



Bodies in nature: Associations between exposure to nature, connectedness to nature, and body image in U.S. adults



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ABSTRACT

Here, we sought to replicate previous work showing a relationship between connectedness to nature and body appreciation, and extend it by examining associations between exposure to natural environments and other body image-related variables. An online sample of 399 U.S. women and men ($M_{\text{age}} = 34.55$ years) completed measures of body appreciation, connectedness to nature, nature exposure, appearance investment, sociocultural attitudes towards appearance, and self-esteem. Path analysis showed that nature exposure and connectedness to nature, respectively, were associated with body appreciation in women and men, both directly and indirectly via self-esteem. Connectedness to nature also mediated the link between nature exposure and body appreciation. In men, but not women, the link between connectedness to nature and body appreciation was also mediated by appearance investment and internalisation of a muscular ideal. These results may point to novel methods for promoting more positive body image in adults through engagement with nature.

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Introduction

There is now ample and credible evidence demonstrating that exposure to natural environments (i.e., time spent in, and engagement with, nature-rich environments) has health-promoting qualities (for a review, see [Russell et al., 2013](#)). For example, one meta-analysis reported significant, moderate-sized reductions in negative emotions, such as anger, anxiety, and sadness (Hedges' $g = .35-.66$), and large-sized improvements in energy (Hedges' $g = .76$) following exposure to natural environments ([Bowler, Buyung-Ali, Knight, & Pullin, 2010](#)). Similarly, in a study of over 10,000 British respondents, it was reported that individuals living in urban areas with more green space had significantly lower mental distress and higher life satisfaction compared to individuals living in urban areas with less green space ([White, Alcock, Wheeler, & Depledge, 2013](#)). Experimental studies have also shown that simply viewing images of nature ([Berman, Jonides, & Kaplan, 2008](#)) or looking at natural environments ([Raanaas, Patil,](#)

[& Hartig, 2012](#); [Tsunetsugu et al., 2013](#)) has positive physiological and psychological effects.

According to Psychophysiological Stress Recovery Theory ([Ulrich, 1983](#)), these positive effects arise because natural environments help people to recover emotionally and physiologically from the stresses of everyday (and particularly urban) life. That is, natural environments can aid, and increase the speed of, emotional restoration by reducing negative emotions – a finding that has been demonstrated through experimental (e.g., [Ryan et al., 2010](#); [Ulrich, 1981](#)), survey-based (e.g., [Korpela, Ylén, Tyrväinen, & Silvennoinen, 2010](#)), and prospective studies (e.g., [Barton & Pretty, 2010](#)). Likewise, Attention Restoration Theory ([Kaplan, 1995](#)) postulates that interactions with natural environments can help to restore depleted cognitive resources (e.g., attention and memory), which in turn promotes effective cognitive functioning ([Bratman, Daily, Levy, & Gross, 2015](#)). Emotional and cognitive restoration through exposure to natural environments are inter-related ([Ulrich, 1983](#)), but the clear conclusion of both theories is that exposure to natural environments has positive effects on multiple aspects of well-being.

These are not the only routes through which exposure to nature can promote psychological well-being. Direct exposure to nature may also facilitate social contact and cooperation with others (e.g., by focusing attention on collective benefits or increasing

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other-focused prosocial tendencies; Zelenski, Dopko, & Capaldi, 2015; Zhang, Piff, Iyer, Koleva, & Keltner, 2014) and provide unique opportunities for personal development and a sense of purpose or meaning (e.g., by promoting reflection on personal problems; Mayer, Frantz, Bruehlman-Senecal, & Dolliver, 2009). In addition, research findings have also suggested that individuals vary in the extent to which they feel connected to nature (i.e., the degree to which they experience a “sense of oneness with the natural world”; Mayer & Frantz, 2004, p. 504). People who have a higher degree of connectedness to nature not only report greater pro-environmental behaviour (e.g., Gosling & Williams, 2010), but are also more satisfied with life and have higher happiness and positive affect (Mayer & Frantz, 2004; Tam, 2013). Importantly, the link between exposure to natural environments and well-being may be mediated by connectedness to nature (Mayer et al., 2009), although the link between connectedness to nature and well-being has itself been found to be mediated by constructs such as mindfulness (Howell, Dopko, Passmore, & Buro, 2011), meaning in life (Howell, Passmore, & Buro, 2013), and spirituality (Kamitsis & Francis, 2013; Trigwell, Francis, & Bagot, 2014).

Recently, scholars have begun examining associations between nature-related variables and specific aspects of well-being, such as body image. Although details of this relationship are only just beginning to be investigated (Swami, von Nordheim, & Barron, 2016), the presumed link is based on research showing that exposure to the natural world decreases negative states (e.g., anxiety) and increases positive states (e.g., affect; Mayer et al., 2009). That is, it has been hypothesised that nature is beneficial because it is restoring – an idea that is common in environmental psychology (Gifford, 2014) – and that those effects may extend to body image specifically (Swami, von Nordheim, et al., 2016). In particular, it is possible that greater exposure to nature focuses an individual’s attention on eudaimonic aspects of well-being; that is, time in nature and strong subjective connections with nature may promote feelings that one is part of a larger ecosystem requiring concern and protection (Mayer & Frantz, 2004; Schutz, 2000; Tam, 2013). Looked at from a different point-of-view, immersion in nature and a sense of connectedness to nature may shift attention away from hedonistic aspects of well-being, including immediate and narrow self-interest (e.g., a focus on one’s appearance; Swami, von Nordheim, et al., 2016).

Greater immersion in nature and a subjective connectedness to nature may also promote an equalitarian worldview. For example, Holloway, Murray, Okada, and Emmons (2014) have discussed how a sense of connection to nature may help women identify commonalities between their gender and wider ecosystems (e.g., by confirming a parallel between the subordination of women and the destruction of nature) and, in turn, develop a change in self-perceptions. The latter may include a critical appraisal of negative stereotypes and ideals of appearance and a relinquishing of impression management rituals, which in turn is experienced as corporeal empowerment (Holloway et al., 2014). In other words, it is possible that exposure to nature and a perceived connection to nature provide some individuals with tools to better appraise and cope with threats to body image, or foster embodying experiences that promote respect and appreciation of the body as a part of a wider ecosystem (Hennigan, 2010; Holloway et al., 2014; Swami, von Nordheim, et al., 2016). Thus, engagement with nature may provide opportunities for individuals to gain ownership over, and compassion for, their physical selves, which in turn may promote healthier body image.

To date, only a handful of studies have directly tested these assumptions. Using a qualitative design, one study of working- and middle-class individuals found that spending time in nature improved body image by allowing women to distance themselves from the wider cultural context, increasing embodying

experiences, and supporting connection to nature (Hennigan, 2010). Experimental work has also shown that greater self-objectification and internalisation of a feminine ideal resulted in lower connectedness to nature in women (Scott, 2010). Finally, a study of British adults found that connectedness to nature was directly associated with body appreciation – operationalised using the Body Appreciation Scale (BAS; Avalos, Tylka, & Wood-Barcalow, 2005), a measure of positive body image – in women ($r = .32$) but not in men ($r = .10$; Swami, von Nordheim, et al., 2016). In explanation, the authors suggested that connectedness to nature may provide unique, gendered opportunities for developing more positive body image (cf. Holloway et al., 2014). In addition, Swami, von Nordheim, et al. (2016) found that self-esteem fully mediated the relationship between connectedness to nature and body appreciation in women.

Although this work suggests a link between a nature-related variables and body image, Swami, von Nordheim, et al. (2016) have called for further research into these issues. For one thing, the BAS has recently been revised in line with developments in the conceptual understanding of body appreciation (BAS-2; Tylka & Wood-Barcalow, 2015a, 2015b). It is possible, therefore, that the null effect in the relationship between connectedness to nature and body appreciation in men reported by Swami, von Nordheim, et al. (2016) was an artefact of measurement issues. More broadly, while the focus of previous research has been on an aspect of positive body image (i.e., body appreciation), associations between connectedness to nature and broader aspects of body image have not been fully examined. This is important because, as Swami, von Nordheim, et al. (2016) have noted, there may be complex associations between connectedness to nature and multidimensional aspects of body image. In a similar vein, a broader perspective in terms of multiple components of body image may also help to uncover alternative mechanisms of causation between nature-related variables and body image (e.g., by protecting against prescriptive, societal standards of beauty).

In addition, although previous work has hinted at the relationship between exposure to nature and body image (Hennigan, 2010), there is a need to test this relationship more robustly. Although one might expect similar outcomes for connectedness to nature and nature exposure *vis-à-vis* body image given their domain similarity, there may be important distinctions between the two variables (cf. Perrin & Benassi, 2009). For example, previous work has reported that the correlation between exposure to nature and connectedness to nature tends to be moderate-to-strong (e.g., Kamitsis & Francis, 2013; Zhang, Howell, & Iyer, 2014), suggesting that, although there is some measurement overlap, the constructs are sufficiently different to have independent effects on outcome measures (Zhang, Piff, et al., 2014). More broadly, identifying independent associations between connectedness to nature and nature exposure, respectively, and body image may highlight different routes to leveraging therapeutic benefits (e.g., spending time in nature versus promoting connectedness to nature).

The Present Study

The present study had a number of inter-related aims. First, we sought to replicate the findings of Swami, von Nordheim, et al. (2016) with respect to the positive association between connectedness to nature and body appreciation. We did so using a more conceptually valid measure of body appreciation (i.e., the BAS-2 as opposed to the BAS) and in a new, but culturally-similar, population (i.e., community adults in the U.S., as opposed to the United Kingdom). Second, we examined direct associations between nature exposure and body appreciation. That is, we sought to establish the extent to which nature exposure, independent of connectedness to nature, is associated with positive body image. Based on the above review of the literature, we hypothesised that

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