experiences with nature are important to one's feelings toward as well as the current experience with nature. In addition, it is suggested that just being exposed to nature is not sufficient for affecting one's feelings toward nature.

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Shibata, S. (2016). Development of the Feelings toward Nature Scale and relationship between feelings toward nature and proximity to nature. *The Japanese Journal of Psychology*, 87, 50–59. <http://dx.doi.org/10.4992/jpsy.87.14075>

161 Greening school grounds: the benefits of greening a school ground on primary school children's wellbeing and functioning.

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Keywords: children, green space, wellbeing, functioning, restorative quality

Abstract:

In a prospective intervention study with a two years follow-up we investigated the benefits of greening school grounds on various domains of children's wellbeing and functioning. Ten schools situated in the western part of The Netherlands with approximately 800 children (age 7-9) took part in the project. At pre-measurement in spring 2014 nine school grounds were paved, one school ground was green. Five more schools greened their school ground between pre-measurement and first follow-up in spring 2015. Between first follow-up and second follow-up in spring 2016 these five schools maintained and further developed their green school ground. Data collection covers a broad set of objective and self-reported measurements. In this presentation we will focus on first general results of the multilevel analyses performed to investigate the impact of greening school grounds on children's perception of the school ground, their social behaviour and level of physical activity at the school ground and their health and emotional functioning. In the classroom, questionnaires were used to assess children's perceptions of the school ground (grade, appreciation, naturalness and restorativeness), social behavior on the school ground and, their health and emotional functioning (Pediatric Quality of Life Inventory (Varni et al, 1998)). During recess, physical activity was measured with accelerometer. Preliminary results confirm the hypothesis that greening a school ground positively affects children's perceptions of the playground. Furthermore, our study showed that greening a school ground has a positive impact on physical activity levels of girls, but was not related to self-reported social behavior at the school ground, health and emotional functioning.

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184 The effect of green areas within school environments upon child's attentional, emotional and prosocial components

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Keywords: attention restoration, nature, schools, children

Abstract:

Restoration theory involves the renewal of people's physical, psychological and social resources diminished because of their efforts to meet everyday demands (Hartig, 2004). Restorativeness and Attention Restoration Theory (Kaplan & Kaplan, 1989) are based on the four components of restorative environments, as well as on directed attention; it requires mental effort and is prone to attention fatigue, that can be boosted by restorative environments. Several researches studied restorativeness in various contexts, also in educational settings, reporting: higher restoration of school playgrounds than school libraries (Bagot, 2004); increases in concentration, attention and self-discipline for children at home with an outside natural environment (Wells, 2000); vegetation in schools yards is important for a restoration process (Arbogast, Kane, Kirwan and Hertel, 2009) both for pupils and staff. In literature not many studies address restorativeness effects on children at primary school level using field experiments comparing different environments. The aim of this research is to examine whether or not the presence of nature in schools exerts restorative effects

on pupils' attentional, emotional and prosocial components: children are tested in their own school during school-time. In a first experiment, the tested hypothesis is that a natural (vs built) environment would exert a restoration effect on pupils' different attention components. With a within-subject design pupils' attention was measured by three standardized tests before and after recess-time, in two different conditions: play in a natural and a built environment. The perceived restoration effect was measured after each recess-time in both experimental conditions. In a second experiment, in line with the first, both a within and a between-subject design were used to test the attention restoration hypothesis provided by a natural (vs built) break after standardized scholastic performance tests. In line with the previous experiments, in a third and fourth experiments a between-subject design was used to test the restoration effect provided by a natural (vs built) break on pupils' attentional, emotional and prosocial components. Repeated measures ANOVAs showed a positive effect of the natural environment on concentration, sustained and selective attention and positive emotions. The natural context is perceived as more restorative than the built. Scholastic performance seems to be stable and not subject to a rapid change. A break in a natural environment during school-time can help attention restoration and pupils' positive affect; theoretical and practical implications are discussed.

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349 Forest school: Wellbeing and nature connectedness

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Keywords: Forest school; connection to nature; wellbeing

Abstract:

Introduction: There has been growing interest in forest school's utility as an intervention for educative purposes and more recently for building social skills, self-confidence and self-esteem (Massey, 2005). Moreover, there is a growing body of evidence to suggest that experiential contact with nature can promote greater emotional connectedness with it (e.g., Sparks, Hinds, Curnock, & Pavey, 2014).

Theoretical background: There seems to be an acceptance that forest schools have a positive impact on people albeit without rigorous supportive empirical evidence (Cook, 2012). Given the diverse array of research regarding the benefits of nature contact and that the effects of forest school are under-researched, the present research investigated the relationship between forest school participation, wellbeing and nature connectedness.

Methods: A questionnaire design was employed at two different time points to assess the effectiveness of the forest school experience for wellbeing (Warwick Edinburgh Mental Well Being Scale), Sense of Mastery (from the Resiliency Scales for Children and Adolescents), Connection to Nature Index (Cheng & Monroe, 2010).

Results: Tests of difference were conducted between two time points to discern the effects of forest school. Initial results indicate that only a Sense of Mastery significantly increased overtime. However, secondary analysis revealed that there were definitive gender differences that affected the results. Despite females having larger mean scores for almost all measures only males showed significant positive increases overtime for all variables. Furthermore, a regression analysis was completed and found that a sense of mastery ($\beta = .60$, $p < .001$), nature connection ($\beta = .15$, $p = .036$) and early environmental experiences ($\beta = .18$, $p = .009$), predicted wellbeing explaining 54% of the variance ($F(3, 119) = 47.10$, $p < .001$).

Conclusions: Forest schools may be able to provide benefits to wellbeing as well as building nature connections.

059 Road lighting and reassurance – cognitive, emotional and behavioural responses

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Keywords: Road lighting, reassurance, perceived safety, physiological response

Abstract:

Introduction: A key purpose of road lighting for pedestrians is to make people feel safer and reduce fear of crime. Increasing feelings of reassurance after-dark can encourage more walking, reduce social isolation and improve physical and mental well-being. It is therefore important to understand what road lighting conditions are most likely to enhance feelings of reassurance after-dark.

Theoretical background: The experience of reassurance has three components: a cognitive appraisal, an emotional reaction, and a behavioural response (Gabriel & Greve, 2003). Here we report an in-the-field experiment to assess the influence of lighting on these three aspects of reassurance, to identify optimal lighting conditions that make people feel safer after-dark. Our goal is to identify the impact road lighting has on feelings of reassurance. A common approach is to evaluate reassurance on roads lit to different light levels: this however suffers stimulus range bias and offers only the trivial finding that more light is better (Fotios & Castleton, 2016). To overcome this and isolate the influence of lighting from other factors that may contribute to feelings of reassurance, such as neighborhood reputation, the day-dark method is used, as proposed by Boyce et al (2000). This involves recording ratings of reassurance during both daylight and after-dark conditions on a number of different streets. The difference between daylight and after-dark ratings provides a measure of the relative effectiveness of lighting on that street. A large difference would suggest the lighting may be relatively ineffective.

Method: Alongside category ratings of safety, we also record two further involuntary responses to reflect the combined cognitive, emotional and behavioural components of the experience of reassurance. First, electrodermal activity and heart rate variability of participants are recorded, providing physiological data that reflects their emotional response to being on the street. Second, eye movements and fixation behaviour of participants are recorded using mobile eye-tracking, providing a behavioural measure of reassurance. Twenty four participants walked along ten separate streets in a residential area of Sheffield, UK, during daylight and after-dark. They completed a short questionnaire on each street that included questions about perceptions of safety. A sub-sample of these participants were also equipped with an eye-tracker and physiological measurement equipment to record skin response and heart rate data.

Results and Conclusions: We present results from a real-world experiment in which cognitive, emotional and behavioural measures of reassurance are recorded under daylight conditions and different road lighting conditions after dark. This data will provide a deeper understanding of the impact road lighting has on pedestrian reassurance. We test the hypothesis that higher illuminances reduce the day-dark difference in measures of reassurance, but that a plateau is reached at higher illuminances.

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234 Measuring the effect of dynamic lighting on pedestrian speed by means of overhead Kinect™ sensors and continuous pedestrian tracking algorithms

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Keywords: Pedestrian behavior; Lighting; Crowd management

Abstract:

For centuries the main aim of public lighting has been to support human functioning at night by providing visibility and a general sense of safety. However, current developments in solid state lighting (e.g., LEDs), lighting controls (e.g., wireless communication protocols) and related developments in smart city technologies (e.g., data-driven city management) provide an impulse to think about novel, and hitherto largely unexplored lighting-based services that include, amongst others, the application of dynamic lighting for crowd management during large events (den Ouden et al., 2014). Although research has been conducted on the efficacy of using dynamic lighting during emergency evacuation (e.g., Jin & Yamada, 1994; Ronchi et al., 2016), there is no research to date that has tested the efficacy of using lighting for crowd management in non-emergency situations, for example by 'nudging' crowds to adjust their direction and walking speed. In the present study we explore how different dynamic lighting patterns affect pedestrian flow—in particular walking speed—using an array of Microsoft Kinect™ sensors and state-of-the-art continuous pedestrian tracking algorithms developed in house (e.g., Corbetta, et al., 2016).

The experiment was conducted during the Glow festival in Eindhoven, the Netherlands from November 12 to 19, 2016. Being a large scale event, Glow is a representative occasion for conducting a naturalistic study on the use of dynamic lighting for crowd management in a city. The location of the experiment was the living light lab Markthal of the Intelligent Lighting Institute (ILI); a 75 by 62.5 meters roofed space equipped with various LED light sources and an array of three by four Kinect™ sensors. An approximately 12 meter wide path was demarcated by means of rope barriers, and an approximate 245,000 people passed underneath the sensor array during the experiment, as based on preliminary real-time analysis. Ten different dynamic lighting patterns and one static (i.e., non-dynamic) and more or less homogenous control pattern were displayed on an array of 24 by 20 ceiling-mounted LED modules and an additional 36 LED lamps directed towards the ceiling. Dynamic patterns consisted of a light wave which moved in one of four directions at different speeds: along with the crowd (at 0.5, 1.0, 3.0, 12.5, or 25 m/s), in the opposite direction of crowd (at 1.0, 12.5, or 25 m/s), or perpendicular to the crowd from either the left or the right (both at 12.5 m/s). All light patterns were displayed multiple times, each time for 8 minutes, in a randomized order for a total duration of 39 hours.

In our presentation we will present and discuss the preliminary results of the experiment. In addition, we discuss the potential of sensor technology and related data analysis algorithms for research in environmental psychology.

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257 The concept and measurement of atmosphere as an attribute of the socio-physical environment related to the development of aggression

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Keywords: Aggression; atmosphere; socio-physical context

Abstract:

Introduction: Aggression is a behavior, which besides biological modifiers and personality characteristics is strongly influenced by socio-physical environment (Anderson, Deuser, & DeNeve, 1995).

Theoretical background: Because of the environmental and contextual influences the development of aggression is best understood through continuous cycle of interactions between people and environment (Goldstein, 1994). Most research on aggression to date, however, have predominantly studied aggression as behavior emerging from and within individuals, and influenced by contextual stimuli (e.g., the presence of aggressive symbols) rather than considering the socio-physical environment in a more holistic manner. (i.e., Donnerstein, Wilson, 1976; Geen, 1978; Bushman, Anderson, 2000).

Methods: We present two field studies investigating aggression in a naturalistic urban night life setting: Stratumseind in Eindhoven, The Netherlands. In our first field study we took an ecological and holistic perspective to investigate the role of the socio-physical environment in the development of aggression. Using different qualitative techniques (e.g. onsite, offsite interviews, observations) and multiple information sources (e.g., business representatives, police and visitors) we studied ongoing behavioral patterns of the crowd together with the changes in the socio-physical environment that co-occurred with the development of unwanted behaviors, including aggression. For this purpose, we refrained from targeting aggressive behavior by single individuals, but focused on changes in the crowd's behavior over time. In a second field study we aimed to quantify the dynamic changes in the atmosphere (the concept that was identified in the first study) by means of methods conventionally used in psychology and aggression research, including the Self-Assessment Manikin (Lang, 1980) for measuring crowds mood, and hostility bias tests (Anderson, Bushman 2002) to capture the aggressive tendencies, and structured observations to record changes in crowd behavior and in the state of the environment. Finally, we included police reports containing evaluations of the general atmosphere of a night to validate the included measures.

Results: In first study, atmosphere—a mood-like, but extra-individual state of the socio-physical environment—was identified as a real and tangible characteristic related to evolution of aggression. 'Real', because it affects the behavior of groups and individuals by emerging from and feeding into ongoing social interactions between people and the environment, and 'tangible' because it is sensed by individuals present on the street. Atmosphere consists of multiple components – crowd affect, behaviors (actions, interactions) and the state of the physical environment (e.g., litter, broken glass) at a given time. In the second study we learned that the use of surveys is by large ineffective for recording the affective component of atmosphere, however observations and expert evaluations of the atmosphere proved extremely insightful. After this quantitative field trial we revised atmosphere instruments and are, at the moment, preparing another field study to pursue the desing of the tool to measure atmosphere.

Conclusions: The concept of atmosphere is related the development of aggressive behavior. The atmosphere is a composite of crowd affect, behavior and physical environment. Thus, the instruments that are intended to measure the atmosphere have to capture these different components. So far not all the conventional methods proved to suit measuring atmosphere.

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360 Neurophysiological measures for perception of insecurity in urban landscape

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Keywords: urban unsafety, neuroarchitecture, risk factor

Abstract:

Safety is a multidimensional construct and theoretical approaches focus on physical and social levels of its determinants and consequences. Some physical features of environment affect human perceived safety that involves physical space, possession and identity but also dominance, control, conflict, safety arousal and vigilance. According to Ferraro (1995) fear of crime, comprise "an emotional response to crime or symbols that a person associates with crime". Fear of crime' is used in a wider sense, referring to the emotion experienced (e.g., perceived safety, perceived risk, perceived threat) rather than actual crime. Physiologically speaking, fear involves a series of complex changes in bodily functioning that alerts an individual to potential danger. Inhabitants that perceive clues of disorder and incivilities in their immediate environment feel more vulnerable, more at risk, more fearful than others do. Following literature about Cumulative Risk Model (Evans, 2003) and perception of Safety / Fear of crime (Ferraro, 1995), a first aim of the present research is to understand if and how cumulative presence of risk factors can influence perception of urban unsafety, using neurophysiological methodologies, such as EEG and eye-tracking. In a first experiment, the tested hypothesis show that proposed urban landscapes (realistic but not real, in order to control for the level of familiarity and attachment to place) are emotionally neutral. Tested neutral images of urban photos from IAPS (International Affective Picture System) database work as baseline. The three most neutral ones were selected to be used in the following studies. In study 2, insecurity/security graphic elements were inserted into the images previously selected by study 1. Furthermore physical order/disorder elements were chosen according to the literature (Bilotta, 2010) and their graphic transposition further tested with a self-report scale in order to test safety/ unsafety level. A linear regression reveals that with an increase/decrease in physical order and disorder factors, perception of safety/ unsafety correspondingly increases/decreases. In study 3 implicit and physiological measures (EEG and eye-tracking glasses) and qualitative interviews display avoidance/approach degree. The experimental session assessed neurophysiological activities by activation state-level of brain (EEG), where visual attention is focused (eye-tracker) and degree of perceived urban unsafety (interviews). Results of previous researches (self-report) about perception of urban unsafety show that increasing risk factors number produces an increase of perception of urban unsafety (Bilotta, 2010). Present findings will be analyzed in order to show if and how EEG and eye-tracker methodologies, along with the measurements of explicit variables, could be used to obtain hidden information, not obtainable otherwise, and, most importantly, how these tools could help to analyze the perception of unsafety urban escape.

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020 Facial Emotion Recognition: A characteristic task for interpersonal judgements between pedestrians

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Keywords: lighting; pedestrians; interpersonal judgements

Abstract:

Introduction: Imagine that you are walking alone, after dark, along a public footpath. Ahead you can see another person or group of people: what visual cues influence the choice of whether or not to continue walking in the same direction or to take action to avoid approaching any closer? This research reviews the current literature on pedestrians' responses to other people with the objective to identify theoretically relevant, ecologically valid and reliable response measures for experimental research of outdoor lighting.

Theoretical Background: Theory of human-environment interaction (e.g. Küller, 1991) proposes that the response would be the result of an appraisal of another persons' intention that in turn is based on the person's perception of environmental cues such as the lighting conditions and the perception of social cues. In the review the focus is in particular upon the social cues used in the appraisal other people's intent and the procedure(s) that might be used to assess these cues in experimental work on pedestrians' responses in artificially lit urban environments.

Method: The study was carried out as a narrative literature review, based on peer-reviewed articles in international scientific journals. The papers were identified through searches of key journals for lighting and environmental psychology and in the list of references of the retrieved papers. In the analysis the papers were organised and reviewed with regard to the social cue and the assessment method used.

Results: The human body, the face and the gaze direction provide important social cues in the appraisal process. In trials of identity recognition where either the whole body, the body only or the face-only were visible to observers, it was found that the face gave the more important cues. Eye tracking also suggests a tendency to spend more time looking at the face than at the body. When observing the face, two evaluations may be relevant: identity and intention. Past lighting research has tended to use identity recognition, but this work has not led to consistent conclusions. One reason for this may have been a failure to consider the method used, e.g. a matching, naming or recognition-rating task, as the varying difficulty of these leads to different conclusions. The identification judgement may be confounded by familiarity with the target person. This may be avoided by focusing instead upon facial emotion recognition, captured by recognition of universally recognised expressions such as happy or angry, and there is evidence that approachability judgments are driven by facial expression.

Conclusion: It is concluded that the face presents the most relevant stimuli to address in studies of outdoor lighting for pedestrians. Previous research also suggests that it should preferably be assessed by a facial emotion recognition task.

133 Walking after dark - The impact of outdoor lighting on pedestrians' perception, evaluation and behaviour

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Keywords: Outdoor lighting, walking, perception

Abstract:

Walking is an important part of a sustainable transportation system (Rastogi, 2011), which reduces CO₂-emissions and improves the living conditions on a local level (Wilson, Wilson, & Krizek, 2007; Xia et al., 2015). Walking does also bring benefits to the public health, by reducing the risk of chronic diseases such as cancer, diabetes and heart disease (World Health Organization, 2009). During the hours of darkness, pedestrians rely on outdoor lighting to provide visual accessibility, perceived safety and facilitate mobility. As a consequence, outdoor lighting has been found to increase the amount of walking after dark in all age groups (Addy et al., 2004; Corseuil et al., 2011; Jago, Baranowski, Zakeri, & Harris, 2005; Lee & Moudon, 2008). Today, energy-efficient LED applications are replacing previous technologies. The present study aims to further the understanding of how different LED applications influence the pedestrian's perception, evaluation and behaviour in the lit environment. In a previous study conducted in a full-scale laboratory methods were identified that discriminated between different lighting application by assessing critical pedestrian tasks, perceived lighting quality and the emotional state of the pedestrians (Rahm & Johansson, submitted). This study applies those of the identified methods feasible for outdoor use in a field setting, allowing for a more realistic evaluation with greater ecological validity. Along a 90 meter stretch of pedestrian path in an urban park in the city of Malmö, two types of LED applications were installed [LED 1, Mean Horizontal Illuminance ($E_{h,mean}$): 26, Uniformity: 0.32; LED 2, $E_{h,mean}$: 15, Uniformity: 0.21]. The study employed a between-subjects design where the first group (n: 42, Age_{mean} : 45; 62% women) experienced LED1 and the second group (n: 39, Age_{mean} : 40, 67% women) LED2. The ability to identify facial expressions and to read street signs were investigated along with measures of perceived lighting quality, emotional state and the perceived safety of the environment. Furthermore, observations were carried out in order to capture variations in pedestrian flow. Preliminary results suggest that the lighting applications were experienced similarly despite differences in horizontal illuminance and uniformity. However, the visual tasks differentiated between the lighting applications, as the lighting application with the greatest illuminance and most uniform distribution allowed the participants to identify facial expressions and read street signs at greater distances. The differences did not appear to have an impact on the flow of pedestrians, however. The respondents rated the overall seeing conditions as good and perceived the path to be safe for both lighting applications, regardless of the age of the respondent. This indicates that the lighting applications used in this study are sufficient for walking after dark in the present context and suitable for recreational areas such as parks. Further research is however needed to investigate the influence of LED outdoor lighting on transport walking in an urban context and to explore how lower illuminance levels might affect the perception, evaluation and behavior of the elderly and the visually impaired.

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024 Changing legal responsibility for cyclist-vehicle collisions to offset risk compensation behaviour

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Keywords: cycling; law; risk

Abstract:

Cycling is a sustainable, healthy form of transport and the UK Government is seeking to promote increased cycle use. Cycling rates in the UK are, however, much lower than elsewhere in the EU, possibly because potential cyclists view cycling as unsafe. It may be possible to increase cyclist safety by increasing the amount of protective equipment or lighting worn by cyclists; in this work we show that changing the law governing road collisions to offer greater legal protection to cyclists may be a more effective approach.

In collisions between motor vehicles and cyclists (as with other collisions), anyone seeking compensation for their injuries must assess which party was responsible for the collision. Cyclists can use lamps and retroreflective clothing to improve their conspicuity and visibility to drivers after dark. Despite legal requirements and advice to use these items, surveys show that there are large numbers of cyclists who choose not to do so. These cyclists are very likely to be considered at least partly responsible for their own injuries in a collision with a motor vehicle.

For cyclists who are struck by a motor vehicle, wearing a helmet may reduce injury severity. A disadvantage of wearing a helmet is that drivers may pass at a closer distance than they give to cyclists not wearing a helmet [Walker 2007]. This risk compensation behaviour by drivers offsets, at least partially, the safety benefit of a helmet. Risk compensation also occurs within cyclists themselves, taking greater risks when wearing a cycle helmet [Hillman 1993]. UK law does not require cyclists to wear helmets, and making protective equipment mandatory can have unforeseen negative consequences; for example, the UK introduction of seat belt laws increased deaths and injuries of pedestrians and cyclists [Adams 2006].

An alternative approach to improving the safety and perceived safety of cycling is to change the legal regime governing road collisions. EU countries with much higher rates of cycling and much lower rates of cyclist injury than the UK (such as the Netherlands, Germany and Denmark) operate a 'presumed' liability system rather than the UK's fault-based system. In the current UK system, the victim of a collision must prove that the other party was at fault. In contrast, presumed liability means that in a collision between a motor vehicle and a cyclist, the motorist will automatically be held legally responsible for the accident. Through this approach, unlike safety initiatives for drivers, the driver is not prompted through risk-compensation towards riskier driving behaviour.

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077 Unveiling CCU product acceptance: The impact of benefit and risk perceptions in different user groups

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Keywords: carbon dioxide capture and utilization (CCU); social acceptance; risk perception, benefit perception; user diversity

Abstract:

Introduction: Due to the limited amount of fossil fuels, technologies are promoted that help to save these resources. Carbon Dioxide Utilization (CCU) is a currently discussed approach to contribute to this goal: CO₂ is captured, e.g., from power plants, and used for example as feedstock for the production of raw materials (polyols). With these raw materials building materials and consumer products (such as expanding foams and foam mattresses) can be manufactured, thereby replacing a part of the required fossil resources (Von der Assen & Bardow, 2014; Covestro, 2016). The roll-out of novel technologies like CCU does not only depend on technical feasibility but also on public acceptance: a positive attitude towards CCU products and the willingness to use them is essential for their market success (Arning et al., 2016; Davis, 1989; Ogawa & Piller, 2006; Venkatesh et al., 2003).

Theoretical background: Research has shown that acceptance of innovative technologies is considerably influenced by benefit and risk perceptions (e.g., Bearth & Siegrist, 2016): people weigh up perceived risks and benefits when deciding on the use of technologies (Arning et al., 2013). Although numerous studies have investigated the acceptance of Carbon Dioxide Capture and Storage (for an overview see LDOrange Seigo et al., 2014), research on the acceptance of CCU (products) is still at an early stage (Van Heek et al., under review). Yet, little is known about the effect of perceived benefits and risks on CCU product acceptance. Following up on the research by Arning et al. (under review), which focused on the influence of different user factors and risk aspects on general risk perception and acceptance of CCU products, the present analysis also considers perceived benefits. By this, the relationship between benefit and risk perception and their impact on CCU product acceptance will be investigated. Furthermore, it will be examined if user characteristics influence risk and benefit perceptions and their effect on acceptance.

Methods: To analyze the impact of perceived benefits and risks on CCU product acceptance, an online survey was conducted in Germany (2016). Participants were asked to evaluate the acceptance, benefits, and barriers/risks of CCU technology and products (mattress, expanding foam). Also, individual characteristics (e.g., technical self-efficacy and self-assessed knowledge about CCU) were assessed.

Results: Overall acceptance of CCU products was positive. Acceptance was influenced by perceived risks and benefits. Depending on individual characteristics, the extent of risk and benefit perceptions on CCU acceptance varied. Characteristically, the benefit perceptions of CCU products outperformed the risk perceptions. The contribution of benefit perception varied with the level of technical self-efficacy (TSE): for participants with a high TSE, the relevance of perceived benefits was, by tendency, lower, meaning the contribution of other influencing factors was increased.

Conclusions: Results show that acceptance of CCU products was affected by perceived benefits and risks. This relationship was found to be influenced by user factors. The findings help to identify groups that are critical regarding CCU acceptance and to develop tailored communication strategies to inform the public about possible risks and benefits of CCU products.

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086 Incorporating public values in natural disaster planning

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Keywords: valued attributes, valued entities, core values, survey bushfire

Abstract:

Values of the public are a critical consideration in disaster planning, influencing what is prioritised for protection. Professionally led disaster planning often focuses on protection of tangible, mappable objects. In contrast, psychological conceptions of values focus on more abstract attributes of communities or environments, or on fundamental principles or ideals for life. A recent conceptual framework proposed a way to integrate these different forms of value, identifying concepts at different scales of abstraction, and tested this framework using qualitative analysis of two data sets (Rawluk et al 2017). We further test and extend this framework using a large scale quantitative survey, focusing on values at risk of bushfire.

Integration of psychological and practitioner understanding of values that can be affected by natural disaster leads us to consider values at three levels of abstraction: valued entities which are objects in the landscape of importance to people, valued attributes which describe outcomes arising from the multiple and dynamic relationships between these objects and the person who value them, and core values which define cross-situational principles or ideas.

We surveyed around 500 residents of two regions of Victoria, Australia. Questionnaire design drew on qualitative research (n=30) which identified values at each level more commonly associated with bushfire management views. These included questions regarding core values of benevolence, universalism, security, and self-direction (adapted from Schwartz, 2012), valued attributes including human life and well-being, sense of normality, identity, natural environment and livelihoods, and a wide range of valued entities such as properties, people (friends and family as well as people more generally), pets, infrastructure.

Multivariate analyses explored the dimensions underpinning values at each scale, and the relationships between these values. This provides insights to sets of tangible entities that are important to people (and so might inform practical bushfire management planning), but more significantly illuminates how these entities are linked to valued attributes and to core values. This allowed us to identify groups of people with similar values and to define these in relation to demographic, experience of fire and other characteristics.

The results confirm the feasibility and usefulness of considering values at different level of abstraction, providing a means to bridge planning frameworks with more psychological understanding of values and valuing.

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340 Risk perception and hazard response in natural disasters among Mexico City residents: A structural equation modeling approach

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Abstract:

Introduction: In Mexico City, disorderly urban growth permits the irregular formation of low-income neighborhoods in high-risk zones, where environmental degradation and transformation, poverty, and social decomposition increase the probability of disasters such as landslides, with devastating economic and social consequences.

Theoretical background: The perception of risk has multiple defining variables the assessment of which has been dependent on the paradigm from which they are measured (Breakwell, 2007; Slovic, 2001). The perception of risk from natural hazards and the relationship to the adoption of protective behavior (hazard response) have a theoretical and societal importance (Mileti & Peek, 2002; Perry & Lindell, 1990; 2008); in the case of a particular hazard as the landslides, the framework that try to explain the hazard protection and their relationship with other variables is the Protective Action Decision Model, have been tested in multiple hazard settings (Perry & Lindell, 2007).

Method: The purpose of this study was to determine whether psychological variables such as risk perception, perceived vulnerability, influence the hazard response formed by residents of communities at geological risk in Mexico City. The study sample was not probabilistic and was made up by 309 adults, 172 women (55.7%) and 137 men (44.3%), between 18 and 86 years of age, with a mean of 35.07 years and a standard deviation of 13.007 years.

Results: The structural equation modeling analysis was used to test a theoretical model to identify a causal relationship between the perception of risk (exogenous variable) and the proposed endogenous variable as mitigation, place attachment, trust in authorities and hazard response (independent variable). The simultaneous regression analysis allows us to conclude that the predictive variables related to hazard response in the structural modeling are significant for the risk perception as predictor of the place attachment and place attachment as predictor of hazard response; this means that place attachment is a mediating variable of the hazard response in the community of study. The Structural Equation Modeling provide a final model with satisfactory goodness of fit ($df=96$; $\chi^2=234.943$; $\chi^2/DF=2.44$; $p=.078$; $CFI=.931$; $RMSEA=.069$; $SRMR=.059$). It is concluded that the model of landslide risk perception and hazard response provides relevant information for decision-making to extreme natural phenomena in Mexico City.

Conclusions: The discussion turns on emphasizing the importance of considering place attachment as a component which should be included in measuring the perception of risk (De Dominicis et al. 2015) and protective behavior, which has not been reported sufficiently in the literature, and stresses the importance of investigating perception of risk in the light of current events involving landslides in gullies in the urban setting of Mexico City.

keywords: Risk Perception, Natural Hazards, Protective Behavior, Structural Equation Modeling.

Sub-theme: Risks and hazards: Perception and Management

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350 Climate change risk perceptions among hurricane survivors: Role of resource loss, posttraumatic stress, coping, and resilience

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Abstract:

Introduction: Few studies have examined how critical experiences during a natural disaster whose strength is linked to climate change are associated with climate change risk perceptions (APA, 2009). Climate change can increase the strength of hurricanes as a result of warming ocean temperatures. Five weeks after Super Typhoon Haiyan (Philippines) and Cyclone Winston (Fiji), we examined relationships among climate change risk perceptions, posttraumatic stress, coping, and posttraumatic growth. Two competing predictions: 1. Climate change risk perceptions would be a unique source of stress and contribute to posttraumatic stress reactions, and 2. Resource loss would contribute to posttraumatic stress, which in turn would activate coping and posttraumatic growth (reflecting on one's life priorities/life meaning), and result in climate change risk perceptions.

Theoretical background: Conservation of resources stress theory (Hobfoll, 1998, 2012) discusses how various types of resource loss contribute to posttraumatic stress. Our recent work shows that posttraumatic stress and posttraumatic growth are common reactions (Sattler et al., 2014), but little is known about how these reactions are associated with climate change risk perceptions.

Method: Participants: Philippines: 322 survivors; Fiji: 650 survivors. Five weeks post impact, anonymous and confidential instruments assessed climate change risk perceptions, resource loss, posttraumatic stress, and posttraumatic growth.

Results: Structural equation modeling. Resource loss contributed to posttraumatic stress, which in turn activated coping and posttraumatic growth (reflecting on one's priorities and what gives life meaning), and this process resulted in climate change risk perceptions.

Conclusions: Findings support conservation of resources stress theory and extend prior work (e.g., Janoff-Bulman, 2006). The findings have significant implications for understanding the development of climate change risk perceptions. The findings raise real questions about the nature of personal experiences and types of information that influence climate change risk perceptions. Implications and future research directions are discussed.

Keywords: climate change risk perceptions, personal experience, natural disasters, posttraumatic stress, posttraumatic growth

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135 Materials developed for deliberation on the pros and cons of nuclear power generation and their educational effect: confidence rating and behavioural intention to gather information

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Keywords: environmental education; nuclear power generation; confidence rating

Abstract:

Introduction: Before 3.11, sources of information about nuclear power generation were only commercials of power companies in which information was biased strongly towards pro-nuclear power generation. After 3.11, some materials were published. However, some of them were about the negative effects of nuclear power generation, while others did not really motivate students into making a judgement on the pros and cons of nuclear power generation.

Theoretical background: Providing unbiased information showing arguments both in favour of and against issues is important for decision making and procedural fairness (e.g. Hirose, 2007). Therefore, we developed new materials to understand all aspects of nuclear power generation to enable deliberation on the topic. The aim of this study was to investigate the validity of our materials as a tool for environmental education. Learners were expected to deliberate each argument both for and against nine issues and determine their attitude towards nuclear power generation. These nine issues were the following: the effect of radiation exposure, global warming, nuclear fuel cycle, interregional fairness, intergenerational fairness, inexpensive electricity supply, economic effects, energy security, and nuclear weapon. On learning both the pros and cons of each issue, learners choose one option (Yes/No), and comprehensively evaluate their attitude towards nuclear power generation.

Methods: In December 2015, using our materials, we conducted a 90-minute class on nuclear power generation once a week for two weeks for university students. A week prior to the first class, 105 students filled out a pre-class questionnaire, and 96 students filled out the post-class questionnaire after the second class. The questionnaire involved ranking from first to third the nine issues based on the degree of importance they accorded to nuclear power generation, attitude towards nuclear power generation, confidence rating of one's judgement on whether nuclear power generation should be used or not, access to information about nuclear power generation and energy issues during the past year (only pre-class questionnaire), and behavioural intention to gain access to information about nuclear power generation and energy issues (only in the post-class questionnaire).

Results: In the post-class questionnaire, participants ranked intergenerational fairness higher and nuclear weapon lower than in the pre-class questionnaire. This implies that our materials enabled participants to look at the broader picture, pay attention to issues that did not concern them earlier, and deliberate each issue. They also began to take a clear stand. With regard to access to information about nuclear power generation and energy issues during the past year and their intention to gather more information, participants showed a higher behavioural intention to reading Internet news portals.

Conclusions: The results of our study indicate that our materials helped participants to deliberate each issue concerning nuclear power generation. Future research can improve on the use of our material. Other perspectives for evaluating the educational effectiveness of our materials can also be discussed.

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320 Contrasting views and practices of rest: Rest with nature view versus none, and guided practice in mindfulness of nature scenery versus mindfulness of breath

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Keywords: Restoration, Mindfulness, Nature

Abstract:

Introduction: The presentation will cover a study intended to extend knowledge about a restoration skills training (ReST) course for people with stress and concentration problems (Lymeus, et al., in prep.).

Theoretical background: ReST integrates mindfulness theory (Bishop et al., 2004) and meditation practices (Kabat-Zinn, 1990) with theorizing about restorative environments (Von Lindern et al., 2017), building on previous work at the intersection of these areas of inquiry (Kaplan, 2001; Lymeus et al., 2016; Tang & Posner, 2009). ReST practice entails mindfulness of sensory impressions, including practice in curiosity and psychological distance. We reason that these mindfulness techniques can support the restorative processes of soft fascination and the sense of being away as described in attention restoration theory (Kaplan, 1995). We therefore anticipate that rest with a garden view supports restoration better than rest with no view, and that ReST practice but not mindfulness of breath practice can further enhance restorative processes and outcomes.

Methods: In this study, university students (N = 44) with perceived stress and concentration problems and little or no meditation experience completed attention tests and ratings of cognitive fatigue and emotional stress before and after a 25-minute adapted Stroop task meant to induce attentional fatigue and emotional stress. They then rested for 25 minutes, randomly assigned to one of four different rest conditions: Just rest in a room with no nature stimuli or outside views, just rest with a window view of a garden, guided mindfulness of breath practice in a room with no nature stimuli or outside views, or guided ReST practice with a window view of a garden. During the rest, participants completed ratings of relevant mediating constructs; state mindfulness and perceived restorativeness of the environment. After the rest participants again completed the attention tests and ratings of cognitive fatigue and emotional stress. The study thus crossed two independent variables; view/no view and environmentally congruent meditation instructions.

Results: Analyses are currently underway.

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369 Generating a reference framework for evaluating nature-based solutions in cities: The CONNECTING project

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Abstract:

The idea of nature-based solutions (NBS) has emerged as both a challenge and an opportunity to assist urban communities in the transition to sustainability. But nature-based solutions are still a complex problem for many city-makers, and there are still many obstacles (physical, cultural, ecological, legal, etc.) to embedding these kinds of solutions into urban planning, policy frameworks, and innovative city design. Individually, cities have been experimenting and testing site-specific solutions and strategies (from micro to macro scale) over the decades and that continue to be living examples of effective urban successful transition strategies.

More recently, there has been a wide recognition that biodiverse ecosystems, including cities, can supply or even augment the ecosystem services necessary for high quality of life and the creation of sustainable and resilient environments. In addition, studies are beginning to explore and reveal the outcome of the interplay between biodiversity, ecosystem services and urban green infrastructure, with respect to social capital networks, perceived and actual wellbeing, physical and psychological health, and productive, egalitarian and democratic livelihoods. Therefore, nature-based solutions have emerged as the main policy driver for most transitioning cities, because they can be used to create multi-functional arenas and to fulfil multiple, simultaneous objectives.

Nature-based interventions are often referred to as blue/green infrastructure. Most cities see blue/green infrastructure as being necessary for absorbing episodic rainfall, as species repositories, and for recreation and wellbeing. Others see blue/green infrastructure such as woodlands and street trees, green roofs and walls, rain gardens and opportunities for reducing the effects of urban heat islands, increasing biodiversity, sinking carbon and diminishing the detrimental effects of particulate and noise pollution. Whatever the blue/green infrastructure typology, the challenges for creating, managing and innovating are high.

Connecting is a H2020 European project that aims to create an open innovation ecosystem approach in cities across the world, by bringing together city governments, SMEs, academia and civil society to co-produce usable and actionable knowledge on nature based solutions and their benefits in cities. A series of European cities, as well as non-European ones are involved in the project, as frontrunner, fast-follower or multiplier cities that will be involved in large-scale demonstration of nature-based solution implementation, through a process that is participatory and involves city-to-city learning.

Besides such demonstrations, the project aims to develop and test a truly global, comprehensive and robust mechanism that will be used to monitor and evaluate the effectiveness of nature-based solutions implementation in cities, with regards to five impact categories: climate change adaptation and resilience; health and wellbeing; social cohesion; economic development potential; and green business opportunities. The process for the development of such a mechanism will include extracting the most important lessons from previous development and implementations of nature-based solutions in European cities as reflected in urban research, previous European projects, existing European databases on green solutions, as well as the experience of nature-based solution exemplars in the front-runner cities. The objective is not to create a comprehensive database of indicators, but rather to build a coherent reference framework that meaningfully connects different types of data and information for the evaluation of the five mentioned areas of performance of nature-based solutions, as well as to identify new synergistic data-gathering techniques that make use of the latest available technologies, allow representation of traditionally under-represented groups in urban policy-making, and are cost-effective. This paper will present a comprehensive review of existing indicators for the evaluation of NBS and will problematize the existing gaps and difficulties in their thorough evaluation, especially when multiple synergistic benefits are taken into account. It will also describe and discuss the methodology towards establishing such a frame of reference within the current project.

Keywords: nature-based solutions; city to city learning; reference framework; climate change adaptation; health and wellbeing.

188 Urban rivers and physical activity promotion: Toward an ecological-experimental approach

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Keywords: urban rivers; physical activity; place experience

Abstract:

Introduction: Physical inactivity lies behind the increasing deaths caused by cardiovascular diseases. Against this backdrop, public health agendas have centered the attention on urban rivers as greenways for enhancing Physical Activity (PA) in people's daily life. Although ecological models allow an integral understanding of the factors that influence PA, most studies still rely on fragmentary and quantitative

approaches. Issues such as the quality of people-place interactions and associated experiential processes remain overlooked despite their value for PA promotion.

Hypothesis: Insights into place-related personal experiences of PA may support the design of better interventions to promote PA in urban rivers. According to this hypothesis, this research proposes and tests an integrated ecological-experiential approach. The specific objectives are:

1. Defining place-experience patterns depending on the motivations for using the place in order to explore commonalities in the way people experience urban rivers by practicing different types of PA;
2. Assessing the perceptions associated with the environmental factors (physical and social) that influence PA, to determine their role as barriers or facilitators among each pattern;
3. Exploring coincidences and divergences among patterns' perceptions of factors.

Methods: The approach is developed in the Caldes Stream, a significant recreational greenway example within the Metropolitan Area of Barcelona (Spain). Along this stream, the succession of public open spaces, forestry and agroforestry areas, low-density residential and industrial estates, provides a wide gradient of place-experiences of PA.

A qualitative approach was defined. During an initial exploratory fieldwork (January-April 2016), observations, documentary research, and meetings with relevant experts allowed gaining familiarity with the context and supported the lay public sampling. Next, 14 in-depth map-based interviews and 10 in-depth go-along interviews addressed to the lay public (June-November 2016) allowed gaining insights into personal place-experiences of PA. The interview guideline was adapted from the Active Living Research database.

ATLAS.ti software was used to process interviews transcriptions and the corresponding sketched itineraries digitalization. A first descriptive analysis allowed to assess motivations and factors separately. A second conceptual level analysis supported the definition of patterns, factors perceptions and the association of itineraries to each pattern.

Results: Six place-experience patterns were identified (Athletes, Nature lovers, Custodians, Cholesterol-route users, Weekenders, and Gardeners) and characterized through five descriptors (Who, What, Whit whom, When, and Where). Five main motivations related to PA were found: personal achievements, mental relief through nature contact, taking care of place, physical health outcomes, sharing time with others, and mental relief through keeping mind busy. Six physical-environmental factors (proximity, accessibility, connectivity, safety, maintenance, and signposting), and four socio-environmental factors (free time management, planned and spontaneous encounters, community involvement, and inter-generational inheritances) were found to be influential in PA practice. Such factors became barriers or facilitators depending on user's perceptions mediated by the specific motivations of each place-experience pattern. The most controversial issue was the safety perception.

Conclusion: This study contributed to the understanding of the complex perception of physical and social factors that influence PA practice. The results suggest the need for specialized and inclusive itineraries and social actions for promoting PA that consider the diversity of place-experience patterns.

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079 From smell to action, a study of smell-sensitivity and uses of nature

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Keywords: human-nature relationship, experience of nature, sensory experience of nature, olfactory experience, smell sensitivity.

Abstract:

In the 21st century, western societies appear more and more separated from nature, notably in urban contexts (Soga & Gaston, 2016). However, regular contacts with urban nature have been shown to have positive effects on human health, cognitive and psychological restoration (Bratman et al. 2012). The experience of nature is complex and multisensory. Sensory experience of nature has been studied mostly through vision and audition. In contrast, despite its importance in the construction of human self and identity, the sense of smell remains poorly included in the understanding of individual psychological relations to nature. In a quantitative study, we studied the individual relations between neurological and physiological smell sensitivity, affective and emotional connection to nature and actual sensory experiences in natural spaces. An online questionnaire combined a Chemical Sensitivity Scale (Nordin et al., 2003), the environmental identity scale (Clayton, 2003), and five questions assessing declared sensory uses of natural spaces in respondent's everyday life. Based on the answers from 500 French adult respondents, we showed that people who have a high smell sensitivity also have more sensory

uses of natural spaces, and that this correlation is mediated by their environmental identity. This first result calls for a better understanding of the smell and sensory experiences of nature, on how these experiences can influence the way we interact with natural spaces, and of perspectives for nature spaces uses and management.

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PSIV-19 SUSTAINABILITY IN ORGANIZATIONAL ENVIRONMENTS

Room: -1.3

084 The effect of introducing new rules for promoting energy saving behavior in companies

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Keywords: Energy saving behavior; Behavioral change; Change agent

Abstract:

This research organizes the consultation method to promote energy conservation behavior in companies by the behavioral change model in social psychology and diffusion of innovation approach (Rogers, 1995). Energy saving is highly effective through not only technological innovations (e.g., LED bulbs, highly efficient air conditioners) but also behavioral changes in the day-to-day work of employees in the company. Further, while a thorough energy-saving behavior contributes to the cost reduction and energy conservation, introducing new rules is necessary for improving the company's operations. The focus of this research is the behavioral changes at restaurants, which develop as a restaurant chain in Japan, with special reference to the switching and setting management of air conditioners, lightings, and refrigerators. Because restaurants in a chain have a similar modus operandi of management, if new rules are introduced on a top-down basis, the company can obtain energy saving effects on the whole. An energy-saving program, originally developed by a consulting company, has been implemented in order to grasp the past behavioral patterns so as to establish new behavioral ones to aid energy saving in the company. To execute the program effectively, the change agent investigates the results of energy-saving behaviors of each branch office, provides a feedback on the quantity of energy used, and communicates the goals and means for achieving these to achieve energy saving. For bringing about such changes in employees, the branch manager needs to urge them to execute actions that help to save energy. Further, achieving energy conservation will directly depend on its management. Through the survey conducted through interviews of four change agents, the branch managers were categorized into four leader types in terms of traits such as independence and cooperativeness with change agents. We conducted a questionnaire survey before and after the consultation for 148 branch managers of the two companies. The main results are as follows: before the consultation, the two companies had difference in their performance in terms of energy conservation; however, the differences decreased after the consultation. The number of employees responsible for energy conservation behavior was higher after than before the consultation. Although there was no direct relationship between the four leader types and energy saving behavior, there was a difference in the amount of information sharing among employees. In other words, in cases wherein leaders were independent and cooperative, the amount of information sharing were high. In branches with a higher level of information sharing, achievement of the monthly target was high. Therefore, we have suggested that it is possible to disseminate information on energy saving behaviors to employees by developing a method of providing change agent information on the basis of the leader type.

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326 How office design affects our wellbeing

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Keywords: well-being; office design; design factors

Abstract:

Health improving interventions of working conditions in an office environment mainly happen on an organisational or process level. This is very important but what impact does characteristics of the built office environment have on users health and well-being?

A systematical review of Evans and McCoy in 1998 identified five important design factors influencing the stress level of users in build environments: *control, stimulation, coherence, affordances and restorative*. In this empirical study 191 employees from numerous different companies and sectors assessed a number of elements of design in their office environment in a questionnaire procedure. Via a factor analysis, three space factors were identified and a new type of questionnaire including 41 items was developed. In this study the three space factors, *Positive Stimulation Through the Space, Coherence of the Space and The Space Provides Control* showed a significant correlation between health, well-being and contentment with the design. The effect increases when users attend 36 hours or more in the office environment and decreases if the working conditions on an organisational level are negative. The results indicate that an office environment has an important influence on users well-being and various environmental characteristics may have a positive impact when complex effects are regarded.

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221 Role theory applied to investigating leadership in sustainability through an environmental psychology perspective in a qualitative study

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Keywords: Leadership; Sustainability; Role Theory.

Abstract:

This study refers to a first phase of a methodological proposal to investigate Leadership in relation to Sustainability in organizational settings. The qualitative approach was inspired by the Role Theory proposed by J. L. Moreno (1997) who described extensive experiments based on sociometric methodology. With this approach, using the concept of Role, the empirical research produced descriptive narrative data on the relationship between people and their physical, cultural and social environments that can also later be empirically tested in other quantitative and/or qualitative inquiries. By aligning this theory to an Environmental Psychology perspective, it allowed us to improve the presented methodology based also on publications in this field such as those carried out by (Páramo et al. 2015), (Steg et al. 2014), and the recent development reports and working papers of the Transit initiative – Theory of Transformative Social Innovation – which was also an important starting point for this research project.

Methods, Results and Conclusions: Five Executives holding high-level positions in different industry sectors in Brazil were invited to and selected for this phase, based on their current positions as CEOs or Directors in charge of implementing sustainability initiatives. The research method included mapping the level of connectedness the executives felt to the SDG¹ cards, a questionnaire on their assessment and vision of the status of each item, and a semi-structured interview. The results show differences between their choices and how connected they felt to the SDG cards, in terms of their priorities and vision of present and future statuses of the items while they were in a leadership position, in comparison to other roles they occupy in their lives. Conclusions indicated an important relationship among roles, behavior and decision-making processes regarding sustainability that enabled to further continue the research.

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¹ Cards with 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development adopted by world leaders in September 2015 at United Nations Summit (<http://www.un.org/sustainabledevelopment/summit/>).

145 Motivations and barriers to sustainability in commercial buildings: A qualitative investigation

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Keywords: Psychology of sustainability; motivations and barriers; energy transitions; comprehensive action determination model; leadership engagement

Abstract:

Introduction: In partnership with the Building Owners and Managers Association (BOMA) of Canada, this research investigates the motivations and barriers for engagement in sustainable energy management practices within commercial office buildings. Improving the sustainability of the commercial real estate sector, particularly existing stock, is seen as a significant step towards reducing greenhouse gas (GHG) emissions. For example, widespread implementation of sustainable energy management in commercial office buildings, using existing technologies, would allow the province of Ontario to achieve its GHG emission reduction targets, while also improving the health and well-being of building citizens. However, even the most efficient, green-certified buildings consistently fail to deliver the emissions and energy-use reductions they promise. This is because buildings are complex systems, and solutions often do not fully account for the dynamic interactions between the physical building features, technology, and human behaviour (including culture). A primary goal of this research is to embed this transformational reorientation of the building-occupant relationship into commercial building management practices, to foster sustainability in this sector.

Theoretical background: This research builds upon the modified comprehensive action determination (CADM) model by integrating autonomous and controlled motivation from the self-determined goal-directed behaviour (SDGB) model. Additionally, dynamic systems theory is used to model the complex building-occupant interaction.

Methods: Interviews are being conducted with approximately 50 private- and public-sector property owners, managers, operators and their tenants. Interview participants have been purposively selected in the Canadian provinces of Ontario and Alberta, covering a range of property classes, and gradation of assets under management .

Results: Preliminary analysis indicates that energy management is seen as an opportunity to create shareholder value and competitive advantage in the private sector, and to provide efficient service in the public sector. Tenant engagement, including the management of expectations, is also a motivation for building owners and managers to implement sustainability energy management practices. A key barrier is not having sustainability integrated into all decision-making processes related to building management and operation. Lack of funding for larger capital investments is another major barrier.

Conclusion: The motivation and engagement of building owners and managers emerged from a literature review as a critical success factor in addressing sustainable energy management in commercial buildings, given the power dynamic between stakeholders. There are both overlapping and unique motivations and barriers between the private and public commercial real estate sectors,

and between Ontario and Alberta. A report will be submitted to BOMA Canada in September 2017; this work will inform a quantitative, national-level survey, investigating the applicability of the regional findings, and solutions, within the broader industry sector.

311 A review of the effects of background speech on word processed writing

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Keywords: speech intelligibility; word processed writing; background speech; open offices

Abstract:

Introduction: The purpose of this paper was to review the knowledge gathered so far about the effects of background sound on word processed writing and to discuss the implications for open-plan offices.

Theoretical background: Irrelevant background speech is amongst the most often mentioned sources of annoyance at work [Banbury & Berry, 2005; Boyce, 1974; Young & Berry, 1979]. Moreover, writing processes are impaired by task-irrelevant background speech [Ransdell & Gilroy, 2001]. Thus, performance and health are challenged when working in open-office environments wherein background sound is common place. To investigate the effects of irrelevant background speech on writing in a more detailed way, five studies were done. Sörqvist, Nösth and Halin (2012) investigated whether the semantic properties of the irrelevant background speech contribute to disruption of writing processes. In a follow up study, Keus van de Poll, Ljung, Odellius and Sörqvist (2014) studied the relationship between Speech Transmission Index and writing performance. In Keus van de Poll and Sörqvist (2013), normal or rotated speech was presented to either the right or the left ear to investigate whether a right-ear disadvantage occurred in a writing context. Keus van de Poll, Carlsson, Marsh, et al. (2015) investigated whether background speech from simultaneous talkers (i.e. 3, 5 and 7 talkers compared to 1 single talker) lead to distraction and in Keus van de Poll and Sörqvist (2016), the combined effects of task interruptions caused by task-shifting and task interruptions caused by background speech were investigated.

Methods: All studies had experimental within-subject designs. Participants wrote stories in the software program ScriptLog while they were exposed to different sound conditions.

Results: Study one revealed that meaningful speech disrupted word processed writing while performance was not impaired by meaningless rotated speech in comparison with silence. In study two, the semantic effect of background speech was replicated, but no right-ear disadvantage was found. Study three suggested that disruption kicks in with relatively low speech intelligibility. Study four revealed that performance was worst with 1 background voice and best with 7 voices. Study five showed that it took 10-15 seconds to reach the same writing speed as baseline directly after resuming the interrupted task. No interactions were found.

Conclusions: Word processed writing seems to be impaired by the meaning of background speech, whilst it is relatively immune to disruption emanating from the acoustic features of the sound including sound pressure level, at least when this level is within a realistic range for typical open-plan offices. The theoretical framework that can explain the sensitivity of writing to these semantic aspects of background speech is interference-by-process (Marsh, Hughes & Jones, 2009).

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092 Fishers as stewards of the seas: Commercial fishers' response to the fishing for litter scheme

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Keywords: Environmental Action, Spill-over effect, waste behaviours

Abstract:

Marine litter is a global, persistent, and increasing threat to the worlds' oceans and the wildlife that live within it. There are numerous clean-up initiatives that exist around the world that supports individuals to help remove and/or monitor this debris. One such initiative within Europe is the Fishing For Litter Scheme, where commercial fishers voluntarily bring back litter that they find at sea, with the scheme paying for the litter to be disposed of responsibly¹. The benefits this scheme has on the environment is evident (e.g., for the first three years of the scheme, 117 tonnes of marine litter was collected in Scotland alone), especially as they can access the remote depths of the ocean other clean up acts cannot reach. However, the impacts on the fishers themselves are less clear. Consequently, we examined whether participating in such a scheme has an influence on the volunteers themselves, looking at whether fishers who are part of the scheme have different perceptions about marine litter and how this relates to their behaviour and engagement with the scheme. Specifically, we used the Theory of Planned Behaviour² to frame our questionnaire, examining their attitudes towards the issue and this activity, perceived behavioural control, and social norms. We also explored potential spillover effects³, investigating environmentally friendly behaviours directly and indirectly associated with this scheme.

We surveyed commercial fishers from the UK who were either part of the FFL Scheme (n=49) or not (n=48). Using both quantitative rating scales and open-ended qualitative responses, we examined their perceptions about marine litter, the FFL scheme, and assessed their waste-related behaviours at sea and on land. Fishers reported being aware of and concerned about the negative impacts of marine litter on the environment. Using thematic analysis, key barriers to joining the scheme and suggestions on how the scheme could be improved were also identified. When comparing fishers that took part in FFL with those that were not, Mann-Whitney tests found that many perceptions were shared across the two groups; however, we did find that the FFL scheme fishers was associated with better waste management behaviours both out at sea but also at home (e.g., fishers were less likely to throw stuff overboard and more likely to recycle at home). This particular finding shows support that the scheme encourages the targeted behaviour (to remove rubbish from the sea), but is also associated with other non-targeted behaviours (fishers' personal waste management out at sea but also on land), which could suggest a spill-over effect may be occurring. The findings provide a useful insight into the workings and impacts this particular scheme has on its volunteers, and highlights future research angles.

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108 Recycling behaviour: A meta-analysis on the influence of individual and contextual factors

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Keywords: recycling behaviour; meta-analysis; individual and contextual factors

Abstract:

Recycling enables the retrieval of secondary raw materials and thereby reduces greenhouse gas emissions (European Union, 2014). The literature on recycling behaviour is large and diverse: many studies have investigated a variety of predictors, and relied on different theories and methodologies to explain recycling behaviour. This highlights the great interest in identifying the driving factors of recycling behaviour. However, it also implies the challenge to keep the overview. In this meta-analysis, we aim to provide an overarching framework to categorize the most consistent and important factors of recycling behaviour.

In general, studies on recycling behaviour have mostly examined the influence of individual and contextual factors separately. Studies focusing on individual factors assessed, for example, the impact of self-identity, personal and social norms and values; studies focusing on contextual factors assessed local circumstances (e.g., the recycling facilities in place, the possession of a recycling bin, the distance to a recycling location) and the housing situation.

After an extensive literature review to find relevant papers (N=95), a meta-analysis for individual and contextual factors were run with the program Comprehensive Meta-Analysis version 3 (CMA; Borenstein, Hedges, Higgins, & Rothstein, 2014).

Overall, the results revealed that individual as well as contextual factors explain recycling behaviour, with a medium effect size. Among individual factors, self-identity, past recycling behaviour, and perceived behavioural control were particularly predictive. In line with the compatibility principle, behaviour-specific factors were more predictive than general factors. Among contextual factors, local circumstances were particularly predictive. The results further point to an intention-behaviour gap: intention to recycle could be better predicted than self-reported, and particularly than observed behaviour.

In conclusion, the current meta-analysis shows that both individual and contextual factors explain recycling behaviour but only to a certain extent. We propose to more systematically investigate the interplay of individual and contextual factors to fully understand recycling behaviour. The influence of individual factors on recycling behaviour may depend on the effort the context implies. More precisely, self-identity may only lead to recycling behaviour when it is not extremely difficult to recycle. To consider the interplay of individual and contextual factors is relevant in the domain of recycling as many different collection systems exist, and thus a variety of contexts in which recycling behaviour can take place, which, in turn, affects recycling behaviour.

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070 The influence of community relations and low-carbon knowledge to low-carbon lifestyle

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Keywords: Climate Change; Community Relationship; Low-carbon knowledge; Low-carbon lifestyle, Behavior of low-carbon

Abstract:

Introduction: The term " low-carbon lifestyle " is highly regarded by the UN / ISDR as an effective response to climate change.

Theoretical background: Individual low-carbon knowledge and community relationship are the keys to living a low-carbon life). The study examined how residents' community relationship and their low-carbon knowledge affect their low-carbon behavior.

Methods: A total of 429 questionnaires were distributed to the sample area of Magong City, Penghu, Taiwan. The effective questionnaires were 386. By the descriptive statistics, reliability analysis, factor analysis, and structural equation model analysis verify the hypothesis of this study.

Results: The causal relationships between community relationship, low-carbon knowledge, and low-carbon lifestyle show that the path coefficient of "community relationship on low-carbon knowledge" is 0.38, the path coefficient of "positive influence of community relationship on low-carbon lifestyle" is 0.28, the path coefficient of "low-carbon knowledge is positively affecting low-carbon lifestyle" is 0.61. All the above assumptions are significant ($p < .001$), assuming a causal relationship was supported.

Conclusions: Community relationship have a significant impact on low-carbon lifestyle, not only directly affect the implementation of low-carbon lifestyle, but also indirectly through low-carbon knowledge. Good community relationship will enable residents to care about their own living environment, and actively carry out low-carbon lifestyle. And they will absorb low-carbon knowledge, indirectly contribute to living a low-carbon life.

096 Goal facilitating agents improve the intention-behavior relationship on environmentally friendly clothing consumption

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Keywords: environmentally friendly behavior; social influence; self-regulation

Introduction: Much evidence indicates that social factors can influence people's behavior. The present study seeks to understand how social factors influence the pursuit of environmentally friendly clothing goals. Specifically, it explores whether the relationship between a goal intention to acquire environmentally friendly clothing and self-reported behavior is moderated by the presence of people supportive (versus non-supportive) of a person's goal.

Theoretical Framework: In the pursuit of attaining one's goals different self-regulation strategies can be undertaken. One effective self-regulation strategy is the prospective planning of how goal-directed behavior is to be implemented and choosing situations that favor goal pursuit and reduce the risks of encountering goal conflicts. When people shop for clothing they are frequently doing so in the presence of other people. Who these people are can significantly influence goal progress. The presence of other people can have both an inhibiting and facilitating effect on the goal-behavior consistency (Hofmann et al., 2012). Specifically, the presence of people supporting the environmentally friendly clothing goal can function as a facilitating agent - for example through supporting one's planning efforts or acting as a reminder of the goal when faced with temptations. In contrast, the presence of people who are non-supportive of the goal can act as an inhibiting agent.

Method: The influence of facilitating (versus inhibiting) agents were tested by means of an online survey conducted in the United States, Germany, Sweden and Poland). The survey included measurements

of life goals, goal intentions, self-regulation strategies, clothing consumption (environmental apparel consumption scale) and the presence of facilitating or inhibiting agents. It was hypothesized that the presence of facilitating agents would positively moderate the goal-behavior consistency. The overall sample size across the four countries was $n = 2,729$: The United States ($n = 388$), German ($n = 742$), Sweden ($n = 845$), and Poland ($n = 754$). The hypothesis was tested through a linear regression analyses.

Results: The linear regression analysis supported the hypothesis that the presence of facilitating agents would significantly moderate the relationship between the intention to acquire environmentally friendly clothing and self-reported environmental clothing behavior ($p < 0,001$). The regression analyses further found that self-reported environmentally friendly clothing behavior was significantly explained by an environmental life goal ($p < 0,001$) and the self-regulation strategy of avoiding temptation ($p < 0,001$). In total, the regression model explained 51,9 % of the variance of environmental clothing consumption with no significant differences between the countries.

Conclusion: The present study shows that the presence of facilitating agents when acquiring clothes significantly moderated the goal-behavior consistency. This suggests that an effective self-regulation strategy is to bring people supportive of one's goal intentions along when acquiring clothes to ensure the environmental friendliness of one's purchases.

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220 Protecting the environment for selfish reasons: Altruism is not the only pathway to sustainability

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Keywords: Pro-environmental behavior, IMEC, environmental concerns, self-interest, altruism, self-enhancing, self-transcendent, environmental communication, sustainability

Abstract:

Introduction: Addressing climate change will require that people do things differently. While there has been some success in developing conservation programs that encourage pro-environmental behavior, there remains considerable debate about the most effective strategies.

Theoretical background: Concerns for environmental issues are important drivers of sustainable and pro-environmental behaviors, and can be differentiated between those with a self-enhancing (egoistic) vs. self-transcendent (biospheric) psychological foundation. Yet to date, the dominant approach for promoting pro-environmental behavior has focused on highlighting the benefits to others and nature, rather than appealing to self-interest. In order to shed light on this fundamental social dilemma, in this paper we build on the Inclusion Model for Environmental Concern and argue that: egoistic and biospheric concerns for environmental issues are hierarchically structured, such that biospheric concerns are inclusive of self-interest

Methods: Three studies test the hypothesis that individuals with egoistically-based environmental concerns will be more likely to behave pro-environmentally when the behavior results in a personal benefit (but not when there is exclusively an environmental benefit), while individuals with more biospherically-based environmental concerns will engage in pro-environmental behaviors when there are environmental benefits, and critically, also when there are personal benefits

Results: As a result, making self-enhancing motivators salient is likely to increase pro-environmental behaviors among a broader audience, whereas self-transcendent messages will tend to be motivational only for the subset of the audience with altruistic environmental concerns

Conclusions: This does not mean that policy makers should promote self-interest and eschew altruism, but rather that both frames could be effectively used to promote pro-environmental behaviors according to different yet interrelated social psychological basis.

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224 Stickiness of pro-environmental behaviours: what factors characterise persistence of water-related behaviours?

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Keywords: habits; persistence of behaviours; social norms; experience; disruption.

Abstract:

Introduction: Effective environmental management requires active engagement of communities. Promoting adoption of household behaviours related to water use and waterway pollution have a significant impact on outcomes.

Theoretical background: Behavioural theories, such as the Theory of Planned Behaviour highlight the importance of key domains in influencing uptake of behaviours: (i) expected outcomes; (ii) self-efficacy; and (iii) social influences such as social norms (Ajzen, 1991). However, relatively less research has examined whether these factors also influence maintenance of behaviours over time. Habit-related theories suggest that disruption to routines (e.g. via natural disaster) can permit new behaviours to be adopted (Verplanken & Roy, 2016), and that linking behaviours to specific routines or locations supports maintenance of these behaviours (Lally, Van Jaarsveld, Potts, & Wardle, 2010).

Methods: We conducted a national online survey with a representative sample of Australian adults (N=5172). Participants were asked to rate the frequency of adopting 21 water-related behaviours (6 key response options, 1=Never, 5=Always, 6=Used to, but not anymore). For all behaviours, a dependent variable was created, coded as 'persistent behaviour' (performing behaviour 'often' or 'always') vs 'discontinued behaviour' ('no longer perform'). Generalised linear mixed models assessed factors associated with the persistent behaviour. Level 1 variables characterised the behaviour, including location, perception of rate other households performing this behaviour, perceived impact, and effort. Level 2 variables characterised demographics (age, sex, education), experience (time at current address, experience of water restrictions) and psychological factors (environmental identity).

Results: The only behaviour characteristic associated with persistence was perceptions about rate of other households performing the behaviour (F=15.25, p<.001). Contrary to expectation, perceived impact, location and effort were not related to persistence. Individual characteristics related to persistence were: older age (F=4.66, p<0.05); experience of water restrictions (F=9.81, p<.01), shorter duration at current address (F=18.94, p<.001) and environmental identity (F=22.11; p<.001).

Conclusions: These findings highlight the importance of both social factors and experience in contributing to the maintenance of environmental behaviours.

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PSIV-21 SUSTAINABLE TRANSITIONS AND CLIMATE CHANGE ADAPTATION

Room: 0.2

076 Effects of policy measures and moderating factors on climate change adaptation among private forest owners in Sweden

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Keywords: climate change adaptation; forest risk management; policy measures

Abstract:

The forest is an important natural resource. However, as a result of climate change, biotic disturbances, such as pest and disease outbreaks, and abiotic disturbances including wind storm may damage the forest. In the long term it is nevertheless possible to adapt to a changing climate by for instance using more broadleaves and fewer coniferous trees, more mixed forests, and changing the rotation length and thinning schedule. In countries with a lot of private forest (e.g., Sweden, Finland, and the US), the government can by means of different policies directed at the owners govern towards an improved forest risk management. The present study independently examined the effects of two policies: an advice and an economic incentive, on climate change adaptation among private forest owners in Sweden. The influences of forest values and the social risk management context were furthermore explored. Two overall strategies have been identified to promote individuals' behavioral change: (1) information and (2) structural changes (including economic incentives) (Steg & Vlek 2009). Since policy measures, forest values, and the social risk management context may be considered potential facilitators of adaptation, main effects of these variables were hypothesized. Furthermore, forest values and social risk management context were believed to also act as moderators of the relationship between policy measure and climate change adaptation in line with previous research (Nilsson et al., 2016; Steg & Vlek, 2009). A questionnaire study including a randomly selected sample of forest owners (20-80 years owning more than 5 hectares of forest land, N = 3000) was conducted and response rate of 50%. Measures included climate change adaptation assessed in terms of the intention to implement five management strategies in response to policy scenarios (e.g., increase the share of mixed and deciduous forest), ecological and production forest values, as well as the social risk management context (e.g., descriptive norms and social support encouraging risk management). Results revealed that both policies strengthened the intention to adapt, but the main effect of policy was not significant (i.e., the economic incentive was not overall more effective than the advice). Ecological and production forest values, and being in an encouraging social risk management context were furthermore important for the owners' response. Production values and social risk management context moderated the effect of policy on intention to adapt, suggesting that the economic incentive was mainly more effective than the advice among owners with strong production values and among owners in less encouraging social risk management contexts. The study has implications for tailoring policy to fit with the target group's needs, but also targeting specific sub-groups of forest owners (e.g., those not part of a supporting social context) to increase the effectiveness of climate change adaptation policies.

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131 Experiences of black outs impact perceptions of energy security and climate change and increase intentions to save energy.

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Keywords: black out; power cut; energy security; climate change ; sustainable behaviour

Abstract:

Introduction: People in developed countries rely on electricity for many aspects of everyday life and without it there is widespread disruption (Kemp, 2016). Given recent cases of cyber terrorism disrupting power supplies and the increasing numbers of severe storms that impact power, black outs may increase in years to come and it is important to plan communications around these events.

Theoretical background: People's experiences help to develop socio-cognitive associations and knowledge about related phenomena (for example we know that flooding experiences impact perceptions of climate change: Spence et al., 2006). It may be that certain extreme events can focus the individual on an issue and result in significant step changes in perceptions that have a long lasting impact on an individual. These events can also be considered important 'windows of opportunity' (Bamberg, 2006) within which to discuss related issues.

Methods: We conducted a national survey of the UK using data obtained from an online panel hosted by a social research company (N = 1729). We gained a quota sample approximately representative of the UK in terms of age, gender, social grade, and location. Participants were provided with points for their participation in the survey, which can be used to gain shopping vouchers. The survey tool recorded demographics and perceptions relating to energy and energy saving intentions; the survey took around 15-20 minutes to complete.

Results: Our data indicates that people who had experienced a black out (N = 182) were more concerned about climate change, more concerned about energy security (including affordability) and rated motivations to save energy more important, both at home and work, than people who had not experienced a black out (N = 1361). The perceptual differences observed in people who had experienced a black out also translated into greater intentions to save energy both at home and at work. Notably, the effect of experiencing black outs on behavioural intentions is indirect, occurring when the experience results in changes to perceptions of energy security, climate change and motivations to save energy.

Conclusions: Black outs have significant impacts on the way people think about energy and climate change, and increase intentions to behave sustainably. Given that black out experiences only impact sustainable behaviour intentions for those who change their perceptions as a result of their experiences, communications around black outs may be key 'windows of opportunity' at which to engage people with broader energy issues and the issue of climate change in order to promote sustainable behaviour.

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141 Linking the environmental and moral self: When self-activation affects decision-making within an integrated self-attributes framework

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Keywords: Environmental behavior; Moral behavior; Values.

Abstract:

Introduction: Recent studies have suggested a relationship between environmental and moral values; although, these two topics are generally considered separately (e.g. Feinberg & Willer, 2013). To address this limitation, we investigated the dynamic interplay between environmental and moral values within individuals' self-representation through a purchase decision-making task.

Theoretical background: Centrality of environmental values predicts environmentally friendly behavior (De Groot & Steg, 2008); however, the role of moral standards in this process remains unclear. We hypothesized that environmental and moral self-attributes were embedded within a set of multiple self-aspects which collectively shape a person's identity. Therefore, the aim of this study was to investigate how individual differences in environmental and moral values drive environmental decision-making.

Methods: We first measured participants' environmental and moral values. Two weeks later, the same participants completed a decision-making task, where they were required to design an ideal TV by distributing a budget of £280 among different product features. Features included sustainable and prosocial/moral aspects. The sum given to the pro-environmental and prosocial features were our dependent variables, as a measure of participants' willingness to engage in pro-environmental and moral (i.e. prosocial) behavior.

Results: We applied a model-based cluster analysis to identify distinguishable profiles based on environmental and moral values. Our results yielded three clusters: high, low and moderate value centrality. Participants in the high centrality cluster reported environmental and moral values as equally central for the self ($p = .102$); in the moderate centrality cluster participants showed higher environmental values ($F(1, 270) = 19.59, p < .001$), while those in the low centrality cluster showed the opposite pattern ($F(1, 166) = 16.86, p < .001$). These results suggest that environmental and moral values are distinguishable dimension is the self-representation, linked to each other in a way that goes beyond a simple correlative relationship. To investigate the behavioral dynamics of this relationship, we further looked at how participants distributed their budget between environmental and prosocial features. In the high ($F(1, 168) = 21.27, p < .001$) and moderate ($F(1, 270) = 15.9, p < .001$) centrality clusters, people spent significantly more for environmental features. Notably, we did not find a significant preference towards any of the features in the low centrality cluster ($p = .24$). Generally, these findings seem to suggest the existence of a hierarchical connection between environmental and moral self-dimensions, where environmental concerns may override moral values in participants' decision-making.

Conclusions: In conclusion, this research sheds new light on the complex structure of moral and environmental self-representations. Further research is necessary to integrate the study of the moral and the environmental self.

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256 Continuity and discontinuity in narratives about ecological change: Understanding artisanal fishers' responses to Climate Change governance

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Keywords: conservation laws; narratives; continuity and discontinuity

Abstract:

In a period of intense debate about the effects of climate change, it is crucial to better understand the psychosocial dimensions involved in how coastal communities respond to the tools that govern the protection of marine resources and to the ideas and values these incorporate. It is especially important to understand the responses of certain groups particularly affected by the changes this governance imposes.

In the present study, we will examine how artisanal fishers, confronted with new conservation laws and their assumptions regarding fish scarcity, present their past, present and future. Some authors have suggested that past-present discontinuity is identity-threatening and negative (Breakwell, 1986). Yet, other approaches show how continuities and discontinuities can both be useful in the positive (re-)construction of identities (Greenwood, 2015). We thus examine whether and how accounts of continuity and discontinuity with the past are (1) presented as negative or positive experiences; (2) mobilized to legitimize or delegitimize the ideas and values incorporated in the laws upholding changes to their trade. For this we performed interviews (n=39) to fishers and seafood collectors living in a coastal protected area in the southwest of Portugal. The analysis had two phases. First, the main themes were identified through a lexicometric analysis with IRAMUTEQ. The second phase of the analysis explores how continuities and discontinuities are mobilized across the specific themes and what functions they fulfill in the narratives. Two main clusters emerged from the lexicometric analysis, each divided in two subthemes: A. Fishing and local knowledge, which included A.1 Fishing Tools and Resources, discussing old and new forms of fishing as well as the current situation of fish and seafood, and A.2 Fishing Places and Actions, offering detailed knowledge of fishing places and conditions; and B. Social Relations, divided into B.1 Informal relations, mainly discussing social memory of private sphere relations, and B.2 New institutions and formal relations, debating their relationship with the governance institutions and conservation laws, as well their new forms of local association.

The second phase of the analysis showed that threats to continuity linked to decrease in resources are dealt with a strategy that oscillates between acknowledgment and denial of the situation, only sometimes associated to excessive fishing. Discontinuity induced by new tools is generally presented as positive, although it is stressed how such innovations also facilitate excessive fishing. Threats to continuity linked to ecological governance and laws are dealt with by both criticizing and defending some of the aspects of the laws. Overall, the presentation of continuities and discontinuities indicates an ambivalent sense making of current fishing practices and enables resistance to the new laws; yet, discontinuity is not always presented as disruptive: it accommodates desired changes (in tools and fishing conditions) and sometimes opens space for the negotiation and integration of new meanings and actions.

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263 Explaining intentions and engagements in behaviors to adapt to climate change of people in and around Cusco (Peru)

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Keywords: climate change; theory of planned behavior; risk perception

Abstract:

Behaviors and psychological processes related to climate change are mostly investigated in industrialized countries with focus on mitigation behaviors (i.e., behaviors that reduce climate change). Investigation in developing countries, where adaptation behaviors (i.e., preparations to negative consequences of climate change) are more important, are rare. This paper taps into this gap and presents first results regarding psychological processes related to climate change in Peru.

Theoretical background: A further specified version of the theory of planned behavior (TPB, Ajzen, 1991) was used in which attitude is operationalized as a cost-benefit calculation considering that effects of behaviors can depend on the number of persons who engage in it. For norms, injunctive and descriptive norms are distinguished. Further, we investigated how risk perception of climate change as operationalized by van der Linden (2015) improves the explicative power.

Methods: Data were gathered in and around Cusco (Peru) by computer-assisted personal interviews. From May to November 2016, about 1,200 interviews were performed with participants selected by the random-route method. We asked about various classes of adaptation behaviors (changing own daily behavior, IB; do one-time investments, INV; engage in collective actions, CA; or support policies, POL) to deal with various consequences (flooding, droughts, and new diseases).

Results: Self-reported behavior could be explained particularly well for IB, INV, and CA related to droughts ($R^2=0.59, 0.45, 0.35$) and flooding ($R^2=0.49, 0.31, 0.33$), while intentions could be best explained for CA and POL related to droughts ($R^2=0.52, 0.48$) and diseases ($R^2=0.51, 0.72$). The *perceived effectiveness* of the behavior is most important for self-reported IB and the intention to CA (Beta = 0.13 to 0.26), and the *probability that enough people engage* in the behavior for self-reported behaviors related to droughts, except POL (Beta = 0.18 to 0.22). *Descriptive norms* are particularly important for self-reported behaviors related to flooding and diseases, except INV (Beta = 0.27 to 0.58), while *injunctive norms* are more important for intentions related to protection against diseases, except IB (Beta = 0.34 to 0.45). Finally, the *perceived feasibility* is important for self-reported behaviors related to droughts, except POL, and INV related to flooding (Beta = 0.30 to 0.44). Risk perception of climate change does not improve the explicative power of the models.

Conclusions: While self-reported and intended adaptation behaviors can be well explained by constructs of a more specific version of the TPB, the results indicate that adapting to consequences of climate change is not a homogeneous class of behaviors and that risk-perception of climate change is not a factor considered in the decision to engage in adaptation behaviors.

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Friday
1st September

09:00 – 10:30 h.

PSV-22 EXPLORING ENERGY SAVING IN HOUSEHOLD

Room: -1.1

075 Early adopter of electric vehicles in Sweden: Attitudinal influence on preferred measures for increased future EV adoption

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Keywords: Attitudes; acceptability; electric vehicles

Abstract:

Introduction: Alternative fuels are on the agenda and plugin-hybrid electric (PHEV) and battery electric vehicles (BEV) are viewed as green options that can keep levels of mobility intact. Here we focus on early adopters of electric vehicles (PHEV or BEV) to better understand what measures need to be taken to stimulate future purchase and use of EVs. To what extent do attitudinal factors influence the perceived needs of different measures for EV stimulation and do mode of use and ownership form play a part in this (e.g. own purchase, private leasing, or company car used in private).

Theoretical background: The challenge is to increase the purchase and use of electric vehicles, and one common way to do this is to use different measures or policies. Such measures need to be perceived as important, and effective to work as intended. Studying factors with an influence on beliefs about measures are therefore important, such as values, beliefs and norms as depicted in the Value-Belief-Norm theory and the Norm-Activation Model.

Methods: Data was collected with an online survey, distributed to 10167 owners of electric vehicles (PHEV or BEVs), with a return rate of 25%. The survey contained a multitude of items and scales; in this study however scales relating to environmental worldview, problem awareness, ascribed responsibility, self-efficacy, social and personal norm, emotions associated with owning an EV (hedonic, nervous, no-guilt), perceived importance of different EV stimulating measures, and socio-demographics (gender, age, and education) were selected.

Results: Results show that pure battery car owners (BEV) hold stronger environmental beliefs compared to those owning plugin-hybrid electric vehicles (PHEV). The largest share of BEV owners was found among those who private lease the car. Participants see the need for measures such as the proposed Bonus Malus system (e.g. higher tax for fossil fuel cars and vice versa), increased knowledge and improved information about EVs, and subsidized purchase and use of EVs). Regression analyses show that it is foremost the view on the Bonus Malus system that is influenced by attitudinal and emotional factors, while information and subsidies only to a small degree.

Conclusions: The emerging market for private leasing your car, instead of buying it, may be a good way to stimulate EV use, since it reduces the financial risks possibly associated with buying a new transportation technology. It is further evident that normative reasoning is important in relation to more structural/hard measures, such as taxation systems, as has been seen before.

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102 Do fine feathers make fine birds or persons? Explaining the spillover from smart energy technology adoption to other sustainable energy behaviours

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Keywords: spillover; environmental self-identity; smart energy technologies

Abstract:

People increasingly adopt smart energy technologies (SET), such as photovoltaic solar panels and electric vehicles. These innovations will significantly reduce fossil energy use, provided that people change their behavior accordingly. It is key to understand under which conditions individual's SET adoption promotes sustainable use of SET and other sustainable energy behaviors (i.e. positive spillover).

Research has shown that people intend to purchase SET driven by different motivations, for example by the symbolic value, environmental impact or utility of SET (Noppers, Keizer, Bolderdijk & Steg, 2014; Bockarjova & Steg, 2014; Noppers, Keizer, Bockarjova & Steg, 2015; Korcaj, Hahnel, & Spada, 2015). We propose that the motivation for SET adoption is of great importance for positive spillover to occur. We expect that when people adopt SET based on environmental motivations their environmental self-identity is likely to be strengthened. This, in turn, increases the likelihood to engage in other sustainable energy behaviors as people are motivated to act in line with how they see themselves. In contrast, when SET are adopted for other reasons environmental self-identity will not be strengthened, making spillover to other sustainable energy behaviors less likely.

In addition, we expect the signalling value of behaviour to play a pivotal role. Research has shown that environmental self-identity is strengthened when the behaviour signals who you are, especially when the behaviour contains multiple signalling features (Van der Werff, Steg & Keizer, 2014). We thus expect environmental self-identity to be strengthened when people purchase SET based on environmental motivations and consider the purchase to be difficult, unique and voluntary (rather than easy, common and pushed by a subsidy or other financial incentive).

We conducted two questionnaire studies among electric vehicle owners. The first study comprised owners active on online fora on electric vehicles (N=73) and the second study comprised people who regularly charge their cars at public charging facilities (N=235).

The analyses showed support for our reasoning: when people purchased electric vehicles for environmental reasons, they were more likely to engage in other sustainable energy behaviors; this relationship was mediated by environmental self-identity. The data on the signalling value of behaviour is still being analysed.

When people purchase SET for environmental reasons, this is related to more sustainable behaviour in other domains. However, when people purchase SET for non-environmental reasons, this is not related to sustainable use and other sustainable energy behaviours. Therefore, the purchase of a sustainable technology might in the end do more harm than good to the environment.

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258 Participative implementation processes of energy balancing concepts in different regions in Germany

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Keywords: Spatial planning and cognition, systemic factors underlying environmental action, multi, inter and trans-disciplinary approaches and principles

Abstract:

The three-year research project „societal acceptance of energy balancing technologies and their meaning for the transformation of the energy system“ focused on energy balancing technologies, e.g. batteries or CHP, both in terms of their technical potential as well as their societal acceptance by using a participatory and transformative research approach. Energy balancing concepts, are one approach to guarantee security of supply within the German energy system because they allow the decoupling of decentralized energy production and use by using e.g. storage capacities.

Aim of the transformative approach was to develop acceptable implementation concepts and to improve the technical systems through integrating social knowledge of different stakeholders, respectively. Four model-regions within Germany have been considered regarding their potentials for implementing energy balancing concepts. One of these regions was an urban quarter where profound understanding of stakeholder behaviour, especially with regard to the initiation of participation processes was examined.

Methodologically, a mixed-methods approach was used. First, eight guided in-depth interviews have been carried out with nationwide experts to identify key criteria for the acceptance of the different technologies. Findings were validated in a subsequent workshop. Furthermore, 18 semi-structured interviews with stakeholders and workshops in the model-regions have been carried out. The main focus was to examine the most relevant stakeholders for implementing energy balancing concepts and to analyze the requirements for the initiation of planning processes for energy balancing concepts, defining realistic time frames and ranking different levels of participation options. Finally, a dialogue process has been displayed in the urban quarter, testing an integrative planning tool for developing regional adapted balancing concepts.

Existing studies indicated that acceptance of new technological infrastructures are influenced by contextual factors, such as location, environmental protection initiatives or legal requirements (e.g. Zoellner et al., 2008). Even though inter alia participation, trust and locations have been mentioned by the experts to raise ‘active acceptance’ [Schweizer-Ries, Rau & Zoellner, 2008], in context of energy balancing concepts, the main criteria seemed to be cost effectiveness and legal requirements. Since the awareness for the necessity of energy balancing has not yet been present, the acceptance criteria regarding the respective technologies can change within the stage of the concrete implementation process.

For spatial planning, local participation and governance processes the workshop and interview results indicated that a shared understanding of the regarded ‘area is crucial besides administrative boundaries. The subjectively constructed concept of the region [‘mental model’; e.g. Jones et al., 2011], e.g. culturally, administratively or economically, is linked to the individual willingness to participate on planning energy balancing concepts. Therefore, the most promising level for planning processes for energy balancing is the municipality as local authorities and power suppliers have been identified as the most relevant stakeholders, besides locally active organizations or networks. Considering the municipal level has implications for perceived responsibilities of local authorities and thus the decision-making process within planning procedures.

Findings also identified different grades to integrate communal stakeholders in the planning process for energy balancing concepts considering local framework conditions e.g. existing climate protection concepts.

129 On how to bridge the intention-behavior gap. An intervention study based on an action-theory inspired website supplementing smart meter and smart home devices

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Keywords: smart meter 1, action-stage-model 2, commitment 3

Abstract:

Introduction: Reduction in electricity consumption by private households is an important factor in enhancing the sustainability of energy infrastructures. With the arrival of new technologies (smart meter, smart home) the question arises how information instruments may be designed that motivate and support consumers in their saving efforts and how the gap between saving intention and action may be bridged. What is possible is shown by the web portal created by one of the projects of the research field user behavior and demand management of the Helmholtz-Alliance Energy-Trans.

Theoretical background: The information architecture of the web portal was designed against the backdrop of a stage model of self-regulated behavioral change (Bamberg, 2013; Mack and Tampe-Mai, 2016). Users are guided in their migration through the stages by the way information is structured. To address the gap between intention and action, the focus is on the support of the implementation of planned behavior. Apart from a consumption analysis tool that provides feedback on total electricity consumption (measured by the smart meter) and on device specific consumption (measured by the smart home), the user is presented with saving tips and information concerning their implementation. The user is asked to commit to the tips he/she wants to try. After committing, every fortnight messages are sent and the user is able to give feedback about his/her status of implementation. A black board shows all tips committed to with their implementation status.

Methods: In a neighborhood of new housings interaction with the portal was analyzed and the effects of portal usage on consumption were evaluated. A GLM with 12 baseline and 12 treatment phase monthly consumption values as dependent variables, commitment completely implemented (yes, no) as grouping factor, study phase (baseline, treatment) and month-of-year (Jan to Dec) as repeated measurement factors, and several covariates (e.g. household size and interaction duration (ID) with that part of the analysis tool that offers device specific analysis options) was computed.

Results: The interactions between commitment completely implemented and study phase and between interaction duration (ID) and study phase attained significance (commitment completely implemented by study phase: $T_2(1,34)=0.201$, $p=0.013$, $pETA_2=0.167$; ID by study phase: $T_2(1,34)=0.202$, $p=0.013$, $pETA_2=0.168$).

Conclusions: Although the sample investigated is lower in consumption than the national average, compared with the baseline phase, households that committed to saving tips and gave feedback that at least one tip was completely implemented consumed less electricity in the treatment phase (-6.3%), while households without commitments completely implemented consumed more (+2.7%). The more time participants spent on device specific analysis options the more they saved in the treatment relative to the baseline phase. This shows that techniques inducing commitment to action and guiding towards implementation of the action plan may be effective in producing real savings of electricity, just as the offer of device specific analysis options.

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Subtheme: Energy transitions and consumption. The human factor.

186 Going with the flow: Exploring the efficacy of social norms for private showering behaviour

Gallagher, E., Verplanken, B. & Walker, I.
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Abstract:

Introduction: The literature to date shows the vast array of domains within which social norms have been an effective behaviour change mechanism. In particular the field of environmental behaviours have seen success in terms of energy reduction, recycling, littering, towel re-use, to name a few. To date in the literature, private behaviours appear to have been largely overlooked, both in terms of their environmental impact and their suitability for social norms interventions. As many consumptive behaviours occur in private, this is an important area to address. Social norms relate to the common behaviour in a given context and have their roots in classic theories such as social learning theory, social comparison theory and social conformity theory, all of which posit that we look to others to guide our behaviours. Social norms interventions change behaviour by indicating to an individual how their referent group behave in a given context.

Method: Part 1. An online study was conducted whereby 318 participants were asked to respond on a scale how frequently they engaged in a number of common behaviours which were both public and private. Following this they were presented the same set of behaviours and asked to state what they perceived was the norm or average response, and then the range of normal responses of the general population.

Part 2. 92 first year students were asked to record their individual shower time using data logging devices. They were not told the true purpose of the study. After baseline data collection, participants were randomly assigned feedback advising that they were X minutes above or below 'the norm'. The feedback (Descriptive Norm) given did not relate to a specific norm but rather was generated using a random number generator. Data was again collected post intervention. Participants were then asked to complete the survey measures and were fully debriefed as to the purpose of the study.

Results: Part 1: A negative correlation was found between behaviours perceived as private and their perceived environmental impact. Mediation analysis showed the more private a behaviour is the less perceived environmental impact and the lower perceived variance in behaviour of others. Discrepancies were found between self-report frequency of behaviours and perception of behaviour frequency 'norm'

Part 2: Split plot ANOVA found to be significant. While the below average condition increased shower time significantly, the above average condition did not decrease their shower time significantly, despite participants scoring high environmental concern, and moderately high in terms of 'consciously taking shorter showers'.

Conclusion: Part 1. There appears to be a lack of association between private behaviours and their environmental impact. For private behaviours, we also seem to believe everyone behaves in the same way.

Part 2. While the below average group easily changed behaviour in line with the norm, the above average group did not. This can be explained with the focus theory of normative conduct in that making the undesirable behaviour salient encouraged participants to engage in the behaviour. Further, this could be explained by the earlier finding that people do not associate private behaviours with the environment, suggesting that the inclusion of an environmental message may useful in further research. This boomerang effect may also be as a result of vicarious moral licensing or psychological reactance.

Keywords: social influence, behaviour change, environment, private behaviours

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218 Making the Smart Meter Social Promotes Long-term Energy Conservation

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Keywords: Energy conservation, real world intervention, social norms, group identity, long term effect, real-time feedback, mixed-model design.

Abstract:

Introduction:

Reductions in residential energy demand can aid in meeting the emissions target outlined in the Paris Climate Agreement of 2015. Thus, it is fundamental to design theory-based intervention to foster and sustain energy conservation over time.

Theoretical background:

Feedback is often cited as a critical tool to promote energy conservation, and recent studies have shown the effectiveness of providing residents with normative feedback rather than personal feedback or financial feedback. Within this perspective, we applied the social norm theory to promote long term energy conservation.

Methods: In this follow-up study, we analysed the impact of real-time feedback on residential electricity consumption over a two-year period. We implemented 3 different kinds of In-Home-Displays (feedback only, feedback+cost, feedback+norm, control group-no display) to provide households with real-time energy information feedback.

Results: Results showed that only normative feedback resulted in long-term reductions, and importantly, greater reductions were observed for households that identified more strongly with the normative referent group.

Conclusions: According to the evidence here reported, a simple addition to the already widespread smart meter technology— conveying a social comparison— offers a readily implementable strategy to promote long-term energy reductions. Because the normative feedback strategy is feasible in

implementation, targets high-consumptive households, and promotes a culture of energy conservation, it warrants serious consideration as a primary tool in curbing energy use behaviors.

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283 Social Norm Effects on Pro-Environmental Behavior: An Examination of a Cycling Campaign

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Keywords: social norms; carbon footprint; attitudes; cycling; behavior; transport modes

Abstract:

Introduction: Transportation choice has implications for traffic density, human health, urban structure, and climate change mitigation. In our study, we survey the long term effects of a competition intended to promote bicycle commuting on behavior and attitudes of its participants.

Theoretical background: Social norms have a major effect on environmental behavior (McDonald, Fielding, and Louis 2014) as well as on transport mode choice (du Preez and Heath 2016; Kroesen 2015; Fruhen and Flin 2015). This study focuses on an environmentally framed social campaign in the Czech Republic and elaborates on previous research (Frick, Kaiser, and Wilson 2004), also focusing on cycling campaigns (Hiselius and Rosqvist 2016).

Methods: In the pretest (CAWI), the full database of competition participants (N=3930, n=410) in Prague and Brno was contacted. Intervention consisted of participation in campaign in May 2016 which included filling of daily transport diaries. We used within-subject design, based on difference in differences with control group (n=407) with the same cycling activity. Posttests including detailed footprint calculations, pro-environmental attitude tests, and General Environmental Behavior tests (Kaiser and Wilson 2000) were realized one and five months after the initial intervention. Peer effects were investigated using covariates and regression analysis.

Results: The effect of team membership in particular companies had a major effect on the total distance travelled by bicycle, the number of trips taken on bicycle, and relative preference of cycling as a mode of transport.

Conclusions: This study confirms the significant effects of social norms on one pro-environmental behavior. The field conditions of the experiment did not allow us to control situational variables, and the data do not provide team affiliations in the control group. Despite these constraints, we recommend knowledge about the effects of social norms on personal transport choice behavior be applied for further use in social policy interventions.

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344 Using Contest-based or Norm-based Interventions?

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Keywords: Intervention, Energy efficiency, Behavior, Social norms, Contest

Abstract:

Introduction: Setting up a contest is a popular tool in promoting behavioral change. Still, our knowledge about these contest-based interventions is very limited (Schultz, 2014). The present paper compares contest-based and norm-based interventions in three experimental studies and two field-studies.

Theoretical Background: We propose that the contest frames a gain goal, while the norm-based intervention frames a normative goal (Lindenberg, 2001; Lindenberg & Steg, 2007). In the contest, participants are expected to define energy conservation as a means to increase their own monetary resources, and therefore show intensive behavioral engagement when higher engagement in associated the possibility to win a prize. In the norm condition, participants are expected to define energy conservation as "the right thing to do", and therefore express more positive attitudes, show positive spillovers (Truelove, Carrico, Weber, & Raimi, 2015; Nilsson, Bergquist, & Schultz, 2016), and feel more obliged to save energy (Thøgersen, 2004).

Method and Results:

Study 1. To examine implications of the contest-based and norm-based intervention technique we first primed a normative versus gain goal experimentally. Results revealed a significant main effect of goal-framing ($F(1, 53) = 4.72, p = .034, \eta^2 p = .082$), showing higher personal energy conservation norms in the normative condition than the gain condition ($d = 0.57, 95\% CI [0.04, 1.09]$).

Study 2 and 3. Participants were randomly assigned to a contest condition or a norm condition, framing an energy conservation task (provided with information material on energy saving and then write as many energy saving tips as possible) or a recycling task (asked to drag and drop 50 pictures of various household wastes to the correct recycling category) as either a contest or providing normative information. Results showed that participants in the contest condition worked more intensive ($d = 1.13, 95\% CI [0.74, 1.53]$) in an energy conservation task, and faster ($d = 0.31, 95\% CI [0.05, 0.57]$) in a recycling task, but also tended to made more errors (Beersma et al., 2003). In the norm condition, personal norms fully mediated the relation between performing the energy conservation task and future energy conservation intentions (see Figure 1). We also found a tendency to express higher personal norms for non-targeted pro-environmental behaviors in the norm condition ($d = 0.24, 95\% CI [-0.02, 0.50]$).

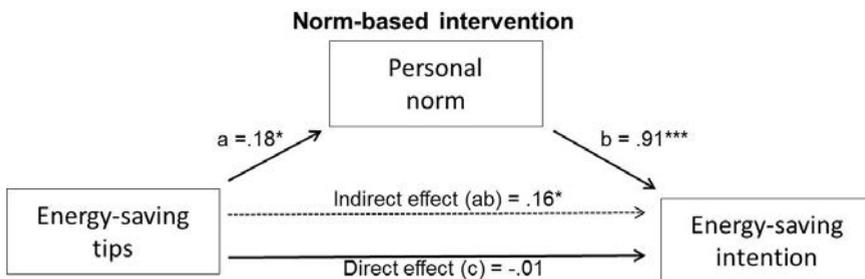


Figure 1a.

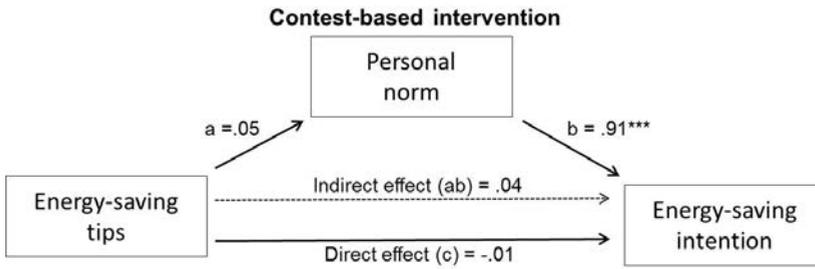


Figure 1b.

Results from Study 2. * $p < .05$, *** $p < .001$.

Study 4 and 5. In two field-experiments, participants were recruited to a two or four week intervention on energy conservation. Participants were provided with prompts, feedback mails, and refrigerator magnets describing the intervention as either a contest or using normative information. We measured attitudes, personal- and injunctive norms, self-reported energy conservation, recycling and water use, and kWh before, during and after the intervention. Data are collected and are now being analyzed.

Conclusions: Taken together, contest-based interventions promotes strong but short-lived pro-environmental engagement, while norm-based interventions activates stronger obligations; which consequently promote future pro-environmental intentions, and provide a basis for positive spillovers.

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PSV-24 DETERMINANTS OF PRO-ENVIRONMENTAL BEHAVIOR

Room: -1.3

284 Can Cycling to work program change environmental attitude and lead to environmental spill-over?

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Keywords: spill-over effect; the Campbell paradigm; environmental attitude; cycling; transportation; attitude change

Abstract:

Introduction: Literature documents that new transportation situations can induce change in people's transportation patterns (e.g., Bamberg, 2006) driven typically by changes in perception of transportation alternatives. Relatively little attention has been paid to whether changing transportation patterns can result in more permanent change in environmental attitude and lead to spill-over effect. In this study, we investigate whether participation in a one-month long program Cycling to work, which motivates employee to form teams at their workplaces and compete for largest distance cycled to work, can change transportation behavior more permanently by changing environmental attitude and/or perception of transportation modes.

Theoretical background: Environmental spill-over effect or an effect whereby strengthening of one environmental behavior leads to changes in other environmental behaviors has received some attention (Thøgersen, 1999). Theoretical explanation of this phenomenon is under-developed but theory of cognitive dissonance (Festinger, 1957) and self-perception theory (Bem, 1967) provide general framework for understanding of this phenomenon.

An interesting perspective on the spill-over effect which is grounded in the Campbell paradigm (Kaiser, Byrka, & Hartig, 2010) was proposed by K. Byrka [2009] who argues that the spill-over effect is driven by change in the level of environmental attitude which results in shift across all possible environmental actions.

Method: A group of participants (N = 400) in the Cycling to work program and a group of non-participants (N = 400) are measured before, immediately after, 2 weeks after and 2 months after the 1-month program. Environmental attitude is inferred using Rasch-calibrated scale of attitude (Kaiser & Wilson, 2000). Effect of the program on transportation behavior and environmental attitude is estimated using quasi-experimental method of propensity score matching.

Results: The program has very strong positive effect, in terms of effect size, on the use of low-carbon transport and resulted in considerable reduction of transport-related carbon footprint but this effect declined by almost 50% only 2 weeks after the program ended. Participation in the program makes low-carbon transportation modes comparatively easier for participants but this effect also declines shortly after the end of the program. Finally, we record only small effect of the campaign on environmental attitude resulting in small spill-over effect.

Conclusions: Programs that induce low-carbon transportation options using engaging team competitions can have large effects on transportation behavior but these effects are only short-lived and do not translate in more permanent attitude change.

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247 Role of psychological and socio-demographical factors for electric bike use in Norway

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Abstract:

Introduction: Electric bicycles (e-bikes), which refers to bicycles with an electric motor, have been emerging as a new type of sustainable transport use. In addition to having the benefits of cycling, such as zero emissions and exercise, people could travel faster with less effort due its electric motor. A switch from use of conventional cars to e-bikes has been shown to contributing to the reduction of energy use and environmental problems due to car use in different countries. Although e-bike use has been increasing recently in Norway, it is not as common as in some other European countries, such as Holland and Germany. There is a clear potential to increase e-bike use in Norway. In order to promote use of e-bikes, it is essential to investigate what kind of factors predict adoption of new technology such as e-bikes. In this study psychological and environmental factors related to e-bike use will be examined in Norway and Holland.

Aims: The specific aims of the study are 1) to identify characteristics of early and late adopters of e-bike use 2) To examine and compare the role of the measured constructs for predicting e-bike use/intentions to use for early and late adopters of e-bike 3) to apply the Value Belief Norm Theory (Stern, 2000) and Theory of Planned Behavior (Ajzen, 1991) to explain e-bike use and intentions to e-bike use 4) to compare the results from the Norwegian and Dutch samples and highlight the differences and similarities between the two samples.

Method: An internet-based questionnaire containing previously validated measurement instruments will be used to collect data among Norwegian and Dutch respondents, including both e-bike users and non-users. A commercial panel will be used to get the response of a representative sample of about 1000 respondents in Norway with oversampling of e-bike users. Data will be collected between December, 2016 – February 2017 in both countries.

Results: Results will be obtained after the data collection is over.

Conclusions: Conclusions will be drawn based on the results.

Keywords: E-bike; sustainable mobility; psychological factors; normative factors; Norway; Holland

References:

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179–211.
Stern, P.C. (2000) Towards a coherent theory of environmentally significant behavior. *Journal of Social Issues*, 56, 407–424.

120 The heterogeneity of sustainability attitudes: Findings from a cross-country study

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Keywords: Sustainable consumption, theory of planned behaviour (TpB), aggregation principle

Abstract:

Previous studies using the theory of planned behaviour (TpB; Ajzen 1991) have shown, based on the aggregation principle, that compound measures increase the explained variance in the context of sustainable behaviour and, thus, argue for the use of aggregated measures (Kaiser et al. 2005). Studies using this approach, however, cannot provide differentiated information on underlying mechanisms of specific sustainable behaviour, which, in turn, might be necessary to develop successful intervention strategies; particularly because previous studies have suggested that consumers' interest in the dimensions of sustainability (economic, social, and environmental) might differ (Bögel 2015). This study aims to test to heterogeneity of the constructs included in the TpB and, thus, the necessity of specific measures.

A survey study with students (n = 142) from a German (n = 65) and a Croatian (n = 77) university was conducted. It examined participants' attitudes, social norms and perceived level of control towards sustainable fashion consumption. According to the assumptions made above the three variables were measured separately concerning a) the social and b) the environmental dimension. The study lend support towards the assumed heterogeneity: In Germany, attitudes towards the social dimensions of sustainable fashion consumption (M = 4.69, SD = 1.53) were significantly more positive than towards environmental aspects (M = 4.22, SD = 1.75), $t(64) = 4.34$, $p < .001$. In contrast, participants from Croatia significantly perceived the environmental aspects (M = 3.51, SD = 1.84) to be more important than the social dimension (M = 3.13, SD = 1.62), $t(76) = -2.17$, $p = .033$. In addition, regarding country differences, the study showed that participants from Germany had a significantly more positive attitude towards the social as well as the environmental dimension of fashion consumption than those from Croatia. Similar effects were found for social norms and perceived level of control.

The findings on differences between the social and environmental dimensions of sustainability attitudes confirm the assumed heterogeneity of the construct. The differences found between the two countries in this regard support the assumption that the insights gained from a specific measurement approaches are needed for successful interventions strategies, e.g. aimed at increasing sustainable

fashion consumption in the two countries. The differentiation between the environmental and the social dimensions of sustainability attitudes and sustainable behaviour are a starting point in this regard, but further research is needed.

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289 Interventions affecting attitudes and behaviours related to climate change

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Keywords: global climate change; public attitudes and behaviours; experimental studies; interventions

Abstract:

Introduction: Substantial part of the social science research concerning climate change deals with the question, how is it possible to influence climate attitudes and behaviours of the individuals. We aim to provide a review and classification of interventions, which are capable to affect individuals' attitudes and behaviours concerning the global climate change and to compare the reported effects of these interventions.

Theoretical background: Various recent studies demonstrated that selected interventions could have the effect on individuals' beliefs and attitudes related to climate change or their willingness to engage in pro-climate behaviours. For instance, one group of interventions is based on the provision of various types of information about global climate change, which are aimed to fulfil the knowledge gaps or correct the misconception among general public (see Linden et al., 2015; Ranney & Clark, 2016). Other group of interventions presents the issue of global climate change within the selected frames, which are highly relevant for the public (see Bain et al., 2012; Myers et al., 2012).

Methods: We performed a thorough search for the relevant articles within the selected databases of peer-reviewed journals (EBSCO, SAGE, SCOPUS, WEB OF SCIENCE, etc.). We collected the studies (mostly experimental studies), which were testing the various forms of interventions designed to affect the attitudes and behavioural intentions of the general public related to climate change. Subsequently we analyzed selected studies, categorized them according to the type of the applied intervention and compared the effects, which they reported.

Results: Our analyses revealed that the interventions based on the provision of factual information about the global climate change (e.g. information about mechanism of global warming; information about scientific consensus) appeared to be more effective than others and have the greatest potential to overcome the polarizations among general public concerning the issue of global climate change.

Conclusions: Studies testing various interventions designed to affect individuals' attitudes and behaviours concerning the global climate change represents rapidly evolving field of research, which is highly relevant due to its practical implications for the process of communication of global climate change towards public and public engagement in the activities, which are intended to protect the climate or to adapt the society to the effects of global climate change. We have pursued one of the very first attempts to provide a summary and comparison of these interventions.

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231 Beyond pro-environmental behavior: The VBN model explaining sustainable behaviors

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Keywords: sustainable behavior; VBN model; interdependence

Abstract:

The attention of scientific literature have focused on behaviors that have a positive impact on the environment, however in order to maintain a living stability on the planet it would be relevant to include other factors that are also conditions for a balanced long term human life. As a consequence, it is relevant to test whether the present theories are able to explain a wider range of human behaviors. In order to predict behavior, the VBN model (Stern, 2000) combines value orientations and environmental beliefs, as general factors, with the more specific problem awareness, outcome efficacy and personal norm. While the model has been applied mainly to predict pro-environmental behavior, we study how the VBN model is able to explain sustainable behavior. This last concept includes those behaviors that preserve natural resources encouraging, at the same time, present and future human wellbeing (Corral-Verdugo & Pinheiro, 2004). Under this definition we include pro-environmental, altruistic and frugal behavior as targets to be predicted by the model. We developed a survey that consisted of one common section and three thematic blocks, in addition to sociodemographic information. The common part included a value scale and a human-environment interdependence scale. Each thematic block measured problem awareness, outcome efficacy, personal norm, and self-reported behavior regarding ecology, frugality and altruism. The items of all three thematic blocks were similar in structure and wording, changing only the key words. We used path analysis to test each model both separately and together. In this study, 302 participants filled the survey either on paper or online. The VBN model was able to explain a significant amount of variance of the pro-environmental, the frugal and the altruistic behavior as separate models. Furthermore, a combination of the three topics into one mixed model also worked as a whole. All the relationships included were significant with the exception of hedonic and egoistic values which we didn't find significant. All behaviors included in this study are sustainable behaviors, they contribute to the present both human and environmental needs without jeopardizing the future ones. We showed that the VBN is a model capable of explain behaviors that belong to different spheres of human activity.

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164 Developing a critical agenda to understand pro-environmental actions: Contributions from Social Representations and Social Practices Theories

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Keywords: environmental-relevant actions; social change; interdisciplinary approach

Abstract:

Introduction And Theoretical Background: Debates over the value and compatibility of different approaches to understanding and changing environmental-relevant actions proliferated across the social sciences. This work reviews and discusses some of the (socio-)psychological and sociological approaches in those debates (see Batel et al., 2016).

Methods: We will start by critically reviewing the (socio-)psychological perspectives and highlight two of their main shortcomings. First, they are often partial in their focus - on the consumption side

of climate relevant actions and in changing these actions at the individual level. They tend to assume that individual change equates social change and, with that, fail to contextualise 'anti'-environmental actions in current socio-economic systems. Second, they usually present the mainstream (socio-) psychological approaches, ontologically more individualistic and cognitive, as the only existent ones, therefore neglecting other key perspectives within Social Psychology, arguably (more) compatible with sociological perspectives.

Findings: We suggest that Social Representations Theory (SRT), as an ontologically social-psychological approach and theory of social change, might be reconciled with more sociological approaches, such as Social Practices Theory (SPT), in contrast to the more individualistic (socio-)psychological perspectives. After reviewing the main tenets of SRT, its discrepancies and potential synergies with SPT, we will discuss how they can be articulated to understand different stages of the social change process towards more environmentally sustainable societies.

Discussion: While SPT might be more suitable to understand stability, SRT might be better equipped to understand how those change.

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PSV-25 EDUCATIVE SPACES AND PRO-ENVIRONMENTAL BEHAVIOR

Room: -1.4

271 Effect of campus design on human needs and educational objectives

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Keywords: Human Needs; Campus Architectural Design; Educational Objectives

Introduction: The new campus of the American university in Cairo was the subject of the present research as a pilot study to investigate if the campus designed spaces were used as intended and/or expected to support behavioral and educational needs. The aim of this research is to describe the role of architectural design in the fulfillment of human needs towards achieving the desired learning objectives in educational institutions. More specifically, the objective is to explore how designed spaces in educational environments can enhance learning objectives.

Theoretical background: The role of the physical environment and its influence on users has been scrutinized in the literature on behavioral sciences and environmental psychology, and have been related to this research which focuses on university campus design and its role in providing a human environment that contributes in supporting or limiting activities related to achieving educational objectives.

Methods: To achieve its objectives, the research adopted the following procedures:

Exploring the architect's design intent; documenting outdoor spaces on campus (drawings and base maps); using behavioral mapping techniques to observe and record different users' activities in outdoor areas at different times of the day and along the semester and relate them to specific educational factors, and to the attributes of these outdoor areas. User's acceptability, the socio-psychological impact of different solutions on users were investigated through: A visual questionnaire; respondents' impressions and preferences are measured based on Osgood's semantic differential scale, where respondents indicate their impressions and preferences of different spaces that represent the selected variables and their combinations. In depth interviews are conducted with a selected sample of respondents to compare their answers, to investigate whether the function of the space affects the fulfilment of educational objectives.

Results: The results obtained concerning the effectiveness of communal spaces in achieving educational objectives, and the preferences and acceptance of the various solutions proposed, and the reasons

behind the choices, yield guidelines for designing communal spaces in learning environments, while fulfilling human needs and enhancing educational objectives.

Conclusions: The results of this study are specific to the AUC campus, but aspects of the results are generalizable to other university campuses. Results will inform theories in human behavior and design, will inform practitioners of the important aspects of building performance they need to put their attention towards.

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217 Just switch off - Experiments to save energy in computer rooms

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Keywords: energy consumption behavior, behavior change, framing-effect

Abstract:

In order to achieve a university's sustainability goals, various structural and operational measures have to be implemented. In addition, the behavior of the users has to be considered as an additional influencing factor. Regarding the fact that campaigns or signs can influence users' environmental behavior, it is still an open question how this information should be conveyed in order to best achieve the desired effect. A meta-analysis of pro-environmental behavior experiments provides some insights regarding this question (Osbaldiston & Schott, 2012). It summarizes 87 published studies containing 253 experimental treatments on environmental behavior. The results suggest that a treatment combination of prompt and justification should have a high effect on users' energy behavior. However, the number of studies implementing this combination is rather small.

To further enrich the body of research we carried out two experiments in computer rooms at our university with the goal to persuade students to shut down the PCs after usage by presenting them a prompt (sign attached to the computer screen) that included a justification for the behavior. In reference to the framing-effect we tested if the phrasing of the justification part of the prompt had an significant impact on user behavior. Following prospect theory (Tversky & Kahneman, 1981), the first experiment examined the effects of positive (gain-frame) and negative (loss-frame) justification on user behavior. In the second experiment, which is currently in progress, we investigate the following question. Does it make a difference to show a message mentioning the activity (in this case working) or referring to the device that uses the energy (in our case the PC). This second experiment is in respect to a study about mental models of domestic energy consumption (Gabe-Thomas, Walker, Verplanken & Shaddick, 2016).

For both experiments an online tool monitored the effect of the interventions on behavior, by continuously assessing the state (on / off) of each computer.

The first experiment demonstrates that using prompts caused a significant decrease of energy use compared to the control group. However, the phrasing in gain or loss frame did not play a significant role according to the results of this experiment.

To save energy in computer rooms, prompts with justifications are a useful measure to help the users remembering to switch off their PCs. Further experiments have to show how the phrasing can be further optimized and also whether this effect will be long-lasting.

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351 Understanding the relationship between university physical learning environments and student and staff outcomes: A systematic review

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Keywords: university; physical environment; systematic review

Abstract:

Introduction: UK higher education (HE) is undergoing pedagogical change to promote student-centred learning and teaching over didactic styles. This has led to major investment in the UK HE estate. In the 2014-2015 academic year, the HE sector invested £397 million (Audit Scotland, 2016) in Scottish estate-related projects which aim to accommodate student-centred learning and facilitate the development of key HE skills. Despite investments, initial scoping exercises suggest there is a lack of a comprehensive evidence-base to support claims regarding the impact of HE physical learning environments (PLEs) on the learning process. Several literature reviews have discussed the topic (e.g. Temple, 2008), however, these lack systematic approaches to synthesis. This lack of rigor can lead to publication and selection biases, which can dramatically influence the conclusions drawn from the reviews. This study will address these issues by conducting a systematic review of the area.

Theoretical Background: Understanding the impact of PLEs is important, as research on school PLEs has shown that environmental factors (e.g. noise and layout) may interact with non-environmental factors (e.g. teaching style) to aid or hinder the learning process (Fisher, 2000). It has been suggested that investment in HE PLEs may increase students' academic performance because they perceive that they are valued, which in turn may increase their motivation and self-esteem (Temple, 2008).

Methods: Psychological, educational and architectural databases will be searched, using terms derived from the scoping exercises. To reduce bias, grey literature databases and search engines (e.g. Google Scholar) will be used. Reference lists of relevant sources will be searched to identify literature not found electronically. Relevant studies will be assessed using the Crowe Critical Appraisal Tool which offers eight criteria against which a variety of research designs can be appraised, and has high reliability and validity (Crowe, Sheppard & Campbell, 2011).

Results: This study will present data which addresses the impact of HE PLEs on students' educational outcomes and academic staff organisational outcomes. It will include three sub-reviews relating to: HE PLEs; school PLEs; and workplace (e.g. office) environments. Textual summaries of included studies will help to develop themes which cluster similar studies within each sub-review together. Themes will be compared across sub-reviews to determine areas for future research on the impact of HE PLEs to address.

Conclusions: At a time of investment in HE estates, this study will offer a systematic overview of existing research addressing the impact of HE PLEs on student and staff outcomes. It will develop an evidence-base to help design future HE PLEs, providing tangible and future-proof benefits for students and staff.

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069 Motivation to change energy consumption - What motivates universities to save energy?

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Keywords: energy efficiency; motivation to change energy consumption; energy at universities

Abstract:

Introduction: Because of both the climate debate and the steadily rising costs in the energy sector, the need for interventions that help reduce overall energy consumption in universities, becomes increasingly central. Very often technical measures are taken into account, when examining ways of saving energy. The significant influence of user behavior on possible savings is often forgotten or disregarded in the process. Simple changes in behavior can reduce energy consumption. Moreover, these savings are often possible without sacrificing comfort. The potential for these savings is estimated at 5 to 15 percent (Abrahamse, Steg & Rothengatter, 2005).

Theoretical background: The interdisciplinary research project "Energy efficiency and CO2-saving at Universities (ECHO)" gives the chance to studying various motivations from the user perspectives to save energy as well as ensuring conducive frame conditions. During the project different measures will be applied to raise the awareness of the university members regarding sustainable energy consumption, and in the long run to establish a new energy culture at the university.

The focus of this project is the motivation of the employees, which is composed of various aspects. The motivation of the employees is to be examined and investigated in accordance with the modified norm activation model (Matthies, Kastner, Klesse & Wagner, 2011). The project assumes that motivation aspects such as social and personal norms, individual and collective self-efficacy influence one's own behavior. In addition, the motivation and thus the behavior are influenced by the perceived motivation of the change agents.

Methods: In order to answer the research questions, employees at seven universities are examined before and after the introduction of the energy save campaign at two measurement times (in October/November 2016 and March/April 2017). Using standardized online-questionnaires, aspects such as motivation (with sub-aspects such as social and personal norms, individual and collective self-efficacy) and behavior with regard to the topic of energy saving are examined. The data are used to evaluate elements by item and factor analysis. Correlation and causal methods are used to examine the relationship between the scales.

Results: The contribution will demonstrate how the consumption behavior can be represented in terms of energy at universities and which motivation aspects interfere with energy reduction. Also, first results from standardized online-questionnaires will be represented what aspects and forms of motivation for energy saving can be observed among employees. A structural equation model will be applied to examine if the perceived motivation of the change agents is an important factor or mediator to predict the behavior.

Conclusions: The surveys will include a detailed overview of the examined factors influencing energy-saving at universities, motivation aspects and behavior.

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008 The effect of images on processing pro-environmental messages: the role of discrete, negative emotions

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Keywords: dual processing theory; emotions; pro-environmental communication

Abstract

Introduction: Images can be a powerful mechanism for engaging people with pro-environmental policy initiatives (Smith & Joffe, 2014). Furthermore, the power of images can only be expected to increase with the growth of new media (i.e., websites and social media) which are heavily image focused. Yet, there is a dearth of empirical research establishing the impact that images have on how people process and engage with the messages that they illustrate. Given that imagery used in pro-environmental communication is often highly emotive, this study assessed the effects of discrete negative emotions (i.e., disgust, sadness, anger, fear and distress) elicited by images on depth of processing and support for a pro-environmental policy initiative.

Theoretical background: Dual processing theories, such as the Elaboration Likelihood Model (Petty & Cacioppo, 1986), suggest that how people emotionally react to images could have a flow on effect on depth of processing. Whilst past research has focused on the influence of unrelated moods and affect valence on message processing (Lerner, Li, Valdesolo, & Kassam, 2015), those findings are not comparable when considering the effects of discrete, integral emotions elicited by images.

Method: A one-way between-subjects design was used to conduct an online, experimental survey. Participants (N = 280, 58.10% Female, Mage = 47.64, SDage = 16.40) for the study were recruited using an external, social research company. Participants were randomly allocated to one of two experimental conditions (i.e., an image that elicits either high or low levels of emotion) or to a control group (no image). All participants read the same communication message about a pro-environmental policy initiative.

Results: For people with a strong sense of environmental identity, the results indicated that the image conditions led to more in-depth message processing when compared to the control group, which led to higher support for the policy initiative. However, for people with a low sense of environmental identity, the results indicated that the image conditions led to lower depth of processing, which led to lower policy support.

Conclusions: This suggests that for the disengaged, the use of images that elicit negative emotions, such as disgust, should be avoided in communication messages designed to improve support for pro-environmental policy initiatives.

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042 The Relevance of Trust and Distrust in CCU Industry for CCU Product Acceptance

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Keywords: Carbon Dioxide Capture and Utilization (CCU); Technology Acceptance; Trust; Information & Knowledge; User Diversity

Abstract:

Introduction: In light of climate change, numerous technologies are developed in order to reduce, save, and store CO2 emissions and save fossil resource use, which have the main responsibility for global warming. Carbon dioxide capture and storage (CCS) and the subsequent utilization of CO2 (CCU) are

two currently discussed and partly already implemented approaches to reduce CO₂ emissions and to use CO₂ as feedstock to manufacture - inter alia - plastic everyday products replacing fossil resources [Kuckshinrichs, 2015; von der Assen & Bardow, 2014]. Besides technological, ecological, and economic perspectives on CCU, it is important to investigate future user's opinions, wishes, and needs, as their acceptance is a decisive factor for the success of new and innovative products [Rogers, 2003].

Background: Previous studies on the acceptance of CCS and CCU show that mental models of CO₂ hold strongly negative connotations (e.g., toxicity, pollutant) [Shackley et al., 2004; van Heek et al., 2016] and CCU (products) are not easily accepted in general (van Heek et al., 2016; Jones et al., 2015; Reiner et al., 2006). Misconceptions, incorrect and misleading information as well as insufficient trust in actors and institutions could lead to delay or even prevention of innovative products or technologies [Wallquist et al., 2010, Midden & Huijts, 2009, Fischer, 2015]. Hence, it is questionable if these factors are relevant for the acceptance of CCU (products), which is why the present study aimed for an investigation of important (dis)trust factors and relevant information input for the acceptance of CCU products.

Method: To analyze trust and information as determinants for the acceptance of CCU, we used data from an online survey (n=127), which was conducted 2016 in Germany. The participants assessed acceptance of CCU, perceived benefits and barriers of CCU, and the credibility of different institutions and information sources. Further, they assessed lists of trust and distrust factors concerning the credibility of CCU industry, which were identified in a previous interview study. As individual user characteristics we assessed demographic data and attitudes towards technology, environmental awareness and behavior, and trust.

Results: The acceptance of CCU products depended on perceived benefits and barriers as well as on the perceived credibility of information sources. Trust in CCU industry could be conceptualized as credibility of a company and the information source as well as company-related trust and distrust factors. Among the most important company-related trust factors were fair working conditions, product quality, and a good reputation of the company, while negative incidents and missing safety standards were the most important distrust factors. CCU product acceptance as well as trust and distrust factors inter alia differed with regard to people with a high and a low attitudinal trust.

Conclusion: CCU product acceptance was determined by multidimensional trust facets concerning the CCU industry and by technology-related benefits and barriers. In addition, trust was affected by user diversity (age, gender, trust). The results showed the importance of integrating future users into product development and allow to give advice and recommendations to companies and product manufactures on how CCU products should be marketed and communicated successfully and customer-oriented.

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144 Communication strategies to increase fruit and vegetable consumption

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Keywords: fruit and vegetable consumption; communication; choice-experiment

Abstract:

Introduction: There is room for sustainability and health improvements when it comes to current European diets. An effective way to improve diets is to increase fruit and vegetable consumption. SUSFANS is a Horizon2020-project that aims to strengthen food and nutrition security in Europe, by providing policy advice on healthy and sustainable food production and consumption. As part of this project, in the current research we conduct an online choice experiment with the aim of identifying effective communication techniques to increase fruit and vegetable consumption.

Theoretical background: Providing product-information can empower the adoption of a more sustainable and healthy diet (Grunert, Hieke & Wills, 2014; Samant & Seo, 2016). To appeal to both high and low involved individuals, it is important to focus on message content as well as on message characteristics (Elaboration Likelihood Model; Cacioppo & Petty, 1984). Concerning message content, we investigate if health information, sustainability information or a combination has the largest impact on consumer choices for fruit and vegetables. Concerning message characteristics we investigate whether specificity of the message and adding numerical information influences consumer choices. We will also take price into account as an important driver of choice, as well as some factors that might moderate the effect of information on behavior, such as motivation, understanding and need for cognition (Grunert, Hieke & Wills, 2014; Samant & Seo, 2016).

Methods: An online conjoint study with fruit and vegetables will be conducted in February 2017, to investigate the attributes 'content' (sustainable, healthy, combination), 'framing' (general, medium, specific), 'number' (percentage, grade, no number) and 'price' (low, medium, high) in a representative sample in three European countries (NL, CZ, FR; Ntotal= 1500). The orthogonal design calculated in SPSS now results in 9 choice sets.

Results: Our analysis will show which attribute has the largest effect on consumer choice for fruit and vegetables and which level within an attribute has the largest effect as well. In addition, insight will be gained in which psychological factors strengthen these effects. These results will be presented at the conference.

Conclusions: Conclusions will be drawn on the most effective communication strategy for promoting the consumption of fruits and vegetables, which can contribute to more sustainable and healthy diets in Europe.

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251 Bridging the distance of climate change communication

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Keywords: climate change communication; psychological distance; media effects

Abstract:

Introduction: Climate change is regarded as one of the most urgent challenges for our society. Climate change communication has the goal to motivate engagement to limiting climate change.

Theory: Based on Construal Level Theory (Trope & Liberman, 2010), it has been argued that one effective media communication strategy might be to proximize climate change by focusing on local consequences.

However, prior experimental studies have demonstrated inconsistent effects of communicating proximity vs. distance on engagement and other outcomes (Brügger et al., 2015; McDonald et al., 2015). Our research examined the impacts of proximising climate change on psychological distance, perceived relevance of the communicated contents, and climate change engagement. Moreover, we asked whether effects might be moderated by individuals' identification with all humanity (IWAH, McFarland et al., 2012). Specifically, we hypothesized that only people who weakly identify with all humanity would evaluate proximal communications on climate change as more relevant and engage more in reaction to them.

Methods: We conducted an online experiment with 508 residents of the UK (264 females, $M = 47$ years of age, $SD = 16$, range 19–84) applying a 2 (IWAH: low or high) \times 2 (climate change communication: proximal or distant) + 1 (control) between subjects design. To manipulate the situational salience of IWAH, we presented one of two videos: either a man dancing with people all over the world or a control video showing fish. Then, we provided one of two news texts about climate change and actions to limit its consequences. Consequences were either communicated as affecting the UK or Bangladesh. In the control condition, participants did not receive any video or text.

Results: We found that communicated proximity reduced psychological distance. Moreover, it indirectly increased three indicators of climate change engagement (i.e., amount of suggested initiatives for individual engagement participants devoted time to, $R^2 = .10$, amount of initiatives supported in a budget allocation task asking participants to distribute funding to local initiatives, $R^2 = .20$, and amount of budget allocated, $R^2 = .14$) through a reduced psychological distance and an increased relevance of the text (serial mediation). Including the video condition (IWAH vs. control) as a moderator of the relation between psychological distance and relevance in the model revealed only a tendency of the expected interaction effect ($\beta = .13$, $p = .09$, negative relation between psychological distance and relevance only present in control condition). Even though participants in the IWAH condition felt more reminded of times when they had felt connected to others than participants in the control condition (direct manipulation check), our broader measure of situational IWAH did not differ.

Conclusions: Communicating climate change as proximal to recipients can increase climate change engagement by decreasing psychological distance of climate change and increasing perceived relevance of the message. Our study was the first to investigate the role of IWAH in climate change communication and we suggest that the revealed tendency is a promising reason to continue this line of research. However, its operationalization needs to be further developed.

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370 The role of new social movements in promoting sustainable lifestyle change: The case of the Slow Food Movement

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Abstract:

Sustainable consumption has become a central focus for national and international policies. The actions that people take and decisions they make to consume certain products and services or to live a certain way have direct impact on the environment as well as on personal and collective well-being (Jackson, 2005). Besides, individual behaviours are deeply embedded in social and organizational contexts that condition or influence their consumption choices (García-Mira et al, 2016). Recent studies (Haxeltine et al, 2016) have focused on the role that grassroots movements - like the Slow Food movement, Transition Towns or the Global Ecovillage network- are playing, engaging citizens in sustainable transitions processes, which aim to foster sustainable lifestyles (Dumitru et al, 2016).

This work is part of the EU-funded research project TRANSIT whose aim is to build a theory on the role of social innovation in transformative societal change. The project adopts a deductive-inductive approach to the study of social innovation, and uses interdisciplinary theoretical resources as well as empirical case study analysis of 20 transnational networks and around 80 local initiatives embedded within them.

This paper focuses on the Slow Food international network and analyses how and through which processes the Slow Food movement – as a grassroots social innovation- contributes to sustainable lifestyle change of members of local initiatives and the communities in which they are embedded. The studied initiatives foster changes in people´s consumption patterns through social learning processes which arise through reflection, interaction and experimentation with new ways of doing, framing and relating that aim to change the global food system. Processes of social learning play an important role in social innovation initiatives becoming transformative, and our analysis focuses on the effects it has on changes in lifestyles at the local level. A total of 20 qualitative interviews (Flick, 2009), following a semi-structured questionnaire, were conducted with slow food activists from the Slow Food International Network (headquartered in Bra, Italy) and with members of the local convivium "Slow Food Araba-Vitoria" (Spain).

Grassroots social innovations demonstrate that supportive contexts can be created in which people can experiment with alternative lifestyles. Wider societal learning promoted by social innovation initiatives might lead to a series of transformational outcomes, which might contribute to the challenging, altering or replacing current social systems and institutions.

Keywords: pro-environmental behaviour, sustainable production and consumption, social learning, grassroots social innovations,

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212 Communities as key drivers for energy transition

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Keywords: energy transition; energy sustainable communities; participation

Abstract:

The German term “Energiewende” has become a set expression for energy transition towards an energy sustainable society. In the research project “EnGovernance” funded by the BMWi we focused on the level of local communities, which play a major role in this implementation process: Local communities are of particular importance because they have a large potential influence on both the renewable energy production and efficient energy consumption. Likewise, most conflicts or public acceptance issues connected to new energy infrastructure are located on this level (Devine-Wright, 2005). In this respect, relevant research questions were examined: Why do some communities actively support energy transition e.g. by fostering the further development of renewable energies, creating new organisational structures in order to implement climate protection within the local administration, or integrate energy issues strategically in their urban development - while others are rather passive? What are success factors of communities being pioneers in energy transition? Which barriers and drivers can be identified concerning their local activity and which support do communities need, taking into consideration their contextual and structural specifics?

In order answer those questions and to develop specific recommendations a nationwide standardised online poll of all German communities was applied. Based on this poll a cluster analysis was conducted, including the data from more than 1.000 communities. The dataset consists of different community characteristics like size, number of inhabitants, and extent of rural/urban areas as well as details regarding the respective situation of implementing energy transition. Results allowed to identify eight different types of communities along the factors (1) internal communal processes and (2) interaction with others. For each communal type two communities were selected and analysed using 16 semi-structured interviews with persons responsible for climate protection or energy transition in an iterative qualitative process according to Mayring (2010).

Results indicate the importance of the interaction of citizens and the municipalities and political leaders. A lack of trust, especially towards the national political level, is still one of the major barriers.

Trust and respect also play a role concerning a cooperative approach in the communities, between different actor types and groups as well as within the municipalities (Ricci et al., 2010). Perceptions of the needs and interests of the other groups and furthermore, the understanding and living of the energy transition as a real joint task of all different parties involved seem to be substantial for the progress in the transformational process in the communities.

Initiating and monitoring formal and informal participation processes in order to implement energy efficacy measures within urban development strategies as well as connected to the planning of renewable energy technologies seem to be difficult for communities due to limited financial resources and also personal competencies.

Recommendations concerning supporting measures on communal level as well as regarding national funding schemes were derived and communicated to the Federal Ministry. For the communities an interactive tool was developed and intercommunal exchange and coaching addressing the points mentioned above will be initiated in the future.

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236 Why citizen involvement in biodiversity-related participatory programs seems to reach a limited public? A case study in France

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Keywords: civic engagement, environmental identity, place attachment, citizen science on biodiversity

Abstract:

In the current biodiversity crisis, the international convention for biological diversity has adopted in 2010 "Aichi biodiversity targets". One of them is that, "by 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably". Among others, experiencing nature in a repeated and complex way can help increase people' awareness towards biodiversity issues and promote pro-environmental behaviors (Evely et al. 2011; S. D. Clayton et al. submitted). Various participatory programs towards biodiversity, at both national and local levels, propose repeated and complex experiences of nature: naturalist field-trips, environmental volunteering, citizen science programs etc. However, as regretted by their organizers, such programs attract few people. This is particularly the case for citizen-science programs in France and for biodiversity-related events proposed locally, in the biosphere reserve "Fontainebleau et Gâtinais Français" (RBF).

In order to understand why so few people are participating, we conduct a study to define the profile of potential participants, according to the three following components: (1) their environmental Identity (S. Clayton et Opatow 2003), which is commonly used to explain a general interest for environmental issues; (2) the place attachment (Raymond, Brown, et Weber 2010), which has been shown relevant to encourage environmental action; and (3) civic engagement profile (Doolittle et Faul 2013), which assess the individual propensity to commit in social activities. By cross-referencing these personal value-related characteristics with more contextual data linked to individual resources (here in terms of time) and practical easiness of the action (here accessibility to the dedicated natural spaces), we define how these components are decisive for citizen involvement in biodiversity-related programs, and eventually aimed at building a profile of the participants' universe.

Preliminary studies (participant observation and unformal interviews) and formal interviews with active participants and organizers will allow us to define a proper scale to measure these three personal value-based characteristics in our context. Then a quantitative survey will be addressed to a wider public at local and national scales. We will focus on people volunteering in different programs, and compare individuals involved in biodiversity programs and others.

This study will allow us to show if and how the civic engagement of individuals influences their participation in biodiversity programs, compared to other volunteering actions. This study will help understand why biodiversity programs are followed only by a specific category of people and not by the entire set of potential participants, and will propose recommendations to address the rest of the population on biodiversity awareness.

1 consulted on November 18th of 2016

2 (HYPERLINK: <http://indicateurs-biodiversite.naturefrance.fr/indicateurs/evolution-de-limplication-des-citoyens-dans-les-sciences-participatives-liees-a-la> – this indicator of the french national observatory of biodiversity show how citizen participation in citizen science programs evolved) – consulted on November 18th of 2016.

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142 Nudging consumers towards better green choices: a field experiment on electricity demand-side response

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Keywords: demand-side response; decision heuristics; acceptability

Abstract:

Introduction: Consumers rarely switch energy tariff despite the large savings on offer¹. This presents a challenge for the smart grid, which relies on domestic consumers switching to new types of electricity tariffs (e.g. time of use tariffs) which incentivise them to use electricity outside of peak times or when renewable generation is abundant. This is called demand-side response (DSR).

Theory: Classical and behavioural economics – the application of psychology to economics – offers two competing explanations for how consumers will decide whether to participate in DSR. According to classical economics, those who can save money on a time of use (TOU) tariff will switch. Participation will only be sub-optimal if the savings are too low or consumers have imperfect information over savings. According to behavioural economics, people fail to make the best financial decisions because they lack time and willingness to read information²; instead, they rely on heuristics to make quick decisions³. Contrary to classical economics, this implies that TOU tariffs could attract consumers who cannot save money unless decision heuristics are designed to 'nudge' consumers towards the best option. A potentially useful heuristic is to tailor TOU tariffs towards consumers who could save money.

Method: These hypotheses were tested in a field experiment over Winter 2016/17 in which ~6,000 visitors to the website of a virtual energy supplier were randomly assigned to one of three conditions: (1) a control, promoting a TOU tariff and the estimated energy bill; (2) a website in which consumers can compare the estimated energy bill on the TOU tariff relative to the average flat-rate tariff, advertising maximum potential savings of £300 (€350); (3) a website tailored towards consumers most likely to save money on the tariff - heat pump and electric vehicle (EV) owners. Google Ad Words was used to recruit participants, with adverts targeted at UK regions with the highest penetration of heat pumps and EVs. The main outcome measure is the proportion of participants who 'get a quote' for the tariff.

Results: Contrary to expectations, get a quote rates were 50% higher in the control group than the price comparison ($p < 0.05$) and tailored group ($p < 0.01$). Ten visitors identified as having a heat pump and 38 identified as EV owners.

Conclusion: Evidence from environmental psychology⁴ and behavioural economics^{5,6} suggests that people are not as motivated by money as classical economic models predict. This argument is often countered with assertions that the monetary savings may not be significant enough⁷. Our results appear to overrule this counter-argument because comparing a flat-rate to a TOU tariff – with advertised savings of up to £300 (€350) – reduced get a quote rates relative to a control group with no savings message. Our results are consistent with other studies finding that financial messages can backfire^{8,9} however, to our knowledge, our study is unusual in having presented such large savings. The results suggest tailoring TOU tariffs towards heat pump/EV owners may decrease overall switching rates to TOU tariffs, potentially because tailoring deters those without heat pumps/EVs, which is currently most of the population. A survey experiment is being run to test this.

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163 Do Future-Oriented Persons Use Less Energy? A Study Combining Survey and Metered Electricity Usage Data

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Keywords: electricity use, environmental concern, future orientation, subjective discount rates

Abstract:

Do future-oriented persons use less energy? Theory suggests that future orientation should foster pro-environmental behavior since most such behavior only leads to conservation in the long run. However, previous research has led to mixed results: Studies assessing future orientation in terms of subjective discount rates do not provide any support (e.g. Bruderer Enzler, Diekmann & Meyer, 2013) while studies based on multi-item scales of future orientation repeatedly have lent support to the hypothesis (see Milfont, Wilson & Diniz, 2012, for a review, or Bruderer Enzler, 2015, for a recent example). However, a major limitation of previous research has been the fact that these studies either rely on self-reported or stated behavior.

The present study therefore combines survey data of 1,095 persons with metered data on electricity use provided by a utility company. Future orientation was measured by both a short version of the Consideration of Future Consequences scale (CFC; Strathman, Boninger, Gleicher & Edwards, 1994) and a binary choice task to assess discount rates (incentivized by a lottery).

Contrary to expectations, we do not find any correlations between energy use and discount rates. The CFC scale, however, is related to energy use. This is particularly true for the future orientation subscale and less so for the concern with immediate consequences subscale. In sum, our results based on metered energy use replicate the results of studies based on self-reported behavior. This is surprising as we expected the behavioral measure to perform as well as (or better as) the psychological measure of future orientation once behavior was not assessed by self-reports. Future research is needed to look into why this could be the case.

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228 Adapting to limited and intermittent energy supplies: A cross-cultural study on building resilience

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Keywords: off-grid decentralised energy, adaptation, social practice

Abstract:

Introduction: This cross-cultural study focuses on energy challenges in the UK and India, looking at how households adapt to changes in energy access, and cope with limited/intermittent energy supplies. India faces challenges, including severe power outages. Furthermore, many rural communities still lack electricity access. Due to the remote nature of some communities, decentralized solutions are being tried (e.g., solar micro-grids) (1). The UK is also facing challenges, including, an aging energy infrastructure, growing demand and an increased use of intermittent renewables (2, 3). A range of strategies could be adopted to ensure quality of UK supply, including the introduction of demand-side response, and/or more decentralized energy. This would involve communities generating, distributing and managing energy locally, as in rural areas of India. Both forms of energy management are currently largely unfamiliar to UK households. Findings provide insights into how people can effectively adapt to limited energy, and how households currently benefiting from full grid-connectivity could manage energy more effectively.

Methods and Theoretical Approach: We take a qualitative approach, using interview data to explore routine energy-use practices in households with varying levels of energy access. Interviews give insights into how new practices emerge (e.g., starting to monitor personal energy use), how they persist (e.g., the continued use of dung alongside electricity), disappear, or are even revived (e.g., UK households reverting to primitive fuels). In particular, this research draws on 1) theories of social practice (4) to look at how routine energy use is influenced by cultural factors, and 2) the habit discontinuity hypothesis (5), which provides insights into how routine behaviors are contextually cued. 92 interviews were conducted. 38 in the UK, with people living off-grid and relying on solar power, batteries, solid fuels and diesel; and with residents of villages who were not connected to a gas supply, and relied on electricity, solid fuels and oil. 50 interviews were conducted in rural India with communities using micro-grids, solar home systems and solid fuels.

Preliminary Results & Conclusions: Strategies used by UK and Indian participants have many similarities, with people monitoring energy use and diversifying energy/fuel supplies. UK participants spoke more about curtailing their energy use and adopting efficiency measures, whereas, participants in India aspired to generate more energy to meet their needs. Participants actively accumulated energy options, rather than simply progressing from traditional to advanced fuels (6). In the UK context, participants actually reverted to using more primitive fuels to bolster energy security. Findings, relate to the habit discontinuity hypothesis, where changes in routine behaviors are contextually cued (5). Importantly, however, we find that some participants deliberately changed their context in order to change their routine energy use (e.g., moving off-grid). The continuation of old practices and materials helped provide resilience against energy/fuel shortages, allowing people to rapidly respond to changes in energy access. Older practices and materials (e.g., gathering wood) persist where there is perceived uncertainty and risk in supply.

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229 Insights from a practice-theory approach to simulate the dynamics of household energy use

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Keywords: Agent based modelling; sustainability, social practice theory

Abstract:

Introduction: Domestic energy consumption accounts for a third of total UK energy demand. Much of this energy use is a byproduct of conducting a range of routine behaviors (e.g., doing laundry, watching TV). In order to develop policies that will effectively reduce energy demand and associated CO₂ emissions and, thereby, help to meet climate change commitments, there is a need to better understand these daily household routines and how they contribute to energy use.

Theory and Method: We present findings from the development of an agent-based model called 'Households and Practices in Energy Consumption Scenarios' (HOPES) (1). HOPES was informed by literature, data from a large-scale household survey (N = 1004), and qualitative interviews (N = 55). HOPES employs theories of social practice, looking at 'patterns' of domestic energy use. These theories propose that in order for a practice (e.g., doing laundry) to be performed the following elements need to come together: 'meaning' or motivation (e.g., wanting clean clothes), 'material' which includes the human body as well as other physical objects (e.g., washing machines), and 'competence' or skills (e.g., knowing how to wash clothes) (2).

Much of this work is theoretical. There is a need to better understand the processes by which elements may come together to form practices, how practices themselves spread and evolve over time, and why is it that some practices eventually cease to exist (2). A key aim in building the HOPES model, therefore, is to apply, develop and clarify theories of practice and, thereby, make them easier to apply, for example, in policy making contexts.

HOPES has three types of agents (households, elements and practices), and three key processes to enable interactions among agents. The choose-elements process enables household agents to adopt meaning, material and skill elements, based on the influence of a variety of factors, such as outdoor weather and social influence. The perform-practices process enables combining meaning, material and skill elements to perform practices. Lastly, the adapt-elements process allows the meaning, material and skill elements in the system to evolve and spread over time. Elements that are repeatedly and successfully used to perform practices remain active, while less frequently used elements become dormant, and eventually die. A genetic algorithm approach (3) is used to combine elements in the active state to produce new elements. HOPES outputs the energy use and CO₂ emissions resulting from the performance of practices, making it possible to use the model to explore possible interventions such as the introduction of time of use tariffs.

Preliminary Results and Conclusions: Findings from both developing and running the HOPES model will be presented. Specifically, we will present insights into five types of energy-consuming household practices: heating, cooking, laundry, visual entertainment (watching TV, Tablet PCs, Laptops, etc.) and electronic communication (e.g., sending emails).

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154 Testing the Ringelmann effect on the energy consumption of communal electricity users: Does a larger group size reduce the motivation to save energy?

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Keywords: social dilemma; electricity consumption; environmental behavior; social loafing;

Abstract:

A communal electricity metering system, where several consumers have to split their electricity bill equally without being able to identify or distinguish between their individual electricity consumption (EC), may create a *social dilemma*. Using this concept as a frame of reference, we hypothesized that increasing the group size of the consumers would increase EC. This hypothesis is based on an observation made by Ringelmann, a French scientist, who reported that when performing in groups, individuals' efforts tend to decrease as group size increases, a process also known as social loafing (Kravitz & Martin, 1986). In an interventional study, which took place in student dorms, where electricity metering is communal, we increased the perceived number of electricity users and monitored actual EC before, during and after the intervention. We found that during the intervention phase, mean EC increased by 28.9% – an increase that disappeared right after the intervention was terminated. The ability to monitor actual EC allowed us also to study the dependence of actual EC on EC-related self-reported attitudes, self- and collective efficacy, pro-environmental self-identity, as well as other variables known to affect cooperation in social dilemmas, such as interpersonal trust and collectivism. Lastly, monitoring actual EC was compared to self-reported habits of EC. Regression analysis showed that the only significant predictors of actual EC were efficacy and trust. Additional analyses showed a lack of association between self-reported and actual electricity use. In the presentation, the implications for conservation of electricity in a communal metering setting and the caution needed when using self-reports of environmental behavior will be discussed.

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109 How Energy Policies Drive or Inhibit Energy Transition – A Comparison of Double-dividend and Spillover Effects of Photovoltaic investments in Diverging Photovoltaic Regimes

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Keywords: photovoltaic policy; double-dividend effects; spillover effects

Abstract:

Energy transition is largely perceived as being technology-driven, which is likely to be insufficient, unless it is accompanied by changes in individual behavior (Baum and Gross, 2016). This however requires understanding the interaction between individual and contextual factors that determine individual behavior. The present study attempts to explore this interaction, in order to grasp how the design of photovoltaic (PV) policies affects energy transition. In a previous study we found that PV policies do not only show the primary effect (increase of PV investments), but also secondary effects (e.g. crowding-in and crowding-out of individuals with specific values, motives, or human-nature relationships). Based on these findings, we now explore other potential secondary effects of PV policies. First, we focus on double-dividend effects, which result from low CO₂-emitting energy production and the ability to encourage changes in household energy consumption (Keirstead, 2007). Second, we examine behavioral spillovers, which describe how one behavioral change can foster other behavioral changes. And third, we scrutinize if such effects are related to the monetary framing of policies as suggested by Steinhilber et al. (2015).

We base our considerations on the individual-centered framework of Baum and Gross (2016) to analyze the interactions between contextual factors (PV policies) and behavioral change at

the individual level (PV investment, energy and environmental behavior). Furthermore, we use the comprehensive model of human behavior of Klöckner (2013) to understand internal determinants of behavior. The comparative study cases consist of contrasting PV policies: high financial support in the province of Bolzano/South Tyrol (Italy) versus lower financial support in the province of Styria (Austria). We used the Drop-off/Pick-up method to survey PV investors, and as a control group, households who had not invested in PVs at the time of data collection. The results confirm the evidence for the double-dividend effect of PVs. Moreover, we found spillover effects on environmental behavior related to food, mobility or waste, which go far beyond energy consumption. However and most important, results reveal a negative relation between monetary incentives on the one hand and double-dividend and spillover effects on the other hand. Thus, the study underlines that the overall environmental impact of an energy policy depends on its design; and balancing monetary and non-monetary measures might be the key to encourage large-scale behavioral changes. This supports Sovacool's (2016) claim, that energy transition needs thinking beyond classical approaches of monetary incentives, or technology-driven approaches.

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PSVI-29 IDENTITY AND PRO-ENVIRONMENTAL BEHAVIOR

Room: -1.3

022 Identities in Environmentally Significant Behavior: A Factor-Analytical Approach

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Keywords: identities; environmentally significant behavior; factor analysis

Abstract:

There are many ways in which we can explain environmentally significant behavior, but which approach is best? Dominant psychological theories, namely, the theory of planned behavior (Ajzen, 1991), the norm-activation theory (Schwartz, 1977), its extension, the value-belief norm theory (Stern, 2000), and the theory of habit (Verplanken & Aarts, 1999) do not explain large parts of environmentally significant behaviors (Klöckner, 2013). A rapidly growing approach is to focus on how consumer's identities predict environmentally significant behavior. Identity is used because theories of identity suggest we have many identities that guide our behaviour (Stryker, 2008; Tajfel & Turner, 1979). Unfortunately, this increase in research has led to over 200 identities having been studied in this area. Therefore, it is difficult to establish which are the key identities for explaining environmentally significant behaviour. We first aim to establish the key identities that are potentially relevant for explaining environmentally significant behavior. Second, we aim to test the extent to which the key identities explain environmentally significant behavior. Third, we aim to provide a theoretical framework of the key identities for explaining environmentally significant behavior. To address the aims, we conduct an online survey study (n = 578) allowing us to gain clarity of the key identities, and their relationship to environmentally significant behaviors. First, the exploratory factor analysis reveals 17 unique identity factors. Second, the hierarchical regression shows only 12 of the 17 factors explain the variance in environmentally significant behaviors, with a large correlation coefficient (effect size): .777. The 12 factors in order of predictive power are as follows: environmentally concerned identity, no environmental identity, environmental place identity, connectedness with nature identity, green-space visitor identity, active ethical identity, carbon off-setter identity, thoughtful self-identity, close community identity, anti-carbon off-setter identity, environmental group member identity, national identity, identification with developed countries, cyclist identity, identification with thoughtful organization, environmental gardener identity, and anti-pesticide use identity. Furthermore, to be able to understand and operationalize the 17 identities, we provide theoretical definitions of each

newly developed identity factor. Unambiguous definitions facilitate the interpretation of results in a consistent of comprehensive manner (Bacharach, 1989). Therefore, we have clarification of how the 17 identities are to be interpreted. Furthermore, these definitions enable us to operationalize the identities. Finally, we reveal a new, theoretical framework that is parsimonious showing how identities explain environmentally significant behavior, to help improve and align our field.

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209 Environmental Identities and the Perceived Social Status of Pro-environmental Behaviours

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Sub-themes: Underlying motivations of individual's involvement in environmental behaviour

Keywords: social status; pro-environmental behaviour; environmental-identity;

Abstract:

It is now well accepted that people engage in pro-environmental behaviours, not only for their pro-environmental credentials, but because they hold social value (Brooks & Wilson, 2015; Griskevicius, Tybur, & Van den Bergh, 2010; Sadalla & Krull, 1995). When an individual engages in pro-environmental behaviour it communicates information about how they would like to be seen by society, including signals of identity (Whitmarsh & O'Neill, 2010) and social status (Griskevicius et al., 2010). While it is known that the green consumption behaviours can be social status enhancing (Griskevicius et al., 2010), the social status associated with other types of pro-environmental behaviours, and the extent to which they are associated with identity have yet to be explored. In the current research, a community sample of Australian residents (N=560) completed an online survey where they were asked to rate the social status of a variety of curtailment, activism and efficiency behaviours, as well as their environmental self and public identity. Participants rated high cost, publicly visible consumption behaviours with the highest social status, while activism and curtailment behaviours were consistently perceived to convey significantly less social status. In addition, participants with holding a strong environmental identities rated environmental behaviours as conveying significantly higher social status than those with weak environmental identities. According to these findings, manipulating the perceived cost or visibility of pro-environmental behaviours might be an effective way to improve the social status associated with pro-environmental behaviours, and boosting environmental identities may increase the perceived social status of pro-environmental behaviours.

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269 Identity of green consumers: Why tough guys don't buy conventional light bulbs and frail women researchable batteries?

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Keywords: environmental conservation, consumer behavior, status competition

Abstract:

Introduction: It has been shown that environmental (Moisander, 2007; Whitmarsh & O'Neill, 2010), pro-social (Sachdeva et al. 2015) and health-related motives (Joshi & Rahman, 2015) are important drivers of green consumption. Conversely, behavioral costs, such as higher prices or reduced availability of green products have been shown to hinder green consumption (Sachdeva et al. 2015). However, recent theorizing on costly signaling (e.g., Griskevicius et al., 2010) implies that comparatively higher costs of green products may also motivate consumption of green products through an increase in social status due to costly signaling.

Theoretical Background: It has been observed that altruism present in green consumption might function as a "costly signal" associated with status and implying that the higher price of green consumption might increase the desire for green products (Griskevicius et al., 2010).

Methods: To investigate whether green consumption is indeed associated with a higher status, and to explore the role of cost in perceptions of status we conducted two studies expanding the 2 x 2 factorial between-subjects experimental design originally used by Sadalla and Krull (1995). In the first study (N=259) each participant was shown a list of conventional or green products that a hypothetical (male vs. female) consumer had bought and was asked to rate him/her on a scale using a list of bipolar personality descriptors. In the second study (N=267) each participant was shown the hypothetical consumers again with the green or conventional products but this time, we systematically manipulated also products' prices.

Results: The results show that status stereotypes attributed to people who engage in green consumption are widely shared by people across different social backgrounds and level of environmental attitudes. We have found that consumers of green products were consistently rated as having higher social status. Study 2 then shows that only part of the perceived social status is attributable to "costly signaling" (cf. Griskevicius et al. 2010) as even consumers who buy low-cost or even discounted products are perceived as superior, in terms of social status, to consumers of conventional goods.

Conclusions: The observed relation between green consumption and status indicates that the race for higher social status could serve the expansion of green consumerism if the major barrier to this – the price – decreased, even among those who have no pro-environmental motivation for green consumption.

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207 Boosting self-perceptions to increase positive spillover

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Abstract:

Understanding how to increase pro-environmental engagement is important if people are going to combat global environmental issues.

The spillover effect could be used to environmental actions. There has been no empirical manipulation of environmental self-identity and environmental self-efficacy and how this may affect spillover. Nor has there been investigation of how contribution ethic, or the idea that one has done their fair share, can affect spillover. The current research aimed to address these gaps by manipulating perceptions of past behaviour and investigating how this influences self-perceptions relating to environmental self-identity, environmental self-efficacy and contribution ethic, and whether this enhancement can influence spillover. We predict that reminding participants of many (versus few) past behaviours can enhance their self-perceptions. Further to this, we predict that enhanced self-identity and self-efficacy will lead to positive spillover and enhanced contribution ethic will lead to negative spillover.

A 2-level between-subjects study was conducted online using university students. Perceptions of past behaviour were manipulated through a behaviour checklist consisting of 13 environmental behaviours. Those in the high reminder condition were asked to select the behaviours they “at least sometimes do”, and those in the low reminder control condition were asked to select the behaviours they “always do”. Measures of environmental self-identity, environmental self-efficacy, contribution ethic and intentions to engage in private- and public-sphere behaviours were taken.

The manipulation was successful, in that those in the high reminder condition checked more behaviours than control. We conducted structural equation modelling to test our spillover model. As predicted, after being reminded of many past behaviours, self-perceptions relating to self-identity, self-efficacy and contribution ethic were increased relative to control. However, only self-identity mediated the effect of the manipulation on private- and public-sphere intentions. Contribution ethic was found to mediate the effect of manipulation on public-sphere intentions. Self-efficacy was not a significant mediator of either intentions.

Expectedly, environmental self-identity was shown to mediate positive spillover into two types of environmental intentions. This finding confirms past research that has examined the importance of self-identity in predicting positive spillover (Van der Werff et al., 2014). Unexpectedly, contribution ethic mediated positive spillover into public-sphere intentions. This finding is counter to how contribution ethic has been theorised in the literature (Thøgersen & Crompton, 2009). This finding suggests that perhaps contribution ethic is a motivational force of environmental engagement, and further research should seek to clarify the effect of this construct on spillover.

Keywords: Spillover; environmental self-identity; contribution ethic; self-efficacy.

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237 Utilizing the social identity approach to save water: Insights from the field

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Keywords: social identity approach; water saving behavior; experimental field trial

Abstract:

In regions already experiencing water scarcity, efforts to address the issue have increasingly turned towards demand-side management strategies. This study builds on recent research that suggests that when integrated into existing information campaigns, the social identity approach may provide a promising avenue to incentivize proenvironmental behavior (e.g. Fielding & Hornsey, 2016). When a social identity as a 'water saver' is primed and made salient, social norms and behavioral intentions may shift, leading to a change in behavior. This study contributes to the limited empirical evidence base. This study investigates the approach through four experiments in a water scarce region in the UK: 1) an online experiment with students (n = 150); 2 and 3) an experimental field survey within a local community (n = 123, and n = 209) and; 4) an experimental field trial (n = 2,400). The first online experiment finds that exposure to the social identity approach is more successful than information alone in increasing perceived social norms and intentions to save water. The second experimental field survey finds that the approach is again successful in increasing water saving intentions and that this effect is in part moderated by in-group identification. Collaborating with the region's water utility company, the third and fourth study (field survey, and experimental field trial) finds that the approach is successful in increasing actual sign-up rates to a water efficiency programme. This study provides insights into social identity approach in the water saving domain, and suggests that it can offer a promising avenue to achieve savings in a water scarce region.

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146 Mapping the relationship between identity, belonging, and motivation for environmental and cultural protection in the Dutch Caribbean

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Keywords: environmental actions; motivation; sense of community.

Abstract:

The Dutch Caribbean municipalities, Bonaire, Saba and St Eustatius (BES-islands) face many challenges when it comes to protecting their natural environment and cultural heritage. One of these challenges is a lack of widespread support from the island community. Only a small group of individuals made up of mostly migrants (non-locals) and some natives (locals) is actively protecting the environment and cultural heritage of the islands. This research centers on these individuals, and is focused on understanding if, and how, being local or non-local affects one's motivation for protecting the environment or cultural heritage.

Building on previous work on volunteering, activism, social identity, and sense of belonging, this study aims to map the relationship between identity, belonging, and motivation for environmental and cultural heritage protection (i.a. Dono, Webb & Richardson, 2010; Liarakou, Kostelou & Gavrilakis, 2011). This research builds on the notion that (in general) people want to improve their sense of belonging within communities, and that one can improve one's sense of belonging, by engaging in actions that contribute to the development of the community (i.a. Manzo & Perkins, 2006). The local - non-local dynamic is of particular relevance in the context of the current study, as there is an increasing local sentiment that non-locals are insufficiently integrated within, and therefore don't belong to, the community. This dynamic can affect the extent to which, and the reasons to engage in, nature or conservation heritage actions. The central hypothesis that will be addressed is that individuals engage in conservation actions

at least partly to improve their social position (i.e. sense of belonging) and their acceptance within their island community.

An online-questionnaire (n = 65) and semi-structured interviews (n = 30) were conducted with individuals living on the BES-islands who protect the environment or cultural heritage in order to examine their actions, community identity, sense of belonging, and motives to engage in conservation actions. The semi-structured interviews were coded for sense of belonging and identification within the community, actions taken, and motives to taking these actions. The results reveal that the stronger a person's sense of belonging within the island community is, the more emphasis they place on the motive to conserve the natural environment or cultural heritage, because it enhanced their sense of belonging within the community. This finding is in line with previous research illustrating that people with a strong bond or sense of identification with a place or community are more likely to engage in actions in favor of that place of community.

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166 The relationship between connectedness to nature and environmental identity: Results of a systematic review

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Keywords: connections with nature; environmental identity; systematic review.

Abstract:

Introduction: A growing number of studies confirm the importance of connection with nature and environmental identity in encouraging the pro-environmental behavior. Promoting the development of emotional links and identification with natural environment, may, in turn, lead to positive psychological outcomes such as increased well-being. Moreover, it may be a prerequisite to the formation of pro-environmental attitudes and behaviors towards the natural environment (Hinds & Sparks, 2008). Although connection with nature and environmental identity may share a similar theoretical background, a small distinction among these constructs may be considered (Nisbet & Zelenski, 2013). Therefore it becomes unclear the autonomy of both concepts, which is crucial in considering theoretical and practical research implications.

Theoretical background: For the last few decades, various assessment instruments have been developed to operationalize and measure aforementioned constructs. Connection with nature shares conceptual backgrounds with the number of other similar notions: affective connection, the inclusion of nature in one's self, the disposition to connect with nature, commitment to nature, connectivity with nature, emotional affinity toward nature, nature relatedness, and connectedness to nature. In a similar vein, environmental identity has several conceptualizations: identity as an environmentalist, environmental identity, and environmental self-identity. Interestingly, the conceptual overlap is evident not only within connection with nature and environmental identity notions if consider it separately, but also between it.

Method: Consequently, to reveal the relationships between different types of connectedness to nature and environmental identity in the adult sample the systematic review was conducted.

Results: At total of 6 peer-reviewed articles containing 23 cases met inclusion criteria and indicate a positive link between the connection with nature and environmental identity: 68,18 % (16 cases) shows positive strong, 22,72 % (5 cases) positive moderate and 9,09 % (2 cases) positive weak link. The results of the current systematic review suggest that associations between connection with nature

and environmental identity are not consistent and may depend on the particularity of the assessment tool (e.g., theoretical background, form etc.) and sample.

Conclusions: This systematic review on connection with nature and environmental identity relations revealed inconsistent results. The number of factors may contribute to this contradiction which is going to be discussed. However, when considering research on aforementioned constructs, the possibility of overlap should be taken into account. Future research can draw focus on methodological clarification of constructs.

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PSVI-30 GREENING EDUCATIONAL SPACES

Room: -1.4

346 The impact of a course on Sustainable Consumption of clothing and food using ICT in university students: an approach for environmental citizenship

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Keywords: sustainable consumption, use of ICT in education, university students

Abstract:

For several decades, the study of environmental issues and concepts of sustainable development and consumption has placed emphasis on social, political, economic and environmental discussion topics. Natural sciences as well as social sciences are concerned about the consequences of contemporary consumption on the environment and sustainable development. Lifestyles mainly in industrial developed societies need to change consumption habits in order of not producing resource scarcity, global loss of biodiversity, global warming, poverty, social exclusion, to only mention some of our actual concerns.

The problematic issues of sustainable development and consumption should become a priority line of research and innovation for everybody interested in education, and therefore achieve maximum participation of teachers and educators as agents of wider dissemination of research results, (Díez-Martínez, 2013).

Sustainable consumption needs to be considered as a group of individual and collective processes involving negotiation and the building of consensus since in some areas this process competes with conventional market operations. This means that if new consumption strategies are to be achieved, all actors must be willing to engage in discourse. As such, the choice of sustainable consumption reflects/conveys not only purchases preference or activity but also a larger representation about economic, social and ecological choice and voice of values and lifestyles.

Methods: Therefore, it is necessary to change towards sustainability, within formal and informal education since matters concerning sustainable behaviors are central for the survival of humanity. Thus, we proceeded to the planning and implementation of a course focused on clothing and food consumption that was presented to university students which purpose was to generate holistic conceptions of the problems and a better decision-making in their consumption habits. The course included 8 sessions using ICTs by Canvas platform and was developed with a group of 24 psychology students of a Mexican public university that included historical, social, economic and ecological aspects of sustainable consumption. A pretest, learning sessions, and posttest design methodology was implemented.

Results: Results show an increase in knowledge in all of the areas revised in the entire sample of students.

Conclusions: Data are discussed considering the increase in motivation for themes and changes of habits and choices concerning sustainable consumption using ICT via digital platform.

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173 Broadening the scope: career choice as a form of pro environmental behaviour

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Keywords: career; pro-environmental behaviour; SCCT

Abstract:

Introduction: Research within environmental psychology has predominantly focused on the consumption side of economic relations, calling for the instrumental and direct approaches to consumer behaviour change (Uzzell, 2010). However, usefulness of these approaches in behaviour change was questioned considering embeddedness of behaviour in a wider socio-economic context, which is one of the reasons why a more focus on the production side came to the fore. The entry of young people into the labour market is a major step in the creation of the workforce and therefore has a great potential for interventions with large indirect effects for the achievement of sustainable development goals. In this paper we explored the willingness of adolescents to engage in occupations that can contribute to sustainability and examined determinants of such decision.

Theoretical background: We used social cognitive career theory (SCCT; Lent, Brown & Hackett, 1994) to predict adolescents' vocational interest and career goals in the domain of sustainability. Following a traditional three-dimensional approach to sustainable development, three models were devised in order to predict willingness for pursuing careers which could lead to enhancement of environmental, social and economic sustainability.

Methods: Respondents were 582 secondary school graduates (413 females and 169 males) enrolled in different secondary schools in the city of Zagreb who were invited to participate in on-line research. Measures of self-efficacy, outcome expectations, vocational interests, goals, contextual supports and barriers, and learning experiences were tailored to cover three domains of sustainable development – environmental, social and economic. Testing of proposed models was carried out in a two-step process. After testing for the adequacy of measurement models (CFA), structural models hypothesizing relationships among latent constructs were tested using SEM.

Results: Model fit indicators for environmental, social and economic sustainability SCCT model showed an acceptable fit based on absolute and incremental indices. All the direct and indirect paths in environmental sustainability SCCT model were significant and in the expected direction, and the model predicted a substantial percentage of variance of vocational interests and goals in the domain of environmental sustainability. On the other hand, same direct and indirect paths in social and economic sustainability SCCT model were (in)significant, suggesting that these models are not as good in predicting vocational interests and goals in social and economic domains of sustainability.

Conclusions: Career choices can have a large indirect effect in promotion of sustainable development goals. In this paper we have presented SCCT model of career choice and confirmed its applicability for predicting vocational interests and goals in domains of environmental, social and economic sustainability.

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Lent, R. W., Brown, S. D., & Hackett, G. (1994). Toward a unifying social cognitive theory of career and academic interest, choice, and performance. *Journal of vocational behavior*, 45(1), 79-122.

063 ENED-GEM: A conceptual framework model for psychological enjoyment and learning mechanisms in educational games about the environment.

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Keywords: Educational Games; FLOW; Thematic Analysis

Abstract: Educational games are continuously growing more sophisticated, and the call for new models on educational game design has been made. In an attempt to answer this call, we propose the ENED-GEM framework as a theoretically sound tool for use in the design and implementation of educational games about the environment. Based on a thorough review of existing models for player enjoyment and environmental communication, this article seeks to unite these fields of study to develop a model of game enjoyment and environmental learning (ENVIRONMENTAL EDUCATIONAL GAME ENJOYMENT MODEL, ENED-GEM). It also seeks to delineate psychological processes that might facilitate learning and inspire behavioral change from educational games about the environment. A critically acclaimed digital educational game about environmental issues (Fate of the World by Red Redemption / Soothsayer Games) was used as a case study. 249 reviews of the game from the popular gaming and reviewing platform known as Steam were analyzed by means of a thematic content analysis in order to identify key player enjoyment factors believed to be relevant to the process of learning from games, as well as to gain an understanding of positive and negative impressions about the game's general content. Our results suggest that the game was overall perceived as enjoyable, although the majority of the reviewers who rated the game positively were more likely to be familiar with environmental issues and themes before gameplay was initiated. Individuals who rated the game negatively were more likely to describe the game as depressing propaganda, and did not exhibit concrete signs of learning from the game in their written reviews. They were also more likely to focus on more traditional elements related to game enjoyment than the game's environmental focus. The end results of the thematic analysis were measured up to the suggested ENED-GEM framework. Initial results generally support the main elements of the ENED-GEM, and future research into the importance of these individual core factors is outlined.

157 Energy saving behavior at the university - Norms, pragmatism or social identity?

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Keywords: energy saving; theory of planned behavior; social norms

Abstract:

In the context of an interdisciplinary research project on the optimization of energy consumption at a medium-sized university, we studied the energy saving behavior of students, scientific and non-scientific staff. For a theoretical basis we used a modified model of the theory of planned behavior (TPB; Ajzen, 1991), which is extended by different aspects of (personal and social) normative beliefs and social identity (cf. Nigbur, Lyons, & Uzzell, 2010). The main research questions were: 1) Can the intentions to save energy and corresponding (self-reported) behavior be predicted by personal moral norms, perceived social norms and perceived behavioral control? 2) Are there differences in the effects of two types of social norms, namely injunctive vs. descriptive social norms, and are their effects mediated by personal moral norms? 3) Can the predictive power of the model be further improved by the additional factor identification with the university, respectively by this factor's interaction with the two types of social norms?, and 4) Are there differences in intention, behavior and the predicting factors between students, scientific staff and non-scientific staff? We analyzed the data of a total of 3.291 participants of a university-wide online survey on the levels of students, scientific and non-scientific staff, which was carried out in two points in time (2013 and 2016). Multivariate data analysis (hierarchical multiple regression, MANOVA) reveals the following results: 1) Our modified and extended TPB-model offers a satisfactory amount of explained variance in intention to save energy, but only a quite small one in energy saving behavior. The strongest predictors are personal moral norms and perceived behavioral control. 2) Injunctive social norms contribute significantly to the prediction of intentions whereas descriptive social norms hardly do. Their effect on intentions is partly mediated by personal moral

norms. 3) The factor identification with the university moderates the effects of both types of social norms on intentions to save energy, but its overall effect is only marginal. 4) Intentions to save energy and self-reported energy saving behavior are most common among non-scientific staff, followed by scientific staff and students. The same ranking holds for most of the predicting factors, too. The results point to the usefulness of a moral norm construct within the TPB and emphasize the need for a differentiation between injunctive and descriptive social norms. For a more practical conclusion, it can be argued that intervention strategies to foster energy saving at the university should be tailored for the separate groups of its members, as they show - to some extent - different perceptions and behavior patterns regarding this topic.

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195 A pilot study of energy-efficient lighting and perceptions in preschool environments

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Keywords: energy-efficient lighting; perceptions; preschool

Abstract:

The physical environment in preschools is important to children's development and lighting is among crucial factors [1]. In Sweden, lighting accounts for about one-third of the total electricity use in such facilities [2]; therefore, energy-efficient lighting has been used to facilitate energy- and cost savings. However, studies on such lighting in preschool environments are somewhat lacking.

Based on the human-environment interaction model that describes the role of the physical environment in influencing human perceptions and behaviour [3], we assume that perceptions of lighting are closely related to indoor environmental quality, thereby affecting affective and behavioural responses of building occupants. The main objective of this present study is to obtain a better understanding of the effects of energy-efficient lighting in preschools, investigating whether and to what extent energy-efficient lighting could provide comfort for occupants in preschools.

The pilot study took place at a preschool in Southern Sweden where perceptions of indoor lighting was assessed by 62 parents when they came to leave or pick-up their children. They were suggested to assess an indoor environment when most electric lights were used, using a questionnaire about subjective lighting quality, with a seven-point semantic differential scale (after [4]). The data were collected before and after the installation of energy-efficient lighting (i.e. fluorescent T16 and light emitting-diode (LED) lamps).

The perceptions of indoor lighting were analysed in terms of 'comfort' (i.e. unpleasant-pleasant, hard-soft, cool-warm, natural-unnatural, varied-monotonous, sharp-mild, glaring-shaded, and good-bad) and 'brightness' (i.e. dark-light, clear-drab, strong-weak and subdued-brilliant). The perceived comfort was significantly lower before the installation of energy-efficient lighting ($M = 2.87$, $SD = 1.10$, $n = 26$) than after ($M = 5.05$, $SD = 1.00$, $n = 34$); the difference was significant ($t(58) = -8.08$, $p < 0.001$). In contrast, the perceived brightness was slightly higher before the installation ($M = 5.16$, $SD = 1.31$, $n = 28$) than after ($M = 4.53$, $SD = 1.14$, $n = 34$); the difference was significant ($t(60) = 2.03$, $p < 0.05$).

This study has shown that the effects of energy-efficient lighting, in this case, on perceptions of lighting and occupant comfort in a preschool remain unclear. Though preliminary calculations have shown lower amounts of energy consumption for energy-efficient lighting, the effects of such lighting in preschools should further be investigated. Furthermore, occupant behaviour in relation to lighting energy use in preschools should also be studied. The findings would contribute with a greater understanding of the relation among lighting use, occupant comfort and indoor environmental quality in the facilities and therefore, the benefit of energy-efficient lighting could be maximized.

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021 What characterizes climate change related art that activates the audience? A study on the ArtCOP21 event in Paris

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Keywords: art; creative environmental communication; emotions

Abstract:

A global festival of cultural activity on climate change, called ArtCOP21, took place parallel to the UN climate summit in Paris in November 2015. It included 163 diverse artistic events which aimed at inspiring public engagement and communicating environmental issues to spark a global climate movement. Artists are generally seen as cultural meaning makers and art has a tradition of functioning as catalyst of change by establishing a more personal and affective connection to any societal relevant topic (Chandler, 2014; Nurmis, 2016). However, the psychological mechanism by which climate change art achieves a higher level of cognitive and emotional involvement is rarely studied. The goal of this study was to explore what kind of psychological effects the artworks in Paris had on their spectators, and in case they had one, which characteristics of the artworks related to audience responses. 874 randomly selected spectators of 37 artworks responded to a questionnaire on their perception of one of the artworks. The questionnaire included potentially influencing factors for environmental friendly behavior. Cluster analysis of the profiles of audience responses to the artworks assigns them to four clusters, in respect to the reactions the artworks evoked on those environmental psychological variables. Two examples are, Cluster 1, which made spectators contemplate, gave them a sense of belonging to a group of like-minded people, scored high on relevance for daily life and was not confrontational. While Cluster 2 was making people aware of the personal consequences of climate change, the social norms they are surrounded by and was perceived as being very confrontational. The cluster solution was then applied to the emotional variables to investigate which emotional patterns the artworks in the clusters induced. The clusters were named after the profile they elicited (Cluster 3 - "the activating", Cluster 1 - "the comforting", Cluster 2 - "the confrontational" and Cluster 4 - "the neutral"). As a last step, the artworks in the clusters were described and categorized in a qualitative way, in order to define which characteristics of the artworks were activating, comforting, confrontational and neutral. The "activating" cluster, for example included artworks that were showing solutions, making cause and effect of human behavior visible, depicting sublime nature, were colorful and rated high on the perceived quality of the artwork. Finally, we suggest based on the results for climate change communication via art and to overcome climate change denial that environmental art should contain the characteristics that were identified from the artworks in the "activating" cluster.

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347 The connection between cognition and behavior: A two-step model analysis

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Keywords: Environmental identity; two-step model, pro-environmental behavior**Abstract:**

An individual's general motivation to act pro-environmentally can determine the actual behavior. However, other influencing variables can counteract this motivation. For the development of political interventions that are supposed to reduce negative environmental effects it is necessary to know which factors actually trigger pro-environmental behaviors. For this reason we want to contribute to this field of research with a two-step model reflecting different variables and their influences on the actual behavior.

Among other existing concepts, we consider the concept of identity as the most suitable one (Vignoles, Schwartz, & Luyckx, 2011). The first step of the model examines the environmental identity which can motivate individuals to act pro-environmentally (Clayton, 2003; Kashima, Paladino, & Margetts, 2014; Van der Werff, Steg, & Keizer, 2013; Whitmarsh & O'Neill, 2010). Additionally the model considers other dimensions of identity which can counteract the environmental identity. An individual's connection to the natural environment can be manifested in different spheres. The perception of the environment, the green values of significant others and social groups as well as the emotions towards the environment determine this dimension of identity (Bosma & Kunnen, 2001; Carrus, Passafaro, & Bonnes, 2008; Clayton, 2003; Clayton & Opatow, 2003; Kashima et al., 2014; Linneweber, Hartmuth, & Fritsche, 2003; Stryker & Burke, 2000; Whitmarsh & O'Neill, 2010). As there are several other dimensions of individual identity apart from this dimension, we also want to consider those and investigate their synergies and influences on the environmental identity (Carrus, 2005; Gatersleben, Murtagh, & Abrahamse, 2014; Skitka, 2003; Smith, 2007; Stets & Burke, 2000; Stryker & Burke, 2000; Truelove, Yeung, Carrico, Gillis, & Raimi, (2016).

As a result we expect that the salient dimension of the identity is an important and influencing variable especially when it comes to decision making processes (Aarts & Dijksterhuis, 2000; Clayton, 2003; Danner, Aarts, & Vries, 2008; Verplanken, Walker, Davis, & Jurasek, 2008). Therefore we take a close look at the variables which may influence the activation of the environmental identity. We assume that the salience of the environmental identity is influenced by its extent and clarity, the weight of non-environmental interests and the weight of behavioral traits (Gatersleben et al., 2014; Kashima et al., 2014; Steg, Vlek, Slotegraaf, 2001).

However, the motivation to act environmentally friendly does not necessarily lead to adequate behaviors. This identity-behavior-gap may also appear when the salience of the environmental identity prevails. For this reason the second step of the model reflects contextual factors (Steg & Vlek, 2009; Stern, 1999) and other variables that can cause a gap between the identity-related, preferred behavior pattern and the performed one. A long walking-distance to a public transport station or a poor public transportation service in rural areas, for instance, may prevent the playing out of the salient environmental identity. However, in certain situations some factors, like comfort interests for instance, may even strengthen the motivation to act environmentally conscious. Eventually, individuals will act pro-environmentally when the salient environmental identity and additional motivating variables are not being pushed back by factors which prevent these behaviors.

The two-step model we want to present at the International Conference on Environmental Psychology does not only visualize the influence of the environmental identity but also the influence of further factors on behavioral decisions.

The results can help policy makers to develop concepts for interventions that reduce the likelihood of unconscious behavior.

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293 Test of the cultural cognition of global warming: polarization or just a differential effect?

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Keywords: cultural cognition theory, global warming, concern about global climate change

Abstract:

Introduction: Provision of information about risks of global climate change (GCC), its mechanism, and the level of scientific consensus are some of the known interventions that can change attitude to GCC. Yet, according to cultural cognition paradigm (CCT, Kahan, 2012), provision of such information can be ineffective or even counterproductive by exacerbating polarization of public opinion on GCC (Kahan et al., 2012).

Theoretical background: The cultural cognition theory maintains that cognitive biases linked to protection of one's cultural identity are likely to hinder attempts to change attitude to global climate change (GCC) through information provision and education (Kahan et al., 2012). Recent critiques of this thesis (e.g., van der Linden, 2016) argue, among others, that cultural values used in CCT do not generalize outside of the

U.S. society and that most GCC interventions examined experimentally so far has not led to attitude polarization but only to differential effect of information interventions on GCC attitude across cultural value groups. Our goal in this study is to examine whether opinion divide in Europe splits also along the cultural values as proposed by CCT and whether provision of information about GCC is likely to lead to polarization of Europeans' attitudes to GCC across the cultural value lines.

Method: We conduct two between-subjects experiments. The first experiment is conducted on a convenience sample of web users (N = 200) and this experiment aims to replicate the consensus-based message intervention (van der Linden, Leiserowitz, Feinberg, & Maibach, 2014) while controlling for pre-treatment levels of cultural values from CTT. The second experiment is conducted using a convenience sample of respondents (N = 600) and uses a novel message that relates GCC and recent migration waves, while controlling for pre-treatment levels of cultural values.

Results: Consistently with CTT, we find that people holding hierarchist and individualistic values are less concerned about GCC. However, we also find that both types of messages tested in the two experiments actually increased average concern levels in all cultural groups, even though this increase was somewhat smaller among people with hierarchical and individualistic values.

Conclusions: Cultural value divide in attitude to GCC does exist even outside of the US but we see no evidence of polarization of attitudes to GCC as a result of information provision.

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292 Environmentalists do not cheat: experimental study of moral licensing in environmentalists

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Keywords: environmental attitudes; conservation (ecological behavior); cheating; prosocial behavior; the Campbell paradigm

Abstract:

Introduction and theoretical background: Research on moral licensing suggested that engaging in environmental behavior makes people more likely to engage in subsequent immoral behavior (Mazar & Zhong, 2010) by giving them moral license and that this effect is comparatively stronger in environmentalists (Hahnel et al., 2015). These findings contrast starkly with the literature on environmental motivation that views environmental conservation as essentially moral behavior (Karp, 1996; Van der Werff et al., 2013) and environmentalists as being pro-social (Kaiser et al., 2010). Building on the theory of moral self-regulation (Zhong, Liljenquist, & Cain, 2009), we hypothesize that stronger morality of environmentalists makes them comparatively more likely to rectify their prior moral failures (cleansing effect). Since many licensing experiments fail to use appropriate control group (Mullen & Monin, 2016), they mistakenly interpret lower levels of moral outcome behavior after initial moral behavior as evidence of the licensing effect.

Methods: We run a series of four web-based experiments on samples (N = 150 - 250) of general adult population. Environmental attitude is measured one week before actual experiments, using GEB scale (Kaiser & Wilson, 2000). We check for potentially confounding effect of attitude measurement

through Solomon design. Measures of moral outcome behavior are based on Die-Under-Cup paradigm (Fischbacher & Föllmi-Heusi, 2013). Measures of altruistic outcome behavior are based on observed donation to charitable cause and observed participation in environmental research (Hahnel et al., 2015).

Result: The first two experiments extended Mazar and Zhong's experiment (2010) by focusing on whether environmentalists are perceived as more moral than other people. Our results indicate that external observers view environmentalists as generally more trustworthy and moral and that such judgments are independent of observers' own environmental attitudes. Experiment 3 demonstrates that environmental attitude predicts moral behavior (cheating in a game for financial gain) which is completely unrelated to environmental conservation. Finally, in experiment 4 we replicate Hahnel et al.'s (2015) licensing mediation test only to find that moderation concerns cleansing rather than licensing effect, which only becomes apparent when control group is used in the experiment.

Conclusions: Contrary to somewhat spiteful message of the licensing literature, engagement in environmental behavior seems to be associated with moral superiority. Environmentalists are not just viewed as morally superior but they also behave more morally.

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POSTER SESSIONS





Wednesday
30th August

14:00 – 15:00 h.

POSTER SESSION I:

Poster Exhibition Area · Floor -1

PO I - 01 BEHAVIOR AND ENERGY CONSUMPTION

038 No drought about it? The influence of personal experience on views of climate change

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Keywords: climate change; drought; personal experience

Abstract:

Introduction: This research was conducted in response to the notion that inaction on climate change can, at least partly, be explained through its lack of immediacy and long-term consequences (e.g. Giddens, 2011).

Theoretical background: However, firstly, both poorer and richer countries in many parts of the world are already being affected by the consequences of climate change (IPCC, 2012). Secondly, perceptions of distance to climate change are socially created (Norgaard, 2011). Thirdly, beliefs about and action on climate change are highly politicized (McCright & Dunlap, 2011).

Method: The research to be presented examined how people living in California experienced the drought in late 2015 (Sept. - Dec.) and to what extent they thought it was linked to climate change. Interviews (n = 77) were voice recorded in different parts of California, including large northern and southern coastal cities as well as rural areas. Influenced by ethnographic field methods, the analysis was also informed by many off-the-record conversations, news coverage and observations. Thematic analysis and grounded theory were used to analyse the interviews.

Results: The reasoning common to people who believed that there was a link between the drought and climate change ranged from relating it to an increase in temperatures, reduced rainfall, science or to a general belief that humans have an impact on the climate. In contrast, people who did not believe that there was a link between the drought and climate change tended to draw on past droughts and cyclical climate patterns as well as invoking science. Participants did not say that the drought brought about a change of mind; rather it seemed that people either already did or did not believe in climate change and accommodated the drought into their existing worldviews.

Conclusions: This suggests that people will not necessarily 'wake up' and take climate change more seriously as the effects become widespread. Instead, there are many other factors, such as political beliefs, which continue to play an important role in the interpretation and response to climate change. The results have implications for the role of systems of beliefs beyond climate change attitudes and consequently for how to communicate and encourage climate change mitigation. Future research needs to examine how perceptions of drought and climate change relate to adaptation and mitigation behaviours.

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295 Ability to save electrical energy at home

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Keywords: Ability; electrical energy; pro-environmental behavior

Abstract:

Since the mid-1970s, the whole world has suffered a serious energy problem. Mexico experiences the urgent need to have electric power to support its productive sectors and to promote the economic and social development of its population which implies a tremendous increase in the ecological damage caused by the indiscriminate burning of fossil fuels. Among the measures that involve citizen participation in the fight against climate change, lifestyle modifications are proposed, leading to a responsible consumption, in this case, of electricity (Natyelly, 2010). Skills are one of the most important variables that predict environmental behavior (Smith-Sebasto & Fortner, 1994). The purpose of this paper is to document the psychometric characteristics of a scale to evaluate skills in electrical energy saving.

Method: We used a non-probabilistic and intentional sample of 251 university students with a mean age of 19.4 years (SD = 1.63), 64.1% were women. An instrument was elaborated with 19 reagents called Electrical Energy Saving Skills (HAEE) with a scale of answers of five options ranging from never (0) to always (4). He went to the classrooms of a public university, if the student accepted was given the scale and a pen.

Results: In order to identify the grouping of the reagents applied, an exploratory factor analysis was performed with the following steps: reagent discrimination considering the results of the t test when comparing groups with high and low scores; A factorial analysis by the principal component extraction method with varimax rotation in which an eigen value of one or more and a factorial load of the reagents was considered to be at least .40 According to the rotated component matrix, Obtained four factors or components that explain 47.764% of the variance and a .738 Cronbach's alpha obtaining a valid and reliable scale of 19 reagents.

Conclusions: The tool developed assumes that environmental skills are actions that result in the protection of the environment, the importance of studying the skills for the implementation of environmental actions is that there is a significant relationship for the execution of environmental actions y protective behavior of the environment (Geller, 1981). It is concluded that the scale meets the psychometric criteria to be applied in Mexican population.

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243 It's time to switch: When do consumers switch to more energy-efficient appliances?

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Keywords: Appliances; Energy Efficiency; Switching Behavior

Abstract:

Just by switching to more energy-efficient household appliances Switzerland could reduce its energy consumption by 2.4 Billion kWh (WWF, 2012) by 2035. However, consumers often stick to their current appliances unless they break (Prakash, Dehoust, Gsell, & Schleicher, 2016). It is unclear to what extent consumers consider the appliance-related attributes (EnergieSchweiz, 2015; Meyer, 2013) age, energy efficiency class (EEC) or general status of their current appliance in deciding, whether or not to buy a new, more energy-efficient appliance.

The 894 students (54% female; Mage = 24.6, SDage = 5.1) who took part in this web-based study had to decide regarding 6 different appliances (e.g., fridge, vacuum cleaner) whether they wanted to stick to their current appliance or buy a new appliance with the highest EEC. We manipulated age (3, 6, 9 or 12 years), EEC (1, 3 or 5 classes below the most efficient one) and general status (no repair necessary, repair recommended, repair not recommended) of the current appliance. Participants were randomly assigned to one of these 36 conditions.

Binary logistic regressions were calculated separately for each appliance with age as a metrical and EEC and general status as ordinal variables. Results show that EEC [all $\exp(\beta)$'s > 1.565, all p 's < .05] and general status [all $\exp(\beta)$'s > 1.771, all p 's < .01] of the current appliance exerted a significant positive influence on the decision to buy a new, more energy efficient appliance.

Regarding age the results were quite heterogeneous, although in the case of the vacuum cleaner age had a significant negative influence [$\exp(\beta) = .842$, $p < .01$], it had a significant positive influence [$\exp(\beta) = 1.133$, $p < .05$] in the case of the PC monitor. Conversely, for example, in the case of the fridge, we found no significant influence. Even though some attributes seem to influence participants purchase behavior, they generally stuck to their current appliance (in between: 57% and 76%).

Besides the mentioned appliances-related attributes, a consumer's decision to switch to a more environment-friendly appliance could also be driven by, for example, their pro-environmental attitude. We therefore asked our participants to state how much their decision was driven by environmental aspects (only, partially, not at all). By adding this attribute into the analysis, results showed a significant positive influence [all $\exp(\beta)$'s > 2.064, all p 's < .01]. Moreover, this variable exerted the strongest effect.

Hence, one promising way to stimulate consumption of more environment-friendly appliances is to encourage pro-environmental attitudes (see Steg & Vlek, 2009 for an overview). However, changes in attitude are not that simple. A change in the consumer's decision architecture (see Thaler & Sunstein, 2009), for example, adding a label with a simple switching message, would instead eventually help push consumers lacking an environment-friendly attitude into the indented direction.

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067 Household energy reduction - content analysis of participators experiences of an intervention

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*Presenter: K. Weimer

Sub-theme: Underlying motivations of individual´s involvement in environmental behaviour

Abstract:

Introduction: Semi-structured interviews were carried out among households after participating in an intervention with motivation-increasing design and behavior focused techniques in order to change behavior towards a reduction of residential energy use. In the intervention differentiated energy use for daily domestic behaviors was monitored in real time via an internet-based system for a period of eight weeks by 25 residents. Modern feedback- and reinforcement strategies, based on learning psychology, were carried out in order to enhance motivation for change and follow-up studies analysed the maintenance of change for another 3 months. The present study will investigate and identify factors influencing the experience of persons participating in an intervention on behavior change towards energy conservation in households.

Theoretical background: Content analysis based on hermeneutic reasons was used to achieve an interpretive understanding of the meaning of the text with special attention to context and original purpose (Patton, 2002).

Methods: Semi-structured interviews, lasting around 30 min, were conducted among eight households, three households in the experimental group and five in the control group, after participating in an intervention for reducing electricity consumption. The transcripts from the interviews were analyzed by means of qualitative content analysis as described by Graneheim and Lundman (2004). The method is based on classification and assessment of symbols and themes, categories and sub-categories, in a systematic and inductive way in order to point out the meaning of a written or verbal communication (Kvale, & Brinkman, 2014; Krippendorff, 2004).

Results: The content analysis of the interview transcripts identified motivational factors and barriers as themes, explaining how change of residential energy behavior within an intervention was experienced. As motivational factors, promoting the willingness to reduce residential energy use, the participants stated expectations and interest, reduction of costs, visual feedback through the graphical display of energy use, advice on energy saving behaviors, specific feedback and increased awareness of behavior and energy. As barriers, explaining why the intervention did not reach the expected energy reduction, reasons stated were difficulties to understand the graphical display, uncertainty about the effects of behavior change, maintenance of old habits and difficulties to choose goals for change.

Conclusions: Future energy policies and interventions should consider the found motivational- and barrier factors in order to be successful in promoting behavior change towards a reduction of energy consumption in households.

Keywords: content analysis; intervention; motivation and barriers for change

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377 Achieving transitions in UK energy and material use: Public deliberations of a low carbon future

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Keywords: deliberative workshops, low carbon scenarios, qualitative analysis, material usage

Abstract:

Introduction: A step change in the energy used for the production and consumption of materials and products is required if we are to achieve a low carbon society; a change that can only come about if we can identify new ways of designing, using, and delivering products, materials and services.

Theoretical Background: Reducing demand for material resources will require radical shifts in Government policies and business models, as well as in social norms, values and practices (Salvia et al. 2016). As part of the Centre for Industrial Energy, Materials and Products (CIE-MAP), we explore the social acceptability of a range of different strategies for reducing consumption based energy use, ranging from lean production to a wholesale shift in consumption patterns.

Methods: In a series of four two-day workshops with members of the public, we utilised deliberative and narrative techniques to explore the possibilities for a low material future. During the workshops we explored respondents' opinions towards six low-carbon future scenarios which deploy a number of resource efficiency strategies (e.g. increasing product longevity, shifts from ownership to service provision, collaborative consumption). The professionally transcribed deliberations about our six low-carbon scenarios were analysed using an interpretative qualitative approach based on grounded theory (NVivo10).

Results: Analysis revealed that concerns about trust (in government, companies, others) and convenience were the most dominant themes that were discussed in relation to all six low-carbon scenarios. Furthermore, we identified that participants were very positive about alternative strategies for re-manufacturing or sharing schemes for products but more sceptical about ownership alternatives (e.g. contracts) or changes to lifestyles (e.g. shared housing).

Conclusions: This works offers first insights into public deliberations of low carbon future scenarios and identifies the main concerns and motivations that will be relevant for a transition in UK energy and material use.

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379 The impact of learning environment on academic performance

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Keywords: learning space; teaching methods; environment; academic outcome

Abstract:

Learning space is a common element in the whole teaching and learning process. Improving the understanding among the learning physical environment and student's relationships, outcome and behaviour, can mean a large-scale cultural development by helping in the fight against rising inequality in recent years, exacerbated by the crisis. Moreover, it is necessary to take into account the longevity of educational buildings and the high economic cost for their rehabilitation or new construction, since the learning space should be able to readjust to the needs of users and teaching methodologies that arise in much shorter intervals than the durability of these edifications.

Literature indicates the influence of learning space factors in academic outcome, behaviour and social relations (Barret, Davies, Zhang & Barret, 2015). Moreover, traditional classroom design entails power

relations between teacher and students (Jacklin, 2004). However, existing contributions come from several fields of knowledge under an individual approach without connecting all different perspectives.

The aim of this research is to analyse how the design of the school environment influences the teaching-learning process in the higher education level at the University of A Coruna. For this purpose, a multi-method approach is used through techniques such as perception questionnaires, and semi-structured interviews and documentary analysis. Moreover, a systematic review of the literature was performed through Education, Environmental Psychology and Architecture to create a self-reported data collection tool, which has been validated through psychometric test, expert judgement and a focus group.

The triangulation of the results lead to a global model that involves three main learning space factors: environmental, attraction to the use of space and workspace comfort and favouring social relationship factor. The multidisciplinary approach has let to support research evidences and to rise up findings that shows the current user needs of space variables (i.e. control of lighting instead quantity).

From these results it is possible to conclude that academic performance at university level is influenced by environmental and spatial variables, and by the capacity of classroom design to promote social relations. The importance of this research, regarding the state of the art, relies on the lack of a holistic vision of learning spaces.

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PO I - 02 SUSTAINABLE BEHAVIOR

005 Sustainable Transport – The Importance of Design and Emotion

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Keywords: Sustainable Mobility, Change Behaviour, Transportation Design, Emotional Bonding

Abstract:

Introduction: The whole presentation is based on an ongoing Ph.D. project. The aim of the presentation is to explain the influence of design on the modal choice. Symbolic, aesthetic and functional levels of design will be considered. These results will help manufacturers and operators of sustainable transport and direct transport infrastructure to classify the importance of the aforementioned factors. In addition, through an appealing design, an emotional bonding to a mode of transport can be established. The research is concentrating on sustainable transport modes like public transport, sharing-systems, walking and cycling.

Theoretical background: The transport sector causes 18% of all greenhouse gas emissions in Germany (umweltbundesamt.de, 2016a). The traffic sector also dominates the primary energy use with around 24% of all consumptions (umweltbundesamt.de, 2016b). The trend of the overall energy consumption over the past 20 years is steady increasing. A large proportion of emission and consumption are attributable to motorized private transport and air traffic. The primary objectives of transport planning are to avoid and relocate traffic as well as handling traffic in an environmentally friendly way (Müller, Scholich 2010). The overall goal is, to convince as much as possible users of environmental friendly transport modes. The aim of this approach is described in the introduction.

Methods: For the interdisciplinary approach, a comprehensive mix of methods is/was necessary. First method was a comprehensive literature review. Practical knowledge was gained during a local conference (with corresponding workshops), where 80 experts participated in 2015/Frankfurt. Furthermore, 27 expert interviews were conducted in early 2016. Furthermore qualitative surveys at

several Good-Practice examples in Europe were done in 2016/2017. The findings of all methods result in comprehensive recommendations.

Results. The project/research is still ongoing. First results show, that the importance of design, regarding the modal choice, is a research gap. Especially the necessary interdisciplinarity scares off a lot of researchers. But all the interviewed experts mentioned, that the potential of that approach has a fundamental importance. The ICEP conference 2016 will be used, to present first exclusive results of the project.

Conclusions. An interdisciplinary project, carried out by engineers, influenced by architects, designers, psychologists and sociologists to promote sustainable transport modes.

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123 Attitude change in personal travel - A qualitative investigation

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Keywords: qualitative; attitudes; travel mode choice; car use

Abstract:

Promoting non-car-mode travel has potential to contribute to reduced sedentary behaviour and the risk of respiratory health issues. Systematic reviews of such interventions suggest it is still unclear how best to promote these alternatives (Arnott et al., 2014; Macmillan, Hosking, Connor, Bullen, & Ameratunga, 2013). Psychological antecedents of non-car travel and switching from car to non-car use have been modelled. Qualitative investigation of these antecedents can highlight change processes and instability of psychological antecedents, including attitudes. We explored variability of transport attitudes in response to different personal goals, considering a range of transport modes. Laddering interviews were conducted with three distinct transport mode users to investigate underlying hierarchical goal and value structures. Comparison of drivers and non-drivers identified differences regarding physical activity, environment and social relationships. Results highlight that travel model attitudes are changeable and sensitive to prompted goals, showing that people’s view of non-car mode transport may change over time and place. These insights imply that different communicative strategies can be effective for different people under different circumstances. The findings have implications both for future attitude measurement and intervention design.

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030 A Study on Urban Elderly's Activity Characteristics and Satisfaction towards Neighborhood Space Affordance in Taiwan

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Keywords: Urban elderly, Activity, Neighborhood space, Affordance

Abstract

Introduction: In recent years, aging has accelerated in Taiwan, and the country is becoming an aging population. Therefore, facing the issue of rapid population aging, how the living environment should respond to the arrival of the aging population and meet the special requirements of the elderly, has become important topics for urban space environment and facilities planning and design in recent years.

Studies on the elderly's living conditions in Taiwan conducted by authorities in recent years indicate that elderlies mainly take "aging in place" form of residence.

Theoretical background: Lawton et al.(1982) believes that neighborhood and household impacts are equally important for the well-being of the elderly. Meer, Droogleever Fortuijn & Thissen (2008) argues that if the friendliness of the hardware aspects (such as friendly design of the space, barrier-free facilities, provision of resting seats) and software aspects (social care for the elderly) in the neighborhood is poor towards the elderly, neighborhood deprivation is formed, which in turn creates environment stress and increases the elderly's vulnerability. Therefore, the degree of supply the neighborhood environment provides for the elderly's everyday life not only affects the contents of their daily activity and scope, it also affects their quality of life in the neighborhood. Thus, constructing friendly urban neighborhood environments is the top priority for cities in Taiwan.

Methods: This study uses Banciao and Hsin Chuang districts in New Taipei City as case study areas. The questionnaire surveys 263 elderlies' actual form of living in the neighborhood and type of space used, and explores the 3 most common spaces for elderly's activities such as neighborhood parks, large parks, and community activity centers, and their degree of provision and effects on the elderly, in order to understand the current situation of activities and supply and demand of neighborhood space, and serve as a reference for constructing a friendly neighborhood environment for the elderly.

Results: Study results indicate that elderlies' average daily outdoor activity in the neighborhood is mainly in the morning; the elderlies' daily neighborhood outdoor activity time is 4.79 hours. The average life space mobility score of elderlies in the neighborhood is more than 60, which is more than active elderly.

The most common spaces used by the elderly in the neighborhood are neighborhood parks, large parks, and community activity centers. Due to the campus access restrictions, different types of schools (elementary, junior high schools) have not become the main activity space for the elderly. The frequency of use of neighborhood parks, large parks, and community activity centers by the elderly is the highest for daily uses (56.4%, 44.2% and 52.8%, respectively). With respect to activity time, the number of elderlies activity in these 3 types of spaces is the highest in the morning on average (47.1%, 35.1% and 52.8% respectively); about 80% of the elderly are active during the day (80.1%, 78%), and about 80% of the elderly go on foot to these 3 types of activity spaces.

Conclusions: The average satisfaction of surveyed elderlies towards the supply of neighborhood environment is 4.118, indicating a high degree of satisfaction. With respect to the supply of each aspect in the neighborhood, the satisfaction towards the supply of daily functional area in the neighborhood is the highest. Surveyed elderlies' satisfaction towards the supply of learning, social areas, and facilities in the neighborhood is lower. From this, it is evident that elderlies are less satisfied with the supply of social and learning spaces in the neighborhood.

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244 Integrated multimodal mobility concepts: Preferences and intention to adopt among car-sharing users

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Keywords: mobility; diffusion of innovations; car-sharing

Abstract:

Multimodal mobility refers to the flexible and barrier-free combination of different means of transportation (cf. Schade, Peters, Doll, Klug, Köhler, & Krail, 2011). An example would be to commute from one's home in suburbia to an inner-city workplace while smoothly combining car-sharing, public transportation, and bike-sharing.

Recent technological developments facilitate multimodal travel by integrating information about available mobility options in a single user platform, like a smartphone app or a website. Such concepts - often referred to as integrated multimodal mobility concepts - may help diminish some of the potential drawbacks of multimodal mobility (e.g., high planning effort) and improve the appeal of using environmentally-friendly means of transportation, such as sharing solutions or public transportation (e.g., by increasing flexibility and reducing travel time). To date, however, little is known about the acceptance of integrated multimodal mobility concepts among (potential) users, as well as their preferences and specific requirements for using these concepts. This is particularly true for (potential) users' interest in various features and types of information that could be provided, including standardised booking systems and one-stop-shop solutions. The present study was conducted to shed more light on these issues.

One challenge of surveys among potential users of new technologies is that they may find it difficult to express their attitudes, preferences, and intentions regarding concepts that are still rather unfamiliar to them. In the present study, this challenge was addressed by conducting the survey among car-sharing users. It was assumed that car-sharing users were relatively familiar with innovative mobility concepts.

In the fall of 2016, car-sharing users in Germany were contacted through car-sharing providers and via social media. They were invited to participate in the survey. Data were collected on participants' socio-demographic status and their intentions to adopt integrated multimodal mobility concepts. In addition, their preferences for various features (e.g., payment modalities) and types of information (e.g., current traffic information) as well as their perception of different characteristics of such concepts were measured. The latter were derived from the Diffusion of Innovations theory (Rogers, 2003).

Car-sharing users' intentions to use integrated multimodal mobility concepts as well as their preferences for specific solutions will be presented. An attempt will be made to distinguish different target groups among car-sharing users, based upon their intentions and preferences. In addition, conclusions for the further development of integrated multimodal mobility concepts will be discussed.

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027 The right traits for recycling

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Keywords: recycling, personality traits, person-oriented approach, theory of planned behavior

Abstract:

Recycling is one of the most accessible pro-environmental behaviors to perform, but its impact on the environment is quite substantial. Therefore recycling has received and continues to receive a lot of attention from researchers using the classical variable-oriented approach who are engaged in understanding and promoting pro-environmental behaviors, however there seems to be a lack of a person-oriented approach in understanding different types of people and what motivates them to recycle.

The present study investigates recycling with a person-oriented approach (Bergman & El-Khoury, 2003), clustering study participants by their personality traits and comparing path models based on the theory of planned behavior (Ajzen, 2011) among the clusters.

A total of 612 children with a mean age of 15.25 (SD = .67) participated in the study. Participants filled in personality questionnaires and a measure of recycling behavior based on the theory of planned behavior.

Analysis revealed that those children who have adaptive personality traits are also the most engaged in recycling and hold the most positive attitudes towards it when compared to other clusters. Comparison of path models among clusters indicated that different types of children differ in what most motivates them to recycle: those that have the least adaptive traits might be more engaged in recycling if their recycling behavior is empowered by providing more accessible opportunities to recycle, extraverted and open children might be more likely to recycle if their attitudes toward recycling were made more positive, while agreeable and reserved children might be most affected by normative influences.

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PO I - 03 SUSTAINABLE CONSUMPTION

090 Yes, we can! Positive campaigns mitigate compensatory “mental bookkeeping” effects and promote pro-environmental behaviors

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Keywords: mental accounting, behavioral spillover, affect, relevant self-aspect

Abstract:

Introduction: To counteract global climate change, people will need to act environmentally friendly over a longer time period and across different domains (IPCC, 2014). To achieve this goal, it is essential to better understand how individuals cognitively organize past eco-friendly or -unfriendly deeds and relate upcoming behaviors to past ones.

Theoretical background: Predicting a mental bookkeeping of past behaviors and taking into account their characteristics, the concept of mental accounting seems like a promising approach to clarify this issue and particularly under what conditions an initial pro-environmental behavior promotes or prevents a subsequent one (Thaler, 1999). In this context, recent research on mental accounting and cognition suggests one's self and affect as probable moderators to offset possible negative effects of mental accounting, such as a licensing effect (Pham, 2007; Gneezy et al., 2012).

Methods: Using an online questionnaire, we presented participants specific advertisements related to the protection of the environment, which were either positively, negatively or neutrally framed. The three different advertisements all had the same message, namely that 90% of all plastic bottles are recycled in Germany and 25'000 tons are improperly discarded every year. Depending from the affect to be induced respectively the relevant self-aspect to be activated, the message was framed differently. We then asked the participants to rate the likelihood of showing a second eco-friendly behavior after hypothetically having performed a first one. The second behavior was either difficult or easy and either similar or non-similar to the first one. On basis of the advertising, the hypothetical first behavior was likewise related to the recycling of plastic bottles.

Results: Supporting a mental accounting mechanism, we observed, that people were less likely to keep acting pro-environmentally if the subsequent behavior was similar to the initial one. As assumed, this was only true for individuals from the negative or neutral framing condition. In the positive framing condition, a first environmentally friendly behavior was not compensated by a similar non- environmentally friendly behavior. In line with research, a difficult initial eco-friendly action enhanced the likelihood of showing a second behavior.

Conclusions: Our findings support the notion, that positive framing of a message can offset undesired balancing effects caused by mental accounting. This is for example relevant when planning environmental campaigns and questions the often used negative framing of messages in environmental advertising.

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381 The role of responsible consumption initiatives in promoting sustainable lifestyles

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Keywords: Sustainable consumption; grassroots social innovations; environmental participation

Abstract:

Sustainable consumption has become a central focus for national and international policies. The actions that people take and decisions they make to consume certain products and services or to live in certain way have direct impact on the environment as well as on personal and collective well-being (Jackson, 2005). Besides, individual behaviours are deeply embedded in social and organizational contexts that condition people's proenvironmental behaviour (Gifford & Nilsson, 2014) and influence their consumption choices. This study will focus on the wider responsible consumption movement which has arisen worldwide, grounded on the active engagement of citizens in promoting sustainable lifestyles in the local and global context. Grassroots sustainable initiatives work locally to transform food production and consumption practices by introducing "responsible consumption patterns" in their community life and by facilitating social learning processes among their members (Dumitru et. al, 2017; 2016).

This paper will present the results of an ongoing study that combines qualitative methodologies (20 in-depth interviews and document analysis of 23 local initiatives) and quantitative methods (survey) which study a sample of responsible consumption cooperatives in Galicia, Spain (Lema Blanco et al, 2015). Interviews were oriented to obtain insights regarding the principle motivations that move food activist to maintain a pro-environmental behaviour; the type of consumption conducted by members; the internal organization and participatory processes involved in this cooperative and, finally, the learning process that emerge within the cooperative. The survey will test these results with a wider sample of food activists and will assess whether, under which circumstances and in what extend, engaging in one of these consumption cooperatives could have “spillover effects” (Thøgersen & Ölander, 2003) over other individual and collective behaviours.

The preliminary results contribute to the understanding of the role that grassroots sustainable initiatives play in terms of maintaining responsible consumption patterns. The study analyses personal factors and (intrinsic and extrinsic) motivations that lead people to engage in low-impact lifestyles. Thus, responsible consumers are active agents that assume ethical responsibilities in their consumption decisions. Sustainable consumption goes beyond the desire of obtaining organic food and promotes local networks of sustainable production and low-carbon distribution, enhancing the revitalization of rural areas. Second, this study demonstrates how the internal context of such grassroots initiatives –as voluntary-based initiatives based on active participation- enables empowering and mutual learning processes that lead to pro-environmental behaviour in a wider context. The members of the cooperatives also support other community-based projects related to energy, ethical banking and mobility, increasing their participation in other cooperatives and social movements. As conclusion, although these networks of consumers and producers are still minority, these may become agents of change, playing a notable role as creators of new cultural frames that turn into social referents for the rest of the society.

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279 The role of descriptive norm and anticipated emotions in reducing meat consumption

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Keywords: Emotions; Descriptive norm; Meat consumption; self-regulated behavioural change

Abstract:

Livestock sector is considered one of the most significant contributors to the existing greenhouse gas. Nevertheless, only in the recent years reducing meat consumption has been recognized as a significant pro-environmental behaviour, as a result of the growing awareness of the environmental impact of dietary choices. Previous studies have shown that health concern can be used as a useful mean to promote a more sustainable diet, but the utility of the knowledge of environmental consequences of a meat-eating diet is less clear.

The present study focused on the effect of descriptive social norm and anticipated emotions on the intention to reduce meat consumption. Descriptive norm has proven to be a direct antecedent of ecological behaviours such as towel reuse in hotels and recycling, but its possible impact on reducing meat consumption has not yet received attention. In the same vein, despite prior evidence

about the role of emotions as a predictor of different pro-environmental patterns, their potential influence on meat consumption is yet unexplored. This study considered also the role of past behaviour (i.e., habit) and general ecological worldviews (i.e., environmental identity and general pro-environmental beliefs). The Stage Model of self-regulated behavioural change (Bamberg, 2013) was used for detecting modifications one week after the exposure to the experimental scenarios.

Participants (N=180) were randomly assigned in a 2X3 between-subjects experimental design including respectively descriptive norm (presence vs. absence) and emotions (guilt vs. pride vs. control) as design variables. Intention to reduce meat consumption, stage concerning the willingness to reduce meat consumption, and general pro-environmental patterns were detected. A follow-up survey after one week was realized for investigating stage change and congruence between intention and behaviour.

Preliminary data elaboration showed the significant influence of norm salience, as expected, on the intention to reduce meat consumption, controlling for past behaviour and environmental identity. A less clear picture emerged for the role of emotions. Intention to reduce meat consumption significantly predicted self-reported meat consumption one week later in the expected direction. Further analyses will be carried out and presented in the light of the theoretical framework. Implications for future research as well as for promoting the reduction of meat consumption will be also discussed.

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286 Water consumption feedback devices: Intention to adopt and correlates

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Keywords: water; feedback; smart meter

Abstract:

Introduction: Household consumption of hot water is directly and indirectly linked to various environmental problems including global climate change. The use of technological devices to provide feedback on consumption levels may help alleviate some of these problems by encouraging households to conserve hot water. To date, however, little is known about what may motivate consumers to adopt such devices. The present study addresses this gap in the literature by investigating correlates of consumers' intention to adopt feedback devices.

Theoretical background: The norm-activation model (NAM; Schwartz, 1977; Steg & De Groot, 2010), served as the theoretical framework for this study. In accordance with this paradigm, the predictive qualities of the following variables were investigated: personal norm (feeling morally obliged to conserve hot water), problem awareness (being aware of environmental problems related to consumption of hot water), ascription of responsibility (feeling personally responsible for hot water conservation and environmental consequences of hot water consumption), response efficacy (being aware of means to effectively monitor and reduce hot water consumption at home), self-efficacy (believing that one can personally monitor hot water consumption and behave in ways to effectively conserve hot water), and social norm (believing that important others, such as friends and family members, expect one to conserve hot water).

Methods: A questionnaire was sent to N = 1000 individuals aged 18 to 65 years who were randomly selected from the population registry of Darmstadt, a medium-sized university city in Germany. The net sample, after one reminder had been sent, added up to n = 243 individuals, resulting in a response rate of 25.18%.

Results: Consumers' intention to adopt feedback devices turned out to be moderate ($M = 2.34$, $SD = 1.21$; measured on a 5-point answer scale with "1" indicating weakest and "5" indicating strongest intention to adopt). Bivariate analyses revealed that all NAM-variables, with the exception of self-efficacy, were positively associated with intention to adopt feedback devices, albeit to varying degrees. When adjusting for common variance in a linear regression model [$F(7, 167) = 11.12$, $p < .001$; $R^2 = .318$; adjusted $R^2 = .289$], only personal norm, social norm, and response efficacy were significant predictors (all positive associations). Social norm showed the strongest association with intention to adopt feedback devices, followed by response efficacy and personal norm.

Conclusion: Initiatives to strengthen social norms, response efficacy, and personal norm may allow for increasing consumers' intention to adopt feedback devices. One way to strengthen social norms is by informing consumers about other people's interest in adopting feedback devices or actual adoption of such devices. Response efficacy could be strengthened by communicating the results of empirical studies that illustrate the effects of feedback devices on household water and energy conservation (e.g., Tiefenbeck et al., 2013). Campaigns aimed at strengthening personal norm could target problem awareness (e.g., through providing information about environmental problems linked to current levels of hot water consumption) or ascription of responsibility (e.g., through applying commitment strategies).

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211 Nature connectedness and pro-environmental behavior: leverage point for sustainability transition

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Keywords: connectedness with nature; pro-environmental behavior; scale

Abstract:

Introduction: Reconnecting individuals to nature has been proposed as a potential leverage point in the transition towards sustainability (Abson et al., 2016). With industrialization and globalization, individuals have lost a sense of connection with nature and see themselves as distant from the natural world. Reestablishing this connection could inspire changes in environmental attitudes and behaviors and play an essential role in solving today's environmental challenges (Zylstra et al., 2014). While research highlights the relationship between connection with nature and pro-environmental behavior, grey area persists in our understanding of where individuals report connectedness and correlations with behaviors categorized by environmental impact. In this presentation, we: (1) propose a conceptual model for understanding relationships between connectedness and behavior at local to global scales, and (2) present findings from empirical work on the relationship between scales of nature connectedness and pro-environmental behavior.

Theoretical background: In the years following Kellert & Wilson's 'biophilia hypothesis' (1995) and Pyle's 'extinction of experience' (1993), scholars have strived to understand and explain human connection (and subsequent disconnection) to nature. Mayer & Frantz (2004), Schultz et al. (2004), and Nisbet, Zelenski & Murphy (2009) provided a foundation for research on how nature connectedness influences environmental values, attitudes and behaviors, as well as the development of methodology to empirically test relationships between the items. This paper builds on these theories, as well as contributing to a recent strand of research investigating linkages between place, nature connectedness, and pro-environmental behavior.

Methods: Our research takes a quantitative, survey-based approach to test correlations between nature connectedness and pro-environmental behavior. This forthcoming research will employ a

newly developed survey instrument to measure geographic ranges of nature connectedness (from local to global), as well as an adapted version of Kaiser et al (2003) General Ecological Behavior scale to measure self-reported behavior. Survey items will be pre-tested on a sample population to ensure item relevance and clarity; secondary analysis will focus on internal consistency and scale refinement.

Results: The findings from our study shed light on how nature connectedness can be expressed spatially and provide further empirical evidence for understanding the relationship between nature connectedness and pro-environmental behavior. We present (a) the conceptual framework used to drive this research, and (b) results from initial empirical testing of these concepts. We compare our findings to existing literature and propose a new research agenda to address emerging research priorities.

Conclusions: We highlight the importance of integrating scale into research on the role of reconnecting individuals to nature for sustainability transformation. Considering scale in nature connectedness methodology provides new insights on ways individuals experience and connect with nature. Including geographical scale opens the door for new avenues of research: examining where and how to connect people to nature in order to promote adoption of sustainable behaviors. These insights contribute new conceptual and methodological approaches that may aid in the development of effective behavioral intervention strategies focused on reconnecting individuals with nature and aiding in the transition towards sustainability.

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PO I - 04 BEHAVIOR IN WORK SPACES

232 Safety of defensive and coping person's behavior

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Keywords: safe behavior, defensive and coping behavior, educational environment.

Abstract:

The educational environment is one of the necessary and important spheres of human activity. The influence of the subjects (teachers and students) to each other in this environment is sufficiently large. And not always this influence and behavior of the subjects meets the requirements of safety.

Safe behavior is understood as a behavior in which a person feels himself protected from various threats, ready to confront difficult situations, as well as capable to activity that doesn't contain threats to himself and other people. Defensive and coping behavior allows the person to cope with difficulties and overcome life threat. At the same time, defensive and coping behavior may be unsafe, detrimental to a person and social environment.

The study was conducted, in which students of colleges and universities attended (n = 338). It applied the battery of personality questionnaires, diagnosing students' behavior, as well as their psychological defensive and coping strategies; in the analysis were used factor, correlation analysis, multidimensional scaling.

As a result, four types of defensive and coping behavior were allocated: adaptive, victim, neurotic and altruistic. Respondents characterized by an adaptive behavior, adapt to the educational environment, feel emotional comfort in it, but don't consider themselves prosperous. This behavior is safe for the respondents themselves, and for their social environment, but more so for the person himself. Respondents implementing victim behavior attract to themselves a lot of unpleasant situations and accidents. This behavior is safe neither for a person nor for people around. Respondents with neurotic behavior tend to manifest emotional instability and irritability. This type of behavior isn't safe for a person, and for others. Realizing altruistic behavior respondents are responsible, caring about other people, help, sometimes sacrificing their own interests. This behavior is safer for social environment. These types of defensive and coping behavior were divided on two grounds: safe / unsafe, directed at the self / other people.

As a result, we built a model of safety defensive and coping behavior of a person in the educational environment.

Thus, this study suggests a comprehensive understanding of functioning system of student's defensive and coping behavior as the subject of the educational environment to meet the requirements to ensure internal and external safety of the educational space and the person in it.

The study was sponsored by Russian Foundation for Basic Research (RFBR), the project 16-36-01057.

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Kruzhkova O.V., Nikiforova D.M. (2014) Safety of defensive and coping behavior of the teacher in the conditions of professional conflict / In the conflict of modernity. Ekaterinburg. Pp. 139-152.

210 Involvement in extremist groups in the Internet environment: the psychological aspect

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Ural State Pedagogical University, Ekaterinburg, Russia

Keywords: psychological impact, strategy of user's behavior in the Internet environment, extremism.

Abstract:

Immersion of world economy into recession, emergence of new complex political and economic conditions actualized numerous social problems, including the spread of extremist ideas among the youth. On average, 80% participants of the extremist organizations are aged less than 30 years. The most congruent environment for the involvement of young people in extremist community is the Internet.

The Internet is dangers not for "special" resources that can be tracked and blocked. Recruiters use the Internet and other services (social networks, chat, etc.). More than 65% of Internet users are adversely affected by the virtual extremist content. Such activity couldn't be remained without experts' attention, but monitoring and blocking of dangerous content doesn't lead to desired result, that makes look at the problem from a different angle, and to assume that in addition to trying to control most of the information environment should pay close attention to the object of targeted attacks - youth and its behavior in the Internet.

As the methods were used theoretical analysis, poll opinion and psychological diagnostics with the use of the battery of personality and projective techniques (n = 1060 adolescents and youth living in Russia).

The main result was the description of the Internet as a medium and a tool of psychological influence on youth, which can be both positive and negative. The advantages are opportunities that offered worldwide network and disadvantages are in growing influence on personality and increasing the potential threat of destruction of behavior. Absorption of teenagers in the virtual space essentially converts and transforms their leading activity that brings to completely different mental tumors. It

considered three main effects from impact of the Internet - "effect of drift of goals", mythologicity and "effect of excitement" and their impact on the individual in each age period.

Youth's network behavior underwent analysis and systematization. Consideration of main motivational reasons, taking into account specifics of building human interaction with the environment possible to identify and describe the main types of behavioral patterns exhibited by youth in the Internet. Internet users have areas of interest, classifying them as sociable, self-expression, gamers, buyers, etc. The degree of young's activity in the network was studied from perspective of integrated strategies of behavior - blocking information, changing distance, control, transformation. In addition to characteristics of 24 possible subtypes were identified grounds for allocating risk groups most exposed to influence of the Internet. Groups of risk are described in terms of greatest susceptibility to extremist influence, through the provision of basic "areas of vulnerability" of representatives of each group. There was generalized and described the process of youth's involvement in extremist communities, highlighted the main steps that recruiters take with regard to the objects of their impact.

The data obtained can be used to identify and effectively prevent the impact of extremist groups in the Internet on younger users.

The study was sponsored by Russian Foundation for Basic Research (RFBR), the project 16-29-09512.

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248 The comfort advantage in "Green" buildings: A reflection of biased self-reports?

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Keywords: green buildings; comfort; eco-label effect

Abstract:

Introduction: Just calling a food product or an artifact "eco-friendly" is enough to make individuals believe that the products have superior features compared to an objectively identical alternative labeled conventional (e.g., Sörqvist et al. 2013). Research show that occupants are more comfortable in "green" buildings (Kim, Hwang, Lee & Corser, 2015), if these self-reports are influenced by the "green" label are still unclear. The purpose of this paper was to extend this eco-label effect even further, namely to buildings. Participants in the environmentally framed condition rated the room as more comfortable to the room framed as conventional. Practical implications and suggestions for future research are discussed.

Theoretical background: Research in environmental psychology have shown that people assign higher taste-ratings to a food-product that is labeled as eco-friendly compared to a conventional alternative, even though the two products are in fact identical. This preference bias has been shown with various products. For example coffee (Sörqvist et al. 2013), bananas (Sörqvist et al. 2015), wine (Wiedmann, 2014), and lamps (Sörqvist, Haga, Holmgren & Hansla, 2015). The purpose of this study was to investigate whether there exist a preference bias for "green" compared to conventional buildings.

Method: Thirty five university students participated in the study (16 women), with a mean age of 28.06 years (SD = 10.22), ranging from 18 years to 62 years.

The study took place in two rooms, the participants were told that one room was run by an environmentally certified system, whereas the other room was run by a conventional system. They were then asked to assign comfort ratings to both rooms.

A within design will be used with informational framing as the independent variable. The dependent variable was general comfort.

Results: The participants perceived the “green” room ($M = 6.11$, $SD = 2.06$) as more comfortable than the “conventional” room ($M = 5.40$, $SD = 1.63$), even though the two rooms were identical, $t(34) = 2.03$, $p = .050$.

Conclusion: Future studies investigating psychological benefits of “green” buildings should control for this preference bias, for example by not letting the participants know if the building is “green” or conventional. Also investigate potential methods regarding how to maximize this effect.

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291 Investigating multi-stakeholder risk perceptions associated with coastal flooding - the PACA coastline, France

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University of Aix-Marseille, Aix-en-Provence, France

Keywords: Marine submersion; risk perception; flood risk communication

Abstract:

Introduction: Effects of climate change (e.g. rising sea levels) coupled with increased urbanisation and touristic activities in flood prone areas (Vinet et al., 2011) means that coastal zones in France, in particular the Southern PACA region, are increasingly vulnerable to the risks of coastal flooding. A range of negative effects/risks are associated with marine submersion, including financial loss, danger to human life and property, and environmental degradation (EPRI, 2012; MPM, 2013). Managing the risks associated with marine submersion and other kinds of flooding, is now clearly written into national policy and underpinned by the EU Floods Directive 2007/60/EC (European Parliament and the Council of the European Union, 2007).

Start Fragment Environmental risk management and communication has typically been based on the ‘information deficit’ model, where the ‘lay’ public is assumed to be ‘ignorant’ & ‘irrational’, and in need of understanding ‘objective’ & ‘expert’ risks (Bickerstaff, 2004; Mostert & Junier, 2009). Resulting environmental risk management overlooks the ways in which publics perceive the risks associated with flooding, and related aspects such as trust in technical experts, perceived validity of FRM strategies, & public acceptance of expert risk assessment (Slovic, 1999; Sjöberg, 2000; Baan & Klijn, 2004) – leading to failed flood risk management strategies. This research is seeking to investigate risk perceptions associated with marine submersion amongst technical experts, tourists, and local residents, in order to enhance flood risk communication and local resilience in response to such future events.

Theoretical background: This research is adopting Social Representations Theory (SRT) as the principal theoretical framework. Firstly, SRT addresses aspects of content and process in the collective social construction (or ‘representation’) of novel and unfamiliar social objects into everyday ‘common-sense’ forms of knowledge – a process otherwise known as symbolic coping (Moscovici, 1981; Wagner et al., 1999). SRT can therefore be effectively applied to the context of sudden and threatening forms of place change from natural hazards, such as marine submersion events, where divergent social groups are likely to construe and represent marine submersion in different, even competing ways.

Methods: This research adopts a mixed methods approach that triangulates data from both qualitative and quantitative methods of data collection. Focus groups enable an investigation of

groups' representations of marine submersion and associated risks, as well as an examination of groups' evaluations of past, present and potential future adaptation strategies. A large-scale questionnaire survey enables an investigation of the influence of contextual and individual-level variables (including socio-demographic factors, place attachment, prior flood experience) on the risk perceptions of different stakeholder groups.

Results/Conclusions: The results will enable a better understanding of multi-stakeholder risk perceptions associated with marine submersion, with a specific focus on enhancing flood risk communication strategies in order to improve awareness and community resilience toward potential future coastal flooding events in France and other locations vulnerable to such natural hazards.

References

To be provided.

339 Environmental chaos at home and in school and its impact on child anxiety

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Universidad Nacional Autónoma de México, México

Keywords: Chaotic environments, physical environment, childhood anxiety.

Abstract:

Introduction: A chaotic environment (Fiese, 2006) is characterized by high levels of noise (Evans & Lepore, 1993), overcrowding, and social instability, and by a lack of temporal and physical structure, and may be found in a home, school, or workplace, and even in a neighborhood; although several studies suggest that high levels of environmental chaos can occur in low-income families (Wachs & Evans, 2010) and/or settings, their appearance is not restricted to that sector of the population alone, and it is relevant to study this kind of environments and their impact on the population.

Theoretical background: Several studies have focused on studying their impact on children (Evans & Kim, 2012; Dumas, Nissley, Nordstrom, Smith, Prinz & Levine, 2005), especially with variables related to instability, such as lack of routines (Matheny, Wachs, Ludwig & Phillips, 1995) or family supervision (Corapci & Wachs, 2005), but it is also important to study those related to the physical environment, such as disorder, overcrowding, and unsanitary or untidiness conditions.

Notwithstanding, aside from the home, the only environment which serves as a broad context for human development, in the first years of life, is school (Maxwell, 1996); if the physical environment of schools is physically and socially chaotic, it can have detrimental long-term effects on children (Evans, Gonnella, Marcynyszyn, Gentile, & Salpekar, 2005).

Taking this into consideration, it is important to evaluate the existence of environmental chaos in children's primary microsystems, i.e. home and school, and its impact on child development.

Methods: We evaluated 135 children with a mean age of 10 years (53.7% girls and 45.1% boys), from an elementary school in Mexico, located in an area cataloged as low-income, and 100 parents with a mean age of 38 years (82% women and 17% men).

Instruments:

- *The Environmental Chaos Scale for Home*, specially designed for this study, uses 27 questions distributed in 2 factors: Disorder with an alpha of .822, and Order .786
- *The Environmental Chaos Scale for School*, specially designed for this study, has 14 questions and a Cronbach's Alpha of .771, distributed in 2 factors (Disorder .712 and Order .632)
- Social Density (Hall, 1973): Accounts for the ratio of number of persons to rooms in a home.
- Children's Manifest Anxiety Scale (revised) Reynolds, y Richmond, 1985)

Results: We compared levels of environmental chaos in children's homes and schools and used a regression analysis to determine the impact of those variables on the manifest anxiety children report, finding that children's total anxiety was explained by an R² of .345, with regression model significance F=16,829, p=.000; the predictors were Perceived stress in school (b=.478), followed by Disorder in the home

($b = .327$), and finally Disorder at School ($b = -.203$). The results show the relevance of environmental variables in generating child anxiety.

On the other hand, parent-reported environmental chaos found that the Stability in the home has a negative impact ($b = -.320$, $p = .027$), meaning that the absence of elements such as supervision or routines may be associated with the anxiety children report.

Conclusions:

We discuss the results in terms of the relevant of environmental impact and parental disorder on child development in Mexico.

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371 Participatory design methodology research for Elementary School restroom remodeling

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Background: According to the Seoul City's survey in 2014, among the school facilities, restroom is the most unsatisfied place to students in Seoul (Seoul Metropolitan Government, 2015). Seoul metropolitan government supports projects to remodeling school restroom in elementary, middle and high schools choosing the way of participatory design methods in order to apply the user's requests in the space. This research, as a part of process the participatory design school restroom remodeling projects on Seoul City, has been in progress on M. Elementary School in Seoul and will be done by July of 2017.

Intro: Author's last study of participation design, satisfaction rate of participants' or users who know that the restroom was designed via participation process was higher than the user who did not know that (Paik, 2016). The higher the direct involvement of children in the participation design process, the more varied and specific the children's needs, and the higher the satisfaction level (Park & Park, 2012). Therefore, the method of participation is important to improve participation design efficiency. [Objectives] By analyzing the user's satisfaction survey of school restroom, find the design problem with participants. Driving individual methods of participatory design process, analyze efficiency and satisfaction of completed space. Propose guideline for future user participatory design based on individual methods analysis. [Methods] Participation design is preceded according to Seoul Metropolitan Government's reference phases: 1) Satisfaction Survey of existing school restroom. 2) Participants' image research for restroom design, 3) Space planning, 4) Color scheme and finishing material, 5) Design confirm and pick accessories. During the process, author uses five different decision making method categories: awareness methods, indirect methods, group interaction methods, open-ended methods, and brainstorming methods that Sanoff (2000) referred. Final, design participants' satisfaction survey of process and completed restroom. And make comparison and analysis each categories of participation method in design. [Conclusion] Since the school built

in 1970's, many parts of construction against the current regulations, such as ADA, standards, and finishing materials. Beside, design problems that user adopted are often a matter of fact, not about design but maintenance and user's behavior. Find which categories and methods are more fit on which phase procedure to make better efficiency based on analysis. POE and final conclusion will be done after construction on July 2017.

Keywords: Participatory Design, Participatory Technique, School Restroom

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Thursday
31th August

14:00 - 15:00 h.

POSTER SESSION II

Poster Exhibition Area - Floor -1

PO II - 05 NATURE CONNECTEDNESS

053 Awe emotion and psychological restoration in natural and urban environments

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Keywords: Awe; psychological restoration

Abstract:

Introduction:

Thirty years after attention restoration theory, there is still a need to explain the reasons why various natural stimuli positively affect psychological functioning. In order to fill in this gap, we have conducted two consecutive studies to evaluate the relationship between beauty, awe emotion and psychological restoration, both in natural and built environments.

Theoretical background: Restoration has been defined as the renewal of adaptive resources that have become depleted in meeting the demands of everyday life (Hartig, 2004). We focus on attentional recovery and mood improvement. There is wide evidence suggesting that natural environments are more restorative than built ones (Staats, 2012). However, beautiful built environments such as plazas also foster psychological benefits. Thus, we see a need to consider beauty when comparing natural and built environments. In addition, most research on restoration has focused on mundane scenes (e.g., urban parks), excluding exposure to extraordinary natural and built environments from the analyses. Although not systematically studied in environmental psychology, the emotion of awe evoked by both natural and built environments has been linked to psychological benefits that could relate to restoration (Joye & Bolderdijk, 2015; Joye & Dewitte, 2016). This suggests that attention restoration research could be broadened in order to include extraordinary settings in its analyses.

Method: Two consecutive studies were conducted to explore if, in equal beauty, built environments are as restorative as natural environments. We also evaluated whether awe-evoking environments are more restorative than non awe-evoking ones. Study's 1 aim: to obtain a categorization of awe-evoking scenarios (both natural and built). Study's 2 aim: to evaluate the effect of exposure to awe-evoking versus non awe-evoking stimuli (pictures presented in slideshows) on participants' psychological restoration. 120 pictures were selected through a systematic search on the Internet. The photographs were randomly distributed in four power point presentations and evaluated in terms of awe and beauty by 10 people, with each participant evaluating 30 photographs. A selection was made with the premise of maintaining beauty constant. Then, four categories of 14 photographs were obtained and organized in four power point presentations: Natural (awe-evoking / non awe-evoking) and built (awe-evoking / non awe-evoking). The restorative power of a 7 minutes exposure to each of the four categories of pictures was evaluated with a pre / post experimental design, with 40 participants per experimental condition. Psychological restoration was registered through the participants' effectiveness in the Digit Span test, their emotional state and the restoration reported after exposure.

Results: Preliminary results show that exposure to awe-evoking environments (natural or built) is more restorative than exposure to non awe-evoking environments (natural or built). In addition, in equal beauty, natural environments are more restorative than built environments.

Conclusions: The perception of beauty should be considered when evaluating people's restorative benefits after exposure to both natural and built environments. The inclusion of awe-evoking stimuli in the study of restoration seems to be a promising line for future research.

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073 Human-Animal Relations viewed by lay and environmentally-involved people: Esteem to Humanity and Empathy with Nature

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² Princeton University, Princeton, United States

Keywords: animal stereotypes; empathy with nature; esteem to humanity

Abstract:

Introduction: The social image of animals (*how society sees animals*) may be differentially perceived by individuals based on the degree of environmental involvement.

Theoretical background: Within the Stereotype Content Model (SCM; Fiske, Cuddy, Glick, & Xu, 2002), the constructs of perceived status, interdependency, intent, and agency are used to show the social image of animals held by lay and environmentally-involved people. Further exploring the differences between lay and environmentally-involved people, we analyzed the relations between the social perception of animals and potentially relevant dispositional variables such *Dispositional Empathy to Nature* (Tam, 2013) and *Esteem to Humanity* (Luke & Maio, 2009).

Methods: Lay (N = 94; general population) and environmentally-involved people (N = 59; environmental science students) were asked to complete an online questionnaire in a correlational study.

Results: Results showed that the social image of animals is more negative for environmentally-involved than for lay people: "Society" grants low status to animals, perceiving them as more threatening, less warm, and less competent. No differences were found in interdependence. Environmentally-involved presented higher dispositional empathy to nature ($M_{Env} = 5.28$ vs. $M_{Lay} = 4.08$; $p < .001$) and lower esteem to humanity ($M_{Env} = 4.39$ vs. $M_{Lay} = 4.80$; $p < .05$) than did lay people. A reverse relation between dispositional empathy and esteem to humanity was found for environmentally-involved individuals but not for lay people. High empathy to nature was associated with Society's negative image of animals: *Society scorns animals* in terms of status, threat, warmth, and competence ($r = .29 - .42$, $p < .05$). High esteem to humanity was associated with Society's positive image of animals: *Society values animals* in terms of status, warmth, and competence ($r = .23 - .30$, $p < .08$). For lay people, no relation was found between dispositional empathy and social image of animals ($r = .07 - .16$, ns) but the relation esteem to humanity-positive social image of animals was maintained ($r = .22 - .33$, $p < .05$).

Conclusions: An Opposition vector between positive evaluations of humanity and empathy to nature was only found for environmentally-involved individuals. Ultimately, environmentally-involved and non-involved people appear to differ in the role of their feelings toward animals' suffering to build a negative social image of animals. Results are coherent with a theoretical framework considering animals as social objects (Sevillano & Fiske, 2016).

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275 Typology of natural settings linked to transcendent experiences

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Keywords: Transcendent emotions; awe; natural environments; content analysis.

Abstract:

Introduction: This study belongs to a set of investigations about the psychological analysis of transcendent experiences in relation to nature. The objective is to learn about the patterns of the natural settings that produced transcendent emotions.

Theoretical background: The concept of “transcendent emotions” are related as “a moment of extreme happiness” or “a sense of harmony with the whole world” (Williams y Harvey, 2001). A range of positive human experiences have been characterized as “peak experience” or “states of flow” (Csikszentmihalyi, 1990). Art and nature are the most important sources evoking (Shiota, Keltner y Mossman, 2007).

Methods: 131 descriptions of transcendent experiences are analyzed. Individual’s own perception of physical features are studied and typology of patterns and settings is worked out, defined by physical characteristics and social usage.

Results: Content analysis revealed that “cliff-beach-ocean” and “mountains”, specially “dusk scenarios”, are the most recalled ones, while “contemplation” is the activity mostly associated with these transcendent experiences. The descriptions include experiences in solitude and in group, being the latter the most frequently described.

Conclusions: The typology obtained is similar to that of previous studies on awe stimuli, such as perceived vastness (Keltner and Haidt, 2003). The results allow us to advance in the understanding of emotional responses and, above all, in the identification of the scenic patterns of nature linked to these transcendent experiences.

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287 Psychological restoration depends on stimulus-source attribution

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Abstract:

Nature settings like forests, lakes and mountains have shown to have a restorative effects in fatigue people, compared to more urban settings like cities (Ulrich, 1984; Kaplan and Kaplan, 1989; Berman et al., 2008; Hartig et al., 2014) A classical view is that the difference in restorative potential of nature and built environments depends on differences in the intrinsic characteristics of the stimuli. Visiting or viewing environments can have restorative psychological effect, while exposure to the built environment typically has more negative effects (Hartig et al., 2003; Hartig et al., 1991). In the study

we used an experimental method with between participants design. Participants conducted cognitively demanding tests prior to and after a brief pause. During the pause, the participants were exposed to pink noise. In one group participants were told the sound source were a nature scene with water, the second group were told the sound source originated from an industrial environment, participants in the control condition were told nothing about the sound origin. Results showed that when participants were told the sound originated from nature they reported higher psychological restoration than participants in the “industrial” condition. The results suggest that stimulus-source attribution is an important mechanism in psychological restoration.

Keywords: Restoration, stimulus-source attribution, nature, built environment

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085 Analyzing the restorative value of virtual (3D) environments

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Keywords: Restorative environments, virtual reality, environmental perception, psychological restoration.

Abstract:

Virtual reality (VR) is a technology that has been widely used to simulate reality (Clemente et al., 2013). Two qualities characterize the VR environments: *immersion* or the extent to which computer displays are capable of enable a vivid illusion of reality (Slater & Wilbur, 1997) and *presence* which describes the individual's experience of 'being there' during the mediated exposure (IJsselsteijn, 2004). Three dimensions underlying the presence construct: a) *physical space*, the sense of being located in a continuous spatial environment, b) *naturalness*, refers to whether the presented content is realistic and c) *engagement*, related to the presented content and the individual's attention or absorption in relation to that particular content (de Kort, et al., 2006). These dimensions could be theoretically connected to Kaplan's restorative dimensions (Kaplan, 1995; de Kort, et al., 2006). Physical space could promote the geographical distance required in being away; naturalness may be related to both extent and compatibility and engagement appears related to the fascination (de Kort, et al., 2006).

The present study is part of a larger research that aims to document the therapeutic effects of exposure to virtual restorative environments. When virtual environments are used for therapeutic purposes, an important prerequisite is the similarity level of virtual environments to real environments (Herbelin, Vexo, & Thalmann, 2002). In congruence with the notion that in technologically mediated environments, the same environment with different visualizations conditions has different cognitive and affective responses (Daniel & Meitner, 2001), the present study compared the restorative potential of the same scenario in its static 2D (photographic version) and 3D or computer-generated environment considering a set of previously established environments with high vs. low restorative potential (HRP or LRP respectively) (Martínez-Soto et al., 2014). Compared to 2D environments, it is expected that the VR experience (e.g. immersion and presence; Witmer, Jerome & Singer, 2005) could enhance its restorative potential.

Method:

Participants: Fifty undergraduate students will be randomly assigned to one of the two conditions: C1 (n=25; static pictures) and C2 (n=25) VR settings.

Instruments: A computerized version of the Mexican Revised Scale of Environmental Restoration Perception (Martínez-Soto et al., 2014).

Stimulus. 2D mediated environments. Six pictures of photographs of settings previously rated with high (n=3) or low (n=3) restorative potential (Martínez-Soto et al., 2014). The VR experience will be provided through the view of the same six pictures manipulated in its 3D virtual version

Procedure: The stimulus will be rated in several experimental sessions through individual applications, following the instruction for EPRA-R measurements considering both the 2D environment and its computer-generated environment. The paradigm will be divided in two conditions developed with the same mediated environment: C1, only photograph of restorative environments could be visualized (6 photographs displayed for 20 s each with 0.5 of black screen between them) and C2, the participants could navigate freely for 20 s at the 6 virtual scenarios. Stimuli's order presentation will be randomized.

Results and discussions are in progress.

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PO II - 06 URBAN SPACES EVALUATION

107 To evaluate the neighborhood parks by using the Child-Friendly Environment Indicators

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Keywords: Pro-child, Child-friendly City, Child-friendly Environment, Neighborhood Parks, Analytic Hierarchy Process

Abstract:

Introduction: Neighborhood parks are the most approachable public recreation facilities, and are also the most common and open recreation sites. This study implements the "child-friendly" concept to establish a "child-friendly outdoor environment indicator" system as the examination basis for neighborhood parks, and uses it to assess the extent of child-friendliness of the environment.

Theoretical background: In 2014, as we mark the 25th anniversary of the adoption of the UN's Convention on the Rights of the Child (CRC), several foundations in Taiwan concerning about children's welfare indicated children and teenagers in Taiwan are facing the threats of violence, drugs and lack of recreational spaces. For the issue on children's use of outdoor space, this study proposed the concept of pro-child/child-friendly spaces. The idea of child-friendliness was grounded in the CRC proposed by UNICEF, which mandates active participation of children in civic life and promotes local systems of good governance committed to children's rights (UNICEF, 2004). The concept of a child-friendly city include: 1. Increase children's ability to make choices and independently access a diverse range of community services and activities; 2. Enhance the capacity for children to engage in play and

develop competence in their local community environment; 3. Ensure the rights of children to be safe and healthy within community public places; 4. Increase the ability of children to feel secure and connected within their physical and social environments; 5. Create spaces that offer children a sense of welcome, belonging and support; 6. Increase opportunities for children to access green, natural areas for play and relaxation (UNICEF, 1996).

The lack of outdoor space or a variety of unfriendly factors have caused many negative impacts on children. In many developed countries, the lack of physical activities have also caused serious damage to children's health (Aarts, Jeurissen, van Oers, Schuit, & van de Goor, 2011). Current discussions regarding pro-child outdoor environment are mainly on environmental affordance and children's independent mobility (Kyttä, 2004; Fyhri & Hjorthol, 2009; Carver, Timperio, & Crawford, 2012; Mitra, Faulkner, Buliung, & Stone, 2014). Recently, some scholars use the establishment of child-friendly city indicators to present the meaning of pro-child environment (Nordström, 2010; Dewi, 2012; Broberg, Kyttä, & Fagerholm, 2013; Aarts et al., 2011; Woolcock & Steele, 2008). According to the study done by Aarts *et al.* (2011), public health, exercise, children and education, spatial planning, traffic and transportation and security are considered to be the potential factors that stimulate children and adolescents to be active in the neighborhood environment. Many scholars believe there should be a common guideline when it comes to standards for diverse environmental resources and children feeling safe to explore. However, existing research scopes are mainly for urban construction and planning and community's overall environment, or exploring the environment's child-friendliness level from only the children's right point of view. Few has proposed fundamental specific recommendations from the view of promoting children's health and welfare, or they present different standards. Therefore, this study choose to use neighborhood parks as study sites for their high family utilization rate in public facilities, to establish an indicator framework for child-friendly outdoor environment.

Methods: Indicator hierarchical framework and evaluation standards are established through reference induction, along with the use of overall weight of the indicators neighborhood Parks. "Analytic Hierarchy Process (AHP)" is used to establish the weight. Then the three people of study panel used the Observational Method to evaluate the three neighborhood parks in Chupei city. All the scores were calculated with the Child-Friendly Indicators.

Results: Wen-Hua Children's Park has better overall planning and design, and therefore, are more child-friendly than the other two neighborhood parks; Hsin-Sou Park is the neighborhood park that is most well maintained; Fu-Hsing Park is full of historical and cultural atmosphere, and is the neighborhood park that has the best sense of neighborhood cohesion.

Conclusion:

(I) Selection of child-friendly outdoor environment indicators

Under the two dimensions of physical environment and social-psychological environment, two more levels and 16 indicators were identified.

(II) Indicator weight analysis

Security under social-psychological environment is the most important evaluation indicator, following by physical environment's natural landscape and artificial facilities; sociability and sense of participation are relatively less important.

(III) The ideal child-friendly neighborhood park

The ideal child-friendly neighborhood park not only should be planned base on the needs of the population and the size of the site, but also should consider the community's natural environment and local cultural background.

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140 Factor structure of the dispositional empathy with nature scale in Spanish

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Keywords: empathy with nature; environmental concern

Abstract:

Introduction: The factor structure of the Spanish version of the Dispositional Empathy with Nature Scale (DEN; Tam, 2013) is tested in this research.

Theoretical background: The DEN – *dispositional tendency to understand and share the emotional experience of the natural world*—fills a gap in the study of the emotional component of environmental concern, the lack of a specific dispositional measure of empathy with the natural world. Also, it proposes a construct, *empathy with nature*, which may explain the development of a close relationship between individuals and the environment (environmental identity, emotional affinity, or connectedness).

Methods: Participants were people in or around a University Campus ($N = 193$), college students during regular classes ($N = 79$), and members of a generalist weblog ($N = 130$). The final sample included 394 people (45.5% female; $M_{\text{age}} = 23.38$ years (16-60 years), $SD_{\text{age}} = 6.62$).

Participants completed a self-administered questionnaire in person or online for which they were compensated. The questionnaire included the adapted DEN scale, and questions about the participants' socio-demographic characteristics. Some of the participants also completed several measures of environmental concern, empathy with humans, and social desirability ($N = 77$) at least 2 months before completing the DEN scale.

Results: The originally propose done-factor structure is found using exploratory factor analysis—FACTOR program (Lorenzo-Seva, & Ferrando, 2006)—with Un weighted Least Squares procedure and optimal implementation of parallel analysis (GFI = .99), along with internal consistency ($\alpha = .93$). The Spanish DEN scale shows moderate correlations between environmental concern measures ($r = .36 - .44, p < .01$) and low-to-moderate correlations with dispositional empathy with humans ($r = .30 - .42, p < .05$), indicating the distinctiveness of the scale.

Conclusions: The Spanish version of the DEN scale is an adequate and reliable instrument to measure empathic tendencies towards nature. Some recommendations regarding its future use are made.

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147 Development and validation of a questionnaire addressing flexible work and recovery

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Keywords: flexible work; validity; survey

Abstract:

Introduction: Modern working life is characterized by an extensive use of information and communication technology, allowing flexible work in time and space. This may offer employees an increased autonomy with respect to organizing their work than what was possible before (Allvin et al., 2006). At the same time, these new opportunities present a challenge for employees to find a sustainable balance between labor and private life (Mellner, 2016). The challenge for researchers is to capture and evaluate flexible work.

Theoretical background: Previous research has indicated an association between flexible work and various health outcomes contributing to lack of recovery, such as disruption of circadian cycles, sleep quality, fatigue and reported health problems (Costa et al., 2006; Arlinghaus & Nachreiner, 2014). Several valid questionnaires have been developed for purposes of relevance to flexible work, such as work-family conflicts (e.g. Netemeyer et al., 1996). However, more detailed investigations into factors that may influence the occurrence and results of flexible work requires development of more valid instruments than those available at present. Therefore, the aim of the present study was to develop and validate a Swedish questionnaire assessing conditions of actual work flexibility and its determinants.

Methods: This study was done in collaboration with the Swedish Transport Administration [STA]. The procedures we used included item generation and examination of face, structural and construct validity. First, to control face validity, discussions were made with a reference group and by qualitative think aloud-interviews with five employees at the STA and one researcher. Next, the questionnaire was adjusted and distributed to 266 office workers at three companies in the sectors of building, municipal administration and customer service in Sweden; 92 workers answered. In order to assess structural validity, principal component analyses [PCA] for each main area of questions were performed. Furthermore, construct validity was assessed through hypothesis testing of differences in flexibility between the three companies, with an a-priori variation in their regulation of flexible work.

Results: Discussions and interviews showed that corrections were needed for some of the concepts and questions, as well as for the design and number of items. The workers confirmed the face and content validity of the revised questionnaire (>95 % judged the items, constructs and structure of questions to be intelligible). The PCAs showed good structural validity (factor loadings >0.6 and no cross-loadings >0.3) for the three main areas of interest; i.e. determinants of actual flexibility, technology use, and work-non-work balance. Furthermore, hypothesis testing showed as expected that the most index variables of actual work flexibility could significantly separate groups with various regulated work, indicating construct validity ($p < 0.05$).

Conclusions: We developed a valid questionnaire for assessing factors associated with flexible work. As a next step, we will perform a confirmatory factor analysis of the questionnaire in a larger sample of office workers. This questionnaire may then be used in surveys regarding actual work flexibility and associations with recovery and health at work.

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380 Symmetrical Analysis of Social Movements for Food Sovereignty

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Keywords: Food Sovereignty, Symmetry, Multi-Sited Ethnography.

Abstract:

The social movements for food sovereignty are ways of collective action between actors, who are considering food as a human right and a way to generate social change. They intend to achieve the sustainable development goal, Zero hunger; through the production of organic foods and the use of technologies that protect the environment. At the same time seek to recover the autonomy through trade local food at fair prices. Are the result of a series networks. They are based on aesthetic experiences and are structured through speeches constructed collectively. It's symmetrical analysis (Rodríguez Giralt, 2009), is based on three principles: (a) Symmetry, nature and society are described in the same terms and the agency will be an effect of the association between these entities (Doménech & Tirado, 1998). (b) Heterogeneity, the actors are a result of the interaction of heterogeneous entities and can be analyzed as emerging effects. (c) Translation, refers to the negotiations and acts of persuasion as a result of consensus and partnerships among a wide range of actors and organizations with the need to regulate and caring for the life in common (Latour, 2001). The use of the Multi Sited Ethnography (Marcus, 2001) facilitates the tracking of meanings attributed to the collective actions of actors positioned in a variety of environments of production and consumption, as well as the interests for social mobilization. In addition makes it possible to study the spatiality to explore the relationship between actors and their quotidian actions. As a partial result is highlighted that the translation of diverse interests to promote the realization of collective actions occurs in spaces of encounter as local markets; Through quotidian conversations that revolve around issues such as: the material properties of foods that can be perceived through the senses (smell, flavor, color, texture), the cost of organic food, its health benefits, care for nature, the recovery of traditional knowledge, the adverse effects of the use of agrochemicals, the creation of agricultural public policies, ways to generate cultural changes through food, among others.

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048 Brasília city maps by its inhabitants

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Keywords: psychosocial maps; urban rethoric; social Psychology.

Abstract:

Introduction: We analysed Brasilia city's drawings made by its inhabitants, from a psychosocial theoretical perspective of individual and group relations. We suppose that the freely constructed city map becomes one opportunity to narrate urban experiences among individuals and groups from different urban areas (Milgram, 1970).

Theoretical background:

According to subject identification or non-identification with the local of residence, as well as to conformity or change of the socio-urban situation, dynamism or crystallization of relations among people involved would be established ((Moscovici, 1961; Billig, et al, 1988). It might imply in equality and/or reciprocity and even in empowerment or not. In that sense, it would be necessary to built and to keep a urban rethoric about areas of the city considered valid or unworthy to be seen, visited or adopted. We could suppose there is a symbolic and semiotic repertoire to express power or search of empowerment within public space (or outside it) through maps and related texts (Barthes, 1957).

Methods: 220 people took part in the research. They were living in three districts of Brasília (DF), which were located in places unequally distant from each other. So Guar (G) and Ceilndia (C) are situated at 16 and 30 km, respectively, from the central part of the city - Plano Piloto (PP) -, as well as presenting unproportional mean family income, the higher one being PP, followed by G, and C being the lowest one. The participants were contacted by students living in the same district. They were asked to draw freely one map of the city, followed by the verbal designation of it.

Results: The data were organized as follows: 1) locality mentioned; 2) size of the locality in the map; 3) communication between localities; 4) symbology of the locality; 5) subjects-objects (or parts of the city) mentioned. In general, subjects drew maps mentioning mainly areas of the city considered more official within the PP, tending not to refer to places distant in the city, even those densely populated. Regarding the size they showed the same pattern to highlight areas of PP and to minimize the presence of others zones. The communication between the areas tended to isolate and centralize the PP, except C, which indicates other forms of conexions, such as paths or neighboring/proximity among them, without ranking them. Regarding the language employed, the maps displayed mainly points/names of localities, but the inhabitants of G and C described PP in geometrical forms, but not the other parts of the city, which were drawn using disform stains. Lastly, participants from PP and G mentioned that PP's urban outline remembers a cross.

Conclusions: The urban inequality would be the result of a power symbolic rethoric, created and kept in some parts of the city, in contrast to the language of other groups, who were searching for empowerment through reciprocity and psychosocial space exchange.

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222 A study of children's independent mobility under the characteristics of neighborhoods of central areas in Taoyuan city, Taiwan

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Keywords: Children's independent mobility in city

Abstract:

Introduction: The neighborhood environment in urban areas is a very important factor in a child's development stage and children's activities relate to their physical and psychological development. have led to reductions in both children's mobility and permitted activities in their local neighborhood. Therefore, understanding the independent mobility of children in the neighborhood and the factors influencing such mobility are an important topic for related researches.

Theoretical background: Children independent mobility is a way to represent the friendless of neighborhood environment for children. it is very important to understand children's independent mobility and other influential factors on children's various activities in the neighborhood. Previous studies of the influence of the neighborhood environment on children's activities have failed to determine whether there were any behavioral differences between the children resulting from their respective environmental characteristics. Tung (2011) studied children's independent mobility from home to school in New Taipei City and found the children living in the "central area" had a higher level of independent mobility from home to school compared to those living in other zones. Drianda and Kinoshita(2012) studied 530 children in central area in Tokyo, Chiba, and two small cities in Shizuoka and found parents in central cities permit children higher independent mobility than parents in small cities.

Methods: This study therefore addresses the issue of children's independent mobility, examining the degree and range of independent mobility in central areas in Taoyuan City. Researchers investigate

children living under different features of the neighborhood environment in urban areas and the differences in independent mobility within the neighborhood. It will also investigate what factors and to what extent the different characteristics of the neighborhood environment influence children's independent mobility. A total of 523 questionnaires were recovered and the results showed the real prevailing environment to the researchers. The empirical field is divided according to the specificities of the neighborhood's environment into three main sections, which include the area in front of the Taoyuan Railway Station, where the city government has planned better public facilities with pedestrian infrastructure, in the residential district; the area surrounding the train station, which are mainly for commercial use, as a central business district(CBD); and the area behind the station, which is outlined for residential use, but where pedestrian infrastructure and public facilities are relatively rudimentary. By making use of the multiple regression analysis, to evaluate children's independent mobility in these three sections.

Results and Conclusions: The results showed that children living in the residential areas in front of the station have the highest independent mobility whereas children from the central business district were credited with the lowest rate. Extrapolating from the same results, it can be predicted that the same children from the same residential areas will still override those from the central business district with a higher independent mobility because of favorable public safety and safer traffic environment in their respective areas.

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PO II - 07 ENVIRONMENTAL ASSESSMENT

151 Vandalism in the urban environment

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Keywords: vandalism; behavior; urban environment

Abstract:

The environment of modern city is modified. Transformations can be legal and implemented to improve the quality of citizens' life or illegal, having vandal character. The latter doesn't only cause material damage to urban environment, but also creates a certain atmosphere in city that's prone to vandals' attacks. It has negative impact on the city image, impact on its perception, reduces investment attractiveness, and reinforces certain inhabitants' behavior. Vandalism is a phenomenon of the urban environment, which requires timely intervention, both at the stage of warning and prevention, and in the direction of operative elimination of its consequences (Ceccato, Haining, 2005). These problems require a detailed science and comprehensive study.

Despite the long history, the abundance of facts and evidence of vandalism, there is a limited number of theories to explain human vandal behavior. Destructive actions are determined by human desire for pleasure, learn surrounding space, attempt to control the situation, a sense of injustice, etc. Scientists identified cultural and environmental laws of vandalism, proved gender and age imbalance among vandals. There isn't comprehensive study of the problem, revealing not only specifics of the spread of this type of deviation, but also its determination from the potential subject of destructive actions, and from the urban environment, which is a subject of destruction.

Studies of our research team cover a wide range of aspects related to human vandal behavior. For example, it was studied the age-specificity of vandalism, as well as individual psychological and socio-environmental factors, forming readiness for such actions in each age periods. For data collection were used: personality diagnostics instruments battery, author's technique to identify the motives of vandal behavior, interview, etc. More than 2.000 respondents were diagnosed.

The following patterns were found during the analysis of the results. The nature of children's interaction with environment is caused by the peculiarities of relationship with significant adults, and therefore determined by the system of child-parent relationships. Children make vandal actions in relation to others' objects, mainly guided by emotional outburst or negative feelings and the regulation of the conduct doesn't include deep reflection.

Vandal actions are typical for teenagers. They are the result of experimentation with social environment or their own capabilities, and characterized by a single manifestation, are gradually losing its relevance for maturing personality. Also it is a manifestation of conformal position in implementation of reactions of grouping teenagers when vandal acts are a way to maintain social acceptance and identification in the reference group. This vandalism differs by systematically, specific focus and a high motivation. In adolescence, this model is fixed; youth studies himself and his capabilities through the conversion of external environment, including unauthorized destruction of its objects. Teens that choose vandalism due to group pressure reinforce behavior through the inclusion in youth subculture, the content of which is directly or indirectly commission of vandal action for ideological reasons.

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152 Vandalism of staff in the organization

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Keywords: vandalism; destructive behavior of staff; organizational environment

Abstract:

Vandalism, deliberately perpetrated by adults, is a rarely described phenomenon. But, there's an environment in which adults' vandal activity often finds its immediate implementation - is the environment of organization where a person works. The study of phenomenon of organizational vandalism is fragmented, as the majority of organizations aren't committed to boasting such cases of destructive behavior of staff, as this causes additional damage to reputation.

Manifestations of vandalism in organization have several forms, which are often studied within close phenomena (aggression in the workplace, Insider Sabotage, etc.) and aren't combined into a single problem (Pietersen, 2005). But it's an integrative approach that allows evaluating the significant damage caused by the organizational vandalism. Thus under the organizational vandalism we understand the social and psychological phenomenon, which manifests itself in unauthorized change (damage, destruction, transformation, etc.) by the staff the organizational environment (material, informational, social and psychological), inflicting damage (economic, environmental) to organization.

To study the concept of organizational vandalism we analyzed scientific articles describing the experience of studying the destructive behavior of staff, as well as a survey of managers and staff of russian organizations.

Provided several forms of organizational vandalism. "Vulgar" vandalism – primitive forms of material injury to an enterprise environment from bully motives or aggressive (breaking of furniture, inscriptions on the walls, etc.). Resource vandalism – damage to information, technology, reputation, other organization resources (petty theft, dissemination of false information about the organization, etc.). Informative vandalism – destructive actions dealing with various kinds of information not due to terrorist purposes, damage to information resources (sending excessively large amount of useless information, resulting in the disruption of the web servers of the company, etc.). "Professional" vandalism is linked with the performance of professional duties of staff, when high-quality execution of work de facto implies the assumption of vandal acts from employees to the private property of others', organizations or state (aggressive opportunist activities of some collection agencies, etc.). There're various motivational reasons for vandal action of staff in the organization. These include the removal of tension, acting out of aggression and so forth.

It's found that for development of vandal staff behavior there's needed a combination of a number of organizational, personal and situational factors. It's proposed a scheme of interaction of these factors with the release of factors- bases, factors-motivators, factors-triggers.

Organizing vandalism – it's not only the internal problem of organization, because assimilated by employee negative model of vandal behavior is fixed, it's stable and transferred from one team to another. As a result, the tacit connivance of a local solution of individual problems without a comprehensive understanding of causes of organizational vandalism at both levels, individual - psychological and social - organizational, don't allow to successfully solving the problem of prevention of destructive behavior of staff.

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196 Using scenarios to explore how values are expressed in bushfire policy and planning

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Keywords: Social values, scenarios, participation, natural disaster, bushfire

Abstract:

Introduction: Values are difficult to observe in policy and planning, but are a key driver in public support. This challenge in making values transparent in policy can mean that conversations with communities about what is important to them can be difficult. We propose and utilise a participatory scenario tool to observe values in policy and planning and foster local conversations about community values. Natural disaster, and specifically bushfire in southeast Victoria, Australia is the context for the research.

Theoretical background: We take a psychological understanding of values and draw on a recently published conceptual framework for how to conceptualise and organize values that can be affected by natural disaster (Rawluk et al. 2017), which drew on core values, valued attributes, and valued entities. We propose and apply a values-based scenario framework (VBSF) to develop creative, comparative scenarios with lay members of the Victorian public. Scenario planning has been used for decades and can be key for unraveling the complexity of wicked problems, visualizing them, and finding a way forward.

Methods: The VBSF is based on another comparative scenario framework and subsequent applications, but drew on four key core values that could be affected by bushfire and bushfire management: benevolence, universalism, self-direction and security (Rawluk et al. 2017). The tool was used in a three-stage workshop series with members of the public (n=11) who initially developed five (5) values-based scenarios. We refine the scenarios into distinct stories of how planning for a region could be.

Results: Three distinct, comparable scenarios for how bushfire planning could be approached were developed that were expressed through different visions and management actions. The first, “Self-reliant people and communities”, was based on the core values of benevolence and self-direction to have local people and communities protecting what is locally and immediately important. The second, “Safe society: separating people and fuel”, was based on the core values of benevolence, social-altruistic universalism and security where government and society protected all of society from bushfire. The third, “Living with nature and bushfire”, was based on the core values of biospheric universalism, self-direction, and security to have government and local people protect the integrity of the environment.

Conclusions: The development process fostered a creative exploration of how values are reflected in planning, what is considered important to protect and how. Scenarios allowed participants and government agencies to consider barriers and opportunities for enacting the different management actions and bringing people together to act. The VBSM could be engaged as a tool for transparently integrating local values into policy and bridges the abstract nature of policy with more concrete understandings of what is important. The VBSM confirmed that core values underpinned both policy and local peoples’ perceptions of it and can enable the scope of values that are considered in policy to be broadened. This research further suggests that core values dynamically interact in policy where security and self-direction consider how things are protected and benevolence and universalism considers what are protected.

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213 Atrium in residential buildings - a design to enhance social interaction in urban areas

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Sub-Theme: Environmental influences on cognition and behaviour

Keywords: Atrium, residential building, social interaction, sense of community

Abstract:

Introduction: Building design is considered to both constrain and facilitate behaviours¹. Atrium, or open courtyard design in residential buildings is one such an example. It is an old architectural design concept which in ancient times were important for social life through a variety of social activities like working and gardening within a sheltered environment². In Nordic climates, an open courtyard design within buildings may restrain social interaction within the building due to shorter daylight hours and poorer outdoor thermal comfort during the cold season. An enclosed and heated atrium design within a residential building may be utilized to a greater extent throughout the year. This article studies one of the few examples of residential building designed with an enclosed and heated atrium in North of Sweden and aims to find if such design can induce positive social effects among residents.

Theoretical background: Social interactions provide opportunities for social weak ties³ which in turn are beneficial for the psychological well-being of individuals; it facilitates a community feeling and sense of pride and attachment among people living in a specific area⁴. A sense of community provides individuals with a sense of the “right to belong”, of security, emotional safety and improved subjective wellbeing.

Methods: A questionnaire survey was conducted among residents living in two apartment buildings: with and without enclosed heated atrium, including questions about social interactions and sense of community.

Results: The results showed significant differences in social factors between the residents of the two buildings (atrium and non-atrium building). The atrium building found to have higher frequency of interactions and sense of community. Large proportion of the differences in social aspects between the buildings could be explained by the building design, as common and semi-private areas within the atrium building provide opportunities to establish weak ties.

Conclusions: Atrium-design in residential multi-storey buildings have a potential to increase weak ties between neighbours through an enhanced frequency of day-to-day encounters. Weak ties have the potential to increase information flow and new ideas among different circles, which may contribute to higher creativity.

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336 Coping styles, environment, and stress in women with cancer

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Keywords: stress, cancer, coping styles, women.

Abstract:

Introduction: For environmental characteristics to function as an aid, rather than an impediment, in therapeutic work, it is necessary to consider not only knowledge of the principles of architectural design, but also the psychological principles or interventions which, if overlooked, can mark the difference between a positive and a negative environment.

Theoretical background: In this regard, we have confirmed that hospitalization places users in a stressing environment, due to hospitals’ physical and architectural characteristics, which may even hinder, instead of facilitating, their achieving the desired outcome (Ulrich, et al., 2008). In this context, several socio-environmental and psychological variables have been linked to environmental stress in different groups of patients (Ortega, et al, 2016).

Method: The purpose of this study was to assess the impact of the physical environment of rooms on hospitalized patients and its association with coping styles in the generation of environmental or situational stress.

For this study, we interviewed 88 female patients hospitalized in the Gynecology Service of a hospital specialized in cancer; the patients’ age varied from 19 to 79 years. 61.4% of the patients were hospitalized in rooms with three beds, 27.3% in rooms with two beds, and 11.4% in private rooms.

To measure psycho-environmental factors we used Ortega’s (2002) “Environmental Assessment Scale.” The scale consists of 12 questions, with a Likert-type response scale of 1 to 10 points. It evaluates four factors: 1. Spatial perception and outfitting, 2. Physical assessment of the environment, 3. Privacy, 4. Signage and orientation.

To assess patients’ stress, we used the Version Adapted by Ortega (2002) for Mexican Population of the “Stress Arousal Checklist” developed by King, Burrows and Stanley (1993), which consists of 10 questions with a response scale of 1 to 5, and evaluates two factors: Stress and Arousal.

We applied the Moos Coping Scale, which consists of 19 questions and measures different ways of responding to varied circumstances of stress, such as: Emotional containment, Logical analysis, Problem solving, Searching for guidance and support, and Social and Cognitive avoidance.

Results: The results of the model of structural equations allowed us to identify socio-environmental predictors (Physical Assessment, Privacy, and Signage) which measured impact through coping styles (Emotional containment and Cognitive avoidance) with the activation and stress hospitalized patients experience. Results were achieved through an adequate convergence of the proposed model, both by fit indices ($\chi^2/df= 1.29$, RMSEA=0.058) and by incremental fit indices (CFI=0.91, TLI=0.90).

Conclusions: The model helps to explain the causal relationships between the environmental variables and the psychological variables involved in the development of environmental stress in

cancer patients during their hospitalization, as well as coping styles, which measured impact; in other words, emotional and social factors have a direct influence on arousal, and consequently on perceived stress.

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372 Generational Differences of User's Behavior in General Hospital

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Abstract:

This study was a basic research to suggest hospitals to design user friendly environmental guidelines. For this purpose, this study constructed an analysis tool through literature review with regards to people born in different generations and their behavior in general hospitals. Definition and classification of generation were referred to field studies made by Kertzer(1983), Kim & Huh(2005), Yeon & Shim(2005). According to a previous study about generation of healthcare facilities (Park & Choi, 2016), different generation shows difference in consciousness and preferences. User behavior in healthcare facilities differs according to family guardian, visitor and staff (Lee, Kim and Yang, 2005), depending on the location, size, frequency of the space in the healthcare facilities (Ji & Yang, 2007). User behavior also varies considerably depending on the duration of stay in hospital (Son & Yang, 2009). Therefore, this study was focused on analyzing user's behavior characteristics across various age groups in the hospitals. An online survey was constructed to ask 1500 people between age 20 to 60, 300 people each age group- 5 age groups of 20s, 30s and so on about their user's behaviors in the hospital for about 3 weeks since September 1, 2016. The results of this study were as follow: (1) based on the age there were significant differences in relevant categories of their visiting frequency, visiting purpose, visiting hour, transportation, companion, and behavior during the wait and selection of a general hospital. (2) All age groups responded that they have visited once or twice per year. People in 20s and 30s responded that their visit for the hospital is to receive specific treatment, while other people in 40s, 50s and 60s visit the hospital majorly for routine check-ups. Therefore, it is imperative for a health check-up center to design an environmental plan that reflects the characteristics of elders in 40s, 50s and 60s. (3) People in 40s, 50s and 60s usually visit a general hospital in the mornings of weekdays, while generations in 20s and 30s responded that they mostly visited a hospital in the mornings of weekend. (4) When they visited a hospital, people in their 20s usually used public transportations, while people in their 30s to 60s used their own vehicles. (5) People in their 20s majorly visited 'lobby' but older groups preferred to outpatient clinic'. Therefore, it is necessary to build an outpatient clinic environment that considers the elderly. (6) Majority of Patients responded that they suffered on the internet using their cell phones, while waiting for their clinic calls but older groups responded that they watched TV or read books or magazines while waiting. Therefore, it is essential to provide cell-phone related services for younger groups.

Keywords: Generation, General Hospital, Behavior

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376 Dynamic pricing and real time information.

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Keywords: Realtime pricing, electricity, behaviour change

Abstract:

Introduction: While electricity prices is getting cheaper, peak production is getting more expensive. This paper explores how dynamic pricing and real-time feedback, affect consumption behavior.

Theoretical background: According to economic theory, dynamic pricing is the gold standard for making demand and output meet. For dynamic pricing to affect residential energy consumption, however, consumers need to be aware of and act on variations in price. The effects of introducing a dynamic scheme, then, should be expected to depend on how information on prices is made available for consumers. In this paper we report the results of a field experiment that compared the effects of a dynamic pricing scheme on consumers with different levels of information access.

Method: Field experiment with 3000 participants. All participants had dynamic pricing. 1000 received no real-time information on price fluctuations or own electricity usage. 1000 had a mobile phone app with information on historic price and usage (up to yesterday). 1000 had real-time information on price and usage.

To measure the effect of the continuous feedback we use a difference-in-differences estimator, with $y = \beta_0 + \beta_1 dB + \delta_0 d_2 + \delta_1 d_2 dB + u$. Here, y is the total consumption, d_2 is a dummy variable for the second time period, which takes into account changes that would have taken place regardless installing the app and the real-time feedback device. The dummy variable dB account for the possible differences between the two groups. The variable u is the error coefficient. The coefficient δ_1 measure the effect of feedback, given by $\delta_1 = (y_{[B,2]} - y_{[B,1]}) - (y_{[A,2]} - y_{[A,1]})$, where A and B are the two groups.

Results: This field-experiment is important because it will give us better knowledge on how information moderates price incentivizing and on the feasibility of the expensive real-time feedback device.

Conclusion: Dynamic pricing and real time-pricing seems to have little effect on consumption.

081 Evaluation of a psychoeducational program and its Theory of change for environmental behavior promotion

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Abstract:

Introduction: The existence of a serious global environmental crisis is increasingly evident and citizen actions are becoming needed. Multiple interventions have been designed in order to reduce negative impact of humans on their environment, but few of them has been evaluated, and they do not specify psychological nor pedagogical principles underlying them.

Theoretical background: Faced with this problem and gap, and given its social relevance, this study seeks to evaluate a psychoeducational program designed to promote environmental behaviors. It was based on research from social and environmental psychology which have identified several variables (psychological, sociocultural and structural factors) associated with the occurrence of environmental behaviors. Within these variables we find subjective and descriptive norms (from Theory of Planned Behavior, Ajzen, 1991); empathy, option generation and critical thinking (from Socio-emotional Competencies, Chaux, Lleras, & Velásquez, 2004); self-efficacy and outcome expectations (from Socio-Cognitive Theory, Bandura, 1997) and environmental knowledge.

Methods: First, 12 sessions were designed for being integrated into the curriculum of natural sciences (8th and 9th grade) in Bogotá, Colombia. Last sessions ended with a project, developed by the students and based on educational principles like Learning doing and Learning for service. Students was randomly divided into two groups. Experimental group received the intervention, one hour per week, and control group took its usual class. Participants answered a set of surveys and scales pre- and post-intervention. All of these scales were constructed and validated on Colombian samples. Others measurements (from devices and experimental tasks) was taken, looking for a multimethod assessment. Finally, we did some interviews, focus groups and video analysis for a qualitative evaluation of the program.

Results: Currently, data analysis is running but first results seems to show that proposed theory of change has sufficient evidence to confirm these variables are useful in a psychoeducational program for young students to promote environmental behaviors.

Conclusions: In this way, this project brings together several widely studied factors from previous research that serve as theoretical framework to propose a model for environmental behavior change. In Colombia, it is the first psychological intervention program integrated to biology class that can help promoting pro-environmental behaviors, focusing especially on sustainable consumption. The implication of the project could be important because it might have and extension to public policy in environmental education.

Keywords: Environmental education, environmental intervention, sustainable consumption

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137 Difference of background music evaluation depending on activities at a Cafe

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Keywords: BGM; Loudness level; Activity

Abstract:

Introduction:

A variety of activities is observed in a cafe. This study aims to clarify the relationship between background music evaluation and the sound level depending on the activities.

Theoretical background: One empirical study¹⁾ based on the research in London reported that the correlation of noise level with people's annoyances was only 0.5. This result reveals the existence of sources of annoyance other than the noise level, such the influence of perceived control, the meaning of sound, etc., which have been suggested in past studies. Therefore, in the evaluation of BGM at a cafe, factors other than the sound level were expected to influence the perception and cognition of the sound.

Methods: A space of 12.6 square meters in a room of a university building was modified into a part of cafe with two tables and four chairs. Each participant of the experiment was asked to sit at a table in the given space and perform one of the following three activities: answering to questions, reading a book, talking to each other in a friend pair, and also evaluate the various BGMs after listening to each for two minutes. They rated adaptability for the activity and the loudness degree of sixteen BGMs (eight music contained two classics, three jazz, two westerns, and one Japanese popular music in two sound levels; approximately 53dB and 57dB on an average with surrounding sound that was recorded in a cafe playing no music) on seven-point scales. The participants were fifty-four young female students aged 18–22 years. The participants at the different tables were not friends.

Results: Average ratings of sixteen BGM conditions were calculated for each activity. The adaptability rating of high-level condition was higher than low-level condition in conversation conditions. This suggested that the participants recognized their conversation was harder to be heard by surrounding people when sound levels were high. Meanwhile, adaptability ratings were higher in lower sound level conditions in study and reading activities. Especially, the adaptability ratings of music with vocals were lowest. These results suggest that obstruction to the two activities was caused by high sound level and meaningful words. In fact, in these two conditions, the BGMs were rated higher than in conversation conditions. Moreover, the sound level on an average correlated to adaptability ratings less than 0.2 for all activities, which was much smaller than the correlation to the sound level ratings: -0.6 for reading and -0.7 for studying. These results suggest that the tune of music relates to the sound loudness and adaptability.

Conclusions:

Tune of BGM and activity affect the BGM sound level perception and adaptability. Selecting BGM based on a person’s perception would be more effective than physical sound level.

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167 The transformative potential of teaching mindfulness meditation to adolescents: environmentally significant outcomes of a school-embedded intervention study

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Keywords: mindfulness meditation, sustainable consumption, education, youth, materialistic values, subjective well-being, compassion

Abstract:

Strengthening the capacity of adolescents to make ecologically and socially responsible consumption decisions is a core aim within the domain of education for sustainable development. However, pro-environmental knowledge, values and attitudes often do not translate into pro-environmental behavior. Current research suggests that mindfulness practice holds the transformative potential to narrow this gap by enabling individuals to make conscious and compassionate consumption decisions based on their needs and values and to disengage from automatic and habitual behavior patterns (Bahl, et al., 2016; Fischer, et al., subm.). Within the last years, the number of school-embedded mindfulness-based interventions and studies has rapidly grown, albeit focused on attentional and health-related issues rather than mindful consumption.

The present study is part of the three-year research project BiNKA (acronym of the German title) and investigates whether teaching mindfulness meditation to adolescents can contribute to environmentally significant changes in sustainable consumption and its correlates. Following a randomized pre-post waitlist control design, a total of 72 high school students (aged 15-16 years, n=36 each in intervention and waitlist group) participated in an 8-week mindfulness-based meditation training with a subtle consumption-specific focus. Due to the explorative character of the study, the intervention was evaluated with psychometric scales on a variety of variables that have been associated with sustainable behaviour in the literature, e.g. materialistic values, compassion, and subjective well-being (Pfattheicher, et al., 2015; Ericson, et al., 2014; Hurst, et al., 2013)

The presentation will focus on the analysis of the interplay of mindfulness experience with sustainable consumption (measured in the consumption domains of nutrition and fashion) and potential mediators such as materialistic values, compassion and subjective well-being after the intervention. Preliminary data of the adult sample of our project suggest no significant increases in sustainable consumption, but a decrease in materialistic values and a strengthened connectedness to nature. Implications for the usefulness of implementing mindfulness training in environmental education will be discussed.

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178 The reasons for change of privacy practices in public space: A cross-cultural study

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Keywords: privacy; public space; culture; cultural norms; content analysis

Abstract:

In the literature privacy is defined in many ways, mostly a one-way procedure of closing oneself towards others (Newell, 1995; Westin, 1967). One of the most comprehensive definition of privacy was made by Altman (1975). He defined privacy as a dialectic process which includes both closing and opening oneself from others when privacy is needed. The need for privacy is a universal need for all human being, however the regulation processes in order to reach desired levels of privacy is changing across cultures (Altman, 1977). Similar to privacy regulation processes, privacy practices might differ across cultures due to cultural norms and values, because public spaces are ruled by legal laws and unwritten cultural norms. The current study investigates privacy practices in public spaces. With this aim we asked participants' privacy definitions, what does privacy in public space mean, and why their privacy behaviors changes between public spaces and their homes. The data was collected from 76 Italian and 80 Turkish university students in Izmir, Turkey and Rome, Italy. Currently, only the Turkish participants' answers were analyzed. Content analyses was utilized to the open ended questions. Results showed that Turkish participants' definition of privacy are mostly fits the mainstream definitions of the privacy; they perceive the privacy mostly closing oneself from the outside and others, or sharing personal information only with specific people. As for the privacy in public and why and how their behaviors change according to place, they specifically mentioned cultural norms, and rules for public spaces. Besides, they are afraid of both being disturbed by others and disturbing others by acting private behaviors in public. For comparing the two cultures, it is expected that there will be common explanations regarding the definition of privacy, nevertheless Turkish participants would be more sensitive to the cultural norms and disturbing others in public space. The results were discussed in the light of the individualism-collectivism and privacy literature.

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378 Examining people's views on the financing of a low carbon energy transition in the UK

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Keywords: Energy transition; responsibility; financing

Abstract:

Introduction and background: Given the Climate Change Act 2008, which committed the UK to reduce carbon emissions by 80% by 2050 relative to 1990 levels, there is a requirement to renovate the energy system. Public acceptance and engagement will be crucial to support such a major shift.

Method: Five focus groups (between 6-9 participants each) were conducted in Glasgow, Cardiff, Birmingham and London (2 groups in the latter) to examine people's perceptions on energy transitions including questions about responsibility and how transitions should be paid for. Participants were recruited to represent a diverse spread in terms of age, gender and socio-demographic background to capture diverse views (age range = 25 – 68 years, 15 females, 22 males, participants represented diverse socio-economic backgrounds on the basis of social grade). Focus groups (approximately 3 hours including breaks) explored participants' views on who is responsible to pay for the transition to a lower carbon energy system (including production, transmission and use).

Results: The preliminary thematic analysis showed general support for a move towards a low carbon energy system, whilst concerns were raised over the importance of having a reliable supply, with particular emphasis on the need for self-sufficiency and independence from international involvement in the provision of energy. Government and energy companies were seen to have greater responsibility to finance such a transition, given their larger power and the profits incurred by energy companies. Nonetheless, participants were also willing to contribute financially on the condition that the money would be used towards social and environmental programmes and that energy companies would also contribute. There was distrust regarding government and companies' level of commitment to an energy transition and suspicions of ulterior motives, such as profit orientation impeding a transition. The distrust was particularly highlighted in participants' discussion of a lack of transparency regarding how energy bills are constituted, whether profits are reported accurately and how profits, taxes, and environmental and social levies are spent.

Conclusions: Involving energy companies in the financing of the energy transition and improving transparency regarding spending will pose some of the factors likely to influence public engagement and willingness to support (including financially) the costs of an energy transition.

AUTHOR INDEX





Abraham, C.: 46, 190, 299
Ahlström, R.: 296
Akca, E.: 333
Alves de Souza Filho, E.: 160, 322
Amicone, G.: 216
Amorim, I.R.: 110, 111
An, E.H.: 312
Anderson, N.M.: 176



Babarović, T.: 121, 284
Babiloni, F.: 221
Bachmann, F.: 161
Bader, C.: 167
Bailey, E.: 104, 107, 310
Balundè, A.: 118, 119
Barth, M.: 128, 129
Bassani, M.A.: 235
Batel, S.: 104, 107, 260
Bauer, A.: 288
Bauer, A.C.: 203
Bauer, J.M.: 240
Bäumer, T.: 262
Bauske, E.: 162
Bautista Blanco, L.Y.: 317
Becker, D.: 250
Becker, N.: 59
Becker, S.: 138, 161, 177, 293, 333
Bekmeier-Feuerhahn, S.: 258
Beldarrain-Durandegui, A.: 322
Benages, M.: 231
Benfield, J.: 199
Bentsen, P.: 182
Bergquist, M.: 255
Bertoldo, R.: 90, 310
Bettin, J.: 171
Beute, F.: 96
Bexell, S.: 109



Cabal, J.: 201
Cada, K.: 187
Campos Gil, J.A.: 311
Capstick, S.: 149, 152
Carmi, N.: 41, 59, 276
Carrico, A.R.: 70, 71
Carroll, L.: 238
Carrus, G.: 56, 58, 74, 76, 79, 128
Castro, P.: 246, 260
Chabada, T.: 173, 187, 254, 256, 259
Chatelain, G.: 302
Cherry, C.: 297
Choi, Y.: 329
Christidis, L.: 174

Andrews, M.: 116
Anpo, Y.: 187
Arning, K.: 98, 103, 225, 265
Arnold, A.: 83, 92
Arnold, O.: 60, 190, 213
Arroz, A.M.: 110, 111
Artho, J.: 161

Blobaum, A.: 79
Bobeth, S.: 41, 42
Boehm, G.: 90
Boeve-de Pauw, J.: 211
Bögel, P.M.: 258
Bogner, F.X.: 123, 125
Bohm, A.: 224
Böhm, G.: 80, 83, 89, 92, 93
Böhme, T.: 332
Bolderdijk, J.W.: 143
Bonaiuto, M.: 216, 221, 241, 333
Bonney, B.: 233
Boomsma, C.: 73
Borges, P.A.V.: 111
Bornioli, A.: 115
Bösehans, G.: 41, 61
Bouman, T.: 121, 131, 134
Bouwman, E.P.: 54, 267
Boyko, A.D.: 307
Braitto, M.: 276
Braun Kohlová, M.: 279, 290
Brechan, I.: 254
Brosch, T.: 66, 85, 87, 143, 175, 195, 245, 302
Brstilo, I.: 258
Bruderer Enzler, H.: 41, 45, 273
Brügger, A.: 89, 91, 247
Burger, P.: 178
Bustos Aguayo, M.: 294

Claudy, M.: 49
Clayton, S.D.: 108, 109, 111
Collado, S.: 94, 314
Conte, B.: 245
Contzen, N.: 64, 68
Conversy, P.: 271
Cook, H.: 210
Corbetta, A.: 219
Cordeiro Ferreira, T.: 110
Corner, A.: 92
Corraliza, J.A.: 314, 316, 320
Costantino, V.: 216
Craig, T.: 37, 38, 74, 77



Danilecki, I.: 327
 Davoudian, N.: 41, 63
 De Dominicis, S.: 216, 241, 253
 De Groot, J.I.M.: 277
 De Jong, S.B.: 277
 De Kort, Y.: 220
 De Mello E Souza, D.: 235
 De Vries, G.: 98, 99
 Dean, A.J.: 242, 280
 Demski, C.: 80, 81, 333
 Devine-Wright, P.: 104, 106, 107
 Devyatovskaya, I.V.: 325

Dias, P.: 310
 Díaz-Ayude, A.: 80
 Díaz-Marín, J.S.: 330
 Diekmann, A.: 164, 273
 Diesch, E.: 251
 Díez-Martínez, E.: 283
 Donche, V.: 211
 Dopico, J.A.: 188
 Dos Santos, A.O.: 155
 Duarte, P.: 204
 Dumitru, A.: 30, 74, 77, 79, 80, 183, 230, 269
 Dzidic, P.L.: 278



Ebinger, M.: 247
 Edgerton, E.: 263
 Edvinsson, J.: 203, 321
 Ejelöv, E.: 255

Eriksson, L.: 243
 Estrada, C.: 328
 Estuar, R.: 193
 Evensen, D.: 81, 333



Faux, N.: 196
 Favis, A.M.: 193
 Ferguson, E.: 205
 Fiamoncini, D.I.: 172
 Fielding, K.S.: 33, 131, 133, 242, 265
 Fischer, D.: 57
 Fiske, S.T.: 315
 Fjællingsdal, K.S.: 285
 Flint, C.: 276

Flores Herrera L.M.: 185, 294
 Ford, R.M.: 176, 226, 326
 Fornara, F.: 212, 304
 Forsberg, L.: 184
 Fotios, S.A.: 62, 218, 222, 224
 Franěk, M.: 201, 289
 Franklin, J.P.: 43
 Friman, M.: 191
 Fritsche, I.: 32, 128, 129, 197



Gabr, H.S.: 261
 Gabriel, R.: 110, 111
 Galeao da Silva, L.G.: 155
 Gallagher, E.: 252
 García-Mira, R.: 30, 74, 77, 79, 80, 179, 230, 269, 303
 Gargiulo, I.: 231
 Gatersleben, B.: 115, 116, 202
 Geiger, J.L.: 239
 Geiger, S.M.: 56, 57, 332
 Gellrich, A.: 37, 39
 Gewinner, J.: 164
 Gherardini, A.: 216
 Giacomantonio, M.: 58
 Glue, P.: 182

González Medina, S.A.: 317
 González, M.A.: 188
 Goodenough, A.: 123
 Goodhew, J.: 73
 Goregenli, M.: 333
 Gorsira, M.: 209
 Gotangco, C.K.: 193
 Goulden, M.: 142
 Graf, M.: 44
 Graham, J.: 228
 Gratton, A.: 85, 86
 Gregory-Smith, D.: 166
 Gruendler, J.: 105



Haans, A.: 219, 220
 Hackenfort, M.: 44, 295
 Haefeli, U.: 161
 Haga, A.: 316
 Haggard, P.: 165
 Hahnel, U.J.J.: 85, 87, 143, 175, 195, 245, 302
 Hallman, D.: 203
 Hanimann, A.: 161
 Hansen, N.: 120

Hansla, A.: 255
 Hanss, D.: 305
 Hartig, T.: 94, 96, 114, 200, 230
 Hartmann, C.: 41, 44
 Healey, D.: 182
 Heib, S.: 270, 285
 Hellwig, R.: 136, 137
 Henn, L.: 213
 Hernández, B.: 112, 206



Herzing, M.: 184
Hidalgo, M.C.: 206
Hilbig, B.E.: 177
Hildebrand, J.: 105, 250, 270, 285
Hille, S.L.: 66, 302
Hinds, J.: 217
Hinse, M.: 104, 105
Hoekstra, E.J.: 88
Hoffmann, C.: 41, 46, 190, 299

Holmgren, M.: 309
Hope, A.: 274, 275
Hornsey, M.: 133
Hovinga, D.: 216
Howarth, C.: 260
Huebner, G.M.: 136, 272
Huijts, N.M.A.: 64, 68
Hurlstone, M.: 65
Hyvönen, K.: 144, 146, 147



Iino, M.: 189
Ijsselsteijn, W.: 220

Imenes, A.G.: 330
Irepan, M.: 183, 328



Jacobson, A.: 184
Jaeger, C.M.: 253
Jahncke, H.: 203, 321
Jans, L.: 131, 133
Jessop, D.C.: 210
Johansson, M.: 214, 222, 223

Jonas, E.: 120
Jonas, K.: 161
Jones, C.R.: 98, 102, 166, 186
Jones, R.: 73
Jovarauskaite, L.: 282



Kouros, J.: 251
Kaiser, F.G.: 60, 190
Kaklamanou, D.: 102, 186
Kalinauskaite, I.: 220
Karl, J.Q.A.: 170
Kastner, I.: 264
Keizer, K.: 141
Kendal, D.: 196
Kibbe, A.: 41, 60
Kim, J.: 169
Kim, K.H.: 196
Kirves, K.: 147, 148
Klackl, J.: 120
Klaniacki, K.: 306

Klein, S.A.: 177
Klöckner, C.A.: 38, 194, 257, 285, 287
Knemeyer, A.K.: 250
Kobayashi, T.: 189
Korpela, K.M.: 117, 145, 147, 148
Krajhanzl, J.: 173, 187
Krause, K.: 74, 75, 264
Krettenauer, T.: 123, 126
Krivoshchekova, M.S.: 307, 308, 324, 325
Krook, M.: 327
Kruzhkova, O.V.: 308, 324, 325
Kühne, S.J.: 295
Kumar, P.: 219
Kusumi, A.: 229



Laike, T.: 286
Langbroek, J.H.M.: 41, 43
Langen, N.: 162
Lans, A.: 70, 72
Lauren, N.: 133, 280
Lawrence, C.: 65
Lazuras, L.: 186
Lede, E.: 281
Lee, K.E.: 196
Lema-Blanco, I.: 179, 269, 303
Lemmen, N.H.: 139, 140, 141
Leviston, Z.: 65, 278
Lygue, C.: 37, 53, 142, 205, 244

Liachenko-Monteiro, A.: 218
Liebe, U.: 164, 273
Lima, M.L.: 108, 111
Lindberg, P.: 200, 230
Linzenich, A.: 103, 225, 265
Lisspers, J.: 296
Liu, L.: 118, 121
López-Chao, V.A.: 297
Lorenzo, E.L.: 316, 320
Louis, W.: 33, 265, 280
Loureiro, A.: 109
Loy, L.S.: 267
Lymeus, F.: 200, 230



Maas, J.: 216
 Mac Donald, S.: 281
 Mac Diarmid, J.: 38
 Mack, B.: 161, 251
 Maclouf, E.: 271
 Maccinga, I.: 79, 80
 Maeda, H.: 229
 Mahmoodi, J.: 64, 66
 Maki, K.: 331
 Manca, S.: 212
 Mannetti, L.: 58
 Manrique, H.: 314
 Mansell, T.: 37
 Mansouri, A.A.: 63
 Maricchiolo, F.: 58
 Martínez-Cabrera, H.: 80, 156
 Martínez-Soto, J.: 317
 Massola, G.M.: 155
 Masson, T.: 128, 129, 130
 Mathiassen, S.E.: 203
 Matthies, E.: 42, 48, 125
 Matti, D.: 161
 Mattsson, P.: 286

Mays, C.: 92, 93
 Mckay, D.R.: 263
 McKechnie, J.: 263
 Medugorac, V.: 118, 121, 284
 Meleady, R.: 281
 Menrad, K.: 288
 Mertens, S.: 139, 143
 Mesbahi, E.: 263
 Mikhof, A.: 56, 59
 Milfont, T.L.: 168, 170
 Molina, N.: 322
 Monge, F.S.: 91, 247
 Moreno, P.: 206
 Moser, S.: 167
 Mostovoy, N.: 276
 Mouro, C.: 204, 256
 Muhar, A.: 276
 Muiños, G.: 112, 206, 260
 Müller, P.: 262
 Mumenthaler, C.: 195
 Muñoz Cantero, J.M.: 179, 303
 Mura, N.: 212



Nagashima, M.: 234
 Naghizade, E.: 196
 Nakamata, T.: 189
 Nakamura, T.: 169
 Nanda, N.S.: 171
 Narasimhan, K.: 275
 Nash, N.: 82, 149, 152

Newton, F.: 265
 Nicolson, M.L.: 272
 Nikiforova, D.M.: 307, 308
 Nilsson, A.: 255
 Nishihara, N.: 169
 Nordlund, A.M.: 192, 248



Oates, C.J.: 166
 Obolenskaya, A.G.: 325
 Oh, J.: 329
 Ohnuma, S.: 189
 Olfe-Kraütlein, B.: 102
 Olivos, P.: 109

Olsson, L.E.: 191
 Oltra, C.: 100
 Orru, K.: 192
 Ortega Andeane, P.: 183, 227, 311, 328
 Otto, S.: 123, 124, 213



Pahl, S.: 70, 73, 238
 Paik, J.: 312
 Pandur, V.: 80
 Panno, A.: 58, 76, 128
 Par, H.: 329
 Pasanen, T.P.: 144, 145
 Patel, M.: 66, 302
 Pato, C.: 172
 Pearson, A.R.: 131, 132
 Penker, M.: 276
 Pensini, P.: 124
 Perlaviciute, G.: 50, 68, 84, 85, 88, 119, 121
 Persson, L.: 203
 Perucchini, P.: 216

Peters, A.: 301, 305
 Peters, A.M.: 249
 Petruccelli, I.: 216
 Petruzalek, J.: 201
 Piccinin, G.: 221
 Pidgeon, N.: 81, 90, 92, 297, 333
 Ping, X.: 109
 Pirchio, S.: 58
 Poom, A.: 192
 Poortinga, W.: 89, 90, 92, 149, 150, 151, 168
 Poškus, M.S.: 118, 119, 302
 Poumadere, M.: 92
 Prévot, A.-C.: 233, 271
 Provost, S.C.: 174



Rahm, J.: 223
 Rashidi, L.: 196
 Ratcliffe, E.: 114, 117
 Rau, I.: 270
 Rawluk, A.: 226, 326
 Reese, G.: 128, 197
 Rego, I.E.: 110, 111
 Reijnen, E.: 44, 295
 Ric, F.: 86
 Richter, I.G.M.: 37, 38
 Riemer, M.: 71, 236
 Rioux, L.: 171



Sala, R.: 98, 100
 Salonen, K.: 144, 146, 147, 148
 Salvador-Ginez, O.: 183, 237, 311, 328
 San Juan, C.: 198
 Sánchez-Mondragón, G.: 185
 Sander, D.: 302
 Santos, T.: 246
 Sass, W.: 211
 Sattler, D.N.: 228
 Sautkina, E.: 56, 149, 150, 151
 Schakib-Ekbatan, K.: 138
 Scherpen, J.M.A.: 140
 Schilhab, T.: 182
 Schleyer-Lindenmann, A.: 310
 Schmidt, K.: 37, 40
 Schmoecker, J.-D.: 169
 Scholl, G.: 39
 Schrader, U.: 57, 332
 Schubert, I.: 178
 Schuitema, G.: 47, 49
 Schulte, M.: 75
 Schultz, P.W.: 241, 253
 Schultz, T.: 265
 Schweiker, M.: 136, 138
 Schweizer-Ries, P.: 105, 250, 270, 285
 Sefara, D.: 201
 Seger, C.: 281
 Sevillano, V.: 315, 320
 Shamsaee, N.: 230
 Sharpe, E.J.: 47, 50
 Sherif, N.: 261
 Shibata, S.: 215
 Shipworth, D.: 136, 272
 Shon, D.H.: 207
 Shon, S.K.: 207



Tamayo, P.A.: 322
 Tampe-Mai, K.: 251
 Tarditi Joz-Roland, C.: 175
 Taufik, D.: 139, 143
 Ter Mors, E.: 72
 Thøgersen, J.: 37, 53

Rivera, B.: 283
 Roberts, A.: 217
 Roberts, E.: 333
 Roberts, L.D.: 278
 Roberts, T.: 274
 Rodríguez Sánchez, C.: 47, 49
 Rodríguez-Rodríguez, G.: 156
 Römpke, A-K.: 197
 Roth, F.: 251
 Ruepert, A.M.: 70, 73, 186
 Rühmland, S.: 105
 Ruiz, C.: 112

Siegrist, M.: 67
 Sijtsema, S.J.: 55
 Simpson, A.: 263
 Simsekoglu, Ö.: 257
 Sippel, C.S.: 258
 Skalik, J.: 173, 187, 254, 256, 259
 Skippon, S.: 46, 190, 299
 Skopková, H.: 279, 290
 Slood, D.: 47, 51, 133
 Smith, J.: 33
 Smith, L.D.G.: 242, 280
 Snoek, H.M.: 54, 267
 Sohre, A.: 178
 Sokoloski, R.: 253
 Sommer, L.K.: 194, 287
 Souto, L.: 140
 Sparks, P.: 210, 293
 Spence, A.: 139, 142, 205, 244, 267
 Spiegelaar, N.: 180
 Staats, H.: 72, 94, 97, 281
 Steensen Nielsen, K.: 240
 Steentjes, K.: 89, 90, 92, 93, 297
 Steg, L.: 33, 49, 50, 51, 68, 73, 84, 88, 119, 121, 127
 133, 134, 140, 141, 143, 186, 209, 239, 249
 Steinhorst, J.: 47, 48
 Stevenson, M.P.: 182
 Suárez, E.: 112, 260
 Subiza-Pérez, M.: 198
 Sugjura, J.: 234
 Sunio, V.: 193
 Susilo, Y.O.: 43
 Sütterlin, B.: 64, 67
 Svartman, B.P.: 155
 Šverko, I.: 121, 284
 Svobodová, R.: 173

Thomas, G.O.: 149, 150, 151, 158
 Thomas, M.: 165
 Thompson, R.C.: 238
 Tiroto, F.: 212, 304
 Tobias, R.: 91, 247
 Toschi, F.: 219



Truong, M.-X.: 233
 Tseng, T.A.: 318
 Tseng, T.Z.: 323



Uchendu, B.: 210
 Udall, M.: 277
 Uhl, I.: 118, 120
 Unal, A.B.: 209, 239



Valencia Chavez, G.C.: 294
 Van de Poll, M.K.: 237
 Van den Berg, A.E.: 216
 Van der Weiden, E.: 72
 Van der Werff, E.: 49, 127, 186, 239, 249
 Van Dijk-Wesselijs, E.J.: 72, 216
 Van Geffen, L.E.J.: 37, 55
 Van Heek, J.: 103, 225, 265
 Van Herpen, E.: 55
 Van Petegem, P.: 211
 Van Suylekom, S.: 72
 Van Trijp, J.C.M.: 55



Wackernagel, S.: 235
 Walker, I.: 65, 252
 Wallis, H.: 123, 125
 Walter, I.: 274
 Wang, S.Y.: 64, 65, 323
 Wardman, J.: 142
 Weber, C.: 202
 Weimer, K.: 296, 327
 Wells, V.: 70
 Wenge, I.H.: 264



Xenias, D.: 98, 101



Yokoyama, M.: 189



Zawadzki, S.J.: 139, 140
 Zeiske, N.: 47, 49, 127
 Zetterberg, A.: 200
 Zhang, H.: 240

Tung, C.-M.: 300, 318, 323
 Tvinnereim, E.: 83, 92, 93

Uno, N.: 169
 Urban, J.: 254, 256, 259, 279, 289, 290
 Uren, H.V.: 278
 Uttley, J.A.: 41, 62, 218

Van Vugt, M.: 216
 Venhoeven, L.: 127
 Verain, M.C.D.: 37, 54, 267
 Verfuërth, C.: 166
 Verplanken, B.: 252
 Villegas de la Ossa, G.: 208
 Vincenti, J.: 200
 Von Lindern, E.: 94, 95
 Vorobyeva, I.V.: 308, 324
 Vozmediano, L.: 198
 Vrieling, L.: 80, 84, 88

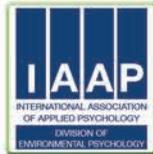
White, E.V.: 115
 White, M.P.: 46, 190, 299
 Whitmarsh, L.: 80, 82, 101, 149, 152, 165, 168
 Whitney, S.: 236
 Wickström, H.: 184
 Williams, K.J.H.: 176, 226, 326
 Willis, R.L.: 174
 Winter, S.: 196
 Wollni, M.: 171
 Wyles, K.L.: 73, 238

Ziefle, M.: 103, 225, 265
 Zimmermann, S.: 262
 Žukauskienė, R.: 302



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