Journal of Environmental Psychology 49 (2017) 65–77

Contents lists available at ScienceDirect

Journal of Environmental Psychology

journal homepage: www.elsevier.com/locate/jep

Seeing our self reflected in the world around us: The role of identity in making (natural) environments restorative

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ARTICLE INFO

Article history:
Received 10 February 2016
Received in revised form
10 August 2016
Accepted 11 November 2016
Available online 14 November 2016

Keywords:
Nature
Identity
Aspiration
Memory
Restoration

ABSTRACT

Exposure to nature has been shown to restore cognitive capacities and activate intrinsic motivational states. The present research considered the role of salient identities in determining these effects. Three studies demonstrated that salient identities modify how people respond to natural environments. Exposure to images of natural environments increased the strength of intrinsic over extrinsic aspirations, and improved cognitive capacity, only when nature was central to a salient identity (Studies 1 & 2), or when the specific nature portrayed was connected to the salient identity (Study 3). Conversely, when nature was inconsistent with a salient identity, exposure had deleterious effects on aspiration and cognition. Together these studies suggest that the restorative potential of environments is determined, at least in part, by social and psychological processes connected to identity. These findings invite a more nuanced approach to understanding the possible psychological benefits of exposure to nature, and suggest that a variety of environments (natural and urban) can have restorative potential.

1. Introduction

Urban life typically entails exposure to a variety of stressors – including crowding, noise, pollution and poverty – all of which can compromise physical and mental health. Conversely, living close to, or even just spending time engaged with, nature has been shown to benefit individual well-being. For example, research has demonstrated that: growing up in the country (versus the city) is associated with reduced brain reactivity to stress (Lederbogen et al., 2011); walking through nature (versus urban environments) improves cognitive and emotional functioning (e.g., Berman, Jonides, & Kaplan, 2008; Berman et al., 2012; Berto, 2005; Bratman, Hamilton, Hahn, Daily, & Gross, 2015; Hartig, Evans, Jamner, Davis & Garling, 2003; Mayer, Frantz, Bruehlman-Senecal, & Dolliver, 2009; Nisbett & Zelenski, 2011); having views of nature increases children's self-discipline (Faber Taylor, Kuo, & Sullivan, 2002), and; exposure to natural objects (e.g., plants) or even images improves working memory (Berman et al., 2008), increases pro-social responses (Weinstein, Przybylski, & Ryan, 2009), reduces stress (Ulrich et al., 1991) and might facilitate physical recovery from illness (e.g., Mitchell & Popham, 2008; Ulrich, 1984). Accordingly, many in the literature have characterized contact with nature as broadly "restorative" for human health and well-being.

However, evidence for the restorative effects of nature is less consistent than is often assumed. Indeed, a meta-analysis of this field found that the benefits of exposure to nature varied considerably across subjective and objective measures (Bowler, Buyung-Ali, Knight, & Pullin, 2010). Improvements in self-reported emotion (i.e., mood) are most commonly studied in this literature and reveal the most robust effects. Improvements on performance in cognitive tasks and assessments of physiological states are less well studied in this literature and effects on these variables are less reliable. This meta-analysis included only studies that involved direct exposure to nature, but the general pattern is reflected in at least one recent study of exposure to natural (versus urban) images (Beute & de Kort, 2014). Here, there were reliable effects on self-reported environmental preference and, to a lesser extent, self-reported mood; but there were limited effects on physiological states and unreliable patterns across assessments of cognitive performance (see Bratman, Daily, Levy, & Gross, 2015; for a similar pattern).

The prevalence of effects of contact with nature on self-report

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http://dx.doi.org/10.1016/j.jenvp.2016.11.002
0272-4944/

measures could raise questions about the degree to which these represent conscious expectations versus more fundamental consequences for psychological functioning and well-being. However, in the context of the literature it seems unlikely that direct or indirect exposure to natural environments would have *no* implications for individual functioning. A more reasonable hypothesis is that benefits may be contingent on other factors — for example, individual differences in background experiences and associations with nature, and variations in the social context within which nature is experienced or evaluated (Bowler et al., 2010).

Contributing to this picture, the present research aimed to explore the role of identity in shaping the effects of exposure to different environments. To foreshadow our argument, we suggest that the psychological benefits of environmental exposure are, at least partly, contingent on the social-psychological connection between the individual and the environment to which they are exposed, a connection that is framed by identity. By picking apart identity and environment, we also believe it is possible for exposure to a variety of environments — urban and natural — to be psychologically beneficial versus distracting. In the space below, we summarize in more detail the theoretical literature that led us to this hypothesis before presenting three experimental studies in which it is tested.

1.1. The positive effects of exposure to nature

Although multiple theories have been used to explain the psychological benefits of exposure to nature (e.g., Ulrich, 1984; Wilson, 1984), much of the contemporary work in this domain is informed by attention restoration theory (ART: Kaplan, 1995). ART proposes a distinction between two different forms of attention: involuntary and voluntary. Involuntary attention occurs when a stimulus is inherently interesting and important and therefore captures attention spontaneously and effortlessly. Voluntary, or directed, attention involves situations in which mental processes need to be engaged to direct attention to the stimulus or task at hand. Voluntary attention involves mental effort and cognitive control, and as such is susceptible to fatigue.

According to ART, one way in which people can restore fatigued cognitive capacities is to switch to tasks that involve involuntary attention. Interacting with nature is thought to be particularly beneficial in this regard because nature is "rich with inherently fascinating stimuli (e.g., sunsets) [that] invoke involuntary attention modestly, allowing directed-attention mechanisms a chance to replenish" (Berman et al., 2008, p. 1207). In contrast to this, urban environments contain "stimulation (e.g., car horns) that captures attention dramatically and additionally requires directed attention to overcome that stimulation (e.g., avoiding traffic, ignoring advertising, etc.)" (p. 1207). Because of this, exposure to urban environments is thought to drain attentional resources leaving these depleted for subsequent tasks that involve mental control. The distinction between voluntary and involuntary attention, and the environments that engage each of these, is taken to explain why exposure to natural environments improves (and exposure to urban environments diminishes) performance on tasks that specifically require cognitive capacity and mental control (i.e., directed attention): the physical properties of nature engage attention in a way that allows for restoration of the mental resources, whereas the properties of urban environments deplete this.

Research supporting this possibility has examined the consequences of both direct and prolonged exposure to nature (e.g., residential environments, nature walks), as well as more incidental exposure (e.g., via office plants or natural images), and has drawn on a variety of cognitive tests as dependent measures. Reflecting the conceptualization of directed attention, these tests typically focus on mental effort (i.e. concentration) and executive control rather than more basic cognitive functions (e.g., orientation). For example, tests that have revealed effects consistent with ART have assessed the storage and manipulation of information in short-term working memory (e.g., backward digit span, Berman, et al., 2008, 2012; Ottosson & Grahn, 2005; or reading span tasks, Raanaas, Evensen, Rich, Sjøstrøm, & Patil, 2011), sustained attention (Berto, 2005), and the inhibition of competing responses (e.g., the necker cube pattern control task, Tennessen & Cimprich, 1995; Ottosson & Grahn, 2005).

Recently, researchers have also drawn on self-determination theory (SDT) to explain effects of exposure to nature beyond the cognitive domain, specifically with respect to positive motivational states and pro-social behavior. SDT has been applied to many social psychological phenomena (see Ryan & Deci, 2000) and distinguishes between two different forms of motivation: intrinsic and extrinsic. Intrinsic motivation involves the pursuit of goals that are inherently interesting and satisfying to the self, whereas extrinsic motivation involves the pursuit of goals for the attainment of external rewards. Because the pursuit of intrinsic goals satisfies fundamental human needs for competence, autonomy, and relatedness, this is thought to contribute to individual health and well-being and positive social orientations. Conversely, the pursuit of extrinsic goals is thought to compromise well-being and inhibit positive social responding.

Researchers working from this perspective argue that exposure to nature is more likely to support intrinsic goals and motivations than exposure to urban environments, which should instead activate extrinsic goals and motivations. Consistent with this, a series of studies showed that exposure to natural images or objects (i.e., plants) increased intrinsic aspirations and precipitated pro-social behavior, whereas exposure to urban environments increased extrinsic aspirations and reduced pro-social behavior, at least to the extent that participants reported a degree of immersion in the environments depicted (i.e., an interactive effect; Weinstein et al., 2009). Importantly, the effects of exposure to natural environments, in combination with self-reported immersion, were mediated through the experience of autonomy and relatedness to nature—supporting the idea that it is the particular capacity of natural environments to satisfy basic human needs that determines their effects on the self and behavior (see also Ryan et al., 2010).

1.2. The role of identities in relating to (natural) environments

The above approaches share a common assumption, namely that positive effects arise from something in nature *itself* — either its capacity to direct attention in a particular way and to restore diminished cognitive reserves, or its capacity to support particular forms of human motivation. In contrast to this focus on the inherent power of nature, a variety of perspectives outside psychology highlight the role of socio-cultural processes in determining what humans see in nature and what they take from it. Historians, cultural geographers, and anthropologists, have noted that the apparent value of nature as an idealized environment for humans shifts across time and place, and that the conception of nature is rarely independent of human culture or human concerns. For example, the extent to which people viewed nature as a site of relaxation versus fear has shifted across the late 19th and 20th century (Cronon, 1995). Colonial societies also actively changed the landscapes in their new territories thereby crafting nature in their own image (e.g., Neumann, 1995; Steinbach, 2011), and breaking