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Nature connectedness: Associations with well-being and mindfulness

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ABSTRACT

Wilson's (1984) *biophilia hypothesis* predicts that people's psychological health is associated with their relationship to nature. Two studies examined associations among nature connectedness, well-being, and mindfulness in samples of undergraduate students while socially desirable responding was controlled. Significant associations emerged among measures of nature connectedness and indices of well-being (in Study 1 and Study 2) and mindfulness (in Study 2). Results are discussed in relation to possible mediators and moderators of the association between nature connectedness and mental health.

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1. Introduction

"Appreciating the beauty of a blossom, the loveliness of a lilac, or the grace of a gazelle are all ways in which people can, in some small measure, fill their daily lives with evolutionarily inspired epiphanies of pleasure" (Buss, 2000, p. 22).

It has been over 25 years since Wilson (1984) wrote *Biophilia*, in which he argued for an evolved inclination among humans to affiliate with nature. A substantial research base concerning biophilia has accrued within the field of environmental psychology, including the seminal work of Stephen and Rachel Kaplan and of Roger Ulrich. As reviewed by Joye (2007), supportive findings include human preference for savannah-like landscapes, favorable responses to natural environments relative to "built" environments, and restored cognitive functioning following immersion in nature. Wilson (1984) also spoke of an association between nature and psychological health, a position stated unequivocally by his colleague, Kellert (1993, p. 60): "The pursuit of 'the good life' is through our broadest valuational experience of nature". Experiences in nature have recently emerged as an interest within positive psychology; for example, Shiota, Keltner, and Mossman (2007) identified nature as an elicitor of awe.

1.1. Nature and well-being

Researchers have manipulated exposure to nature in order to examine nature's impact on well-being. Saraglou, Buxant, and Tilquin (2008) showed that exposure to a nature-oriented film boosted levels of positive emotions such as enjoyment and

wonder. Mayer, Frantz, Bruehlman-Senecal, and Dolliver (2009) showed that immersion in a nature preserve boosted positive affect. Weinstein, Przybylski, and Ryan (2009) showed that exposure to nature-oriented slides or a plant-laden laboratory increased endorsement of intrinsic goals. And, Ryan et al. (2010) showed that immersion in either simulated or actual nature boosted vitality.

In the Mayer et al. (2009) and Weinstein et al. (2009) studies, the temporary state of *nature connectedness* partially mediated effects of nature exposure on well-being. Nature connectedness has also been viewed as a *trait*, defined as "individuals' experiential sense of oneness with the natural world" (Mayer & Frantz, 2004, p. 504). Establishing associations between trait nature connectedness and well-being is important as such work complements experimental work by trading-off the strengths and weaknesses of each research approach.

Mayer and Frantz (2004) demonstrated a significant correlation between trait nature connectedness and life satisfaction. Mayer et al. (2009) showed no associations between trait nature connectedness and positive affect in three studies. Leary, Tipsord, and Tate (2008) showed no association between a measure of nature connectedness and a measure of life satisfaction.

Facets of well-being beyond positive affect and life satisfaction may be most associated with trait nature connectedness. Theorists have distinguished between aspects of well-being described as hedonic (e.g., feeling good) and those described as eudaimonic (e.g., living a fulfilled life; Ryan & Deci, 2001; Waterman, 1993). Given that nature connectedness involves a sense of meaningful involvement in something larger than oneself, it may relate most strongly to eudaimonic aspects of well-being. In this vein, Nisbet, Zelenski, and Murphy (2011) showed that nature connectedness was consistently associated with autonomy, personal growth, and purpose in life; nature connectedness was also associated with positive affect but not with life satisfaction.

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The current work builds upon these recent findings by examining the relationship between nature connectedness and a comprehensive conceptualization of mental health which incorporates scales of emotional, psychological, and social well-being (Keyes, 2005). This allowed us to examine whether trait nature connectedness was associated with feeling well (i.e., hedonic well-being, as assessed with the emotional well-being scale) and with functioning well (i.e., eudaimonic well-being, as assessed with the psychological and social well-being scales; Keyes, 2005; Keyes & Annas, 2009). In addition, we examined relations among nature connectedness and a second index of positive mental health, mindfulness.

1.2. Nature connectedness and mindfulness

Mindfulness, as defined by Brown and Ryan (2003), is “being attentive to and aware of what is taking place in the present” (p. 822). Mindfulness enhances the richness and vitality of moment-to-moment experiences (Brown & Ryan, 2003; see also Brown, Ryan, & Creswell, 2007). The enhanced sensory impact of experiences in nature fostered by mindfulness may strengthen nature connectedness among mindful individuals. For example, Wilson (1984) wrote, in describing the state of mind of a naturalist, “He goes alone into a field or woodland and closes his mind to everything but that time and place, so that life around him presses in on all the senses and small details grow in significance” (p. 103). Brown and Ryan further discuss that mindfulness enhances self-regulated functioning; that is, mindfulness sensitizes individuals to intrinsic needs, allowing people to better regulate themselves toward meeting those needs. In this vein, Kellert (1997) argued that key psychological needs can be met through affiliating with nature, including autonomy, competence, and relatedness needs. These needs are central to self-determination theory (e.g., Deci & Ryan, 2000), and have been shown by Brown and Ryan to correlate with mindfulness. Therefore, if mindfulness fosters the meeting of important needs, and if these needs can be met, in part, through experiences in nature, mindfulness and nature connectedness should be positively associated.

No research has examined associations between mindfulness and nature connectedness. However, Nisbet, Zelenski, and Murphy (2009) showed that openness to experience is associated with nature connectedness; Mayer et al. (2009) showed that attentional capacity is related to nature connectedness; and Leary et al. (2008) showed that internal state awareness is related to nature connectedness.

1.3. The current research

In Study 1, we examined correlations between nature connectedness and the emotional, psychological, and social scales of Keyes (2005) index of well-being; we examined associations between mindfulness and nature connectedness; and we controlled for

the influence of social desirability. The hypothesis was that higher levels of nature connectedness would be associated both with higher levels of well-being and with greater mindfulness.

2. Study 1

2.1. Method

2.1.1. Participants and procedure

Participants were 452 introductory psychology students at an urban Canadian university who consented to participate and who received course credit. Females comprised 69.4% of the sample, and 81.8% of participants identified Canada as their country of birth. The average age was 22.17 (SD = 6.14). First- and second-year students comprised 66.6% and 21.7% of the sample, respectively.

2.1.2. Measures

Mayer and Frantz (2004) devised the 14-item Connectedness to Nature Scale. Items (e.g., “Like a tree can be part of a forest, I feel embedded within the broader natural world”) assess a sense of oneness with the natural world, and are rated on 5-point scales with endpoints 1 = *strongly disagree* and 5 = *strongly agree*. Higher total scores denote greater nature connectedness. Mayer and Frantz reported a coefficient α of 0.84 and evidence of scale validity (e.g., positive associations with environmental concern).

Keyes (2005) compiled a 40-item measure of well-being; emotional well-being is assessed via ratings of positive affect reflecting the preceding 30-day period and a rating of overall life satisfaction; psychological well-being is assessed via ratings of self-acceptance, positive relations with others, personal growth, purpose in life, environmental mastery, and autonomy (Ryff, 1989); and social well-being is assessed via ratings of social acceptance, social actualization, social contribution, social coherence, and social integration (Keyes, 1998). Research has supported the three-factor structure of the measure (Gallagher, Lopez, & Preacher, 2009), as well as its reliability and validity (e.g., Keyes, 2005).

The Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003) employs 15 items, rated on 6-point scales with endpoints 1 = *almost always* and 6 = *almost never*, which assess the extent to which an individual is aware of and attends to current experiences. Items describe mindless experiences (e.g., “I could be experiencing some emotion and not be conscious of it until sometime later”). Higher total scores denote greater mindfulness. Brown and Ryan established the internal consistency of the measure ($\alpha = 0.82$), its test-retest reliability ($r = 0.81$), and its validity.

Paulhus's (1994) Balanced Inventory of Desirable Responding is composed of two 20-item subscales: Self-deceptive enhancement reflects the tendency to provide unintentionally inflated self-descriptions and impression management reflects the tendency to present a deliberately favorable view of oneself to others. Items

Table 1
Descriptive statistics and correlations for all variables: Study 1.

Variable	N	M	SD	Observed range	Possible range	α	Correlations			
							1	2	3	4
1. Connectedness to nature	437	45.78	8.81	22.00–65.00	14.00–70.00	.84	–			
2. Emotional well-being	442	10.38	2.04	2.50–14.83	0.00–15.00	.90	.01 (–.02)	–		
3. Psychological well-being	416	32.40	4.57	19.00–41.33	6.00–42.00	.82	.15* (.14*)	.57** (.51**)	–	
4. Social well-being	418	23.39	4.21	6.33–34.67	5.00–35.00	.82	.20** (.21**)	.42** (.39**)	.59 (.56**)	–
5. MAAS	427	57.99	11.17	27.00–88.00	15.00–90.00	.86	.03 (–.03)	.36** (.20**)	.42 (.25**)	.37** (.24**)

Note: Coefficients in parentheses are partial correlations controlling for self-deceptive enhancement and impression management. MAAS = Mindful Attention Awareness Scale.

* $p < .05$.

** $p < .001$.

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