22.13 Perceived restorativeness of public green space / NBS

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Perceived Restorativeness	Health and Wellbeing
Description and justification	In recent decades a growing body of environmental psychology research has demonstrated the psychological benefits of interacting with natural environments, especially green spaces (Joye & Dewitte, 2018). There is strong evidence that experiencing nature through leisure activities pursued in green spaces (i.e., walking in parks, gardening) has benefits in mental health, creativity and mental relaxation (Aspinall et al., 2013; Bratman et al., 2015; Braubach et al., 2017; Hartig et al., 2014; Van der Berg & Custers, 2011; Williams et al., 2018). Natural physical settings play an important role in coping with stress, as there are robust links between exposure to natural environments and recovery from physiological stress and mental fatigue (Berto, 2014). Two complementary theoretical perspectives explain the psychological pathways of beneficial effects of nature on health, wellbeing, and mental states, namely Attention Restoration Theory (ART - Kaplan, 1995) and Stress Recovery Theory (SRT - Ulrich et al., 1991). Regarding ART, the theory suggests that concentration capacity is a limited resource and susceptible to fatigue by overuse, but that it can be restored by exposure to natural environments (Ohly et al., 2016; Zhang et al., 2017). These environments are a healthy resource, which allows and promotes the restoration of individuals within it from their state of directed attention fatigue (Zhang et al., 2017). Although this theory has been widely cited, there is uncertainty regarding which attentional aspects are affected by exposure to natural environments (Ohly et al., 2016). It is hypothesized that the restorative effect of these environments derives from its soft fascinating characteristics; these can set an individual in an effortless mode of attention, thereby giving directed attention to a relative opportunity to rest and replenish itself (Joye & Dewitte, 2018). Softly fascinating stimuli not only requires little effort, but also leaves mental space for reflection (Basu et al., 2019). In turn, exposure to nature can boost an individual's sense of connectedness (i.e., emotional or cognitive bonds to the natural world), as there is a bidirectional relationship between connectedness and restoration (Wyles et al., 2019). Both the connection with nature and nature

	restorativeness are an alternative source of motivation, to reinforce the relationship between environmental knowledge, environmental attitudes and engagement in pro-environmental behaviour (Berto & Barbiero, 2017; Whitburn et al., 2019). Much of recent research in the restorative process of natural environments has focused on knowing how cities can incorporate elements that facilitate attentional restoration, since this process can be affected both positively and negatively by different urban factors (Zhang et al., 2017). Cities can be potentially restorative, improving urban designs to offer psychological benefits to citizens (San Juan et al., 2017), since urban nature environment fosters mental health as a natural therapy intervention to improve pro-environmental behaviour for urban communities (Othman et al., 2020). Specifically, the restorative potential of an urban area can be reinforced by the design and proper selection of landscape types and elements (Deng et al., 2020). These authors stress that the elements that promote the optimal restorative environment are water features and the appearance of natural forest. In fact, urban gardens are an essential source for the psychological restoration, as well as urban biodiversity or ecosystem services (Young et al., 2020). Biodiversity, or ecological quality of environments (number of species, integrity of ecological processes) has numerous benefits to human health and well-being (Meyer-Grandbastien et al., 2020; Wood et al., 2018). In addition, there are other factors that contribute to increasing the restorative power offered by urban environments, such as the presence of sounds characteristic of nature as opposed to noise sounds related to traffic (Zhang et al., 2017), or the amount vegetation and perceived safety (Tabrizian et al., 2018). In conclusion, exposure to natural scenes mediates the negative effects of stress reducing the negative mood state, and above all enhancing positive emotions and wellbeing (Berto, 2014), that´s why city planners and designers should seriously attend to restorativeness effects in urban areas.
Definition	Restoration can be seen as a sequential, interactive process that begins with physiological relaxation and results in affective and attention restoration and broader life reflection (Pasanen et al., 2018).
Strengths and weaknesses	+ The indicator allows to know the restorative potential of a nature-based solution - Understanding the relationship of the indicator with well-being involves knowing the intermediate attentional mechanism
Measurement procedure and tool	☒ Quantitative P: Scale/Scale inventory/Questionnaire (survey procedure, paper-and-pencil administration, computer-based administration)

	o T: *Perceived Restorativeness Scale* (the short, PRS - 11) (Pasini et al., 2014), a shorter, parallel version of the Perceived Restorativeness Scale (PRS – 26) (Hartig et al., 1997), developed to address original psychometric limitations; PRS is based on the Attention Restoration Theory (ART; Kaplan, 1995) and its short version measures an individual's perception of 4 restorative factors assumed to be present to a greater or lesser extent in the environment, namely physical and/or psychological "being-away" from demands on directed attention, "fascination" a type of attention assumed to be effortless and without capacity limitations, the "coherence" and "scope" perceived in an environment. Participant's judgments are made on a 0 to 10-point scale, where 0 = not at all, 6 = rather much, and 10 = completely.
Scale of measurement	▪ Perceived Restorativeness Scale (the short, PRS - 11) (Pasini et al., 2014) *We are interested in how you experience this environment. To help us understand your experience, we have provided the following statements for you to respond to. Please read carefully, then ask yourself: "how much does this statement apply to my experience there?". To indicate your answer, circle only one numbers on the rating scale beside the statement. A sample of the rating scale is given below and at the top of each subsequent page. So, for example, if you think that the statement does not at all apply to your experience of the environment, then you would circle "0" (not at all), if you think it applies rather much, then you would circle "6" (rather much), but if you think that it applies very much, you would circle 10 (very much).* 1. Places like that are fascinating (Fascination) 2. In places like this my attention is drawn to many interesting things (Fascination) 3. In places like this it is hard to be bored (Fascination 4. Places like that are a refuge from nuisances (Being Away) 5. To get away from things that usually demand my attention I like to go to places like this (Being Away) 6. To stop thinking about the things that I must get done I like to go to places like this (Being Away 7. There is a clear order in the physical arrangement of places like this (Coherence) 8. In places like this it is easy to see how things are organized (Coherence) 9. In places like this everything seems to have its proper place (Coherence)

	10. That place is large enough to allow exploration in many directions (Scope) 11. In places like that there are few boundaries to limit my possibility for moving about (Scope)
Data source	
Required data	✓ Essential: NBS characteristics for each city/site, more specifically nature of activities one can get involved into while engaging with nature ✓ Desirable: Data on symbolic/affective meanings assigned to NBS (case studies, participatory data collection methods) – see also indicator SC6 (Place Attachment)
Data input type	Quantitative
Data collection frequency	After NBS implementation or aligned with timing of targeted (especially long-term) objectives
Level of expertise required	☒ Methodology and data analysis requires high expertise in psycho-social research ☒ Quantitative data collection requires no expertise
Synergies with other indicators	SC5.1 Perceived safety SC6 Place attachment (Sense of Place): Place Identity SC 11.1 Positive environmental attitudes motivated by contact with NBS SC11.2 Environmental identity SC ?? Pro-environmental behaviour HW3 General wellbeing and happiness HW10 Prevalence, incidence, morbidity of chronic stress HW11 Mental Health Wellbeing: Depression and Anxiety HW 12 Enhanced Physical Activity HW 14 Improvement of behavioral development and symptoms of attention-deficit/hyperactivity disorder (ADHD) ENV23 Green-space accessibility
Connection with SDGs	Goal 3. Ensure healthy lives and promote well-being for all at all ages Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable
Opportunities for participatory data collection	No opportunities identified
Additional information	
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