

Dr Anna Bornioli

The influence of city centre environments on the affective and restorative walking experience.

PhD thesis extended abstract

This PhD thesis explored the influence of the built environment on the affective walking experience. In fact, while urbanisation trends are increasing, levels of walking in urban settings are decreasing, despite to the important health, social, and environmental benefits of walking (Robertson et al., 2012). However, while there is a rich literature on the restorative benefits of walking in nature, not many studies addressed the potential positive benefits of walking in attractive urban areas. However, according to the United Nations (2014), by 2050 66 per cent of the world's population will live in cities. In addition, recent research has shown how experiencing nature is a rarity for most urban dwellers (Cox et al., 2017). Therefore, it is important to explore what elements of the urban realm can have positive effects on people's health, especially during walking.

A novel theoretical framework was applied, combining two main disciplines: environmental psychology literature on environmental affect (Russell and Pratt, 1980) and psychological restoration (Stress Recovery Theory - SRT: Ulrich, 1983; Attention Restoration Theory – ART: Kaplan and Kaplan, 1989), and the geographical literature on walking and place. Specifically, this research introduced in the debate on restoration the conceptualisation of place from human geography (Tuan, 1977; Relph, 1976). Geographers conceive places not just as mere physical settings, but as the result of the interactions between the individual and the environment.

ART and SRT argue that it is exposure to natural environments that can promote restoration. The restoration literature abounds with examples of studies examining the synergic benefits of physical activity and the mediating effect of natural environments. In debating the dichotomy nature versus urban, and the moderating effect of settings on affective variables, scholars tend to associate urban environments with negative effects, such as stress and psychological discomfort (Ulrich et al., 1991). However, it is argued that in past decades, the tendency was to select for research studies 'grey', unattractive urban places such as commercial and industrial areas (Johansson, Hartig, and Staats, 2011), urban outskirts (Hartig et al., 2003) or streets with heavy motor-traffic (Van den Berg, Jorgensen, & Wilson, 2014); in doing so, the potential for some urban environments also to offer restoration was downplayed, as already noted by some scholars (e.g., Karmanov and Hamel, 2008). In fact, according to restoration theory, any environment that possesses one or more restorative properties can be restorative (Kaplan and Kaplan 1989). In line with this, more recently, scholars have shown that some urban contexts can

have restorative effects, and these have included a modern urban development near Amsterdam docks (Karmanov & Hamel, 2008), a historic panoramic site (Fornara, 2011) and the city of Stirling (Roe & Aspinall, 2011). Still, and as noted by Hartig et al. (2003) and Fornara (2011), there is a substantial lack of literature assessing the impact of “attractive” urban places on affective variables. It was the intention of the current thesis to address this imbalance, and to investigate the affective and restorative potential of non-grey urban settings.

In addition, research indicates that personal characteristics such as socio-demographics and personal experiences and attitudes can influence affective and restorative experiences (e.g., Ratcliffe and Korpela, 2016). Therefore, it seems important to examine more fully the role of socio-demographics and personal characteristics of participants, especially looking at past experiences, memories, and attitudes. However, previous empirical research on restoration is heavily based on student participants, as highlighted by reviews of the evidence (e.g., MacMahan and Estes, 2015). Arguably, this group has specific socio-demographic characteristics and, potentially, a specific set of values, attitudes, and experiences, thus not allowing a deep analysis of the role of personal characteristics on affective experiences. Therefore, another aim was to explore whether the affective and restorative walking experience differs between populations.

The following main questions were addressed:

- In what ways can walking in urban environments support affect?
- How can the mobilities and environmental psychology literatures be integrated to inform a critical realist study of the affective benefits of walking in city centre environments?
- What is the role of motor traffic and architectural styles on the affective and restorative benefits of walking in urban settings?
- To what extent two different populations (employees and students based in Bristol) experience different affective and restorative walking experiences?
- What are enablers and barriers to a positive affective and restorative walking experience in urban contexts other than presence of natural elements?
- To what extent does the affective walking experience influence walking intentions?

A mixed-methods strategy was adopted. First, an online experiment with residents of Bristol (UK) (n=385) compared affective outcomes (stress, hedonic tone, and energy) of walking in five settings in Bristol city centre following a video-simulated walk. Participants were 386 individuals (69% females) ranging in age from 18 to 87 years old, mainly white British (82%). 130 were undergraduate Psychology students, and 255 were employees of public and private organisations based in Bristol city centre. Each respondent was randomly assigned to one of 5 environmental simulations. A 1-minute video of a simulated walk was filmed for each environment, a popular tool in the literature (Van den Berg et al., 2014). Three recognisable leisure-oriented streets in

the city of Bristol were selected, identified as places where residents go to shop, eat, and stroll:

- Pedestrianised historic environment (PedHist): The historic heart of Bristol, dominated by neoclassic buildings.
- Pedestrianised modern environment (PedMod): A modern complex of public spaces, green areas, residential buildings and leisure areas.
- Pedestrianised mixed environment (PedMixed): A built area with green and historic elements close to the Bristol Cathedral.
- Commercial area with traffic (CommTraf): A commercial street with traffic in the shopping area of Bristol.
- Park: An urban park in Bristol City Centre.

Second, a sub-sample of 14 participants (employees and students) that had previously participated in the experiment was involved in photo and video-elicited interviews based on a real walk. The aim was to explore perceptions, practices and activities, or social interactions related to in-situ experiences. Data were then analysed using thematic analysis (Braun and Clarke, 2006) and considered in the context of ART (Kaplan and Kaplan, 1989) and SRT (Ulrich, 1983) as well as literatures on walking and place (e.g., Tuan, 1976).

Quantitative results showed that the simulated walks in pedestrianised areas without green elements were associated with affective benefits, as opposed to a commercial area with traffic. In addition, the pedestrianised mixed area was associated with affective benefits not statistically different from those in the park setting. Importantly, the commercial area with traffic was the only built setting associated with an increase in stress and a decrease in hedonic tone. Figure 1 shows pre-post stress scores in the five settings.

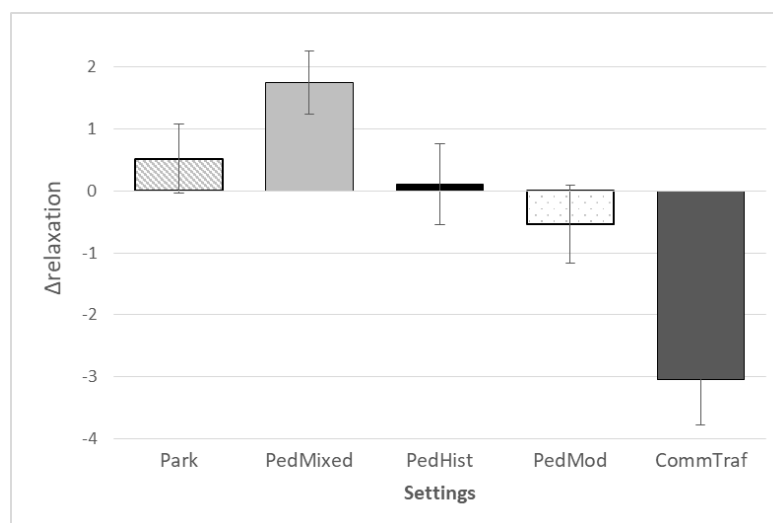


Figure 1: Δrelaxation per setting

Note: Difference between pre–post scores on relaxation scale in five settings. Maximum score is 16. The y-axis shows the change in relaxation (post *minus* pre-test scores); a bar above the y-axis represents an increase in relaxation. Error bars (95% confidence intervals) are shown.

In addition, some differences between the two populations (employees and students) emerged, as students experienced higher affective benefits following the simulated walks in the pedestrianised historic setting and in the park. In addition, students became significantly more stressed following the walk in the commercial area with traffic.

The qualitative phase aimed to explain these findings in more detail. Enablers and barriers of restoration in the urban context were identified. Among the barriers, it was found that motor traffic, poor aesthetics, and city busyness have a negative impact on affective variables. These results contributed to explain why the commercial area with traffic was the only setting associated with negative affective outcomes. Arguably, the role of traffic, city busyness, and poor aesthetics could also be the common denominator in those studies that found that urban walking is not restorative (e.g., Johansson, Hartig and Staats, 2011; Hartig et al., 2003).

On the other hand, presence of nature and an engagement with place were among the enablers of a positive affective and restorative experience. Specifically, it emerged that personal associations, engagement with Bristol’s identity, and sense of community support affect and restoration:

1. Personal memories, habits, and associations related to place, such as memories of home triggered by a shop or a building can stimulate hedonic tone, happiness, and relaxation. This set of results also contributed to partially explain the differences in affective experiences between the student and employee populations identified in the quantitative phase. In fact, students tended to associate positive memories to nature, due to the fact that they had spent most of their life in natural-rural, rather than urban, settings. As a consequence, their walking experience in the park and in the pedestrianised historic setting was significantly more restorative than for the employee group.
2. Engaging with Bristol’s identity can promote positive affect and cognitive recovery. For example, experiencing a “sense of history” in historic areas can prompt curiosity, imagination, and pride (Figure 2).
3. A connection with community, triggered by social events, active frontages and public spaces, can aid positive affect and enhance perceived safety (Figure 3).



Figure 2: Historic elements are symbols of the identity of Bristol; Figure 3: A well-kept garden triggers sense of community

Generally, these ideas mirror Relph (1976) and Tuan's (1977) conceptualisations of place as the product of personal experiences and involvements. By introducing in the debate on restorative environments the geographical idea of place, the enablers of the affective and restorative potential of built settings were identified. In line with previous research, it was found that place memory (Ratcliffe and Korpela, 2016), place attachment (Ratcliffe and Korpela, 2016) and identity (Morton, van der Bles, and Haslam, 2017) have a role in restorative experiences. Findings also contributed to explain why visiting a historic site (Fornara, 2011) and walking in a historic centre – among a group of individuals with poor mental health, Roe and Aspinall (2011) – presented restorative features, and this is related to the meanings associated with the identity and history of place.

Finally, a separate set of mixed quantitative-qualitative analysis showed that affective experiences of walking influence future intentions to walk. In fact, multiple regression analyses highlighted that affective experiences (stress and hedonic tone) predict walking intentions and mediate the role of perceived aesthetics. This revealed that a positive affective and restorative walking experience can encourage walking intentions, thus confirming that affective experiences influence approach/avoidance behaviours (Ulrich, 1983; Mehrabian and Russell, 1974). Therefore, it is highlighted the policy need to identify how urban walking can be relaxing, pleasant, and restorative, in order to increase walking levels in urban contexts.

To conclude, this thesis found that some non-natural, non-grey settings can support affective and restorative experiences, and barriers and enablers of a positive affective walking experience were identified. In addition, this research has examined the policy implications of affective and restorative experiences, and has revealed that a positive affective walking experience can encourage walking.

Selected References

- Braun, V. and Clarke, V. (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology* [online]. 3 (2), pp.77-101.
- Cox, D. T., Hudson, H. L., Shanahan, D. F., Fuller, R. A., & Gaston, K. J. (2017). The rarity of direct experiences of nature in an urban population. *Landscape and Urban Planning*, 160, 79-84.
- Fornara, F. (2011). Are “attractive” built places as restorative and emotionally positive as natural places in the urban environment? In M. Marino Bonaiuto, M. Bonnes, A. M. Nenci & G. Carrus (Eds.), *Urban diversities - environmental and social issues* (pp. 159-169). Hogrefe Publishing.
- Hartig, T., Evans, G. W., Jamner, L. D., Davis, D. S., & Gärling, T. (2003). Tracking restoration in natural and urban field settings. *Journal of Environmental Psychology*, 23(2), 109-123.
- Johansson, M., Hartig, T., & Staats, H. (2011). Psychological benefits of walking: Moderation by company and outdoor environment. *Applied Psychology: Health and Well-being*, 3(3), 261-280.
- Kaplan, R., & Kaplan, S. (1989). *The experience of nature: A psychological perspective*. Cambridge University Press.
- Kaplan, S. (1987). Aesthetics, affect, and cognition: Environmental preference from an evolutionary perspective. *Environment and Behavior*, 19(1), 3-32.
- Karmanov, D., & Hamel, R. (2008). Assessing the restorative potential of contemporary urban environment(s): Beyond the nature versus urban dichotomy. *Landscape and Urban Planning*, 86(2), 115-125.
- Matthews, G., Jones, D. M., & Chamberlain, A. G. (1990). Refining the measurement of mood: The UWIST mood adjective checklist. *British Journal of Psychology*, 81(1), 17-42.
- Mehrabian, A. and Russell, J.A. (1974) *An Approach to Environmental Psychology*. [online]. The MIT Press.
- Morton, T.A., Van Der Bles, A.M., and Haslam, S.A. (2017) Seeing our self reflected in the world around us: The role of identity in making (natural) environments restorative. *Journal of Environmental Psychology* [online]. 49 pp.65-77.

- Ratcliffe, E. and Korpela, K. (2016) Memory and place attachment as predictors of imagined restorative perceptions of favourite places. *Journal of Environmental Psychology* [online]. 48, pp.120-130.
- Relph, E. (1976) *Place and Placelessness*. Pion London.
- Robertson, R., Robertson, A., Jepson, R., & Maxwell, M. (2012). Walking for depression or depressive symptoms: a systematic review and meta-analysis. *Mental Health and Physical Activity*, 5(1), 66-75.
- Roe, J., & Aspinall, P. (2011). The restorative benefits of walking in urban and rural settings in adults with good and poor mental health. *Health & Place*, 17(1), 103-113.
- Russell, J. A., & Pratt, G. (1980). A description of the affective quality attributed to environments. *Journal of Personality and Social Psychology*, 38(2), 311.
- Staats, H., Jahncke, H., Herzog, T. R., & Hartig, T. (2016). Urban options for psychological restoration: Common strategies in everyday situations. *PloS One*, 11(1).
- Tuan, Y. (1977) *Space and Place: The Perspective of Experience* [online]. U of Minnesota Press.
- Ulrich, R. S. (1983). *Aesthetic and affective response to natural environment*. In Behavior and the natural environment, 85-125. Springer US.
- Ulrich, R. S., Simons, R. F., Losito, B. D., Fiorito, E., Miles, M. A., & Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology*, 11(3), 201-230.
- United Nations. (2014). *World urbanization prospects*. UN.
- Van den Berg, A. E., Jorgensen, A., & Wilson, E. R. (2014). Evaluating restoration in urban green spaces: Does setting type make a difference? *Landscape and Urban Planning*, 127, 173-181.