



An occasion for unselfing: Beautiful nature leads to prosociality



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ABSTRACT

Past studies have documented interpersonal benefits of natural environments. Across four studies, we tested the hypothesis that exposure to more beautiful nature, relative to less beautiful nature, increases prosocial behavior. Study 1 yielded correlational evidence indicating that participants prone to perceiving natural beauty reported greater prosocial tendencies, as measured by agreeableness, perspective taking, and empathy. In Studies 2 and 3, exposure to more beautiful images of nature (versus less beautiful images of nature) led participants to be more generous and trusting. In Study 4, exposure to more beautiful (versus less beautiful) plants in the laboratory room led participants to exhibit increased helping behavior. Across studies, we provide evidence that positive emotions and tendencies to perceive natural beauty mediate and moderate the association between beauty and prosociality. The current studies extend past research by demonstrating the unique prosocial benefits of beautiful nature.

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"In the woods we return to reason and faith. There I feel that nothing can befall me in life – no disgrace, no calamity (leaving me my eyes), which nature cannot repair. Standing on the bare ground – my head bathed in the blithe air and lifted into infinite space – all mean egotism vanishes."

Ralph Emerson. *Nature* (1983, p. 39)

1. Introduction: scientific studies on the benefits of nature

An emerging literature in psychology demonstrates that exposure to nature yields many positive outcomes (Kaplan, 1995; Wilson, 1984). For instance, several studies have examined whether exposure to nature enhances health (see Bratman, Hamilton, & Daily, 2012 for a review). In one study, hospital patients who had a window view of nature, compared to patients without such a view recovered faster and had shorter post-operative hospital stays (Ulrich, 1984). More recent studies extend this initial finding. For instance, patients in hospital rooms furnished with plants and flowers consumed fewer postoperative pain killers, showed lower systolic blood pressure, and experienced less pain, anxiety, and fatigue than patients in a room without plants and flowers (Park & Mattson, 2008, 2009).

Others have found that immersion in outdoor nature influences cognitive processes in beneficial ways. For example, participants

who watched a video with images of nature exhibited improved executive function as evidenced by better performance on the digit span backward test compared to participants who watched a video depicting urban scene (Berman, Jonides, & Kaplan, 2008). In a related study, participants who took a 50-min walk in nature showed better performance on memory tasks than participants who had walked through an urban setting (Berman et al., 2012). In keeping with these results, participants performed better at a problem solving task (Remote Association Test; Mednick, 1962) after a four day hike in natural environments compared to a separate sample of participants that completed the task before the hike (Atchley, Strayer, & Atchley, 2012).

Beyond these health and cognitive benefits, researchers have documented several socio-emotional benefits brought about by exposure to nature. For instance, there are reduced property and violent crimes near residential buildings that are surrounded by greater vegetation (a higher density of trees and grass) (Kuo & Sullivan, 2001). Children with Attentional Deficit Disorder displayed fewer symptoms after playing in a park setting compared to those playing in an indoor setting (Taylor, Kuo, & Sullivan, 2001). Exposure to nature also buffers children from some of the adverse effects associated with stressful life events and trauma (e.g., being bullied; Wells & Evans, 2003). More generally, exposure to nature leads to prolonged and enhanced positive affect, which is a critical component of subjective well-being. For instance, in the aforementioned study in which participants took a 50-min walk in either a natural or urban environment, participants who had spent time in nature reported greater positive affect compared to those who had

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spent time in an urban environment (Berman et al., 2012). This emerging literature points to many psychosocial benefits of natural beauty.

Particularly relevant to the current investigation is research on the link between nature and prosocial tendencies. For instance, researchers have documented a correlation between exposure to nature and prosocial traits (Mayer & Frantz, 2004; Nisbet, Zelenski, & Murphy, 2009). One experimental study demonstrated that exposure to photographs of natural environments, relative to images of urban environments, led participants to endorse greater communal aspirations (e.g., “To have deep enduring relationships”). Furthermore, exposure to plants in laboratory settings led participants to behave more generously in an economic game than those in a no-plants setting (Weinstein, Przybylski, & Ryan, 2009). In another study, participants completed a stress induction task before they observed nature through a glass window or stared at a blank wall (Kahn et al., 2008). Following the stressful task, looking at nature through the glass window led to greater heart rate deceleration – a physiological index of orienting toward and engaging with others (Caccioppo & Sandman, 1978; Eisenberg et al., 1989; Goetz, Keltner, & Simon–Thomas, 2010; Stellar, Manzo, Kraus, & Keltner, 2012) – than did looking at a wall. These findings suggest that exposure to nature may promote other-focused prosocial tendencies.

It is important to note that the experimental studies we have reviewed have predominantly focused on examining the positive consequences of exposure to nature versus exposure to urban or non-nature stimuli. These studies, therefore, give rise to an intriguing question: What factors account for the wide-ranging benefits of nature? To address this question, the present work investigates whether subjective beauty is one property of natural environments that facilitates the effect of nature on prosocial behavior. Guided by conceptual work on subjective perceptions of beauty (Gepshtein & Kubovy, 2000; Kubovy, 2000), we examine the thesis that nature leads to prosociality via subjective perceptions of beauty. Thus, we investigate the possibility that it is not nature per se but rather perceptions of beautiful nature that promotes prosociality. To test this hypothesis, we compared the effects of natural environments that are perceived to be more beautiful against those perceived to be less so.

2. Objective and subjective beauty

Theorists have proposed a variety of answers to how aesthetic judgments of beauty are developed (Feagin, 1995). For instance, landscape research has identified that scenic beauty is influenced by the quality of the environment. In one study, hikers were asked to rate the scenic beauty (e.g., “How does the scenic beauty of this view compare to others you have seen along this trail?”) of 12 landscapes during a hiking excursion. The landscapes that were rated as more beautiful tended to include more mountains, trees, depth of fields and open sky (Hull & Stewart, 1992; Hull, Stewart, & Yi, 1992). Other studies have highlighted individual difference as a predictor of beauty and attractiveness toward environment. For instance, Kaltenborn and Bjerke (2002) demonstrated that individual’s sense of attachment to specific natural settings is associated with finding the settings as more attractive and pleasant. Similarly, people who are prone to experience awe are more likely to appreciate nature’s beauty (Güsewell & Ruch, 2012). These findings set the stage for two schools of thought (objective and subjective) that have examined the development of individual’s judgment of beauty in the larger neuroaesthetics literature.

For instance, on the objective beauty perspective, some have argued that beauty arises from the property of an object that elicits a positive valenced experience in the perceiver (Tatarkiewicz, 1970). Since then, researchers in the emerging field of empirical

aesthetics have found several critical objective features that give rise to perceptions of beauty. These include features such as the symmetry, complexity, clarity of the stimulus, as well as the amount of contrast in it. Researchers have found that symmetry contributes to individuals’ ratings of the attractiveness of faces (Rhodes, Sumich, & Byatt, 1999). Further, participants rated circles with high contrast to be prettier than circles with low contrast (Reber, Winkielman, & Schwarz, 1998). In a separate study, pictures of everyday objects (e.g., desk, bird, plane, etc) that were either preceded by a degraded contour of the same or different picture were presented to participants. The matched pictures, enhancing visual identification, led participants to rate it as more likable than non-matched pictures (Reber et al., 1998). This kind of research is in keeping with one philosophical approach, that perceptions of beauty arise from a stimulus’s objective characteristics.

Another tradition of scholars working on aesthetic experience is rooted in the assumption that subjective processes give rise to the perception of beauty, independent of objective features of the stimulus (Kubovy, 2000). This subjectivist approach highlights how the perception of beauty arises as a function of the individual’s own construal of the object (Rolston, 2008). The British philosopher Samuel Alexander (1968) nicely described this subjectivist perspective:

“The nature we find beautiful is not bare nature as she exists apart from us but nature as seen by the artistic eye...we find nature beautiful not because she is beautiful herself but because we select from nature and combine... a construction on our part and an interpretation”.

pp. 30–31

Prior research in neuroaesthetics has compared individuals’ subjective perception with objective features of a stimulus and differential brain activation. For instance, participants listened to their subjectively rated beautiful (ugly) consonant or dissonant chords. The results showed that beautiful consonants, compared to the other conditions, activated the left middle temporal gyrus (visual perception; Suzuki et al., 2008). In a separate study, participants rated black and white geometric patterns on beauty and symmetry (Jacobsen, Schubotz, Hofel, & Cramon, 2006). Symmetry is positively correlated with beauty ratings. However, symmetry ratings were not associated with significant activation, whereas beauty ratings were correlated with significant activation in the fronto-medial cortex. While objective features contribute to beauty judgments, the theoretical and empirical literature we have reviewed suggests an idiosyncratic approach to beauty, one that emphasizes the individual’s subjective perceptions of a stimulus (see Gepshtein & Kubovy, 2000 for further review).

In the current research, we are interested in the consequences of individual’s subjective perception of nature. A subjectivist approach to beauty and its effects has two important implications. First, beauty should only yield effects for those individuals prone to subjective experiences of beauty. This notion – that individual differences moderate the effects of feelings upon judgments and action – has been widely validated in the literature on emotion and social cognition (e.g., Lerner & Keltner, 2001). Second, more subjectively beautiful stimuli should have more powerful effects than less beautiful stimuli. Guided by these lines of reasoning, the present investigation tested the hypothesis that subjectively beautiful nature leads to more prosociality than less beautiful nature.

3. The psychological effects of beauty

There is little direct evidence linking subjective perceptions of beauty in nature to enhance prosociality—the central hypothesis

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