Connectedness to Nature is More Strongly Related to Connection to Distant, Rather Than Close, Others

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Abstract

Much research supports the contention that human beings have a fundamental need to belong (Baumeister & Leary, 1995). This need can be satisfied by social connections such as friends and family or by a connection to more abstract entities such as culture, country, or humanity as a whole (McFarland, Webb, & Brown, 2012). Ecopsychologists have also argued that the need to belong can be satisfied by feeling connected to nature (Baxter & Pelletier, 2018; Mayer, Frantz, Bruehlman-Senecal, & Dolliver, 2009; Passmore & Howell, 2014). Despite conceptual similarities between connectedness to nature and social connectedness (Schultz, 2002), there have been conflicting findings in the literature regarding relations between these two constructs. The aim of the present study was to help clarify the relationship between social connectedness and connectedness to nature by measuring multiple forms of both of these broad constructs. Key Words: Connectedness to nature—Social connectedness—Belonging—Need to belong.

Connectedness to Nature

Many scholars have argued that, similar to how humans form feelings of connection with other humans, positive experiences with nature can lead to an emotional affinity and cognitive identification with nature (Kals, Schumacher, & Montada, 1999; Leopold, 1949; Mayer et al., 2009; Wilson, 1984). A range of constructs have been introduced in the literature which all represent related components of a connection with nature

(see Tam, 2013). While these constructs differ in specific focus, they all describe some form of relationship toward an abstract, generalized “nature” (Beery & Wolf-Watz, 2014). Tam (2013) found that scales targeting these constructs tended to converge around a common factor, implying they are all tapping into the same construct, which we will refer to as *connectedness to nature*.

However, supporting the proposition that connectedness to nature can be split into distinct affective and cognitive components (Schultz, 2002), Tam (2013) found divergence between measures of *emotional* and *cognitive* connectedness to nature. While measures of *emotional* connection—for example the Connectedness to Nature Scale (Mayer & Frantz, 2004) and the Love and Care for Nature Scale (Perkins, 2010)—assess an affective bond with nature, measures of *cognitive* connectedness to nature—such as the Inclusion of Nature in Self Scale (Schultz, 2002) and the Allo-Inclusive Identity Nature subscale (Leary, Tipsord, & Tate, 2008)—assess the degree to which nature is included in one’s schema of the self.

The relationship between social connectedness and connectedness to nature

The case for a negative relationship. Although connectedness to nature and social connectedness are conceptually similar—and both have been argued to be able to satisfy the need to belong (Cleary, Fielding, Bell, Murray, & Roiko, 2017; Mayer et al., 2009; Passmore & Howell, 2014)—only a small amount of research has focused specifically on their relationship. Prima facie, there are reasons to expect that social and nature connection could be negatively related. For instance, the rise of “nature religions” has arguably been driven by increased alienation from society, as people seek connection that they cannot find in society (Kramp, 2013). Conversely, people whose relatedness needs are satisfied by other humans may not be motivated to seek a connection with

nonhuman entities. Similarly, people who feel a deep sense of connection with nature (e.g., hermits, naturalists) may not feel the need to foster social connectedness.

Baumeister and Leary (1995) argue that the need to belong operates as a drive state. Like seeking food when hungry, people will seek out reconnection with other human beings when they feel socially disconnected (Maner, DeWall, Baumeister, & Schaller, 2007). Decreased social connectedness has also been shown to increase motivations to connect to *nonhuman* entities. For example, Epley, Waytz, Akalis, and Cacioppo (2008) found that both trait and state loneliness predicted increased anthropomorphism of nonhuman agents and a belief in God, which the authors argue occurs to facilitate connection. Since nature as a whole has been proposed as a source of belonging, people may seek out a connection with nature in order to cope with a lack of social connectedness. Along these lines, Poon, Teng, Chow, and Chen (2015) found that ostracism increased *desires* to connect to nature. It is plausible that given time, the desire to connect to nature could translate into the development of increased feelings of connectedness to nature. Thus, decreased feelings of social connectedness could lead to the development of connectedness to nature.

Additionally, there is complementary evidence that higher levels of social connectedness may lead to an emotional distancing from the natural world. Waytz and Epley (2012) argue that close relationships (i.e., friends and family) diminish the motivation to affiliate with distant others. Specifically, they found that the satisfaction of relatedness needs (such as by bringing a friend to the experiment) led to increased dehumanization of out-groups. In a similar fashion, individuals higher in social connectedness may also be less motivated to form connections with nature.

The case for a positive relationship. However, there are conceptual similarities between social connectedness and connectedness to nature which imply the possibility of a positive relationship. For instance, both involve commitment (Davis, Green, & Reed, 2009) and inclusion of the other (nature or other person) in the self-concept (Aron, Aron, Tudor, & Nelson, 1991; Schultz, 2002). These similarities imply that social connectedness and connectedness to nature may positively correlate due to shared personality variables that govern the tendency to feel a sense of attachment. It may be that certain types of people are “connection” prone and, thus, are more likely to feel a sense of connection both to other people and to the natural world.

Supporting this hypothesis that social and nature connection may be positively related, a number of studies have found significant positive relations between measures of social connectedness and

connectedness to nature. Trigwell, Francis, and Bagot (2014) reported a significant correlation ($r=.26$) between the Connectedness to Nature Scale and the Positive Relations with Others subscale of the Scales of Psychological Well-Being (Ryff & Keyes, 1995): a measure of the extent to which an individual has warm, trusting, intimate relationships with others. Similarly, Howell, Dopko, Passmore, and Buro (2011) found positive correlations between “social well-being” (i.e., feelings of social acceptance and integration) and the Connectedness to Nature Scale (Study 1, $r=.20$; Study 2, $r=.23$), the Nature Relatedness Scale ($r=.29$, Study 2), and the Allo-Inclusive Identity Nature subscale ($r=.21$, Study 2). Howell, Passmore, and Buro (2013) found comparable correlations between social well-being and the Connectedness to Nature Scale (Study 1, $r=.26$; Study 2, $r=.19$), the Nature Relatedness Scale (Study 1, $r=.21$), and the Allo-Inclusive Identity Nature subscale (Study 1, $r=.17$). Lee, Ashton, Choi, and Zachariassen (2015) found correlations between the Connectedness to Nature Scale with feelings of connection to humanity in general ($r=.44$), identification with country ($r=.32$), and identification with community ($r=.26$). Furthermore, Leary et al. (2008) found that the Nature and Humanity subscales of the Allo-Inclusive Identity Scale moderately correlated ($r=.35$). In reviewing the literature, Passmore and Howell (2014) conclude that “in multiple studies utilizing multiple measures, social well-being has been shown [sic] to correlate significantly with nature affiliation” (p. 378). Passmore and Howell (2014) also suggest a causal mechanism underlying this relation: “experiences with nature afford us a greater sense of relatedness and *social connectedness*” (emphasis added, p. 377).

However, a number of studies have reported negligible correlations between several forms of social connectedness and connectedness to nature. Unlike the findings of Trigwell et al. (2014), who utilized the Connectedness to Nature Scale, Nisbet, Zelenski, and Murphy (2011) found nonsignificant zero-order correlations across two studies ($r=.10$ and $.07$) between the 21-item Nature Relatedness Scale and the Positive Relations with Others subscale of Ryff and Keyes’ (1995) Scales of Psychological Well-Being (Ryff & Keyes, 1995). Likewise, Zelenski and Nisbet (2014) reported largely nonsignificant correlations between the same 21-item Nature Relatedness Scale and measures of loneliness, belonging, attachment, interdependence, and collective identity. They remark that “some-what surprisingly, nature relatedness appears largely distinct from these other connections” (p. 15).

Aims

Thus far we have reviewed conflicting theoretical evidence for a relationship between social connectedness and connectedness to

nature and documented the inconsistent findings in the literature pertaining to this relationship. The previous research has been inconclusive, in part, because each study has used different measures of both social and nature connectedness. The goal of the present study was to develop a clearer understanding of the relationship between social and nature connectedness by testing correlations between multiple indices of each. As part of this approach, we incorporated measures of both *cognitive* and *emotional* dimensions of connectedness to nature. We also measured social connectedness in terms of concrete interpersonal ties with significant others, ties with hypothetical strangers, and abstract connections with social identities. By doing so, we aimed to provide an authoritative picture of the relationship between these two broad constructs, and to be able to identify possible boundary conditions around the relationship.

Method

Participants and procedure

A total of 286 first-year Australian psychology students (203 female, $M_{\text{age}} = 20.16$ years, $SD = 3.35$) completed an online survey in return for course credit. After giving informed consent, participants completed the measures in a randomized order.

Measures of connectedness to nature

The *Connectedness to Nature Scale* (CNS; Mayer & Frantz, 2004) is a 14-item measure of an individual's *trait* levels of *emotional* connectedness to nature that is scored on a 5-point Likert scale. An example item is "I feel a sense of oneness with the natural world around me." High internal consistency ($\alpha > .80$) has been reported (Mayer & Frantz, 2004). Although there has been some contention that the scale may be measuring *cognitive* connectedness to nature (Perrin & Benassi, 2009), Tam (2013) found that the Connectedness to Nature Scale converged with measures of *emotional* connectedness to nature, supporting its original conceptualization.

The *Inclusion of Nature in Self Scale* (INS; Schultz, 2002) is a measure of *cognitive* connectedness to nature that measures people's inclusion of nature within their self-concept. It is a single item whereby participants select one of seven pairs of circles that represent varying degrees of overlap between nature and self.

The *Nature subscale* of the *Allo-Inclusive Identity Scale* (AII-NS; Leary et al., 2008) measures people's perceptions of shared identity with different elements of nature. Participants choose one of seven diagrams depicting an incremental overlap between a circle labeled "you" and another labeled "Other." For instance, a participant would select the circle that best represented "The connection between you and an eagle soaring in the sky." The scale possesses acceptable re-

liability, with Leary et al. (2008) finding an alpha above .75. Although not originally conceptualized as a measure of connectedness to nature, the content of the scale and criterion relationships support its classification as a measure of *cognitive* connectedness to nature (Tam, 2013).

Measures of social connectedness

The *Social Connectedness Scale* (Lee & Robbins, 1995) is an 8-item measure of interpersonal social connectedness with other people in one's life. An example item is "Even around people I know, I don't feel like I belong." It is rated on a 5-point Likert scale. This scale has reported excellent internal consistency ($\alpha = .91$) and has been used in a large number of experimental and clinical studies. As wording in the scale is reversed, we refer to the measured construct as *social disconnection*.

The *UCLA Loneliness Scale* (Russell, 1996) is a 20-item measure of feelings of interpersonal loneliness. It is scored on a 4-point scale from *Never* to *Often*. An example item is "There are people I feel close to" (R). The scale has reported excellent internal consistency, with Russell (1996) finding Cronbach's alphas between .89 and .94.

The *Humanity subscale* of the *Allo-Inclusive Identity Scale* (AII-HS; Leary et al., 2008) measures people's perceptions of shared identity with different individuals and groups of humans. It shares the methodology of the *Allo-Inclusive Identity Nature subscale* described above and consists of eight items measuring identity overlap with close others (e.g., "your best friend of the same sex") as well as distant others ("a homeless person on the street"). The scale possesses acceptable reliability, with Leary et al. (2008) finding a Cronbach's alpha above .75.

The *Identification with All Humanity Scale* (McFarland et al., 2012) measures feelings of connectedness toward targets that are increasingly distant from the individual: community, country, and all humanity. It consists of nine three-part items, each asking about attitudes toward "(a) people in my community, (b) people in my country, (c) all humans everywhere." An example question is "How much would you say you care (feel upset, want to help) when bad things happen to..." from *Not at all* to *Very much*. The subscales possess good internal consistency, with McFarland et al. (2012) generally finding Cronbach's alphas between .75 and .90.

Results

We conducted two sets of correlations. The first set of correlations examined all the indices of connectedness to nature with all the indices of social connectedness, with the exception of the Allo-Inclusive Humanity subscale (see Table 1). The second set of correlations examined all the indices of connectedness to nature with each

Table 1. Correlations Among Scales of Nature and Social Connectedness

VARIABLES	<i>M(SD)</i>	1	2	3	4	5	6	7	8
1. Connectedness to Nature	3.31(.51)	(.82)							
2. Inclusion of Nature in Self	3.51(1.40)	.62***							
3. Allo-Inclusive Nature	2.77(1.15)	.58***	.71***	(.89)					
4. Loneliness	3.21(.48)	-.01	-.17**	-.08	(.92)				
5. Social Disconnection	2.22(.76)	-.06	-.20**	-.08	.81***	(.92)			
6. Connection to Community	3.56(.77)	.18**	.15**	.05	-.24***	-.27***	(.90)		
7. Connection to Australians	3.45(.66)	.18**	.19**	.14*	-.26***	-.28***	.58***	(.86)	
8. Connection to Humanity	3.25(.61)	.35***	.31***	.35***	-.13*	-.16**	.45***	.59***	(.83)

Note. Cronbach's alpha internal consistency reliabilities are stated in the main diagonal.

* $p < .05$. ** $p < .01$. *** $p < .001$.

individual item within the Allo-Inclusive Humanity subscale (see Table 2). This analysis was conducted as some items of the Allo-Inclusive Humanity subscale measure connection to close others (e.g., family, the person you are closest to), while other items measure connection to distant others (e.g., a homeless person, a stranger on a

bus). Thus, as they are tapping into conceptually distinct forms of social connectedness, it was deemed more informative to look at correlations at the item level for this measure.

Overall, the majority of the correlations suggested a positive correlation between social connectedness and connectedness to

Table 2. Correlations Among Scales of Connectedness to Nature and Individual Items of the Allo-Inclusive Humanity Subscale

VARIABLES	<i>M(SD)</i>	1	2	3	4	5	6	7	8	9	10	11	12
1. Connectedness to Nature	3.31(.51)	(.82)											
2. Inclusion of Nature in Self	3.51(1.40)	.62***											
3. Allo-Inclusive Nature	2.77(1.15)	.58***	.71***	(.89)									
4. Person you feel closest to	5.85(1.17)	.02	.20**	.09									
5. Family	5.56(1.42)	.10	.23***	.11	.55***								
6. Best Friend Same Sex	5.33(1.25)	.21***	.36***	.26***	.61***	.46***							
7. Best Friend Other Sex	4.70(1.52)	.11	.21***	.17***	.52***	.40***	.53***						
8. Average Australian	3.10(1.09)	.24***	.42***	.27***	.30***	.29***	.48***	.40***					
9. Stranger on Bus	2.26(1.10)	.26***	.35***	.39***	.18**	.14*	.31***	.28***	.53***				
10. Person of Another Race	3.78(1.40)	.36***	.43***	.44***	.36***	.26***	.39***	.41***	.48***	.31***			
11. Homeless Person	2.41(1.14)	.36***	.41***	.50***	.16**	.09	.27***	.28***	.49***	.62***	.42***		
12. Total score for All-HS	4.12(.85)	.30***	.48***	.42***	.69***	.61***	.76***	.73***	.71***	.59***	.68***	.59***	(.82)

Note. Cronbach's alpha internal consistency reliabilities are stated in the main diagonal.

* $p < .05$. ** $p < .01$. *** $p < .001$.

nature. However, this relationship seemed to be stronger when social connectedness was measured with reference to abstract social categories (e.g., connection to people within one's nation and to humanity generally). As the social ties became more concrete and specific, the relationship weakened. For connection to one's community, for example, the positive correlation was only significant on 2 of 3 indices of connectedness to nature. For measures of how lonely and disconnected people felt with others on an interpersonal level, the positive correlation was only significant on 1 of 3 indices of connectedness to nature. Overall, though, it should be noted that there was no evidence for a negative relationship between the two constructs.

As seen in Table 2, the pattern of correlation between measures of connectedness to nature and the individual items of the AII-HS reflected the pattern of correlations in Table 1. In 19 of the 24 relationships tested, social connectedness significantly correlated with connectedness to nature. Again, however, the relationship was notably weaker when participants rated their connection with concrete examples of people in their life. When participants rated their connection with abstract exemplars of social categories, the relationships were significant in all 12 cases (average $r = .37$). In contrast, when participants rated their connection with specific loved ones, the relationship was only significant in 7 of 12 cases (average $r = .17$).

Discussion

The present study clarified the relationship between social connectedness and connectedness to nature by measuring relations between multiple forms of these constructs. The correlations between social connectedness and connectedness to nature ranged from nonsignificant to positive moderate correlations depending on the measures. However, there were no significant negative correlations between any forms of these constructs.

Implications

Passmore and Howell (2014) suggest that experiences with nature afford humans greater social well-being. The results of the present study provide mixed support for this proposition. In general, there were nonsignificant or small correlations between connectedness to nature and measures of loneliness, social disconnection, and connection to close others (e.g., family, best friends). Nevertheless, there were consistent moderate correlations between connectedness to nature, and connection to abstract social groups (e.g., connectedness to all humanity) and distant others (e.g., "a homeless person on the street").

Although these data are correlational, they lend support to a more limited proposition that connectedness to nature may afford greater feelings of social connectedness to other humans at a more distal level

of the moral circle (Singer, 2011). Interestingly, mirroring the observed correlational evidence in the present study, Saroglou, Buxant, and Tilquin (2008) found that viewing beautiful nature increased feelings of connection to humanity as a whole, but *not* connection to close others. Thus, although they did not specifically measure connectedness to nature, their findings are aligned with the present correlational evidence. Nevertheless, both the correlational evidence presented here and the experimental findings of Saroglou et al. (2008) suggest that connectedness to nature may not be able to stave off feelings of loneliness and facilitate feelings of connection to close others.

It must be noted that the Inclusion of Nature in Self item tended to show stronger correlations with measures of social connectedness compared to the Connectedness to Nature Scale and the Allo-Inclusive Identity Nature subscale. This finding dovetails with that of Zelenski and Nisbet (2014), who found that the Inclusion of Nature in Self item—compared to the Nature Relatedness Scale—had a stronger correlation with a connectedness composite comprised of different forms of social connectedness. Zelenski and Nisbet (2014) suggest that this finding may have been due to common-method variance. However, in the present study, Inclusion of Nature in Self generally showed stronger correlations with measures of social connectedness regardless of measurement method. This suggests that *cognitive* connectedness to nature may be more strongly related to social connectedness. However, providing some evidence against this claim, the Allo-Inclusive Identity Nature subscale (another measure of *cognitive* connectedness to nature) performed more similarly in this regard to the Connectedness to Nature Scale. Thus, the relative relatedness of *cognitive* and *emotional* forms of connectedness to nature with social connectedness remains ambiguous.

Future directions

Despite the nonsignificant to small correlations between measures of connectedness to nature and interpersonal social connection, the results of the present study do not strictly rule out the possibility of a causal effect of connectedness to nature in reducing feelings of loneliness. As suggested earlier, there is evidence to suggest that connectedness to nature may be motivated by decreased social connection, with Poon et al. (2015) finding that ostracism was linked with increased *desires* to connect with nature. As such, it is possible that, over time, social disconnection may motivate the development of connectedness to nature, which then feeds back to reduce feelings of loneliness. However, cross-sectional data would not be able to measure this dynamic relationship; both effects may cancel each other out when taking a temporal snapshot of the relationship. While not specifically measuring social disconnection and connectedness

to nature, Poon, Teng, Wong, and Chen (2016) found that exposure to nature could reduce the effects of ostracism on aggressive behavior, thus providing indirect support for the idea that connectedness to nature may reduce feelings of interpersonal social disconnection—or at least reduce its *effects*. Future research could investigate the relationship between loneliness and connectedness to nature using longitudinal methods to tease out possible dynamic relations. It is possible that a temporal analysis would reveal that the development of connectedness to nature may lead to decreased feelings of loneliness.

Another possibility to consider is that the correlations that were observed between connectedness to nature and social connectedness may be explained by shared individual differences variables. Lee et al. (2015) found that the personality domains of *Honesty-Humility* and *Openness to Experience* explained a significant proportion of the relationship between connectedness to nature and connectedness to all humanity. Lee et al. (2015) note that a significant proportion of the variance was left unexplained, and they speculated that this could be due to either connection to humanity or connectedness to nature having a *positive* causal influence on the other. Nevertheless, it could also be the case that related individual differences not measured by Lee et al. (2015) may account for the unexplained shared variance between connectedness to humanity and connectedness to nature. For instance, Crimston, Bain, Hornsey, and Bastian (2016) found that both connectedness to all humanity and connectedness to nature are related to *moral expansiveness*: the tendency to include more distant entities in one's moral circle. This finding is not surprising, as both constructs tap into connection to entities at a more distal level of the moral circle. Moral expansiveness provides a possible explanation for the findings of the present study: The strength of the observed correlations between connectedness to nature and social connectedness followed a general trend where the more *expanded* the form of social connectedness being measured (i.e., the more morally distant the individual or group), the more it correlated with connectedness to nature. Out of all the measures of social connectedness, connectedness to humanity *as a whole* had the strongest relationship with connectedness to nature. These data are consistent with an effect of *moral expansiveness* explaining a significant proportion of the shared variance between connectedness to nature and social connectedness to distant individuals and groups, although this hypothesis would require future research to be corroborated.

Conclusion

The aim of the present work was to test relationships between different forms of social connectedness and connectedness to nature, and in doing so, help clarify a literature that has reported inconsistent

relationships between these constructs. We found that the relationship between measures of social connectedness and connectedness to nature varied from nonsignificant to moderate positive correlations, and, interestingly, this relationship appeared to depend on how “expanded” the form of social connectedness being measured was. Although correlational, the present findings are consistent with the notion that connectedness to nature may facilitate broad feelings of connectedness to humanity; it may be that a rediscovery of the wild may also lead to a renewed appreciation of the unity of humanity. In this sense, the mission of ecopsychology to reconnect people with nature need not come at the expense of feelings of community with humanity, but, rather, may actually facilitate social harmony. We hope future research will expand on the present findings by testing the underlying causal mechanisms involved.

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