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**HUMANS
IN THEIR
SURROUNDING
WORLD**

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Environmental Psychology: “Humans in their surrounding world“

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Introduction

The environmental psychology has been around for several decades, yet it is still somehow unknown field of applied psychology. It had its ups and downs and moved through various perspectives and approaches. Nowadays it is getting more and more interest, sadly because the issues it is dealing with are more dangerous and actual than ever.

The text of Enric Pol serves as thorough historical introduction to the field of environmental psychology and stresses out some of the big questions and milestones in the development of the discipline. Aline Barlet offers on the other hand a rather personal text on how she entered the world of environmental psychology and her journey and realizations about the importance of the different approaches. Third and the last text in the introduction part is about the architectural psychology. By some considered a sub-discipline of environmental psychology, by others an independent discipline by itself, it is nevertheless a fascinating field and Lubomír Kostroň talks about its various practical uses.

The next chapter focuses on the issues relating current climate change and how could environmental psychology help solving it. Alina Mia Udall shows how pro-environmental behaviour might be connected with identities and Thomas Brudermann on the other hands explains the reasons behind still not getting enough people engaged in battling the environmental issues. Findings like these might serve in trying to motivate the public. Ricardo García Mira focuses on different level of engagement – what changes need to be done to integrate such findings from applied psychology in environmental policies and therefore reaching maybe much greater influence.

As the general focus in environmental psychology shifted towards ecological and sustainability themes it influenced architectural psychology as well. On of the ways how the intersection of psychology and architecture might tackle this is by aiming for greater social part of sustainability. Ceren Bogac talks about one of the main concepts of environmental psychology – love of place, topophilia or place attachment, as the positive affective bond towards a space might be the solution on how to keep people caring about their surroundings. It can be enhanced for example by more walkable streets and Ebru Cubukcu is offering a method exactly for this – how to measure the

walkability of a neighbourhood. There is also a very active movement aiming for creating more lively places with the so called placemaking approach. Evangelina Pavlaki gives her opinion on this and why is an important part of architectural practice nowadays.

With the ever growing movement of people towards living in cities there are some other issues on the rise, sometimes sadly even very severe mental health problems. Majd Gharib introduces the developments on research about mental health and built environment and Natalia Olszewska with Nour Tawil explains more the current interest in the application of neuroscience on these issues. The two extremely common types of environments are also discussed. Michal Matloň gives examples on how psychology could be applied for better office design and Fiona de Vos stresses out that we should not resign on design for well-being in hospitals.

The final chapter focuses on the works of architecture in itself. Ana Mirea describes how our childhood is influencing our architectural preferences and therefore why we might be drawn towards certain styles or design features. Extremely interesting text from Vladimír Šimkovič about the Sea in Bratislava offers an insight into how the perception of the environment might be influenced even by the collective subconsciousness.

The presented texts should serve as an introduction to the different uses of environmental psychology and its topics of interest. We hope that they will get the readers engaged, help them to learn more about the environment around them and get them activated towards taking care of their surroundings.

Aline Barlet

Doctor in Environmental Psychology, Aline BARLET has also a Master's Degree of Architectural and Urban Acoustic. She teaches the sustainability issue, comfort and atmospheres from the physical and the psychological points of view, at the higher national school of architecture and landscape of Bordeaux (Ensap-Bx). She is researcher at the GRECCAU Research Group, which she is in charge since 2017. Supervising PhDs on these subjects, she participates in more than twenty



national and international research projects in the fields of comfort, territorial consultation, sustainability and design. She also works as a private consultant.

Environmental psychology, Architecture and sustainability

Why choose after a PhD in environmental psychology to teach and to conduct researches in an architecture school? Perhaps to have a direct impact on users' living spaces, a role in the ecological performance of architectural and urban designs, in short to feel useful.

But, what does environmental psychology bring to future architects and to architecture? It allows, for example, to:

- understand how man interacts with the environment by studying essential notions (perception, representation, evaluation, attitude and behaviour);
- become aware, beyond the physical components, of the subjective aspects of comfort;
- know and master territorial dialogue processes and integrate the points of view of the various actors, in particular by recognizing the user expertise;
- adopt ecological values leading to livable, viable, reasonable and equitable spaces;
- understand certain ecological projects' underperformance of and to learn from it.
- All these contributions have to be considered in the design process to place man at the heart of architectural and urban projects, still too often seen as artistic and technical expressions.

Teaching and research in an architecture school can be a way to influence production of future generations and to promote a real perceptible ecological transition in practices and projects.

Environmental psychology emerged in the 1950s when researchers questioned the influence of the environment in the care of the mentally ill [1]. In France, for example, the work of Sivadon [2] enabled him to concretize his reflections on man's interrelations with the environment. In particular, he helped design a psychiatric hospital in La Verrière (France).

At the same time, after the end of the Second World War, society was in the midst of reconstruction and architects had a lot to do. They expressed their need to understand users' expectations in order to provide them with a suitable living environment. In fact, they were faced with an increase in the dissatisfaction of the populations in the face of an architecture that was increasingly egocentric and that responded above all to the satisfaction of the personal need for aesthetic affirmation of the architect.

It was in the 1970s that environmental psychology really took off [3], with the realization of the necessity to integrate the human dimension in environment design. Psychology became, for architects, the means of bridging concrete and operational problems with the identification of optimal solutions [4]. This bridge operated both from an aesthetic point of view and from the point of view of the functional suitability of the architectural space, respecting the needs and expectations of the users.

It was also during this period, and following the first two oil shocks, that the question of sustainable development was raised, notably with the Meadows report in 1972 [5] and the Brundtland report in 1987 [6]. This report, drafted by an independent commission set up by the UN to prepare for the 1992 Rio Conference, emphasizes human use of the biosphere so that current generations derive maximum benefits from living resources while ensuring their sustainability in order to meet the needs and aspirations of future generations.

Thus, environmental psychology has developed around architectural and urban issues on the one hand, and issues related to ecology and sustainability on the other.

A specific personal background

Beyond a strong awareness of environmental issues, my interest in this science was born from the objective itself of environmental psychology, which aims to identify and characterize the processes that regulate and mediate the relationship of the individual to the environment. The aim is to highlight the environmental perceptions, attitudes, assessments and representations on the one hand, and the accompanying environmental behaviour and conduct on the other. That is why very quickly I wanted to do a PhD.

As interesting as the study of the effects of environmental conditions on human behaviour is, my PhD rather aimed to identify the needs and expectations of school space users in terms of comfort, and more particularly in terms of acoustic comfort [7]. Conceptualizing this concept was, for me, a relevant objective due to the limited knowledge available at that time on this subject and its close relationship with the processes of environmental cognition mentioned earlier.

However, in order to carry out this study, it seemed to me necessary to acquire knowledge of the physical phenomena, which I wanted the school space users to assess. In order to obtain these skills, I prepared a master's degree in architectural and urban acoustics with students who were architects and engineers. While this training allowed me to acquire solid engineering sciences skills, it also revealed to me the gap created since D. Canter's work between architects and psychologists.

Therefore, after obtaining my master's and PhD, I chose to join the ENSAP in Bordeaux to teach first human sciences and then quickly sustainable development issues by crossing objective approach (engineering sciences) and subjective approach (environmental Psychology).

Hope for an impact on tomorrow's space productions

The use of environmental psychology theories and concepts in teaching and research on architectural and urban design allows for a focus on human and sustainable dimensions in projects. Designing sustainable spaces requires striking the right balance between economic, social, environmental and cultural pillars.

But how do we know if an environment is livable for its occupants without knowing how man interacts with his environment?

How to master the ambiances and comfort in a built or natural space without being aware of the subjective physical and social components that characterize it? How to propose an acceptable building or district rehabilitation if the designer doesn't have knowledge of territorial dialogue processes that allow integrating the views of the various actors, in particular by recognizing the expertise of users and their attachment to the place?

How can we avoid the underperformances of certain sustainable building, often wrongly justified by the unsuitable behaviour of users?

How can we be innovative and support change in the face of societal challenges, such as the energy transition, without understanding people's attitudes and behaviour towards these topics?

How can we agree to modify our own architectural and urban production practices with regard to environmental performance injunctions?

So many questions, and more, to which knowledge from environmental psychology can help answer. There is no need for the designer to master all the concepts developed in environmental psychology, but at least he must be sensitized in order to adopt ecological values and propose suitable and accepted design.

Whatever the scale envisaged - micro-environment, meso-environment, macro-environment, global environment – the designer must be aware that he is acting as much on the physical environment, by the development of the built or natural environment, as well as on the social environment.

To integrate environmental psychology contributions in teaching can take place at all stages of the curriculum and even awareness raising must begin as soon as possible, before the student has already integrated decontextualized and especially dehumanized design processes. It must be theoretical, with lectures, but also pragmatic through interventions in project workshops or tutorials.

Research in architecture is also a strong vector of environmental psychology valorisation in its applied aspect, whether performed by established researchers or by master's or PhD students in architecture [8]. To better understand comfort needs and expectations of users for different types of space [9], to identify attitudes and behaviour to climate change in terms of building use, to study constructive innovations promoting bio-sourced materials acceptability etc. are all topics addressed from the perspective of environmental psychology and can lead to the creation of decision-making tools for architectural and urban design.

Teaching and research in an architecture school can be a way of influencing future generations' productions and promoting a genuine ecological transition perceptible in practices and projects.

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Ceren Boğaç

Dr. Ceren Boğaç is an architect interested in the ways in which people's ways of life is translated into spatial dimensions or architectural language. She was born in Famagusta in 1979. She is currently an Assistant Professor of Architecture at Eastern Mediterranean University (EMU). She has a Master and PHD in Architecture (in the field of Environmental Psychology) from EMU, Department of Architecture. Between 2010-2011 she conducted post-doctorate research at Academy of Art Design and Architecture in Prague, Czech Republic. Her specific areas of expertise are environmental psychology, place attachment, sense of place, meaning in architecture, ecocity/eco-architecture, and urban peace-building studies. She has given lectures related to the interplay between human beings and environment, as well as architecture and urban design studios for more than 10 years. She has publications in environmental meaning and place attachment studies both at national and international levels. She received the European Commission research (2010) and Fulbright Visiting Scholar (2019) grants.



Dr. Boğaç is also involved in many civil society projects based on 'human rights' which were funded by the European Union. Between 2008-2010, she worked as the project coordinator of an EU funded project in London, Brighton, Manchester, UK; Brussels, Belgium; Malta, Malta; and Nicosia, Cyprus. She still works actively on many community empowerment projects such as; advocating for equal rights and queer spaces in North Cyprus, turning the city of Famagusta into Europe's model Ecocity (The Famagusta Ecocity project), a pilot project to demonstrate the vision of the Ecocity Project with the Home for Cooperation in Nicosia, developing participatory planning and implementation tools for local municipalities to make them part of the international slow city (cittaslow) network.

Besides her academic work, she has many award-winning and published short stories in Turkish. She is a board member of the International Network for Traditional Building, Architecture and Urbanism INTBAU Cyprus Chapter and one of the associate editors of the Journal of Cyprus Studies.

Love of place: Emotional engagements and psychological process

Through the perspective of my multiple selves, as an architect and environmental psychology scholar, with this study I want to develop an account on the love of place. People have transactional relationships with their places; as people act on their environment, so does the environment on them. This unbroken flow generates emotions that are evoked in a place, cognition that is associated with a place, and an expressed behaviour which generates love for a place. The psychological process of this stream has generally been neglected in architecture but has been attracting the interest of the environmental psychology studies for a while. Architecture is an influential tool which shapes the characteristics of a place. In this sense, bonding with a place depends on its architecture to a certain degree. Therefore, architecture should not only respond to the functional requirements of places but also to their emotional qualities. If people do not attach themselves to their places emotionally and spiritually, they cannot integrate with their living environment which directly affects their well-being. Therefore, understanding the phenomenon of 'love of place' is important not only for the domain of psychology, but also for architecture.

Keywords: place, love, attachment, environmental psychology, architecture.

People and their experience with places have regained interest and become a proliferated research topic during recent decades. From geography to philosophy, architecture to environmental psychology, sociology to politics, anthropology to human ecology, concepts related to the transformation of society, as well as individuals, in time has been developed with a place inquiry. The conceptualization of place has been distinctively separated from the discourse of space -which earlier had been used interchangeably- with the contributions of human geography and environmental psychology studies that came to prominence during the 1970's. The term 'space', which is still being used often in architecture education and practice, refers to something abstract without any substantial meaning. Place, on the other hand, refers to a space that carries social and symbolic meanings through a personal or collective process. In other words, it acts as a setting for life's actions.

Since the time of the Greek philosophers, discussions regarding the 'ideal community' and what kind of places such communities shall live in have always been a central subject for everyday life (see Casey, 1997). In this sense, architecture as a formative tool of a new environment has been considered the transformation of social, ideological, scientific, philosophical or religious values into concrete physical forms by creating new places. The ambition of creating aesthetically motivated objectives of the architect for the settings became dominant during the Modern Architecture movement which emerged after the Industrial Revolution. Modern Architecture philosophy considered architecture as a means of transforming society only with building forms - that are very simple and geometrically pure or cubic-, and with new construction materials and techniques by rejecting the symbolic values of the past.

Conceptualizations of people and place interactions

Most polemical issues about Modern Architecture occurred around the concepts of 'form' and 'function'. In fact, the American architect Louis Sullivan's dictum of "form follows the function" became the basic principle of the movement. With this statement Sullivan seemed to have highlighted the superior role of functional requirements of a building in the conceptions of its overall 'form'. In other words, the look of the building is supposed to reflect its function. This movement tried to limit social activities into standard geometries with the illusion that social problems could be solved with the functionality that the form follows (See Venturi et al., 1996; Gawne & Swodin, 2004). Modern Architecture is based on a belief that the built environment is a major determinant of human social behaviour (Brolin, 1976). This was the biggest breaking point in the history of architecture. This architectural approach, which rejects historical, local and cultural elements, as well as the emotions of people, has been criticized since the 1960s and it is emphasized that architecture should be interpreted as a means of a system of communications within society, not transformation, which is developed through people's emotions and narrative within the place. 15th June 1972, at 15:32, the awarded Pruitt-Igoe residential blocks in St. Louis (Missouri), which had originally been constructed for low-income individuals, were demolished; for the reason that 'they were not proper for human survival'. This event became the symbol of the necessary collaboration between architecture and psychology.

When we look at 21st century architecture which had been transformed after learning from the mistakes of the Modern Architecture, what comes forward is the creation of a new order with new life repertoires that may be meaningful to people through the psychological process of self and place interactions. In literature there are many different conceptualizations of people and place relations, such as sense of place (Tuan, 1977), place identity (Proshansky et al., 1983), and place attachment (Altman & Low, 1992). Although all three concepts are used to explain psychological processes of meaning making towards a place, theories on place identity focused on how place becomes part of one's self identity, whereas the conceptualization of sense of place became more ambitious to examine many levels of people-place interactions such as rootedness, alienation, and placelessness. Studies after the 1990's revealed that, the process of constructing meanings between self and place is developed as a result of various mental states of experiences, in other words emotional engagements. This emotional connection between self and place is called 'bonding' which mainly became the subject of place attachment theories. Place attachment studies concentrate both on the emotional connection process with the place, as well as the outcome of this process (Giuliani, 2003) that is 'bonding'. The essence of this bond is feeling of 'love' for a place.

In other words, falling in love with the place itself. "What generates this love?" or "how do we fall in love with places?" is the main subject of this study.

The affection of love for a place

Developing an account on the phenomenon of love is a difficult theme for each subject, not only for architecture. Hence, it might be helpful to start the discussion by rising up the question of "what initiates love for someone or something at first place?", if "is it the physical appearance, the beauty?" or not. The question of physical beauty in architecture takes place mainly within the discussions of formal aesthetic theory. This theory is formulated mainly by the students of Gestalt Psychology, which tends to explain visual perception only on the basis of geometric characteristics of the environment, such as shape, proportions, rhythm, scale, the degree of complexity, colour, illumination, shadow etc. Based on the formal aesthetic, the urge to create something iconic or unique enslaved many architects to image producers rather than being meaning makers. Nevertheless, the studies revealed that merely physical beauty

is not something which makes people fall in love with something and sustain this love (Nasar, 1992; Boylan, 2008). The affection of love requires a very strong attachment (Altman & Low, 1992; Manzo & Devine-Wright, 2014).

There is an unbreakable flow between us and our places: we act on our environment and in turn the environment acts on us. This flow generates emotions that are evoked in a place and our cognition that is associated with any place is shaped by these emotions. We constantly gather information about our surrounding with our senses. We filter this information in our brain and set it into categories to store it in our mind and recall it when needed, which is called cognition. Once we recall a place that we love, we can easily see that our cognitive-emotional bond with a place does not have much to do with beauty or its physical attributes. This place matters to us because of the way it makes us feel, because of the memories that were shared in it. There are memories constituting the milestones of our 'life story' composed of memorable times. There are also memories of events happening inside a 'place' which are shared by many, constituting a 'collective memory' of our community. Places tell us a narrative and we keep them alive with our narratives.

Concluding remarks

Places keep the past and future connected. Place studies show that emotional connections with one's surrounding is part of human nature (Altman & Low, 1992; Lewicka, 2011; Manzo & Devine-Wright, 2014). This bond helps us develop a healthier psychologically investment in our places, such as better involvement in social and political actions of the community (Mesch & Manor, 1998), working together (Brown et. al, 2002) and developing certain behaviour to protect social and physical features of the place (Mesch & Manor, 1998). In this sense, places have always been and will always be affected by architecture since bonding with a place depends on the design of the place to a certain degree. To contribute healthier living environments, architecture should be used as a transformative tool to provoke emotions that lead to a connection with a place which turn into love that people develop through social and psychological means. Consequently, understanding the phenomenon of 'love of place' is important not only for the domain of psychology, but for architecture.

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He has been working as a researcher and lecturer for various national and international research institutions, such as International Institute for Applied System Analysis, Vienna University of Economics and Business, University of Klagenfurt and University of Graz. He also has been a visiting researcher at the National Institute for Environmental Studies (NIES), Japan, visiting faculty at Asian Institute of Technology (AIT), Thailand, and guest lecturer at Vytautas Magnus University, Lithuania.

He has a background in informatics and economic psychology, and his current research focusses on decision making and decision analysis related to sustainability and innovation research.



Humans and Climate: Why is it so difficult to behave climate-friendly?

Human decisions cause a variety of environmental impacts, including biodiversity loss, radical changes in biochemical flows, or climate change. These impacts pose an unprecedented challenge to society. Adaptation and mitigation strategies addressing these impacts will require public acceptance on national and global scales as well as international cooperation. Transitions towards “sustainable societies will hardly be a linear and straight-forward process. Understanding human decision making – including decisions made by citizens, organizations and households – is a key to develop effective and feasible strategies for sustainable development. This lecture will give an overview on how insights from environmental psychology and related fields add to the understanding of human decisions, and how the formulation of sustainability strategies may benefit from these insights.

To achieve the goal of climate-friendly societies, technological innovations will need to be complemented by fundamental shifts in lifestyle choices and consumption patterns. Despite increasing public awareness on the issue of climate change on a global level, and even high levels of acknowledgment of human influence on climate, only small and slow changes in consumption patterns can be observed, and these changes only occur in parts of the population.

Intuitively it could be concluded that a lack of knowledge on science in general, and knowledge and/or literacy on climate change in particular, might be part of the explanation. While it has been confirmed that climate change literacy in the general public is limited and error-prone (Reynolds et al. 2010; Sundblad et al. 2009; Tobler et al. 2012), science literacy seems not to predict perceived climate change risks (Kahan et al., 2012). Often, political beliefs and political affiliation outweigh the effect of knowledge. In a recent Austrian study with a general population sample, participants on average correctly answered only 5.5 out of 10 true-false statements concerning climate change (Thaller & Brudermann, 2019), and participants’ confidence in their answers was much higher than the accuracy of their answers. Nonetheless, climate change knowledge (or the lack of thereof) seems not to play a role in climate-friendly or climate-unfriendly behaviours. Knowledge however at least has a positive effect on the acceptance of climate change policies (Tobler et al., 2012; Bostrom et al. 2012).

One could argue that (detailed) climate change knowledge is maybe not necessary for a general public, but that awareness of the problem is. Indeed, belief in climate change has a solid relationship with the extent to which people intend to behave climate-friendly – but only a small to moderate relationship with the extent to which people ‘walk the talk’ (Hornsey et al., 2016).

Apart from well documented effects such as attitude-behaviour gaps or intention-action gaps (Kollmus & Agyeman, 2002, Diekmann & Preisendörfer 1998), several other psychological barriers inhibit climate-friendly behaviours: Among them are moral licensing effects or single action biases; i.e. people use small environment-friendly actions to justify that they do not engage in more relevant, but more difficult climate-friendly actions. Temporal discounting effects (e.g. take a flight now and use more climate-friendly transports in the future), or relief of guilt by buying CO₂ compensations, are other popular excuses for climate-unfriendly behaviours.

Climate-friendly attitudes and climate friendly behaviours thus have different drivers. Belief in climate change can be well explained by political affiliation and political ideology (in North-American studies); eco-values also play a big role.

Regarding climate-friendly behaviours, an upcoming Austrian study (Thaller et al., forthcoming) found that willingness to sacrifice is the most important predictor for respective behaviours. Only if people are willing to give up on something for the sake of climate change mitigation, and at the same time don't feel powerless, they are likely to act in climate-friendly ways. Willingness to sacrifice clearly is an intrinsic motivator, and intrinsic motivators are not particularly sensitive to external influence (e.g. policy interventions). The main challenge for environmental psychologists and policy makers with regards to climate friendly behaviours therefore will be to facilitate the activation of such intrinsic motivators, and how to effectively use extrinsic incentive schemes, without crowding out the very important intrinsic drivers.

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Ebru Cubucku

Prof. Dr. Ebru CUBUCKU: is Professor of City and Regional Planning Department in the Faculty of Architecture, Dokuz Eylul University, Izmir, TURKEY. She received her PhD from The Ohio State University, US, in the year 2003. Amongst the list of selected honours she received includes, PhD Scholarship to Study Abroad, Higher Education Association, Prime Ministry of Turkish Republic, (1998-2002), The Ohio Commendation Medal, Ohio, US., (2004); Award for Excellence in Teaching, The Graduate School of Natural and Applied Sciences, Dokuz Eylul University (2010). Her research interests focus on human behaviour and physical environment, perception and cognition in virtual environments, post occupancy evaluation, environmental aesthetics, creativity and walkability. Currently, amongst others, she is conducting a long-term research project on active living and environmental determinants of physical activity supported by The Scientific and Technological Research Council of Turkey (TUBİTAK). Her other research projects are funded by Scientific Research Projects at Dokuz Eylul University and Izmir Development Agency. She has been serving in the editorial board of Archnet – International Journal of Architectural Research since 2010, and Asian Journal of Environment Behaviour Studies since 2009, Housing and Built Environment since 2018. She reviewed papers for various journals and conference proceedings including, The Environmental Design Research Association (EDRA), Colour Research and Application, Building and Environment, Environment and Planning B, Gazi University Journal of Science, Journal of Housing and Built Environment.



Walkability Maps and People's Travel Behaviour

In 2007 a private firm in Seattle, Washington began to measure and publish walkability maps of cities, neighbourhoods, and streets via “walkscore.com”. Although “walkscore” have been criticized for its parameters, it has been used in urban design to create better environments for all and to design better environments which encourages people to walk more in cities. Besides those maps influence house values in cities and can be used to provide the most pleasurable routes (instead of the shortest route) in cities when one needs to travel from one destination to another. Such maps have been published for developed countries and they are based on various parameters. However, the parameters that influence walkability in cities may change from one culture to another. No such initiative has been undertaken in developing countries. This study aims to introduce and discuss an alternative model to measure walkability on street level via Geographic Information Systems (GIS). About 12000 street segments in Izmir, Turkey (third largest city in Turkey) have been digitized. A walkability score (based on street networks, land-use, environmental aesthetic, traffic safety, perceived safety in the neighbourhood etc.) for each street segment was measured via GIS and its extension Spatial Design Network Analysis (SDNA). Walkability maps of the selected case area was produced and whether those maps are parallel to people's choice of active transportation (behaviour) was investigated. Data on 185 participant's travel behaviour was gathered via travel surveys, GPS and accelerometer devices. Results show that those maps are valid in predicting people's choice of active travel (walk).

A growing body of literature addresses the fact that obesity and overweight are the greatest public health challenges of this century (Pego-Fernandes et al, 2011; Holt, 2005; Selassie & Sinha, 2011; Omoleke, 2011). Physical inactivity is identified as the leading cause of obesity and overweight problems (Tremblay & Willms, 2003; Vuori, 2004; Prentice & Jebb, 1995; Weinsier et. al., 1998; Dubnov, Brzezinski, & Berry, 2003). On the other hand, physical activity, is assessed as a remedy for obesity and overweight. Given that, voluminous number of actions have been initiated to increase physical activity by actors from local, national and global institutions and by public and private organizations (Cubucku, 2013). Experts from academia also offered various actions which can increase the physical activity statistics locally and globally. One of

these actions relate to promotion of walking in daily life because walking is the most popular, simple and easy form of physical activity.

Considering the physical transformation of the built environment and the recent increase in obesity rates, the famous quote “we shape buildings there after they shape us” receives an ironic meaning and highlights the importance of interaction between physical environment and human behaviour (Wells et al. 2007). After modernization, urban transportation plans focused on motorized transportation and ignored sustainable transportation modes. Recently, the need for better urban transportation plans which promotes sustainable transportation modes such as walking has been acknowledged. Only with such plans, it is possible to encourage people to walk and increase physical activity levels of a society. Given that, the term walkability has gradually received attention and become an essential element of urban planning and design. Figure 1 shows that the share of references for the term “walkability” has remarkable increased since 1960 based on the Google anagram viewer results.

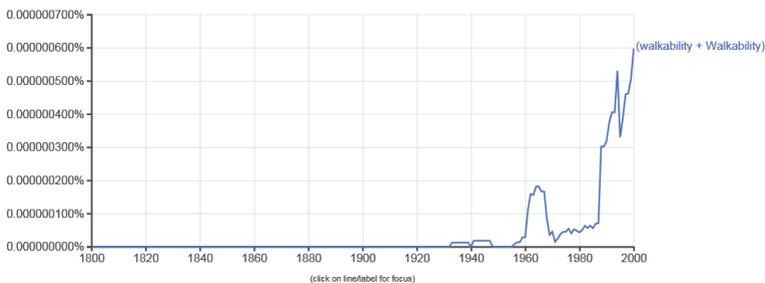


Figure 1. The share of references for the term “walkability”

Walkability is defined as the extent to which the physical environment encourages people to walk for transportation, exercise and recreation. In 2007 a private firm in Seattle, Washington began to measure and publish walkability maps of cities, neighbourhoods, and streets via “walkscore.com”. Although “walkscore.com” have been criticized for its parameters and measures, it has been used in urban design to create better environments for all and to encourage people to walk more in cities. Besides, walkability maps influence house values in cities and can be used to provide the most pleasurable routes (instead of the shortest route) in cities. Such maps have been produced via public and private organizations and published via internet in developed countries. Yet, no such initiative has been undertaken in developing

countries. This study aims to do that, because the parameters that influence walkability in cities may change from one culture to another. Given that, walkability maps should take into account the local measures as well as globally accepted measures.

Walkability scores of neighbourhoods and streets calculated based on various parameters including land-use, environmental aesthetic, traffic safety, perceived safety, pedestrian comfort around the street and/or in the neighbourhood and accessibility calculated based on street network, etc. However, how these parameters are measured varied from one study to another. This study aims to introduce and discuss an alternative model to measure walkability via Geographic Information Systems (GIS) and its extension Spatial Design Network Analysis (SDNA). This model is developed and tested in various parts of Izmir, Turkey (Karsiyaka, Bornova, Buca as central districts and Foca as periphery district) with the support of related municipalities and/or funding from Dokuz Eylul University Research Center and The Scientific and Technological Research Council of Turkey (TUBITAK: 11K383, DEÜ_BAP:2012.KB.FEN.090, TÜBİTAK:116K358) over the last 7 years. About 5000-12000 street segments in each district have been digitized and evaluated for various urban qualities via on site observations. Walkability maps based on each separate criteria (such as presence, continuity or quality of sidewalks etc.) and aggregated scores for all criteria (such as pedestrian comfort or suitability for walking for exercise etc.) were produced via GIS for the case study areas.

People's actual walking behaviour and the results of those walkability maps were also compared with a series of research. First, data on people's actual walking behaviour was collected via subjective measures such as International Physical Activity Questioners (IPAQ), general transportation habit surveys and travel diaries. Beside other limitations, these subjective measures fail to show the actual routes where people prefer to walk or use motorized vehicles. Given that, the average walkability scores in close vicinity of participant's residence (400 meters radius) and participant's tendency to walk was compared and weak correlations were found between the walkability maps and people's behaviour. This weak correlation may stem from the false assumption (which states that people walk only around their house) suggested by a voluminous number of studies. Given that, the necessity to trace people's actual travel behaviour via objective measures such as Global Positioning Devices (GPS) and accelerometers was acknowledged, and next series of studies were held. About 180 participants' physical activity and the location of those activities were recorded for a week for 10

second intervals via these devices. The data from GPS and accelerometers were synchronized and analysed to differentiate the routes that are preferred for motorized trips and for walking trips. In order to that, the data for sedentary behaviour and other physical activities (such as running) were eliminated with various algorithms. Then the street segments where people walk and where they do not were differentiated via a new algorithm described in TÜBİTAK:116K358. Density of pedestrians on streets with different walkability scores were compared and results showed that walkability maps are valid in predicting people's choice of active travel (walk).

These series of studies are important in showing how methodology to evaluate urban qualities for walkability and observation of travel behaviour can be improved and highlighting the fact that there is still room to enhance the methodology to study the relation between urban qualities and people's actual walking behaviour.

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Majd Gharib

My name is Majd Gharib. I have a BA in Architecture from Al Ba'ath University, Syria, and I obtained a MSc in Construction from Izhevsk State Technical University, Russia.

In my master studies, I noticed the lack of design considerations based on psychological factors in urban reconstruction which is specifically important in post-war reconstruction. I addressed this gap in my project and proposed guidelines to include psychological factors in the post-war urban planning and design strategies.

Later I met Prof. Jan A. Golembiewski and Prof. Ahmed A. Moustafa, both are well-known in research regarding architecture and neuropsychology, and they were interested in my work, which led to scientific cooperation that resulted in writing the paper that I will be discussing in this conference. It was published in 2017.

I worked as an Architect for three years at Arkhstroyinvest, a leading architectural bureau in Izhevsk, Russia, then I started working remotely about a year ago for the US based company Cognitive Design in Atlanta, GA, and I am still currently working there as Research and Design Consultant.



Mental health and urban design – zoning in on PTSD

Together with Jan A. Golembiewski, Ahmed A. Moustafa

The review firstly explores the relationship between mental health and urban design, pursuing the role of urban design in both health promotion and illness prevention against the mental illness epidemics, by conducting a comprehensive literature search; secondly, a systematic literature search is conducted to explore the relationship between urban design and post-traumatic stress disorder (PTSD) specifically. Apparently, health in general and urban design do share a solid history, however, even though mental health/urban design relationship has been increasing over the past 20, they seem to share a weak historical relationship, and even recent research that tries to define links between the two is still preliminary. On the other hand, a gap in knowledge can be addressed regarding the relationship between PTSD and urban design.

Keywords: Mental health, Urban design, Environmental psychology, Post-traumatic stress disorder (PTSD), Public health

Introduction

The Psychologist Abraham Maslow (1966) said in his book *The Psychology of Science*: BI suppose it is tempting, if the only tool you have is a hammer, to treat everything as if it were a nail[^] (Maslow 1966). This famous concept is known as Maslow's law of the instrument, and while it represents an over-reliance on a familiar tool, it also draws attention to the importance of trying new approaches to develop our conventional methods or even to try new methods that have not been used before; a practice that would require an understanding of both the conventional tools and the new tools that will replace or improve them (Kaplan 1973). In our case, it means understanding the interrelationship of both mental health and urban design, two domains that were presumed to have a weak, or almost no, relationship about one hundred years ago (Drummond 2013). Mental health is defined as Ba state of well-being in which every individual realizes his or her own potential, can cope with the

normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community^ (Mental health: A state of well-being 2014). Urban design, on the other hand, has been defined in variety of ways according to the different opinions of the writers and practitioners of this discipline. Generally speaking, it is the design of towns and cities, streets and spaces (Bahrainy and Bakhtiar 2016); however, it can be defined as Ban inter-disciplinary subject that utilizes elements of many built environment professions, such as landscape architecture, urban planning, architecture, and civil engineering^ (Van Assche et al. 2013). It is unfortunate that the separation between mental health and urban design has been so longstanding (Drummond 2013) considering the high degree of interconnectivity between both fields. There is now a growing interest in how mental health promotion requires amenable environments to support wellbeing and to allow people to adopt and maintain healthy lifestyles (Mental health: strengthening our response 2016; Golembiewski 2016). This goes in line with the goal of urban design that is making urban areas functional, attractive, and sustainable (Boeing et al. 2014). In other words, the more we understand the links between these disciplines the better we address and cope with today's major health concerns, which becomes crucial in cases when mental disorders become widely spread such as in post-war societies, when Post-Traumatic Stress Disorder (PTSD) in addition to other major mental disorders can be found in high rates (Junne 2010). This review discusses the connections between the two major disciplines – mental health and urban design, with a particular focus on PTSD relationship with urban design.

Methods

Literature Search Strategy

A systematic search was done to identify studies of the general history and relationship between health and urban design. The search was conducted in April 2017, and no time span was specified for date of publication. First step was to search using Google® search engine, NCBI®, and Google Scholar® databases. Synonyms relating to the topic (e.g. history of urban design) were combined with terms for mental health (e.g. the relationship between health and urban design). Terms related to mental health were used and combined with terms related urban design, such as BPTSD^, BPost-

traumatic Stress Disorder^, Bwell-being^, Bdepression^, Bstress^, Bmental health^, Bpublic health^, Bschizophrenia^, Bpsychosis^, Bbuilt environment^, Bnatural environment^. Another systematic search for studies of the relationship between PTSD and urban design was conducted in all the databases of NCBI®, and in Google Scholar®, using the following terms combinations in exact match mode to make sure the studies have both of them: BPTSD^ AND BURban Design^, BPost-traumatic Stress Disorder^ AND BURban Design^. In a second step, the reference lists of the articles included in the review were manually checked for relevant studies not identified by computerized literature searching. There was no language restriction, however, all included papers were in English.

Results

Studies Found

The combined search strategies of the first search yielded a total of 122 articles, of which after a complete full text analysis, 41 were included. The second search resulted in 223 articles, 217 results in Google Scholar®, and only 6 articles in all NCBI® databases. After a complete full text analysis, surprisingly, only 3 studies were included; 2 from NCBI®, and 1 from Google Scholar®. The reason why the 216 excluded studies appeared in the search is simply because they have both the terms BPTSD^, BURban Design^, in their text, however, these articles had totally unrelated topics to our scope despite the existence of both terms in them, and the terms weren't related to each other. In addition, 2 of the 3 included studies are only remotely related to our topic, while only 1 study is firmly related to the relationship between PTSD and urban design. The final overall number of studies that were considered eligible is 44 published studies.

The Historical Presence of Health as a Factor in Urban Design

Urban movements have always happened whenever citizens attempted to achieve some control over their urban environment which consists of the built environment, the social fabric of the city, and the local political process (Pruijt 2007). Such movements in the nineteenth and early twentieth centuries drew urban design and health sectors together until the 1930s (Hebbert 1999), when again these ideas fell out of favor. While the following examples of integration between urban design and health sectors (including public health) do not directly represent an explicit

relationship between mental health and urban design, they seem to have paved the way for this relationship to emerge later. Examples of emergent urban/public health plans include the Sanitary Movement in 1840s England, the City Beautiful Movement and the *l'Égout* Movement in Paris, later in the Century, and the Garden City concept of the early twentieth century, to the era of Modernism and postwar suburban expansion. At the time, infectious diseases were a major problem of the health sector, while mental health didn't seem to be as important. Finally, and as infectious diseases were faced by both aforementioned disciplines in the early twentieth century, the invention of antibiotics in the mid-century appeared to be the final blow to this integration, making both disciplines appear to be forever separate henceforth (Drummond 2013). The most likely first effective integration that happened between health and urban design was mainly enabled by movements that were created to combat health epidemics of the 1800s which were not related to mental health. Epidemics such as cholera, typhoid, and yellow fever were believed to be caused by the environment. This led to developing new citywide sewer systems, an action that marked a shift toward public intervention in city services (Peterson 1979). According to the studied literature, it is clear that relationships between mental health sector and urban design were not investigated during this period. In the late 1800s, and after the establishment of the American Public Health Association (APHA), a simple approach was adopted: the prevailing views that dense urban populations and overcrowding were at the root of disease meant that open space and nature were cures for this disease. The result was more focused on the sanitary value and uses of shade trees, clean air, bright sunlight and abundant nature (Drummond 2013); that is, the features of the natural environment. In the early twentieth century, utopian ideas such as Ebenezer Howard's Garden Cities of Letchworth and Welwyn endeavored to separate living areas from industrial zones and thereby make cities less polluted, greener, more livable, and attractive. A major component of these plans included public parks and citywide systems of open space. This high integration of general natural environment features improved health conditions; they might have helped – unintendedly – to improve mental health, even though mental health was not a direct aim of these movements (Hebbert 1999; Hall and Tewdwr-Jones 2010). Thus, urban design played a major role in controlling physical disease spread until the 1920s by zoning to isolate pollutants and to quarantine infections. This led to more healthy and hygienic cities during the 1930s (Duhl et al. 1999). Ironically, this was a turning

point that paved the way to the separation between the disciplines few years later because the new – relatively – healthier cities decreased the need for planners to deal directly with health concerns, therefore, less of a need for these professions to work together toward the same goals. The public health field began to drift away toward the biological causes of diseases rather than the environmental and psychological ones. During this era, urban design and health were still linked in title but not in practice (Drummond 2013). No direct consideration of mental health -as a part of public health- was addressed by urban designers. The separation between public health and urban design lasted till the end of the twentieth century. The need for reconnecting the fields of urban planning, urban design, and public health including the mental health sector emerged again in (1999) in the WHO's Healthy Cities project. It focused on the impact of behavior, health delivery, and interagency coordination to adopt precautionary approaches to health, taking into account issues of the designed environment (Duhl et al. 1999). The WHO's report Making a difference (World Health Organization 1999) highlighted major aspects regarding urban environments and health support, including higher attention to mental health problems and a focus on how to deal more effectively with inter-sectoral issues; in particular, the threats to health that result from environmental causes. Since then, both urban design and health fields have once again started to connect deterministically. Relationships between the physical, natural, social environments, and health, were observed in order to focus on chronic lifestyle related epidemics such as diabetes, heart disease, obesity, asthma, and finally, mental illness. But even with this renewal of shared outlook, the silos of expertise between mental health and urban design are very difficult to breach (Drummond 2013).

Recent Research on the Relationship between Mental Health and Urban Design

Since the new millennium, the search for links between urban design and mental health has been in the shape of an explosion of interest in the effects of the designed environment -which is a part of urban design- on mental health and well-being, largely due to the discovery that environmental factors cause significant variation in genetic expression; epigenetics and ecogenetics (Choi and Kim 2007). From the urban design point of view, most research focuses on the ways that natural and designed environments can improve human well-being (White et al. 2013). The review literature regarding the urban design \mental health relationship suggested that this aforementioned research hasn't yet formed a clear body of knowledge with defined

boundaries, but instead, many studies with rather preliminary results can be found, that might -combined- help to shape this area knowledge in the future. Some examples of these studies, for instance, the findings of one study suggest that natural green environments offer better opportunities for moderating or coping with stress (Thompson et al. 2012); another study proved that greater access to green space is associated with fewer incidences of depression (Cohen-Cline et al. 2015). Some other study found that higher levels of green vegetation were associated with decreased mortality rates (James et al. 2016). Other researchers studied the impact of views of water – such as lakes, sea, and waterfalls – on health. These studies found that these effects are no less important than green spaces; in fact, their findings showed that views of water were associated with lower psychological distress and a significant positive impact on mental health (Miller et al. 2012; Nutsford et al. 2016). This is not directly related to urban design; however, the elements of natural environment are essential elements of urban design (Van Assche et al. 2013; Lang 1994), thus, these studies and other similar studies might help to improve mental health through urban design. In addition to the impact of natural environment, research was also concerned with the impact of designed environment - also a part of urban design- on health and behavior. Some of these studies tried to identify abstract elements of the design that might affect the psychology of a person, thus, might have an effect on his mental health. For instance, a study concluded that an environment which features sharp shapes led to more aggressive behavior while rounded shapes were associated with warmth or pleasantness (Hess et al. 2013). While this Curr Psychol type of psychological studies is cutting edge, it is still very low in terms of quantity. It is also important to notice that where urban designers have focused on wellbeing in general, public health researchers have been far more specific. They have made extraordinary associations between the mental illness sector of mental health, and urban development, including replicating epidemiological data (Kelly et al. 2010; van Os et al. 2010), and even tied these findings to specific neurological morphologies (Haddad et al. 2014; Lederbogen et al. 2011; Lederbogen et al. 2013). Attempts to draw the science of public/mental health and urban design is still rare according to the found literature, although it has been done, leading in some cases to practical recommendations for architects and urban designers to put mental health factors into consideration during the design process (Golembiewski 2012, 2013, 2016). A look at these examples leads us to conclude that there is a general acknowledgement that urban design and mental health has

connections that are mainly observed through the epi- and eco-phenomenal impact of environment on general health including mental health – and thus, there has also been some interest in the recovery effects that some appropriate environments could have. This type of research is also still in preliminary stage; however, it suggests a possibility of improving the treatment of mental health disorders including depression, stress, anxiety, and Posttraumatic Stress Disorder (PTSD) with the help of the features of the designed or natural environments, as there are many other studies that support this claim. For example, there is growing awareness that environment has specific effects on other mental illnesses such as depression (Golembiewski 2017) and severe psychosis; for instance, a study found that urban environment as place of birth increases the odds of developing schizophrenia up to 28–34.3% (Haddad et al. 2014), and again, studies that have discovered that early-life urbanicity appears to cause anatomical alterations in many brain regions that are associated with environmental stress and risk for schizophrenia. Such studies relate city living to an increased prevalence of mental health disorders, particularly schizophrenia, due to increased social stress; a potential feature of urban environment that could be one reason of such disorders (Haddad et al. 2014). This factor is considered as one of the most powerful causes for the development of mental disorders including schizophrenia in urban minority groups but it still needs to be validated in the general urban population (Lederbogen et al. 2013). From another perspective, a study has linked living in a rural environment with lower odds of developing schizophrenia on the grounds that rural setting may have protective factors such as the high social interdependence and low social fragmentation compared to urban setting (Padhy et al. 2014). While many studies have confirmed that exposure of individuals to natural environments – including blue and green spaces – can boost stress reduction and assist in mental recovery (Golembiewski 2012, 2013, 2016; Depledge et al. 2011), there are still very few studies that address features of the designed environment that may either trigger mental illness or protect against it (Golembiewski 2016). This area of the urban design/mental health relationship can be particularly important in the post-war urban design, as a high percentage of people most probably suffer from various mental illnesses. Many of these mental disorders can be triggered by elements of the surrounding environment such as PTSD, so it is logically safe to say that post-war urban design could play a big role in illness prevention by using mental health factors and considerations.

The Relationship between Urban Design and PTSD

Posttraumatic Stress Disorder (at first known as shellshock, then Gross Stress Disorder) was reported widely following the First World War, and in all conflicts since. The codification of PTSD in the Diagnostic and statistical manual of mental disorders: DSM III and onwards has relaxed the definition to include any severely traumatizing event, even outside of war, a psychiatric disorder that can occur in people who have experienced or witnessed a traumatic event such as a natural disaster, a serious accident, a terrorist act, war/combat, rape or other violent personal assault (American Psychiatric Association 2013; Sherin and Nemeroff 2011). PTSD and other mental disorders such as stress and anxiety disorders, are associated with – but not defined by – the dysfunction of several brain structures such as the amygdala, hippocampus, insula, and specific parts of the cerebral cortex; and also somatic symptoms including neuroendocrine alterations associated with the development of these disorders such as abnormal regulation of some hormones (Baker n.d.; Holzschneider and Mulert 2011), sweating, nausea, loose motions, and raised blood pressure (Sherin and Nemeroff 2011). This disorder causes clinically significant distress or impairment in the individual's social interactions, capacity to work or other important areas of functioning including somatic problems (Sherin and Nemeroff 2011). In war-torn countries like Syria, for example, between 50 and 57% of refugees experience PTSD (Junne 2010). Current treatment protocols are constantly changing, but usually employ a suite of cognitive or talk-therapy methods (Sherin and Nemeroff 2011). Most found studies in the systematic search explain the association between PTSD and neighborhood crime and unsafe traffic, and the role of community in helping individuals to overcome their illness (Jaśkiewicz and Besta 2016; Gapen et al. 2011). A new understanding of the relationship between urban design and mental illness presents an opportunity in countries and cities that are recovering from war, as there is a confluence of new knowledge, increased PTSD incidence and the need to completely rebuild all coming together, and should be an important consideration during the development of reconstruction strategies (Galea et al. 2005). This relationship has been noticed recently, and a study was done that is one of the very few studies that directly explore the links between PTSD and the architectural environment, but not urban design. PTSD is known for the re-experiencing symptoms which means reliving the traumatic event which can be easily triggered by a stimulus of any kind such as visual, tactile, acoustical, and olfactory sensations, as

long as they are related to the traumatic event. The study, is limited to the visual contributing factors, as posttraumatic stress is complex and multifactorial. The study is on US veteran who live with PTSD, showing how human-centered design could help to provide a setting in which patients and providers can most effectively perform psychotherapy. The study discusses the features of the designed environment and how it affects people with PTSD by triggering intrusive memories and causing the re-living symptoms. The importance of the study is that it is one of the first in regarding this topic, and it points out to the need for an interdisciplinary research team including psychology experts to uncover the knowledge required to be able to achieve such type of design as it far exceeds what can be expected of any individual (Finn 2013.). Even though this is not directly related to urban design but understanding how architectural spaces affect people with mental illnesses can contribute in understanding the relationship between mental health and a higher scale type of design; that is, urban design. These effects are not limited to PTSD, as effects of environment can also be more severe and noticeable among people who already live with a mental disorder like schizophrenia as they might be suffering from symptoms such as paranoia (Golembiewski 2017). A study explores why psychotic patients are supersensitive to what is called Bnegative environmental features^, for instance, triggers of a specific paranoia for schizophrenia patients and places that create the feeling of being trapped for PTSD patients (Golembiewski 2016). This study concluded that environments characterized as nice and homely, for instance, are not enough for people who live with a mental disorder, especially those who seem to be highly sensitive to negative environmental features as a result of their mental illness. In such case, this study recommends designers to aim for achieving an environmental effect that helps decreasing the symptoms of the targeted mental disorder (Golembiewski 2016). This could be done by following a number of suggested environmental and psychological design considerations and guidelines to achieve a design with recovering features; that is, a Bgenuine respite^. These recommendations include – but not limited to – removing environmental features that might trigger war-related memories; considering higher quality design; providing good wayfinding, access, and exit because people with PTSD – for instance – should not feel trapped; and other recommendations to assure a greater benefit and protection against unwanted symptoms (Golembiewski 2016). Such studies help to develop a body of knowledge about the physical environment and how it affects people living with a mental disorder,

however, much more is still needed to work on a large scale such urban design. A practical example of this is another study which made some recommendations for post-war reconstruction, mindful of the new needs that emerge after wars (Junne 2010). This study suggested achieving stability and peace via the designed environment by pointing out the importance of ideas such as focusing on both the future and also the past, as the conflicting parties in wars are often prisoners of their past. They tend to blame each other for past atrocities. The study explained how architecture can play a major role in turning people's attention from what has been, which is war and division, to what should be, which is peace and unification. For example, after tearing down the Berlin Wall followed by the reunification of Eastern and Western Berlin, a coordinating committee of district planning officers was designated with a balanced participation from the East and West on the aim of planning the wall area after the reunification. The notable thing is the presence of the Wall in all the plans that were created after reunification. The reason was the consideration to preserve the memory of the wall; by locating landmarks; leaving walkways and bicycle paths along the border strip; and preventing temporary uses along the border zone. In other words, the designers did not erase the past; they managed the division by transforming it from Bwhat it was^ to Bwhat it should be^; that is, an urban space that hosts functions for both sides of the previously divided city, Berlin (Caner and Bölen n.d.). In case of cities which became divided during and after a war by real walls just like the previous example, or by barriers in the minds of their inhabitants, people usually become isolated in different communities located in different parts of the city. When the war ends, planners are advised to focus their attention on the possible role of the border areas between these parts of the city as a safe shared space that could function as meeting grounds for people of each side to interact with each other. To overcome these mental borderlines in the minds of people, it is recommended to construct buildings with high symbolic value for both sides, and those in charge of the planning have to avoid the trend of building something new which intends to symbolize that change has taken place or to insult second party, simply because this could lead to more violence in the future (Junne 2010). These guidelines seem to be based on psychological aspects by considering the emotional side of city inhabitants after wars, or may lead to psychological effects but it is not clear whether these aspects are intentional or not. This study, Curr Psychol though, sets a good example of how could mental health

aspects and considerations be practically added to the urban design process with the aim of designing better, more sustainable spaces for affected societies.

Conclusion and Discussion

A historical relationship between health and urban design has emerged and disappeared as the disciplines drifted toward and away from each other to finally meet again in the early twentyfirst century. While it is clear that no relationships between mental health and urban design were noticed before the late twentieth century, the mentioned cases of integration between urban design and other health sectors in this review can be looked at as steps that led to the urban design/ mental health sector relationship in the end. The same logic can be applied on the usage of the natural environment elements in urban design, as they drew the attention to the importance of these elements, which could be the first unintentional step towards the mental health\urban design relationship as the elements of the natural environment are an essential part in this relationship as we know it today. In other words, as a combined understanding, the disciplines of public health and urban design have been of help in combat epidemics due to pollution and infectious disease. Today's public health problems such as mental health disorders can again be addressed by this multidisciplinary confluence. This hypothesis is supported by many recent empirical studies in psychology and urban design which give a general acknowledgement that the environment has an epi and ecophenomenal impact on mental and physical health, however, the features of environment that may affect mental health and any theories regarding this matter need to be empirically verified. Along with new discoveries about epi- and ecophenomenal impacts on the brain, body and even genes, it seems legitimate to say that better understanding the mental health\urban design relationship, can be helpful to design for a better living environment. In addition, the gap in knowledge regarding the aforementioned relationship when it comes to PTSD should be covered with epidemical studies as understanding the effects of both the natural and the designed environment on people living with PTSD could have considerable results in urgent cases of urban design such as post-war reconstruction where special measures for mental health should be considered.

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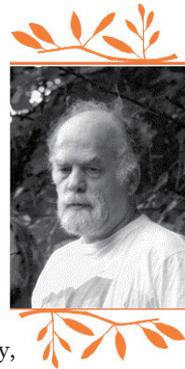
Studies: psychology at UJEP Brno (1965-68), University of Colorado at Boulder (1968 - 70), later economics (VŠE Praha, UK Bratislava).

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Since 1994 till 2017 lecturer in human resources development in MBA programs at Brno Business School.

Since 2016 till 2018 lecturer in selected topics in cognitive psychology at UNYP in Prague, presently again at School of Social Studies MU Brno.



Psychology in architecture and city planning

1 – The contribution of both professions

Architecture, city planning: skills to produce building & construction projects; translating functions, required by investors into a 3 D space & visualizations; combining rational functions, economics and aesthetics into a project; balancing surrounding environment (ecology) features and the projected creation together.

Psychology, sociology: training one's own sensitivity to "feel" (intuition); understanding the social context requirements; understanding the functions of the space; developing observation, listening and communications skills; negotiations: finding the balance between competition and co-operation of all parties involved (investors, neighbourhood e.g. society, authorities & political parties); focusing on emotional impact of the project, clarifying the vision of the future city; city as a ground for training social skills (socialization) – understanding one's own identity.

2 – Does the co-operation of architect and psychologist result into higher quality projects?

Yes: it results into a lively and richer human city environment; involves a larger number of societal segments into an active social life and well-being.

Examples: William H. Whyte, "Projects for a Public Spaces" Manhattan, Jan Gehl and his followers.

Methodology of social research (namely action research).

3 – Mutual relations between human mind and the environment compose a feedback cycle of causes and effects with better or worse outcomes.

4 – Overcoming barriers – what should be done.

During studies, getting the information about the content of the other profession is not enough. We need to share and to train practical skills during joint workshops: patient observation of the place, society and processes, taking place there; listening and communication; understanding the explicit as well as the implicit (hidden) interests ("territories") at play. Finding a common (higher level) interest of

all parties in eventual conflict – mediation, conflict resolution. Training a multilevel imagination in creation of the mobilizing urban visions.

We answer four typical questions in the presentation:

1 – *What are the specific contributions of both professions*

Architecture, city planning: skills to produce building & construction projects; translating functions, required by investors into a 3 D space & visualizations; combining rational functions, economics and aesthetics into a project; balancing surrounding environment (ecology) features and the projected creation together.

Psychology (sociology): if needed, skills to serve as a self-tuning device; training one's own sensitivity to "feel", experience (intuition); understanding the social context requirements; understanding the functions of the space ("territorial behaviour"); developing observation, listening and communications skills; negotiations: finding the balance between competition and co-operation of all parties involved (investors, neighbourhood e.g. society, authorities & political parties); focusing on emotional impact of the project (what do we put into motion?), clarifying and focusing the vision of the future city; planning the city as a ground for training social skills (socialization) of a new generation – understanding one's own identity and extending the cultural traditions (history).

2 – *Does the co-operation of architect and psychologist result into higher quality projects?*

Yes: it results into a lively and richer human city environment; involves a larger number of societal segments into an active social life and well-being, fights social pathology.

Examples within my own generation: William H. Whyte, "Projects for a Public Spaces" Manhattan,

Jan Gehl and his followers.

Also, the methodology of social research (namely action research) is being proposed to use.

3 – *What is the mutual relation between human mind and the environment?*

Both compose a fundamental feedback cycle of causes and effects with better or worse outcomes – in the case of an individual (developmental) as well as in an evolutionary sense (socialization). It impacts all psychological processes – cognitive (perception, thinking – judgment, emotional experiencing, motivation – see also ad)1.

4 – *What should be done to overcome barriers between disciplines?*

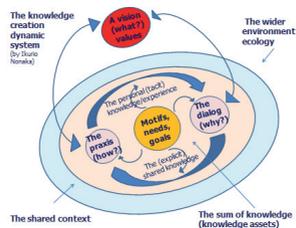
During studies, getting the information about the content of the other profession is not enough. We read about a lot of things without understanding them. We need to share and to train practical skills during joint workshops: a quiet, patient observation of the place, people and processes, going on there; listening and communication; understanding the explicit as well as the implicit (hidden) individual /group interests at play (“territorial behavior”, proxemics). Finding a common (higher level) interest of all parties in an eventual conflict – mediation, conflict resolution. Training a multilevel imagination to create and to share a mobilizing urban vision.

These skills, however, are usually learned by imitating Masters – and there are not many around. Schools are usually more proficient in sharing knowledge, then skills. From the point of view of a teacher, there is more effective “one to many” than “one to one” relationship in sharing the information, as well as assessing how well it was learned. The memory is also a short one. From the point of view of the learner, to acquire skills needs much more effort: repeated trials, feedback, overcoming frustration – a long time and perseverance. In the case of many advanced skills – a real lifelong process.

Some of the skills, which the professional architects/urban planners as well as psychologists need, can be (and are) trained in the school, in advance. Some of them, not to be just a “school cases”, however, require a real-life setting. Then we need the schools of architecture as well as schools of psychology to apply for grants to solve a real social/city problems in the neighbourhood together. This all requires good, personal and working relationships between personalities in both academic domains, as well as city administrations (departments of social work, city police, city architect, strategic development) as a project “investor” – to understand the joint profit well. The financial resources for such projects must be allocated as a separate, not to compete with those, devoted to architectural competitions. On the other side, it also means, to

consider into what school program such a joint project is to be placed. According to my experience, the M.A. level would be a good try – a well prepared elective course, with a majority of hours devoted to a field work, outside of a classrooms. Two course leaders, supplied by each school. Credits, for the course work, must be accepted by both schools. The most productive, of course, would be to have few PhD students, solving together some real city projects, resulting in so much needed publications. The result – a real problem-solving experience using one´s own discipline, the development of not only professional and social skills, abut also mutual business connections and friendships – so much needed in a real life.

If you succeed to introduce (support) such a process in your own town, you will create a self-reinforcing mechanism, which will make, as a consequence, your town richer and happier and the professional more useful.



All things considered, there are few universities lucky enough, to have personalities such as William H. Whyte of Jan Gehl at hand. Hopefully, there are few around, who take their academic life-time missions seriously and generate graduates of this kind. Our hopes for the future. Look around, who are they?

Marek Malůš

Marek Malůš is the Head of Psychology Department at the Faculty of Arts of University of Ostrava, intensively researching restricted environmental stimulation since 2010, conducting experimental studies in collaboration with the Faculty of Medicine of University of Ostrava since 2015. He has acquired the doctor's degree at Palacký University in Olomouc in pursuance of conducting the first systematic research of restricted environmental stimulation in the Czech Republic. Since 2007, he has undergone several stays in restricted stimulation environment himself (7 days, 3 days and 14 days stays), occasionally works as a caretaker/therapist at two darkness therapy providers. He has been in professional contact with REST research Nestor, professor emeritus Peter Suedfeld from the University of British Columbia, since 2015. He has undergone five-year-long accredited training in dynamic and interpersonal integrative psychotherapy and has been presenting the topic of restricted environmental stimulation at local and abroad professional conferences in the form of original experimental studies, chapters and monographies. In November 2018, he was awarded the rectorial award for scientific-research workers under 35 for his research efforts.



Environment where there is none

The Restricted/Reduced Environmental Stimulation Technique/Therapy – REST – is an experimental therapeutic method and has two basic variations in the present concept, which are Chamber REST and Flotation REST. Its origins date back to the 1950s and were originally associated with research of perceptual isolation, sensory deprivation and social isolation. Alternative names “Darkness therapy” or “Dunkeltherapie” are used for various modifications of the Chamber REST type. When applying the Chamber REST, the person stays alone in a chamber or, rather, an apartment (most commonly an antechamber and the main “living room” chamber). Basic equipment like bed, armchair and sanitary facilities are always available. The person is in an environment of reduced stimulation (complete darkness, substantial silence and solitude). Food and drinks are provided to the person according to his/her needs on a daily basis. The individual usually remains in this space for several days or longer (most often for one week, sometimes even for its multiples), and is (or should be) provided with therapeutic support.

The majority of chamber REST research studies were carried out in the United States and Canada during 1970 and 1980 (especially habit modification and addiction treatment with the focus on smoking cessation) but new research has been conducted in the Czech Republic since 2010. This research found a positive influence of a week-long darkness therapy stay on existential meaning in life, mindfulness and self-esteem (significant increase in all mentioned) as well as on psychopathology symptoms (significant decrease in majority of scales measured by Symptom Checklist 90) among healthy adults.

The most recent research was focused on a qualitative analysis of a case study material of participants who have experienced a week-long darkness therapy stay in the Czech Republic. The main research objective was to assess whether participants in the study made essential changes in their lives due to the chamber REST stay, and also to describe which particular changes were made. In this context, researchers investigated an effect of the restricted environmental stimulation as perceived by the participants. Another important aspect was the dynamics of the experience that created space for change, which meant focusing on the process itself. The next goal was to look for parallels between established therapeutic approaches and the REST procedure. It was the focus on the psychotherapeutic process triggered by effective therapeutic factors that was the main interest.

Due to the type of research questions, a qualitative approach was chosen, namely the design of a multiple case study. Besides the detailed examination of individual cases, a mutual comparison of participants' experiences and effects was also carried out. The chosen design can be referred to as a collective instrumental study because the analysis of individual cases does not primarily serve to understand the individual, but to understand the therapeutic potential of so-called Darkness therapy in particular. The study involved 32 participants (15 women and 17 men) who underwent a week-long Darkness therapy stay in the past years. The average age at the time of the interviews was 46.6 years (Min = 23, Max = 76), and during the stay in the darkness it was 42.6 years (Min = 20, Max = 72). A detailed semi-structured interview was conducted with each participant. The following was found: most important motives for undergoing this variation of chamber REST were curiosity, challenge and experimentation, rest, stress reduction, self-awareness and personal development, and spiritual ambitions. As for the main dynamic aspects of therapeutic process of participant experience, these factors were found most important: awareness raising, environmental change, relationship and life/value recapitulation and confrontation with the problem. Mostly mentioned effects of Darkness therapy stay were: rest/calming down, positive influence on self-concept, reassessment of attitudes, positive change in important relationships and spiritual experience. It has been concluded that therapeutic factors identified during the Darkness therapy process are compatible with the therapeutic factors of the main therapeutic approaches (e.g. psychoanalytic and psychodynamic psychotherapy, person-centered approach, gestalt psychotherapy, cognitive behavioral therapy and more). Methodology and results of this study are much more in-depth described in a book *Terapie tmou: Katamnestická studie* by Kupka, Malůš and Charvát published in 2019.

Research history (perceptual isolation and sensory deprivation) has shown quite strong and often unpleasant impact on actual cognitive and emotional processes. Later, REST research has risen first therapeutic hypotheses as a result on chamber REST stay lasting for circa twenty-four hours (as well as for repeated flotation REST procedures lasting for circa one hour). Also, new research investigation in a specific variation of chamber REST – so-called Darkness therapy – implied new hypotheses on therapeutic use of chamber REST stays lasting approximately one-week long. These hypotheses are worth and in need of more detailed examination.

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Michal Matloň

Michal studied applied psychology at Comenius University in Bratislava. He explores how architecture and environment affect our thinking, feeling and behaviour. He contributes to creation of spaces enabling people to be healthier, feel better, create communities, and fulfil their potential. Michal currently works for a real estate developer HB Reavis, where he advises on human-focused design principles. In the past, he also worked in the fields of technology, photography, journalism and branding, creating a pool of multidisciplinary knowledge he uses today.



What psychologists can say about office design

In today's office design, there are multiple pressures influencing the decisions about workplace design. There's a constant cost-saving pressure by operational and finance people, often focused on short-term financials. There are the managers, voicing the needs of their departments, as well as projecting their own ideas about how a workplace should look like. Then there are the architects, bringing their creative and problem-solving input. For a psychologist, coming today into this already lively discussion, there's a question – how to fit in here? Although we are still creating (or rather re-creating) our role in architecture and design, there's a lot we can contribute. We can help create spaces where people will feel better, have better mental health and even do a better job at their work. Our knowledge can benefit both the people and companies employing them. I will show you what are the topics and problems you can help solve as a psychologist and inspire you with practical examples of how psychology can be applied in office design and architecture.

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For a psychologist, coming into this already lively discussion, there's a question of how to fit in there. Although psychologists are still shaping their role in architecture and design, there's a lot they can contribute. Through understanding human needs and workings of their brains, they can help create spaces where people feel better, have better mental health, are more productive and even creative.

Here, I want to show you examples of topics where psychology has a lot to say, when it comes to designing workplaces:

1. Privacy and focus

Focused work is a necessary part of today's intellectual and creative work. But being able to pay attention for an extended amount of time has become rare in the world of offices without walls and attention-grabbing communication tools. The role of psychologists is to show the importance of focus for productive work and employee

satisfaction, and to explain what people need to focus and how to build spaces which enable concentration.

Focus also relates to the need for privacy, which in offices doesn't only serve as a tool for concentration, but also as an opportunity for mental rejuvenation, thinking and even high-quality collaboration through group privacy.

2. Territoriality, proximity and density

With real-estate costs rising and pressure for cost-saving increasing, people's personal space in today's offices is often endangered. This can lead to higher emotional exhaustion, dissatisfaction, and in the end, companies losing more money through their people than saving on the space itself. The role of psychologists in workplace design is to explain people's need for personal space and control over it. This should lead to architects designing offices providing people with enough personal space and organizations supporting personalization, instead of fighting it in form of clean-desk policies.

Desk sharing (or hot-desking) is another trend which needs to be examined, its impact researchers and designers and managers provided with guidelines and knowledge about whether, in which cases and how to design, communicate and maintain shared desk environments.

3. Choice and control

Many managerial philosophies created in the last century and still being used today can trace their roots to Taylorism and managerial control of employees as one of their core values. However, with most of work shifting from factory into the office, as well as from mechanical to intellectual/creative production and services, these philosophies are losing their relevance.

Psychologists, whether in position of researchers or, even more importantly, consultants and advisors, need to find and spread evidence-based managerial techniques leading to employee satisfaction, intellectual productivity, creativity and long-term value for the society.

This is becoming especially important because of constant search for innovations which companies engage in today. Both on organizational and design side, giving up managerial control and empowering employees is getting backed by more and more evidence and an effective way to support creativity and innovation.

4. Biophilia

Human evolution and its impact on how our brain works translates into a broad pool of knowledge in biology, psychology, cognitive and neuroscience. One of its implications for office design is called biophilia (or biophilic design). It seems that biophilic measures can contribute to decreasing stress symptoms, as well as enhancing cognitive performance and mood. This topic is becoming quite popular today and while mainstream knowledge about biophilia mostly stops at incorporating plants or natural colours into office design, we know that it can go deeper than that.

There are multiple evidence-based patterns of biophilic design identified, each with more than a dozen possible ways of implementing it. These include using natural materials, patterns, shapes (natural geometry like fractals or smooth curves), working with light and water, as well as creating specific types of spaces for stimulating different emotional experiences.

These examples are far from a complete list of areas where psychologists can make working environments better for people. However, they illustrate their relevance for this field and aim at encouraging psychologists to become active not only as researchers, but also as consultants to architects, designers and managers, where their knowledge is most needed.

Jana Merhautová

Mgr. Jana Merhautová (born 1964). A founder and director of the Eco Art Therapy Institute Private practice: Art psychotherapist, supervisor, lecturer of accredited courses and training. The academic education at the Charles University of Prague, at the Faculty of Humanistic – graduated the Master's degree in Supervision. Psycho-therapeutic education in the field of art therapy: a deep-oriented psychotherapy focused on art therapy. The Institute of Global Education -



Applied Eco-psychology - Project Nature Connect USA - the Ph.D. study programme. Foundation of accredited educational institution with many programs for social services (in 2008) accredited by The Ministry of Labour and Social Work of The Czech Republic and by the Ministry of Education of the Czech Republic with training programs focused on Eco Art Therapy and Eco Artefiletic (awarded Trademark by Industrial Property Office). She works with the ECO ART principle, which is an innovative psycho-therapeutic direction, based on an artistic way of self-expression in nature, strong experiences in it, and imaginative psycho-therapeutic techniques. Member of the Committee of the Czech Art Therapy Association with guaranteed membership, where she is also an accredited supervisor. Member of the EUROTAS European Transpersonal Association, included in the National Register of the Independent Social Services Experts. Externally, she teaches at the Faculty of Humanistic Studies of the Charles University in Prague "Creative Approaches in Supervision" and at the Faculty of Arts " Author's work as a Psyche Projection Screen". Currently she is preparing a project called the "Psyche Wellness" in the National Park Czech Switzerland.

The threat of social destruction

"Most people do not really want freedom because freedom involves responsibility, and most people are frightened by responsibility." Sigmund Freud

" Civilization began the first time an angry person cast a word instead of a rock"
Sigmund Freud

Since 1984 technostress and technosis have become a new social paradigm in the world. It is defined by American psychotherapist Craig Brod. These terms are associated with unhealthy behaviour in connection with new information and communication technologies. This includes both fear of technology and its impact on the physical and mental health of humans, but also dependences on these technologies. Overuse of mobile phones, computers, laptops, and the strong need to be always connected to the Internet carries the risk of losing our personal identity. At the same time, it teaches us to do many things at the same time, browsing among icons, which greatly overwhelms our attention and increases stress, ultimately weakening the psyche. Common symptoms include headache, insomnia, anxiety, mental fatigue, depression, eyestrain, frustration, irritability, and a loss of control.

The World Health Organization (WHO) calls stress the twenty-first century epidemic. The more stress is accumulated, the more illnesses are presented such as heart attacks, cancer, various mental illnesses.

Anxiety and depression cost the European Union € 170 billion per year. Around 80 million Europeans live in a very noisy environment. Natural silence has become one of the most endangered sources on our planet. Since 2000 we have officially become an urban species. According to the United Nations statistics, the world's urban population has risen from 746 million in 1950 to 3.9 billion in 2015. We consume media, new technologies and suffer from their overuse.

Our excessive separation from the nature is disproportionate, unreasonable and meaningless. We have been affected by the loss of the natural values, we have lost the ability to appreciate that we can breathe oxygen, drink clean water, enjoy tree shadows in hot weather and their ability to create natural oxygen circle, greenery is such a remedy, etc.

It is influenced by destructive patterns, spread by advertising or fashion trends.

The health information institute statistics and statistics of the czech republic are alarming.

In 2017, 2 924 000 psychiatric examinations were performed, which is 33 983 more than in 2016.

During this period the number of patients increased by 11,117. In total, there were 652 780 patients.

Every year in the Czech Republic about 1400 people commit suicide, is an average of 4 suicides per day. In the Czech Republic, according to this statistic, suicide is the second leading cause of death among young people aged 15-24. Worldwide it is 800,000 suicides cases per year (according to the World Health Organization).

In 2017, there were 59 274 hospitalizations, while only 4% of people did not need an additional care.

Of the total number of psychiatric hospitalizations, 4.7% of the children were 0-14 years old. The average treatment period in psychiatric inpatient facilities reached 57 days, in psychiatric wards in hospitals 16.6 days and in psychiatric hospitals is 81 days.

A high number was also reported concerning people with psychiatric diagnoses and their incapacity to work. Of the 41,941 cases, two-thirds on sickness leave were women. Women on average took 10 days longer one case of work incapacity than men, is 88.0 days.

Worldwide research and innovative solutions

In some countries, they have already started to focus on the impact of civilization stress and have begun looking for healthy, innovative solutions. The Forest therapy is becoming popular. Its effects on health are manifested, for example, by lowering blood pressure, blood sugar levels, reducing stress, improving cardiovascular and metabolic health, improving concentration and memory, reducing depression and aggression, boosting the immune system, increasing the production of anticancer proteins, activating energy, etc.

New Zealand has been involved in “green therapy” for long, and since 2009, the US National Park initiative has joined this initiative with over 150 forest therapy programs. In 2015, the United Kingdom and Ireland also joined the Green Therapy and the National Health program. One of the most ambitious forest medicine programs is

practiced in South Korea. Its government spent over \$ 14 million to build the National Forest Therapy Center and it created thirty-seven state recreational forests.

In Japan, Nippon Medical Scholl, Associate Professor at the World's leading Forest Therapy Expert Dr. Qing Li became very active in this area. In 1982, he founded the National Forest Therapy Project "Shinrin-Joku". In 2006, the Akasawa Nature Park was declared a site suitable for forest therapy by the Japanese Forestry Authority (a year later, Kisu Hospital. Iijama became the first area in Japan to be Shinrin-Joku certified. Currently, there are 62 bases, which have been authorized for the forest therapy in which therapeutic properties have been demonstrated.

In the czech republic was founded **the eko art therapy institute z.s.** (2016)

Mgr. Jana Merhautová is a founder, MUDr. Pavel Kozlík (psychiatrist) is an expert supervisor. The mission of the Institute is to spread the EKO ART METHOD in the field of psychotherapy, education and supervision. The concept is based on a strong personal experience in nature, creative art of psychotherapeutic work. It links the art therapy with the ecopsychology and the transpersonal psychology.

Emphasis is placed on empathy, self-empathy and work with the 54 senses according to Dr. Cohena.

“The only important thing is to follow nature. A tiger should be a good tiger; a tree, a good tree. So people should be people.” C.G.Jung

The aim of the Institute is to build a sanatorium with a crisis center in the wild nature.

At present, the Institute's activities are based on the eco-arts residential therapy programs for adults, families with children and supervising educational programs focusing on the eco-arts principle.

THE EKO ARTS METHOD works with the projection of the psyche into an author's artistic creation, externalization of traumas, exposure of the unconscious map and ritualizing mental processes. It is a multilevel technique, it works with genetic predispositions, transgenerational transfer of traumas, influences of gender patterns, exposure of psychic map, role dramatization. It is based on the psychological development of a client, his / her personal experience, education and relationship patterns, reaction to stress, ability to overcome obstacles, functioning of his/her defense mechanisms, and compensation. At the same time, it helps to discover one's

own resources, competences, talents, values, but also the spiritual dimension of life and the meaning of one's own existence.

Art therapeutic stay in the nature

Staying in the nature relieves stress, reduces anxiety, slows down an over-accelerated pace, detaches us from worries, can bring us to different thoughts. A Therapeutic support helps in long-term unresolved stress, anxiety, phobias, insomnia, eating disorders, panic attacks, etc.

Eko arts method

It takes place in any weather, in all seasons, at day and night.

It strengthens the ability to rely on ourselves, creates a training experience in the natural environment. Exposure to natural stress conditions reinforce competences and responsibilities for one's own health.

It extends the sensory perception (working with the 54 senses and sensibilities, according to Dr. Cohen). Some of the 54 senses, such as feeling temperature and temperature changes, the sense of near or far distance, the sense of physical location, the sense of navigation, the sense of time and rhythm, the sense of self-visibility or invisibility and subsequent camouflage, the sensitivity to touch through the skin, the sensitivity to gravity, the sense of knowing and surrendering excessive stress. Our senses consciously register what we feel and we learn to name it. We use focusing and participation in the environmental health. The connection of the psyche with the network of life in the nature heals and restores our natural senses, self-healing processes, it transforms and integrates our disorders, and it heals our relationships. Natural mapping takes the form of Grokking. It is an effort to understand oneself and the surrounding intuitively or with empathy, to gain a greater sensitivity. By doing this mainly in the nature, the relationship with the nature is strengthened and the nature is understood as our second body, home, etc.

With the EKO ARTS principle, the landscape becomes an art studio through which the conscious and unconscious parts of the psyche are depicted. These are displayed both in creative activities and in the projection screen provided by the landscape. It has an inspiring dimension, enhances creativity, imagination and work with the symbolic level of the unconscious. Intuitive art creation in the nature brings

an opportunity to discover a new dimension of art in itself. There are a plenty of art materials in the nature that can be experimented with and some of our limits can be pushed further.

How does the institute contribute?

Treatment programs are based on taking personal responsibility for own physical and mental health. It puts energy and hope in the family's restoration through preventive-educational and therapeutic programs for parents and children.

Is there a light at the end of the tunnel?

We need to see social destructive patterns where the main trends are set by the entertainment industry, business, top sports, and social prestige. We need not to accept corruption, manipulation, tough business, a toxic food industry, overconsumption, garbage, perverse technology.

It is up to us how this story turns out. If we change ourselves and realize the true values, if we gain empathy for home and acknowledge animals as living beings, their right to life, if we admit the reality and start acting as adults, we have a chance. If we change the adolescent way of living our lives in an adult kind of living life, we will not die for fun or its immature consequences.

Ricardo García Mira

Ricardo García Mira is a Full Professor of Social Psychology at the University of A Coruna, Spain, where he leads the People-Environment Research Group from 1995. He has conducted applied research in environmental issues during the last 25 years. He is also a Visiting Professor (2016-2020) at the Institute for Policy Research of the University of Bath, UK. He was elected as a Fellow of the International Association of Applied Psychology (IAAP) in 2018, and he was invested



Doctor Honoris Causa by the University 'Alexandru Ioan Cuza' of Iasi, Romania, in 2018. Recent finished research: Funded by the European Commission FP7 and Horizon-2020 programmes, he has been the Project Coordinator of the GLAMURS project (2014-2016), as well as the LOCAW project (2011-2013), and a partner of the TRANSIT project (2014-2017). Current research: He is a partner in the European research Consortia: CONNECTING on Nature Based Solutions for Cities, and SMARTEES on Energy Efficiency and Social Innovation. He was the President of the International Association for People-Environment Studies (IAPS) (2014-2018) and he is the current President of the Institute for Psychosocial Research and Studies "Xoan Vicente Viqueira". European Editor of the Journal of Architectural and Planning Research. In the last years he was elected a Member of the Parliament of Spain (2015-2019), where he was the Spokesman in the Commission for the Study of Climate Change.

The Integrating Path of Environmental Psychology and Environmental Policy in Transitions towards Sustainability

Creating environmental knowledge among citizens and stakeholders who meet policymakers is not easy for social psychologist unless it is through a process of promotion of public participation. This paper summarizes the different requirements for relevant social actors in the integration of environmental psychology and environmental policy. That is, for researchers, they should reform the educational system of universities and research centres, as well as establish a new paradigm of knowledge development. For policymakers, they should change their configuration of politics and create a suitable space for innovation and social participation, where transformative social innovation can emerge, as a result of the creative processes arising from the encounter of the different actors. For other social actors, they should participate in policy making process actively and make suggestions from their unique knowledge.

Keywords: Environmental psychology, environmental policy, sustainability, integrating path, public participation.

Connecting research and policy

When one thinks of the role a social psychologist should play, what immediately comes to mind is work in social groups, with communities and society; this is political work, where there are many players, and where numerous social and human dynamics arise that have to be taken into consideration. Our responsibility as researchers is to transmit to professionals in psychology, and also to those in political sciences, these keys that should contribute to action, based on the results of psychosocial research. And yet when one attempts to connect research and policy, the first thing one notices is that it is not an easy task. Thinking in terms of the practical application of a scientific discovery is not difficult for the researcher initially designing his/her experiment or performing his/her analysis and exploration of social reality. What is difficult, however, is starting the implementation process through which the research results

actually become the real counterpart of research investment made by citizens by means of the tax they pay. They expect a return in the form of concrete actions, in the form of learning, or in the form of guidelines and recommendations for political action.

Politicians and public administrators need the existence of a strong link between research and policy. Otherwise, political action is more complex and it becomes difficult to achieve the goals of social responsibility that lead to improving the welfare of citizens. We are not referring to a rhetorical link, but a real link in the form of practical engagement, considering that political action should be rooted in knowledge based on social science, and should recognize, moreover, the need to base decisions in research on how communities work, and the need to consider the contribution that civil society - in its many forms of organizing and manifesting itself - makes to the generation of the knowledge base.

There are several arguments that explain the problems that universities and research centres suffer and which constitute real barriers to the implementation of research results. On the one hand, socio-environmental problems, which in order to be addressed in all their breadth, must go beyond specialized disciplinary analysis, which is detrimental to an inter-or trans-disciplinary analysis. Furthermore, if problems are multidimensional, solutions should be too. Thus, the transfer of research results to social and urban practice, and to environmental policy, as well as the exploitation of public resources, requires a comprehensive strategy and not just focusing on a single source of obtaining knowledge.

The conversion of research results into practical and useful results in everyday contexts raises issues that question the very educational system of universities and research centres in two different ways: (a) Firstly, the problem highlights the need for a transversal program for learning to work under an inter- and trans-disciplinary model; (b) In addition, a new paradigm of knowledge development is needed, starting from methodologies that integrate the citizen, the user, the politician and the stakeholder within a comprehensive system of co-generation of knowledge. Regarding the first point, this refers to reconnecting science with its primary objective, which is the systematic generation of well-structured knowledge through observation, reasoning and experimentation from disciplines working in cooperation and attempting to explain the functioning of phenomena via hypotheses, laws, theories and systems. I would like to emphasize that the trans-disciplinary element here refers to

the joint work that generates new knowledge and goes beyond a specific discipline. Regarding the second point, the emphasis is also placed on the co-generation of knowledge; however, not from disciplines, but rather from entities and people involved and interested in applying and obtaining social benefits from the results of an investigation.

Learning to research together: from multi-disciplinarity to trans-disciplinarity

In general, as Rathzel (2008) pointed out, the academic world has adopted disciplinary (e.g. specialized academic disciplines), multidisciplinary approaches (e.g. specialist disciplines work in a team but remain independent in their contribution to the solution of a real-world problem through the input of their own disciplinary concepts and methods), and interdisciplinary approaches (e.g. the mixing of disciplines). This means that each discipline usually works in a self-contained manner and while there is an attempt to share and integrate, it is only through transdisciplinarity that the focus shifts towards integration at a disciplinary level that creates new knowledge (probably involving lay perspectives), perspectives and insights.

Although there is no consensus on the meaning of transdisciplinarity, we can, however, identify some characteristics in trans-disciplinary research which allow us to identify this approach. As Lawrence and Després (2004) and Després (2005) pointed out, *transdisciplinarity* as a mode of knowledge production: a) *Challenges knowledge fragmentation*. It deals with research problems and organizations that are defined from complex and heterogeneous domains; b) *Is characterized by its hybrid nature, non-linearity and reflexivity, transcending any academic disciplinary structure*; c) *Accepts local contexts of research and uncertainty*; d) *Is the result of a research process that includes the practical reasoning of individuals with the constraining and affording nature of social, organizational and material contexts*; e) *Is action-oriented*; and f) *One of its aims is to bridge the gap between knowledge derived from research and decision-taking processes in society*.

Knowledge also needs to involve citizens, policymakers and stakeholders towards a conceptually different approach, aimed at decision-making, and which incorporates

social innovation as a key element. Knowledge co-production involves not only the coming together of actors with different opinions, agendas, languages and expectations, but it demands a consensus on new governance models, discarding those that are guided by criteria of *experience*, in favor of innovative models of participation for building up community policies.

There is a key difficulty that emerges as a barrier to the integration of scientific knowledge into specific policies that give rise to social action: (a) the lack of interest of policymakers in research in general. They appear to be more interested in knowledge based on experience than in knowledge that is scientifically sustained; (b) the lack of interest among researchers in the possible impact their research could have in the political arena; and (c) the lack of an effective (and bi-directional) communication for building bridges between languages, agendas and interests.

The impact of psychology in environmental policymaking

In recent decades, in Europe and North America, there has only been a modest impact of psychology on environmental policy-making. Some general reasons for this have been already discussed by Stern and Oskamp (1987) and by Vlek (2000). Among these reasons, we could say that many policy-makers are technologically optimistic and prefer “hard” data, while the conclusions from psychological research are often seen as too “soft” and seemingly less reliable than technical and engineering reports.

The problem in understanding sustainability as a set of actions contributing to the development of a social and economic system, balanced with nature, requires certain basic assumptions. On the one hand, an analysis from a trans-disciplinary perspective is necessary, based on the generation of new knowledge, proposals and approaches informing several scientific fields, as well as several groups from the government, NGOs, CSOs and citizens in general. On the other hand, a previous identification and analysis of the conflict of interests in the use of existing natural resources is required, both between different groups and between the individual and the social framework (Breiting & Mogensen, 1999). This analysis allows us to see how sustainability responds to a construction of social and spatial reality, which starts from a set of interpretative frameworks, built in reply to the action of several agents influencing the maintaining of that state of representations that favours their own interests, related to territory, the use of the land and the exploitation of natural resources.

Lawrence & Després (2004) and Uzzell (2008) pointed out, however, several reasons to explain the difficulties that arise in the study of sustainability: (a) its complexity; (b) the compartmentalization of scientific and professional knowledge; (c) the sectorial division of responsibilities in contemporary society; (d) the increasingly diverse nature of the social contexts in which people live, and (e) the lack of effective collaboration between scientists, professionals and policymakers, which has led to a gap in applicability to sectors that deal with both the natural and human-made environment.

Conclusions

The role of Environmental Psychology in giving responses to key societal challenges is becoming more widely recognized within the broader field of Environmental Sciences. A number of research areas are very useful in providing both conceptual frameworks and methodologies for exploring human-environment interactions: (a) Research on the experience, meaning and management of the urban and organizational space, with its policy implications; (b) The development of public participation models for decision-making in the planning and management of sustainability; (c) the analysis of human factors involved in transitions to sustainable societies; and (d) the study of psychological processes involved in spatially and temporally situated human behaviour. All of them have been an important matter in European environmental psychology over the last decade. We analysed different research aspects trying to contribute to building up theoretical frameworks which allow the advance of knowledge about sustainability (i.e. LOCAW, GLAMURS, TRANSIT, CONNECTING...7th and 8th Framework Programme of the EU). The advantages of inter- and trans-disciplinary collaboration in solving the multi-faceted problems of climate change have been clearly underlined. These projects try to contribute from environmental psychology to develop a fresh and stimulating dialogue not only with other social sciences (economics, sociology etc.), but also with other hard sciences (e.g. engineering), tackling issues of sustainability from different perspectives, and introducing a reflection on issues of power in the production of knowledge, with normative implications for how the search for solutions should be structured.

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Ana Mirea

Ana Mirea, now based in London, graduated from “Ion Mincu” Faculty of Architecture and Urbanism of Bucharest-Faculty of Architecture in March 2016 but also studied for a semester as an Erasmus student at Università Degli Studi di Palermo, Facoltà di Architettura, in 2014. Currently, she is a Ph.D. Student, at the same university where she graduated from, with a thesis entitled *The Influence of the Built Environment from Childhood on the Brain*, under the supervision of Ph.D. Arch. Dorin Stefan and Ph.D. Andrei Miu.



The Influence of the Environment and the Brain

The aim of the workshop is to find correlations between the environment that one grew up in and the future architectural preferences. Our research will be based on two questionnaires, one related to their childhood environment and the other to their current preferences. The influence of the environment (both built and natural) they grew up in is essential to their future as humans, as it shapes who they are. Major differences are dictated by the culture and traditions of each geographic area. The diversity of human behaviours is fascinating, their metamorphosis from one region to another, determining the variety of habits and behaviours. But what makes people unique is, in fact, their differences, the ones that come from our different backgrounds. We dwell to the extent that we preserve the essence in things, build, as far as we are able to preserve the essence, this means being authentic and striving to preserve our cities and natural habitats. Heidegger states that architecture should be like a bridge, who unites two banks of a river, subtle enough, but meaningful and capable of enhancing the beautiful qualities of the scenery. Are we creating bridges for future generations, to inhabit our Mother Earth?

As an architect, how do you know what are the architectural preferences of the person you need to design the house? It is a great responsibility you are engaging in. The house is “something” very personal, very intimate, is the space where one spends a great amount of time. How this home should look like? It is a great responsibility for an architect who knows little about a person, to begin the design. His design will be based on his knowledge acquired during all the years he studies and practiced architecture, but it might not fit the personality of the does not know the future.

How can we understand the true impact the architecture has on our brains, personalities and future architectural preferences? The answers should come outside the fields, as architects might have the tendency to be absorbed into their own thoughts and dogmas, and not see unbiased what it is in fact important.

House as a Mirror of Self

House as a Mirror of Self is the name of a book written by **Clare Cooper-Marcus (1934)** is an American architect, in 1995. After more than 25 years of research, mostly

in the area of San Francisco, where she is based, she decided to write a book, about which is a compendium of testimonials, of people and their experiences with their homes, how they interact with them, and how they are transformed by them. She has this theory, that the house is a “mirror of our inner psychological self” [1]. It is more or less the same, as the famous quote of Winston Churchill, “we shape our buildings and thereafter they shape us.” Our journey in life starts with our childhood, and with the persons that rise use. Our blossom starts when we are little, and it all depends if our parents nourish our creativity, by means of manipulating the space we live in.

Architect's Childhood and the Influences on their Architecture

In 2015, at the Roca Gallery in London, Clare Farrow curated a very unique exhibition, titled *Childhood ReCollections*, interviewing 6 famous architects (Daniel Libeskind, Kengo Kuma, Nieto Sobejano, Denise Scott Brown and Zaha Hadid) about their childhood memories, and how they are still inspiring them in their architectural process.

Zaha Hadid is was born in Baghdad, Iraq, in 1950, and revolutionized the world of architecture, not only architecturally speaking, but also ideologically, because she is the first woman to receive the equivalent of the Oscar, the Pritzker Prize in 2004. Nowadays, the percentage of women and men in architectures schools is more or less the same, but in the seventies, when she attended the Architectural Association in London, things were much more different. She herself acknowledges the importance of her upbringings, as she received from her parents, an ever ending belief in her power to change things, by means of education, with a great accent on mathematics (which would later prove helpful to her in her parametric designs) which gave her wings to fly.

I remember when I was 7 and I went with my parents to Beirut to see some new furniture they had ordered for our home. I can still remember going to the furniture maker's studio and seeing our new furniture. The style was angular and modernist, finished in the chartreuse colour, and for my room there was an asymmetric mirror. I was thrilled by the mirror and it started my love of asymmetry. When we got home, I reorganized my room. It went from being a little girl's room to a teenager's. My cousin liked what I had done and asked me to do hers, then my aunt asked me to design her bedroom, and so it started. But it was my parents who gave me the confidence to do these things. [2]

Heidegger's Hut

In his lecture, for a school of Architecture, *Building, Dwelling, Thinking*, the philosopher Martin Heidegger questions the notions of building and dwelling, the role of architecture, and the more contemporary notion of sustainability. He asks three questions:

1. *Building is really dwelling.*
2. *Dwelling is the manner in which mortals are on the earth.*
3. *Building as dwelling unfolds into the building that cultivates growing things and the building that erects buildings. [3]*

His main idea, who changed the paradigm of architecture is that one must first have to dwell, in order to be able to build something. One first has to learn how to dwell, and then he will be able to build. And building becomes an expression of life. By building, one exteriorizes his feelings and believes. But how does this building must be done? He uses a metaphor, to explain the role of architecture. He says architecture should be as a bridge, which unites two waterfronts. This means architecture has a very specific purpose, functional, utilitarian, but on the other side, it should mould on the environment, it should have a very sensitive understanding of it, and once the building is built, the environment should be transformed, in a sense that its qualities should be intensified.

Jung and Psychoanalysis – Dreams and Architecture

Carl Gustav Jung's analytical psychology, is also known as complex psychology, because he thought complexes play an important role in one's life. The concept of complexes, led Jung to his discovery of archetypes, and they can appear in the so called slips of tongue ("Freudian slips") or in dreams. But what these concepts have in common with architecture? Architecture is a form of expression. By architectural means, one speaks about himself. Most often, people make unconscious choices regarding their houses, and they can become an important tool for the psychologist, to understand his or her personality. The childhood period it is a very important one, it is when our personality develops. If we are not encouraged by our parents to express it, also by manipulating the surrounding environment, we can repress our creativity, and this will impact our future architectural preferences. We will learn after something

which we did not have, and in fact is a part of ourselves that did not had the chance to be known. And this can express through different means. Some people are lucky enough to *build in stone*, their fantasies, as Jung himself does with his Bollingen Tower, other can only dream about an ideal house. It is fascinating to read, how Jung describes a dream he had, and then how he describes it, because he makes parallels between the human psyche and the storeys of a house. Parallels between architecture and psychology.

“It was in a house I did not know, which had two storeys. It was ‘my house.’ I found myself in the upper storey, where there was a kind of salon furnished with fine old pieces in rococo style...Descending the stairs, I reached the ground floor. There everything was much older, and I realized that this part of the house must date from about the fifteenth or sixteenth century. The furnishings were medieval... Everywhere it was rather dark. I went from one room to another thinking, ‘Now I really must explore the whole house.’... Descending again, I found myself in a beautifully vaulted room which looked exceedingly ancient...the walls dated from Roman times. My interest by now was intense. ... the floor. It was on stone slabs, and in one of these I discovered a ring. When I pulled it, the stone slab lifted, and again I saw a stairway of narrow stone steps leading down into the depths. These, too, I descended, and entered a low cave cut into rock. Thick dust lay on the floor, and in the dust were scattered bones and broken pottery, like the remains of a primitive culture. I discovered two human skulls, obviously very old and half-disintegrated. Then I awoke.”[4]

And he interpreted the dream “It was plain to me that the house represented a kind of image of the psyche—that is to say, of my then state of consciousness, with hitherto unconscious additions. Consciousness was represented by the salon. It had an inhabited atmosphere, in spite of its antiquated style. “The ground floor stood for the first level of the unconscious. The deeper I went, the more alien and the darker the scene became. In the cave, I discovered the remains of a primitive culture, that is the world of the primitive man within myself—a world which can scarcely be reached or illuminated by consciousness. The primitive psyche of man borders on the life of the animal soul, just as the caves of prehistoric times were usually inhabited by animals before man laid claim to them.”[5]

For all the writers quoted in this brief study, both for the field of architecture, as Clare Cooper Marcus, but also from the phenomenologist point of view of Heidegger, or from the psychoanalytical one of Carl Gustav Jung, architecture is seen as a form of

expression. It is an externalization of one's personality, and a materialization of one's dreams, wishes and repressed feelings. It is a round circle, with the use of psychology and philosophy we can better understand our selves, and by building better environments, we in fact help create and healthier brains and humans.

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Natalia Olszewska & Nour Tawil

Natalia is a practicing medical doctor. She also works as the Lead for Human Metrics Lab at HUME, the science-informed architecture and urban design studio created by the architect and researcher Itai Palti. Being a graduate in medicine (Jagiellonian University & Tor Vergata), neuroscience (Sorbonne Université & ENS), Brain and Mind studies (UCL) and 'Neuroscience applied to Architectural Design' (IUAV university) she aims to work between disciplines and create insights which could change our architectural and urban environment and make it more user friendly. At work, she combines her deep care for people and their well-being with her passion for architecture and design. Her specific professional interest is the impact of architecture on different aspects of our lives: social, behavioural, health & well-being and cognition.



Nour Tawil is a Lebanese, Beirut based architect with extensive experience in project management and delivery of medium to big scale residential, hospitality, and commercial projects. After finishing her Architectural Engineering bachelor in 2003, she immediately began her practice in Beirut, working with a multitude of architectural firms and real estate developers.

Nour's upbringing in war-ridden Beirut exposed her to the traumatic impact and fueled her passion for psychology and the understanding of brain processes. She pursued her master's degree in "Neuroscience applied to Architectural Design", the world's first program combining two vastly different disciplines within the fields of arts and science, and graduated in 2018 from Università Iuav di Venezia, Italy, with her work focusing on psychiatric spaces.

Nour's main subject of interest revolves around the impact of architecture on mental health, cognition and behaviour. She's working towards the identification and development of architectural solutions that promote well-being, help prevent mental disorders (where possible), and support the vulnerable population.

Architecture & mental health

Recent research has confirmed the direct relationship between the built environment and our mental health and well-being. The interdisciplinary efforts of neuroscience and architecture are providing a new perspective on how architecture can impact our body/brain system and behaviour, proposing to reapply the neglected human centric approach.

In every conscious experience, a human mind processes an emotion, a cognitive response, and a specific perception, all related to the physical milieu the subject is occupying, resulting in variations in the sense of well-being, mood and behaviour. In the case of mental disorders, the sensitivity to the architectural environment is higher due to the occupant's special physical, mental and emotional conditions. Mental disorders are behavioural or mental patterns causing significant distress or impairment of personal functioning. Understanding the different natures of the pathologies and recognizing the specific spatial needs of the mentally ill can contribute to developing more responsive, restorative and optimized spaces.

In this presentation, we highlight the role of the built environment in improving the lifestyle of the population suffering from mental disorders with an attempt to identify key architectural elements of environmental quality that help with the creation of an enhanced healing environment.

Traditionally the metrics used in the context of built environment have been focused on efficiency rather than effectiveness and human impact. However, there has been a noticeable shift of the paradigm towards psychological sustainability. This change has been reflected also by an emergence of 'wellness movement'. Mental health extends beyond the absence of the disorder and as per *World Health Organization* definition, it is understood as a state of well-being in which individuals can cope with day life stress, work efficiently, explore their fullest potential and contribute to their communities. It has become evident that long-term solutions are needed more than attainable treatments, with 'prevention' proven to be as important as 'cure'.

It has been previously proposed that architecture can serve as a preventive measure. Some urban designers and architects interested in human experience, have previously drawn from Maslow's Hierarchy of Human Needs. Additionally, various concepts addressing some aspects of human needs and theories on what constitutes a 'good space' have been proposed. To mention a few, *physical setting, activities*, and

meaning of a physical environment (Relph, 1976); *locale, location, and sense of place* (Agnew, 1987); *identity of place* (Punter, 1991); '*sense of place*' (Whyte, 2009). The most holistic approach to human needs in architecture is reflected by The WELL Building Standard, an evidence-based system for measuring, certifying, and monitoring performance of building features that impact human health and wellness. However, the standards don't refer to a problem of optimal cognitive and emotional functioning and the top levels of Maslow's pyramid.

Whereas Maslow's motivational theory is still vastly discussed and finds application in various fields, we argue that that Maslow's model could be redefined, and it could constitute a theoretical frame for neuroscience research findings applicable to neuro-architecture and neuro-urbanism.

Physiological Needs

On the most basic level, humans need shelter, food (calories), ample hydration and light. Both food and natural light entrain biological rhythms known as circadian rhythms, with light being normally the primary stimulus for resetting the biological clock. A growing body of research has proven that the exposure to bright light could alleviate seasonal depression and today light is considered as a medical treatment for some patients with affective disorders.

Recent research dismisses the popular belief that natural light is better than artificial light. However, the role of natural light goes beyond circadian regulation as exposure to sunlight is required for ultraviolet-B (UVB)-induced vitamin D production in the skin.

The other physiological need is sleep. Research demonstrated that humans need on average 6-9 hours of sleep to be able to learn and get over past emotional trauma. Sleep quality is a concern to a wide range of people, and the problem of insomnia can be aggravated in urban environments. Lack & Wright (1993) provided evidence that the application of light at certain critical times during the circadian cycle can increase sleep length and efficiency.

Movement, another synchronizer of biological rhythms, has many beneficial effects on human organism, including improved cognition. A considerable body of research proved that physical activity reduces symptoms of mental and physical health. Environments that promote physical movement are characterized by: access to

physical activity facilities, proximity to services, residential neighbourhoods, inclusion of mixed-use developments and walkability.

Safety Needs

On the second level, people need to feel safe and secure, both physically and psychologically. On a physical level, this aspect is covered and continuously updated through international building laws, codes and standards, ensuring optimal safety measures. Within the urban fabric of cities, Police & Fire departments promote safety. Dimension of psychological safety is linked to perception of interpersonal risks and refers to the next level of Maslow's pyramid.

Belonging & Love Needs

On the third level, once survival needs are fulfilled, people need to feel that they belong and connect, also physically. Safe and inclusive environments boost level of trust. Research of Zak and colleagues suggests that trust can be evoked by oxytocin release which in turn reduces a fear of trusting a stranger and increases a person's empathy. In his book 'Happy City', Charles Montgomery describes a relation between Zak's research and urban environment. Pleasant environment designed with human scale in mind can induce oxytocin and therefore trigger trust and prosocial behaviour.

Esteem Needs

On the fourth level, spaces need to provide opportunity for learning, hence space (city) should offer novelty which boosts level of dopamine. Research also indicates that positive engagement is correlated with good levels of dopamine in executive attention or self-regulation networks and reward circuitry and only moderate levels of activation of the threat circuitry.

Cognitive Needs

Cognitive needs refer to the desire to know, understand, and solve problems. According to Maslow, when cognitive needs are blocked, growth is threatened. Among the most universally expressed human cognitive needs, one finds impetus to learn, explore, discover and create in order to have a better understanding of the world. Learning, navigation, problem-solving and creativity can be supported and enhanced by various design solutions.

Aesthetic Needs

It has been known since times of ancient Greece, that beauty can alleviate human spirit. Philosophers have been disputing over ages whether beauty is a property of an object, or it lies in the 'eye of beholder'. Neuroscientist Semir Zeki coined the term 'neuro-aesthetics' to describe his pioneering research on the neurological mechanisms underlying perception of art. Zeki's work have focused on localizing regions of the brain that correlate with human appreciation for aesthetic beauty. The most recent publication of Semir Zeki proposed that presence of beauty in architecture is a necessity.

Self-Actualization & Transcendence

Contact with good infrastructure and strong community supported by good urban design offers more opportunities for self-actualization, whereas contact with nature gives possibility of experiencing natural beauty, next to restoration of depleted cognitive resources. Natural and at times artificial beauty can also evoke awe, an emotion linked to a state of self-transcendence. Research has shown that awe can result in encouraging prosocial and altruistic behaviours and improvement of overall life satisfaction. Among design elements that can trigger awe one can find: infinity, obscurity, silence, 'safe danger' and nature.

To conclude, the better we understand human needs and explore the role of architecture in answering to these needs, the better outcomes of the design process will be. Therefore, spaces (and cities) could be designed in a more human-focused way to support optimal biological, cognitive and emotional functioning, consequently promoting overall health, mental health and well-being.

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Evangelia Pavlaki

My name is Evangelia Pavlaki and I am a Ph.D. research and teaching assistant from the Department of Architecture and Built Environment in the University of Nottingham, UK. My main area of interest is Urban Design and Placemaking where I also hold a Master of Architecture. My current PhD research focuses primarily on the relationship between Media Architecture and Placemaking.

The urban design studios where I teach have as a fundamental background the revitalisation of public space, the enhancement of social interaction and community feeling and the application of creative, innovative and sustainable ideas in the process of making.



Urban Regeneration Vs Placemaking

Opportunities to improve human experience in public space in the contemporary regenerated city

Urban regeneration initiatives in UK cities are ultimately necessary due to the rapid growth of urbanization. Over the last 20 years there has been a dramatic increase in projects planned to provide more dense, sustainable and financially and socially viable communities. Although their success can be witnessed in terms of the growing numbers of people now residing in those areas, urban regeneration, as any top-down approach shows also some major challenges. These challenges are mostly based on the fact that urban regeneration strategies are formed in order to deliver a particular set of predetermined design outcomes and requirements without considering human-centred parameters like visual stimulation, social interaction, comfort and enjoyment. So, how can Placemaking potentially address those issues? Placemaking is a versatile approach to urban design which aims to infuse with quality, activity and character different types of public space so that they will be loved and used properly by residents. Moreover, digital Placemaking is seeking to achieve this vision by implementing innovative digital technologies into traditional Placemaking schemes.

The goal of this study is to explore the diverse opportunities that digital placemaking offers for the transformation of contemporary urban regenerated spaces into vital and charming areas having a “rich” human-environment interaction as their main priority.

At the start of the third millennium, the world is denser than before. Particularly regarding city population, the phenomenon of urban growth is impressive. Currently, 55% of the total world’s population lives in cities, a figure that is projected to grow to 68% by 2050 (United Nations, 2018). Urban growth, although global, shows an interesting paradox as, in most cases, it is not uniform. As a result, a massive metropolitan development is observed along with the simultaneous decline and deterioration of the inner core of various cities. A major factor for this is that the Industrial Revolution led to several large monofunctional industrial areas in the 19th and 20th century that now lay blighted in the heart of many cities. Therefore, in the

context of these great urban challenges transformative processes seem to be the only solution. However, it is crucial that urban transformation is guided through a consistent vision.

The role of urban design in addressing urban transformation is critical. Generally, it is not strictly concerned with architectural forms and details, rather it focuses on the role built and unbuilt spaces in the entire city fabric. Urban design has been characterized as a “mongrel discipline” (Carmona, 2014), which explores and shapes cities as complex systems of spaces, people and networks. Dealing with individuals, community and society as a whole it is considered as “the process of making better places for people than would otherwise be produced” (Carmona et al. 2003:3). Practices and approaches regarding the design of cities and urban transformation can be vital as it has been evidenced that the form, perception and function of the urban realm is significant for our subjective as well as social well-being (Thwaites et al, 2017). In the next paragraphs, two major urban design practices and are going to be introduced emphasizing on their approach to human-environment relationship; Urban regeneration and Placemaking.

Urban regeneration is a systematic process aiming to address urban decline by improving the physical, economic and social condition of blighted areas. Being a broad term, various different approaches and scales of urban regeneration can be identified. Generally, the goals of urban regeneration projects include: a. the effective use of buildings and land, b. the retention and development of economic activity, c. the creation of attractive and safe environments and d. the provision for housing and social needs for the local community. Essentially, as a set of coordinated actions urban



Southall Waterside Regeneration, London, UK, Final masterplan. Source: <https://www.jtp.co.uk/projects/southall-waterside>

regeneration can provide macro-level solutions for urban contexts that suffer from economic, social, housing and environmental problems and therefore it is deemed as a crucial element for the enhancement of quality of life as it seeks to offer jobs, trade opportunities, community facilities and leisure (Yu and Kwon, 2011).

A well-known urban regeneration project located in the United Kingdom is Liverpool's docklands regeneration which acted as a driver for economic revival and competitiveness. The main vision for Liverpool's regeneration was to reconstruct the poor infrastructure and post war sites, to amend some typical 1970s interventions in order to enhance permeability of the site and to celebrate the historic architectural heritage. This comprehensive initiative, although having various benefits for the city including the advancement of economic viability, the improvement of urban image and identity and the revitalization of tourism sector, it also had some serious drawbacks. These include the creation of "hot spot" neighbourhoods and areas of antisocial behaviour. These are common indicators of top-down and formal design strategies that do not prioritize human experience in space and exclude human-environment relationship from the design process.



Liverpool One, Source: <http://www.bdp.com/en/projects/a-e/Chavasse-Park/>

Urban regeneration results have often been characterized as standardized products, not highly sensitive to city's unique identity and character, especially in terms of public space. Also, these processes being long-term and often working in large scale, can provide broad solutions towards community's major issues such as social imbalances and crime, however they are rarely able to provide ideas and frameworks on how

process, also known as social design, real people flows are imagined and human experience is constructed resulting in environments that ultimately have a human face, an “envelope” for human behaviour (Sime, 1986).

An interesting placemaking project, which aims to improve human-environment relationship, while conveying at the same time a strong social message, took place in the city of Derry in Northern Ireland. In an attempt to minimize the growing number of suicides in the area, local stakeholders along with design teams worked together on transforming the riverfront into a place for positivity, happiness and community sharing. The project, which includes art, digital installations and tactical interventions, aims to “heal the place” by re-engaging citizens, bringing them together and by “building” peace (Spencer and Alwani, 2018).



The Foyle Bubbles. Source: <https://www.urbandesignmentalhealth.com/journal-5---river-foyle.html#>



The Foyle Reeds lit up at night (left) and controlled through an app (right). Source: <https://www.urbandesignmentalhealth.com/journal-5---river-foyle.html#>

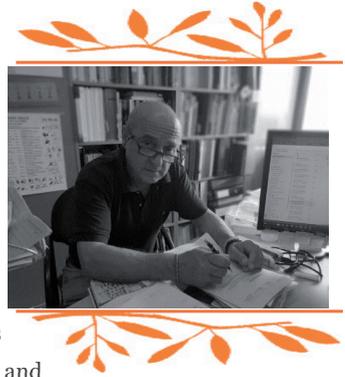
To sum up, the urban regeneration and placemaking approaches, or in other words, the social and psychologically responsive schemes comparing to the more functional ones do not necessarily have to be adversarial. When planned and applied properly, both strategies can manage to deliver human needs in the city, yet in different scales. Ideally, both approaches working collaboratively could provide successful and thriving urban environments being at the same time prosperous and sustainable but also enjoyable and happy places to live.

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Enric Pol

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Technologies of the Environment, of the Universitat de Barcelona. Among its areas of work and research is the development of Environmental Management instruments with emphasis on aspects related to individual, social behaviour and organizational. The concern for the educational, communication and socialization aspects are also expressed in the coordination of the Catalan Research Network in education for sustainability (edusost.cat) between 2006 and 2010.

He is a reviewer of national and international journals and research projects. He has developed numerous research and advisory activities for companies and public administrations on issues of management and citizen behaviour in relation to environmental issues. Author of numerous articles and books on the subject highlight the chapter of Environmental Management, published in the *Handbook of Environmental Psychology* (Bechtel and Churchman, 2002), and with prof. Fleury-Bahi and prof. Navarro, he has been co-editor of the *Handbook on Environmental Psychology and Quality of Life Research* published by Springer on 2017.

Environmental? Ecological? Architectural? Psychology...

Legitimacy of name in the historical origins' legitimacy for the present and future challenges.

Why is the term "environmental" used, if we talk about human habitats and cities? Is the "ecological sensitivity", a late "conversion"? To face "global warming", has become one of the current challenges for Environmental Psychology (EP). How does it relate with other used names, like Architectural Psychology?

The first mention to the nucleus of the concept of EP, is in 1911 by Willy Hellpach on his book "Geopsyche." Later, he will use the term Umwelt Psychology (1924), also used by Martha Muchow (1935). Kurt Levin emphasise "Environment", and his disciple Roger Barker, use the term "Ecological Psychology". During sixties and seventies, it dominated "Architectural Psychology" (Lee and Canter, between others). In 1970 Proshansky, Ittelson and Rivlin published their "Environmental Psychology"...

The epistemological key is in the nuanced meanings that Uexküll gives to the term Umwelt. That helps to understand and justify the "legitimacy" of the different "names" of discipline over time.

At present, the great challenge is how we change -or how we set the conditions to change-, the environmental behaviour, and how we deal with structural "facilitators or difficulties" (physical, socio-economic and political) in a globalized world, in which, most of the persons feels helplessness rather than empowered.

Why the term "environmental" is used whether we talk about human habitats and cities? Is the "ecological sensitivity" a late "conversion"?

The ecosystems balance and the global environment with "natural" criteria to face "climate emergency" or "global warming", has become one of the current challenges, that as environmental psychology we try to deal. Environmental Psychology not only contribute to improve the individual and the social behaviors of people. Its contributed to understand and help to establish which forms, configurations, materials and resources are more suitable for an habitat that allows greater well-being, and which space organization of our surrounding facilitates or hinders behaviors that are desirable for sustainability. This is our current sensibility. However, how does it relate to "architectural psychology", or to other names that we

can found in our large history? This make in question dispute the "identity" of the discipline and the right to tell us "Environmental psychology".

We found the first explicit mention to the nucleus of "Environmental Psychology" in 1911 by Willy Hellpach on his book *Geopsyche*. Later, the same author will use the term *Umweltpsychologie* (1924). Martha Muchow (1935), adopting the *Umwelt* approach from Jakob von Uexküll and William Stern (see Mey and Günther, 2015) will use the term *Life Space*. The disciple of Kurt Lewin, Roger Barker and his team, in the 40s-50s used the term *Ecological Psychology*, because they focused on "behaviour setting" (as a real ecosystem with meaning for people, in the same way of Uexküll conception of *Umwelt*). During the sixties and seventies of the Twente century, in Europe it dominated *Architectural Psychology*, used between others, by Terence Lee and David Canter. In 1970, Proshansky, Ittelson and Rivlin published their *Environmental Psychology*, term which it ended up adopted by Canter in his master program and publications. On the other hand, in 1972, Abraham Moles and Elisabeth Rohmer published their *Psychologie de l'espace* (Space Psychology), a term that was especially successful in French-speaking area. Further, in 2002, Schmuck and Schultz, use a "new" label: *The psychology of sustainable development*. Now, the latest fashion is to use the term *Natur based Solutions*, as a transdisciplinary approach, to address the reduction of emission of climate change effects, from re-naturalizing the city. However, in this perspective, psychology is not sufficiently present. This authentic "Babel Tower" questions the disciplinary identity... but all the names want to refer to a similar concept and approach.

The triggers of the discipline are related with the social challenges and contextual evolution technological changes imply. This is from the revolution of steam to electricity and telephony, the concentration of population in cities that involve the industrial revolution, the bad habitability conditions; the contrasts between cultures that wake up by facilitating mobility and commerce, etc. This leads to situations such as the creation of *Völkerpsychologie* by Wilhelm Wundt (he gives courses since 1859, but the book is in 1904, who will influence his student Willy Hellpach -and hence *Geopsyche*-). We have to consider the increase of awareness of the effects on health of environmental degradation or the living conditions (Engels's work on workers' housing, at the time where it appear of the "hygienist movement") that brings new architectural proposals. De facto, this means that we are between very opposed movements: ranging from the reintroduction of nature in stone or decoration form, by

modernism/art nouveaux/jugendstil/modern style, in one hand, and the great formal revolution of the Bauhaus, Le Corbusier and the movements of Modern architecture in the other. These last they were looking for a healthy and inexpensive housing for a greater number of people, removing the decoration in architecture and trying to change the social valuation of aesthetic (the structure form is beautiful). This will be parallel and linked to the development of the perception and cognition Gestalt theories.

The wake of what started in the reviews of Kaminski (1976), Kruse and Graumann (1987), EPol (1993, 2006, 2007) or Mey and Günther (2015) (among other contributions, but not so many) allows us to clarify the epistemological source that gives coherence and explanation to this apparent nonsense. The key is in the differentiation that Uexküll makes between the different meanings of Umwelt. Following Linask, Magnus, and Kull (2015), the translations into the use of this German term refer to both general, common and shared "environment", as well as to the specific "habitat" of an individual or a specie (near what would later be called "ecosystem"). The nuanced meanings that Uexküll gives to the term, and that both Hellpach and Muchow adopt in their psychological work, help to understand and justify the "legitimacy" of the "names" or denominations that Environmental Psychology has been adopting over time (including Architectural Psychology). In addition, it also explains and legitimizes the way to address the present challenges that we have to face.

In a world dominated by the so-called new smart technologies (ITC, Smart cities, etc.), communication processes (and therefore communication management) have taken on more relevance than ever. And it is easier than ever to spread fake news or inaccurate information that leads to serious errors. We must be alert in the face of certain widely extended tendencies and beliefs that are not true or not enough accurate, that may distort the behaviour of people. As Festinger showed to us many years ago, we are resistant to change; to have the information is not enough for changing our behaviour. The human being is more "rationalizing" than "rational". The human being looks for rational arguments that sustain his position and filters, ignores or denies those that contradict him, if he is not "forced" to change. Human behaviour will always remain unpredictable, emotional, influenced by the presence of others, and NOT rationally changeable.

In short, the great challenge at present is: how we change -or how we set the conditions to change-, the environmental behaviour of people and society, and how we

deal with structural "facilitators or troublemakers" (physical, socio-economic and political) in a globalized world, in which, for the most part, the person feels helplessness rather than empowered.

In addition, we must remember that if we return to the original meaning of *umwelt* from Uexküll, Environmental Psychology is necessarily linked to the peculiarities or the differential facts of each place, each ecosystem (including architectural and urban form), and that has epistemological implications.

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Vladimír Šimkovič

In his practice, he has dealt with many diverse areas - from theory of architecture to restoration of historical objects to digital architecture and its broader context - especially the overlap into virtuality. He is a co-author of the renewal of the University Library in Bratislava and other monuments.

Interest in phenomenology and the psychology of the environment (particularly in terms of analytical psychology) and its possible application as a starting point in architecture is his constant concern.



Sea in Bratislava - Subconscious and environment

Reflection on the very old problem of the subconscious mirroring of the inner and outer world. Some reflections on the perceived common images - spatial archetypes of the environment as a basis for creation are efforts to apply phenomenologically oriented approaches in architectural design. As a more specific example, we present here the problem of so called "Sea in Bratislava". It is an attempt to describe a common subconscious feeling of a certain number of inhabitants and visitors about the signs of the presence of the sea or a large lake near the city. In fact, none of them could ever see it because it existed before 9 million years. The contributions of geologists concretise the factual state of art and thus create a prerequisite for demonstrating architectural designs inspired by this approach.

Together with *Ján Janso*

“Bratislava used to be washed by the sea a long ago. The sea is still here, there are moments when you can feel it in the air, even when it was a long time ago, millions of years ago“ (Lucia Piussi: My Bratislava, SME newspaper 02.06.2012, 60,000 copies).

The feeling of paradoxical existence of the sea in Bratislava has not very few people. Everyone agrees that everyone thinks that this is just their own not entirely understandable opinion and they are surprised that someone else has it too. How did they realize it when in fact no one could ever see it? How many people are there in Bratislava that this problem has got into a nationwide newspaper?

The geological fact is that the last great remnant of the Baden-Sarmat open sea is its conversion to the vast Pannonian Basin about 9 million years ago. With the gradual drying up, its last remains have been preserved in the form of shallow lakes Neusiedler See and Balaton. From a geological point of view, the presence of the sea is relatively close in time and the environment still retains some of its original features. The vast flat landscape, when coming from the mountainous northern part, truly resembles the scale of the sea.

Why do not few inhabitants of the city still have this unconscious feeling?

The present paper is a consideration of a layman with an enthusiasm for a deeper experience of the surrounding environment and regrettably has no ambition to provide a precise scientific explanation. It is rather the most open testimony about seeking convincing explanations and feeling about their truth. It is best to admit the starting points at the outset - they are inclined to Jungian inspiration, overlapping into analytical deep psychology with branches to various other areas.

As an architect, I have always been close to matching psyche to an imaginary multi-storey building – “mental house”. Basements are an area of subconscious and unconscious, floors in contact with the terrain are a sphere of concrete rational reasoning (here and now) and the top floors are in contact with the transcendent and the universe. The diagram approximately copies the hierarchy of EEG waves with their possible meanings. The "actual self" moves as a computer cursor on a floor and thinks of its logic, but also suspects the existence of other floors. Windows are places of communication with the outside world - they do not exist in the basements and the reasoning is closed in itself and the mental outlook widens as the height increases. However, for each storey there is its own way of living, which is not entirely transferable to another storey - perhaps it is the different states of consciousness that are closely related to the extent of the possible outlook. The interconnection of floors ('staircases') is the point of transition between different levels of consciousness.

The view of the landscape is often described in art as “the earth as a state of the soul”. Extensive view of the country from high viewpoints (“higher floors”) reminds us of the effects of a light drug - it seizes the current consciousness and transmits it to other dimensions and states, other space-time.

The whole "trip" could be described as a sequence of the following feelings when moving in a "mental house":

- Current situation of movement in real space - “ground floor”, rational reasoning, current situation - state 1

- A sudden confrontation with the "upper floor" view - a far view of the landscape (flat, huge, straight ...) that vastly exceeds the normal rational human space-time scale. Transfer of the current self (cursor) to another mental state - transcendence
- "*Einfall*" - influx of intuition from the unconscious - fall through the "staircase" to the "basement" floors of the collective unconscious, suddenly intuitive understanding of the landscape collective archetype of the "sea" as an explanation of a previously unconscious feeling
- Return to the reality of the "ground floor", where all experiences from other "floors" of the psyche are preserved in the enriched current state of self - 2.

The whole experience of the "sea in Bratislava" lasts about 10 minutes and people remember it almost all their life. It shows them the different dimensions of (unconscious) channels connecting us with the surrounding mainly natural environment. In the interview, this phenomenon is described as unclear - where did it come from? - but as effective and truthful. They are convinced that there are other dimensions of the psyche that we do not normally use in practical life, but which still exist in the background and work effectively. A glimpse into the earth will shake all the levels of the psyche like a large orchestra and let them act simultaneously as a strong whole. The whole process starts automatically without a conscious rational impulse - as if the body automatically responded to the environment by a separate internal organ (?). The resulting shape of the "sea in Bratislava" is a kind of symbol - a metaphor in which the impulses from the outer and inner world, the spiritual world and instincts merge into a single image - a certain local archetype as an intersubjective reality. The resulting sense of expanded consciousness is a liberating touch with unsuspected possibilities of human feeling of the country.

In the sea sediments in Bratislava, the salty water is still here at a depth of about 100 m. Somewhere equally deep in the psychic layers of the subconscious is also its archetype. These correlates of the real and psychic world are perhaps not quite a coincidence. The environment is part of us and vice versa.

Architectural supplement – example of river revitalization

Nowadays there are projects of river revitalization in the world - restoration of natural state from technically regulated streams. Rivers from hard concrete hoops

become a new nature by artificial intervention - both landscape and psychological archetype are being restored. The water management solution is kept in its entirety but is achieved in a softer and more natural way. The reason is not primarily economic – but rather psychological and only then useful. It is the creation of a more attractive environment for people. The landscape archetype of the river is reinterpreted in its current context without denying it - perhaps this is the way to the future.

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Alina Mia Udall

Alina has a passion for teaching and research in environmental psychology. In 2013, she completed a Postgraduate Certificate in (Higher) Education in Psychology from the University of Southampton. Alongside teaching, at Bournemouth University, Alina researched what motivates people to behave moral and pro-environmental. Alina then completed a Ph.D. at the University of Bath, looking at how people's identities (e.g., environmental self-identity, social identity, and place identity), play an important role for explaining pro-environmental behaviour. Next, Alina went to the Warwick Business School (WBS) and tested how these different identities predict pro-environmental behaviour, alongside the dominant psychological theories used in environmental psychology (i.e., theory of planned behaviour, norm-activation theory, its extension, value-belief norm theory, theory of habit, and social identity model of pro-environmental action). Also, at WBS, Alina worked with Dr Daniel Read and Dr Umar Taj to develop and test a new seven-step process, namely Nudgeathon, which was used to help individual businesses to become environmentally friendly (Udall et al., 2019). Finally, Alina is at the Norwegian University of Science and Technology (NTNU), where she still researches identity and the dominant psychological theories in environmental psychology. In addition, Alina continues collaborations with Daniel and Umar to test/validate this seven-step process (Nudgeathon) in Norway.



How I See Me: The Power of Identities for Changing Pro-Environmental Behaviour

Research in environmental psychology has shown that people's identities shape their pro-environmental behaviour (PEB). However, it is unknown how different identities are related to specific PEBs. I will present work that was in collaboration with the University of Bath, Maastricht University, University of Groningen, and NTNU, where we aimed to study these identity and behaviour relationships. Specifically, I examine three gaps in the present literature. First, research in identities and PEB has expanded rapidly over the last 20 years, including the variety of identity measures which have been developed, with no systematic review. Therefore, I report on a systematic review showing what identities and measures have been studied. Second, to further test how the identities related to PEB I report a meta-analysis. Finally, multiple identities are assumed to simultaneously explain PEB, yet no primary empirical study has attempted to assess this claim. Therefore, I report on a survey study among a UK representative sample ($n = 578$), which measured the identity types found in the systematic review, and meta-analysis and test these in relation to PEB. For the first time, I reveal that 15 identity factors emerged, whereby nine explained PEB. I conclude by showing how to help further develop and move the research in identities and PEB forward, theoretically, and in practice.

Keywords: identity theory, social identity theory, place identity theory, pro-environmental behaviour.

Research in environmental psychology shows that people's identities shape their pro-environmental behaviour (PEB; Caillaud et al., 2016; Vestergren et al., 2018). However, we do not know how different identities relate to specific PEBs (Udall et al., *In Press*). I presented work where we studied these identity and behaviour relationships (Udall et al., *In Preparation b*).

Specifically, I presented three gaps in the present literature (Klößner, 2013; Klößner & Oppedal, 2011; Ofstad & Klößner, 2017; Rise et al., 2010). First, research in identities and PEB has expanded rapidly over the last 20 years, including the variety of identity measures tested in relation to PEB with no systematic review (Brick & Lai, 2018; Brick et al., 2017; Sparks & Shepherd, 1992). Therefore, I report on a systematic

review showing what identities and measures are used (Udall et al., *In Press*). We provided a theoretical assessment of this research (Stryker & Burke, 2000). Three main identity theories seemed to explain the research best (Stryker & Burke, 2000; Proshansky et al., 1983). Specifically, and two-fold, identity, and social identity theory (SIT), collectively known as the unified identity theory (UIT; Stryker & Burke, 2000), and place identity theory (PIT; Proshansky et al., 1983). As these theories overlapped more than differed in their understanding of identity, we combined these theories to avoid redundancies in identity theorizing, provide a universal approach to identity in terms of the processes, and outcomes, and explain the PEB research most succinctly, referred to as the pro-environmental levels of identity (Udall et al., *In Press*). Therefore, we understand identity similarly between the theories, and offer a universal identity theory approach based on the theoretical definitions, and assumptions (Udall et al., *In Press*). In addition, we demonstrated how the theory can be used to explain the identity and PEB research. Furthermore, to identify the research on identity in PEB research, we conducted a systematic review using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses [PRISMA] guidelines, where 62 studies were relevant. Multiple identities were relevant for a given PEB. Identities are assumed to be either individually-, group-, and/or place-focused, drawing on the specific sub-sets of our universal PEB theory; PEB-identity theory, -SIT, and -PIT respectively. Identities related to behaviour, where identity increased PEB more so than decreased PEB.

Second, to further test how the identities related to PEB I reported on a meta-analysis (Udall et al., *In Preparation b*). Identities related to PEB with a medium effect.

Finally, multiple identities simultaneously explained PEB (Gatersleben et al., 2019; Stryker & Burke, 2000). However, no primary empirical study has attempted to assess this claim. Therefore, I reported on a survey study among a UK representative sample ($n = 578$), which measured the identity types found in the systematic review, and meta-analysis and tested these in relation to PEB (Udall et al., *In Preparation b*). For the first time, by conducting an exploratory factor analysis I revealed that 15 identity factors emerged, whereby a regression analysis revealed that nine explained PEB. I concluded by showing how to help further develop and move the research in identities and PEB forward, theoretically, and in practice (Klößner, 2013; Klößner & Oppedal, 2011; Ofstad & Klößner, 2017; Rise et al., 2010).

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The Seven-Step Process: Influencing Pro-Environmental Behaviour Positively

Many attempts to influence pro-environmental behaviour (PEB) in a positive way (e.g. recycling correctly, using design-thinking, and participatory design) are used (Behavioural Insights Team, 2017; Lourenço et al., 2016; World Bank, 2015). However, each approach alone has its limitations (e.g., Dolan et al., 2012). To overcome these challenges and best influence PEB, we combine these approaches, and propose a new comprehensive behaviour change model, namely, a seven-step process – Nudgeathon (Udall et al., 2019). This seven-step process proposes seven consecutive stages that can lead to any type of behaviour change, and in any contexts, and especially for PEB (for example, reducing energy use in student's accommodation).

The seven-step model is a behavioural sciences' theory, which incorporates best practice from research on design-thinking (which we modified; Meinel et al., 2011), participatory design (such as using drama theory), and encouraging choice architecture (nudge theory) solutions. Nudgeathon has encouraged people to save for a rainy day, women of child-bearing age to supplement folic acid and improve the rate of detection of atrial fibrillation (heart murmur). Nudgeathon aims to provide effective behavioural change interventions as the people concerned co-create solutions throughout the intervention lifecycle.

The model has two consecutive phases. First, the *Figure Out Phase*, which comprises of four consecutive stages, *Define*, *Empathise*, *Ideate* and *Present*. Second, the *Follow Through Phase*, which comprises of three consecutive stages, *Refine*, *Prototype* and *Test*. Completing the two phases with their seven component stages consecutively leads to behaviour change. For example, pro-environmental heating behaviours in any context including on-campus university accommodation, or at the workplace, to name just a pair of examples, we addressed. The *Figure Out Phase* comprising of four stages, *Define*, *Empathise*, *Ideate* and *Present*, aims to get participants to develop an understanding of the problem and provide potential solutions theoretically. Specifically, the *Define* stage refers to stating and describing exactly the nature, scope, and meaning of the given 'problem'. The *Empathise* stage refers to gaining an understanding and sharing the thoughts, feelings, and behaviours of others. The *Ideate* stage refers to thinking of ways to solve the given 'problem' each

time through discussion, debate, suggestions, and development of novel perspectives. The *Present* stage refers to giving, providing, and communicating to all stakeholders involved the solution to the 'problem' as identified during the *Ideate* stage. Finally, the *Follow Through Phase* which comprises of three consecutive stages, *Refine*, *Prototype* and *Test*, aims to get participants to develop the final solutions to address the problem practically, which can be successfully implemented. The *Refine* stage refers to making changes to the ideas presented during the *Present* stage in order to improve and clarify the solutions to the 'problem'. The *Prototype* stage refers to the initial evaluation of the identified solution in order to understand its usability and replicability. The *Test* stage refers to the procedure intended to establish the quality, performance, and reliability of the identified solution for addressing the 'problem' prior to becoming widely available. The solutions (interventions) identified during the process are used to encourage behaviour change and can be applied in any context.

The aim of this session was to take participants through the seven-stage process that we successfully tested in different organizations where we observed positive PEB change. In this session, participants co-created key issues and solutions for influencing people to alter their behaviour for the better, a key premise of this seven-step process (Parviainen et al., 2016, July). Furthermore, we have used this new behaviour change process in seven different countries, such as the UK, Norway, and Australia, and we now shared here in Prague. Therefore, we have the benefit of having implemented projects and research using this process, and now the opportunity to share, as well as evaluate and gain insight to how it works in a new setting, Prague. That is, we can provide in one easy session tools that participants can use to implement within their own organisation to increase PEB or any type of behaviour.

Based on the above, we presented a paper (Udall et al., 2019), in this session of two hours, and we provided people with a brief toolkit of how to encourage pro-environmental behaviour in organizations, a seven-step process, namely Nudgeathon. We provided people with a short explanation of the seven-step process that we developed to help organizations change their behaviour. Next, we provided a concrete example of the seven-step process in action at Warwick Business School. Penultimately, we ran a short version of the seven-step process to attempt to solve an issue raised by people in Prague, the overuse of plastic bags that are still free. We then shared the solutions based on doing this seven-step process and concluded the session. Using the

session layout of a cabaret style, so seated in circles, but with a central computer to show a short presentation, people saw this process and experienced it.

Keywords: Nudgeathon, design-thinking, participatory design, nudge theory.

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Fiona de Vos

Fiona de Vos is a pioneer on environmental psychology and healing environments in the Netherlands. She is the founder and owner of Studio dVO (1996), a small consulting and research firm specialized in the interaction between the built environment and people. Her mission is to improve the fit between healthcare settings and its users, in order to enhance healing and wellbeing, and to improve a healthcare organization's clinical outcomes, economic performance, productivity, and customer satisfaction. Studio dVO works closely with (healthcare) organizations, architects, and interior designers to improve environments by incorporating essential psychological considerations. Fiona de Vos is specialized in the programming and evaluation of healthcare settings. In working closely with patients, visitors and staff she helps organizations to create environments that better suit the needs of their users. As an independent researcher she evaluates the strengths and weaknesses of healthcare settings in order to improve the efficiency and satisfaction of staff and wellbeing of patients and visitors. De Vos received her Ph.D. (2006) in Environmental Psychology on Healing Environments at the Graduate Centre of the City University of New York. Fiona has published three books, teaches at different Dutch Universities and is a speaker and consultant on healthcare design and healing environments in Europe and the United States.



Beyond cosmetics: improve well-being and health by adding psychology to design in hospitals

Creating an environment that enhances wellbeing and independence for patients families and staff in hospitals requires a *true* understanding of the impact the environment has. The psychological impact of the environment cannot be underestimated. A building can enhance or diminish users' efficiency, well-being and satisfaction. It pays off to really dig in and add psychological insights to the design process. The attention, time, and devotion spent early in the design process will result in a building that actually 'fits'; a place where people flourish.

This session will provide two basic principles of environmental psychology that are essential in understanding the interaction between people and the environment. Examples of applying these two principles will be shared. Next a theoretical model on holistic healing environments will be given that can be used as a starting point when defining a vision and strategic objectives for building a hospital. From there, eight dimensions for creating a healing environment will be introduced as a tool to develop a behavioural program of requirements and to evaluate existing hospitals. The session will conclude with sharing the benefits of adding psychology to design such as improving a healthcare organization's clinical outcomes, economic performance, productivity, and customer satisfaction and a reflection on the design process and ways to engage communities to improve this process and the end product: a building that better fits.

Objectives

- Test your assumptions. Assuming we know how users will respond to design features is no longer enough. Verify and use available knowledge.
- Understand the benefits of knowing the specific design-behaviour relationship for patients, families and staff.
- Apply the model and 8 dimensions of healing environment when designing a hospital.

Learn how to improve the design process in order to create a building that better suits the needs of its users.

1. INTRODUCTION

Everyone can recognize what Nietzsche means by his quote: *When one has finished building one's house, one suddenly realizes that in the process one has learned something that one really needed to know in the worst way - before one began*; it is inevitable that new insights, gained during the execution of a plan, will influence the plan as well as the end result. This is especially the case with complex projects such as the (re)building of a care facility.

The pessimist could therefore conclude that preparation is useless, and that we only need to lay the first bricks in order to start a building project. This might sound absurd, yet in reality we often start with little more than an ideal image of the end result and an outline of the planned route. Of course, the statement by Nietzsche was intended cynically: without a thorough preparation, we might end up in a very different place than intended at the beginning of the project.

Therefore, it is important for an organization to clearly understand what direction it wants to take, before the first bricks are laid. After all, the building should be of substantial value in achieving the strategic goals of the organization, like increasing hospitality and patient safety, or the reduction of medical errors.

Figure 1: “...we might end up in a very different place than intended.”



Photo by Florian Schütz

2. BUILDING WITH A VISION

Within the Dutch healthcare system, it is not yet established practise to utilize a building as a means for reaching strategic goals. We invest millions in development and renovation—yet without the guarantee that these projects connect to the organizational core values or strategic goals. In fact, there is often no organizational vision at all on housing before beginning the building process.

The first and crucial step towards a unique building is the drafting of a housing vision. Described herein are the identity and vision of the organization, which work processes the building accommodates, and how the building will contribute to the realization of the organizational goals. The housing vision forms the foundation of the design process and serves as a touchstone for every decision.

1. Translating hospitality

In practice, however, the start of a design process often lacks such a housing vision. When Derek Parker, a renowned American architect, looks back on his career, spanning more than fifty years, he ascertains that the buildings on which he is most proud share that the client had a clear vision and was involved from beginning to end. In his career, this has happened only five times. Often, the initiative to build triggers thinking about a housing vision. And sometimes, an organization has to acknowledge that their own core values and culture are not even written down, let alone supported by the whole organization. And yet it is precisely commitment from all stakeholders involved that can turn both the process and the end result into a success.

In order for the organization to carry out one identity, the housing vision, and its translation to the building, should correspond to the work processes and the culture of the organization. This identity should be clear to the employees as well as to the patients and visitors. If patients experience the same identity on the website as they do in the entrance of the hospital and during procedures, the identity will be strengthened.

If a hospital feels strongly about hospitality, visitors will get mixed signals when the medical staff is friendly and professional while the website is confusing, the entrance hard to find, and the main lobby cold and sterile. For an optimal experience,

it is important that every aspect breathes hospitality. The core value “hospitality” should thus be secured in the housing vision.

Figure 2: The three pillars of a housing vision; the primary process (care), the secondary process (facility), and the culture of the organization.



2. *Building more consciously*

Having a proper housing vision, even before beginning the design process, will enable conscious and well-informed decisions. Building more consciously will improve the performance of both the building, and the organization. By, for instance, optimizing the self-reliance of patients, by applying the principles of family-centred care, and making sure the environment supports the work process of the organization, considerable savings in operation costs can be achieved.

Every decision in the design process has consequences, either positive or negative. Ideally, the design brief, the drawings, and the final building are derived from the organizational vision and core values. Hospitals that aim for an increase in patient safety, for instance, still do not by default choose for single rooms when planning a new building. Yet, research into healing environments and Evidence Based Design has shown that single rooms lead to a significant reduction in both cross-infections and medical errors.

Sometimes, for instance when there is a lack of space, there might be no other choice, but more often, poor arguments are used. It is argued that multiple-bed rooms

would be more sociable, or that a roommate could help to signal a problem, or that the investment would be too big. However, the first two arguments do not outweigh the medical benefits, and practise has shown that the investment pays itself back within a few years.

3. *Misfits*

Most clients are relatively inexperienced when it comes to building projects. Often, it is actually a unique event in their career. In practice this usually leads to the wheel being reinvented. Partly because of this, the process is outsourced to an architect or project developer at too early a stage.

Subsequently, the client assumes that the advising parties know what he or she needs, whereas the advising parties assume that the client knows what he or she wants. This creates a large potential for misunderstandings, which leads to errors and misfits in the design.

Frequently buildings turn out different than expected; they do not fit the business processes, they are less hospitable than was planned, or they need to be adjusted immediately after completion because they do not function correctly. Cases like these often involve high adjustment costs. This a disappointment not only to the users and the client, but to the architect as well.

As an illustration, nurses in new hospitals often complain about excessive walking distances. Usually, however, this is not because of the hallway being too long, but because of the distance to auxiliary facilities such as medicine rooms, washing kitchens and linen rooms. Hence, not shorter hallways, but a better accessibility of these facilities is the solution. An adequate mapping of the work processes pays itself back through a more efficient building. In order to bring the right information from the right people into view, environmental psychologists can guide the participation and involvement of different users in the design process.

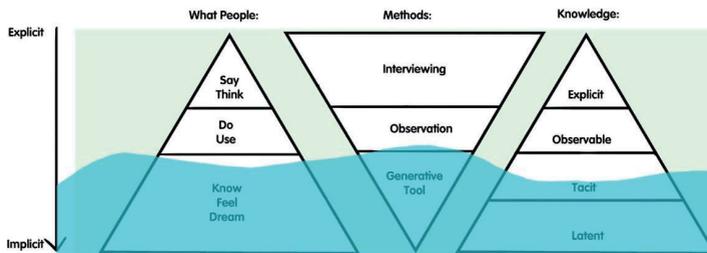
4. *Focusing on the end users*

By involving end users, and adding psychology to design, at an early stage of the design process, disappointments can be avoided. End users are the true experts of their experience, they possess vital information and knowledge. The challenge is to identify their implicit wishes and needs, rather than their explicit momentary frustration. For

precisely these implicit needs provide the building blocks for a solid design brief, and thereby guarantee a building that will withstand the test of time.

A strong collective vision and an inspiring and informative design brief contribute to a smooth design process, a flying start in use, and a reduction of design errors and failure costs.

Figure 3: Three levels of end user knowledge and corresponding research methods



Based on Sleeswijk Visser et al., 2005

3. CONCLUSIONS

Before construction or renovation, it is important for an organization to have a clear idea of their direction. Without a distinct vision and strategy, it is impossible to design a building that optimally supports the work processes, company culture and needs of the end users.

We can build more consciously by applying the principles of Evidence Based Design, carefully mapping and balancing the interests of the different users and making conscious decisions. Not only do we then obtain crucial information by involving the end users, we also create a support base for the housing plan.

This way, disappointments to the client, end users and architect can be avoided. Moreover, the realized building will fit the identity of the organization, optimally support the work processes, and truly contribute to the wellbeing of its users. Doing it right the first time also significantly lower the failure costs. As Simon Sinek put it: we

never have the time or money to do it right the first time, but they always have the time and money to do it again. A good building is not built with stones, but with a vision.

Environmental Psychology: “Humans in their surrounding world”

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