The role of social relational emotions for human-nature connectedness

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Keywords

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Abstract

Little is known about the psychological processes that can explain how connectedness to nature evolves. From social psychology, we know that emotions play an essential role when connecting to others. In this article, we argue that social connectedness and connectedness to nature are underpinned by the same emotions. More specifically, we propose that social relational emotions are crucial to understanding the process, how humans connect to nature. Beside other emotions, kama muta (Sanskrit: being moved by love) might play a particular crucial role when connecting to nature. Future research should address the consideration of social relational emotions in a range of areas when investigating the human-nature relationship.

Contribution to the field

A strong connection between humans and nature shows to be essential to sustain both the well-being of the environment as well as human well-being. In this scope, we explicitly propose the relevance of social relational emotions. By analysing underlying psychological-emotional mechanisms, this paper adds explanatory value to understanding human-nature interaction that goes beyond the biophilia hypothesis. Shifting focus towards the understanding of emotions that facilitate and strengthen a sense of nature-connectedness has the potential to inform moves to increase human well-being as well as environmental and pro-environmental behaviour.

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Abstract
The connection between humans and nature is a topic that receives increasing attention linked to debates on human well-being as well as environmental issues. While the need to provide and improve those relationships is a present issue, little is known about the psychological processes that can explain how connectedness to nature evolves. From social psychology, we know that emotions play an essential role when connecting to others. In this article, we argue that social connectedness and connectedness to nature are underpinned by the same emotions. More specifically, we propose that social relational emotions are crucial to understanding the process, how humans connect to nature. Beside other emotions, kama muta (Sanskrit: being moved by love) might play a particular crucial role when connecting to nature. Future research should address the consideration of social relational emotions in a range of areas when investigating the human-nature relationship.

1 Introduction

“When one tugs at a single thing in nature, he finds it attached to the rest of the world”. John Muir.

A positive relationship between humans and the natural world shows to be cross-culturally essential to sustain both human well-being and the well-being of the environment. This claim is supported by evidence of health-related and emotional well-being benefits from human interaction with nature (Hartig, Mitchell, De Vries, & Frumkin, 2014; McMahan & Estes, 2015) as well as its effects on pro-environmental attitude and behaviour to address environmental sustainability issues (Geng, Xu, Ye, Zhou, & Zhou, 2015; Ives et al., 2018; Rosa, Profice, & Collado, 2018). In this context, there has developed a substantial body of literature examining the human relationship and orientation towards nature. Among the conceptualisations are nature relatedness (Nisbet, Zelenski, & Murphy, 2009), inclusion of nature in self (Schultz, 2002), emotional affinity toward nature (Kals, Schumacher, & Montada, 1999) and connectedness to nature (Mayer & Frantz, 2004). Some of these concepts tap into cognitive appreciation of being embedded in nature, while others focus on the emotional
attachment or address material dependence on nature (Ives et al., 2017). Despite their differences, all of the concepts seem to agree on same core phenomenon: a relatively permanent connection to nature on the individual level (Capaldi, Dopko, & Zelenski, 2014; Tam, 2013). Psychometric scales used to measure this, such as the nature relatedness scale (Nisbet et al., 2009) or the connectedness to nature scale (Mayer & Frantz, 2004), are all highly correlated with one another (Tam, 2013). Accordingly, we will not distinguish between the different concepts in this paper, and we will refer to nature connectedness as an umbrella term. A growing demand to provide and improve a positive human-nature relationship has led to an interest among diverse scientists to conceptualise this phenomenon. Today, a variety of concepts such as nature relatedness (Nisbet, Zelenski, & Murphy, 2009), inclusion of nature in self (Schultz, 2002), emotional affinity toward nature (Kals, Schumacher, & Montada, 1999) and connectedness to nature (Mayer & Frantz, 2004) offer frameworks for describing and evaluating different aspects of the human-nature relationship. Despite differences in focus, all concepts characterise a relatively permanent feeling of connectedness to nature (Tam, 2013), which is the term we will continue to refer to.

Nature connectedness has recently been identified shown to be a predictor for human well-being (Capaldi et al., 2014), as well as pro-environmental attitude and behavior (Mackay & Schmitt, 2019). Explanations addressing the general question of why humans connect to nature are for the most part theoretically rooted in the Biophilia Hypothesis. First coined as a term by Fromm (1964) and later expanded by (Wilson, 1984), the Biophilia Hypothesis originates from the evolutionary notion that humans depend on their natural environment. It is claimed that this dependence evolved into a predisposition to be cognitive and emotionally attracted to nature and to affiliate with it (Kellert & Wilson, 1993). In this sense, the Biophilia Hypothesis provides a basis for an interdisciplinary research agenda to understand the general motivation of humans connecting to nature. However, it leaves the question open how such feelings of connectedness to nature are instantiated.

2 Knowledge gap and aim of the paper

We need to understand and investigate the specific pathways that lead to nature connectedness in order to provide possibilities for it to occur. In this scope, psychological mechanisms have been stated to be central when examining the routes to nature connectedness (Lumber, Richardson, & Sheffield, 2017; Zylstra, Knight, Esler, & Le Grange, 2014). While research from social psychology demonstrates that connecting to others is closely tied to emotional processes (Fiske, Seibt, & Schubert, 2019), but little attention has been given to about the emotional mechanisms that presumably enable and mediate connecting to nature (Milton, 2002). Consequently, the present paper adds explanatory value to understanding human-nature interaction by proposing stressing that specific emotional processes play an important role for connectedness to nature rather than being a side-effect or outcome. To the best of our knowledge, this is the first paper to suggest that social relational emotions have an important role to play in the process of connecting to nature. We specifically suggest that social relational emotions are crucial in the process of connecting to nature.

In the next sections, we firstly discuss the relationship between social connectedness and connectedness to nature and explain why both concepts are most likely underpinned by the same emotional mechanisms. We then describe the function of emotions for the process of connecting to social others, and highlight the potential of social relational emotions in this scope. In the third paragraph of the paper, we present the current specific research examples on the role and impact of these emotions in the scope of connecting to nature. We conclude by addressing the significance and implications of social relational emotions within future research.
3 Connectedness to nature and social connectedness

Humans are social beings and therefore have a fundamental need to relate and belong (Baumeister & Leary, 1995; Dunbar & Shultz, 2007; Fiske, 2018). This need into belonging is often satisfied by socially connecting to others such as the partner, family or friends. However, we know that people also socially relate to animals, deceased ancestors, deities, abstract entities such as countries, humanity as a whole, or even imagined collectivities in order to meet their need to relate for belonging (Fiske, 2004; McFarland, Webb, & Brown, 2012). Likewise, ecpsychologists have pointed out that the need to belong-relate can be satisfied by feeling connected to nature (Baxter & Pelletier, 2018; Schultz, 2002).

While social psychology has mainly focused on connections between humans, ecpsychology has tried to understand the connection between humans and the natural world. Although little research has specifically investigated the relationship of these two concepts, the literature points to the conceptual similarities between social connectedness and connectedness to nature. First, Kals et al. (1999) and Mayer, Frantz, Bruehlman-Senecal, and Dolliver (2009) demonstrated that similar to how humans establish connections with other humans, positive experiences with nature can lead to an emotional affinity and cognitive identification with nature. Second, both relationships involve have similar basic features, modes of actions, such as commitment (Davis, Green, & Reed, 2009) and inclusion of the other (nature or other human beings) in the self-concept (Schultz, 2002). Third, several studies have found relations between measures of social connectedness and connectedness to nature. For instance, Howell, Dopko, Passmore, and Buro (2011) and Howell, Passmore, and Buro (2013) found significant positive correlations between social connectedness, framed as social well-being (Keyes, 1998) and the connectedness to nature scale by Mayer and Frantz (2004), the nature relatedness scale by Nisbet et al. (2009) and the allo-inclusive identity nature subscale by Leary, Tipsord, and Tate (2008). Finally, the notion of being connected itself is a psychological one, which is mediated by culture, context, and experiences (Mesquita, Boiger, & De Leersnyder, 2016).

Therefore, it is plausible to hypothesise that connecting to other human beings and connecting to nature are underpinned by the same general psychological mechanisms, which include cognitive, emotional, and behavioural processes. We focus here on specific emotions that play an essential role in connecting to others.

From this point of view, it is plausible to hypothesise that connecting to other human beings and connecting to nature are underpinned by the same general psychological mechanisms, which include cognitive, emotional, and behavioural processes. In this scope, research from social psychology shows that there exist specific emotions that play an essential role in connecting to others.

4 Social relational emotions – their function for social connectedness

In this paragraph, we discuss what kind of emotions facilitate social connectedness and how.

Emotions, in general, play a crucial role in our daily life as they influence how we think and behave (Ekman & Davidson, 1994; Scherer & Ekman, 2014). Emotions can be defined as rather short-lived, object-directed and high in intensity in contrast to state of moods, and for the purpose of this paper are best described by the approach of appraisal theory (Moors, 2010; Moors, Ellsworth, Scherer, & Frijda, 2013). Typically, humans experience emotions more strongly when events are relevant to their current needs, aims, motives, values, norms, attachments, beliefs, or expectations (Frijda, 1986; Lazarus, 1991; Scherer, 2005). Furthermore, emotions can impact make experiences to be more memorable (Reisberg & Heuer, 1992). In this sense, emotions are functional, guiding us in adaptive responses to social relational opportunities and challenges (Fiske, 2002, 2010). For instance, although
often perceived as negative, the primary function of anger, shame, grief, guilt and embarrassment is to establish, regulate, and maintain social relationships and social positions relative to others (Bastin, Harrison, Davey, Moll, & Whittle, 2016, p. 457). Due to the specific underlying function of establishing, regulating and maintaining relationships, these emotions can be categorised as social relational emotions.

More recently, emotions with positive valences have as well received scientific attention. These emotions are awe (Keltner & Haidt, 2003; Shiota, Keltner, & Mossman, 2007), admiration (Onu, Kessler, & Smith, 2016), gratitude (Ma, Tunney, & Ferguson, 2017; McCullough, Kilpatrick, Emmons, & Larson, 2001), compassion (Nussbaum, 1996) and moral elevation (Haidt, 2003; Pohling & Diessner, 2016). All these emotions seem capable of boosting a sense of connection with others and can, therefore, be categorised as positive social relational emotions. For instance, Stellar et al. (2017) highlighted that emotions like awe, gratitude, and compassion are powerful proximal determinants of prosocial action. According to the authors, it is through prosocial tendencies, that these emotions (termed by the authors as self-transcendent emotions) bind individuals to others within social collectives.

In this context, we highlight the potential of one specific positive emotion, namely kama muta, (Sanskrit: being moved by love; Fiske et al., 2019; Seibt et al., 2017; Zickfeld et al., 2019), which may be the most crucial social relational emotion in connectedness. Holding a new-born baby in your arm, surprisingly seeing a loved one again after a long time, or unexpectedly receiving a great kindness are typical example of moments in which people experience kama muta. In vernacular English, kama muta is often described as being moved or touched, while the elicitors may be called heart warming (Fiske et al., 2019). The primary appraisal involved in kama muta is experiencing a sudden intensification of communal sharing. A number of studies suggest that kama muta has evolved (biologically and culturally) to regulate communal sharing relations (Schubert, Zickfeld, Seibt, & Fiske, 2018; Seibt et al., 2017). Communal sharing, one out of four relationships humans use to coordinate their social interactions, is the foundation of relationships in which people feel shared identity, are motivated by unity, share resources according to need and ability or signal and commit to being one by assimilating each other’s bodies (see: Relational Models Theory: Fiske, 1991; 1992; 2004). While kama muta is often evoked by the perception of a sudden intensification of a communal sharing relationship with another human being, the theory is not restricted to it. It explicitly suggests that encounters could occur with another being such as an animal, deity or even an abstract entity such as the earth or the cosmos. Therefore, this theory-based emotion offers particular potential for investigating its meaning for nature connectedness.

According to the Relational Models Theory (Fiske, 1991, 1992, 2004), humans coordinate and organise social interactions based on four relational models. These four forms of relationships are Communal Sharing, Authority Ranking, Equality Matching and Market Pricing. For instance, holding a newborn baby in your arm, surprisingly seeing a loved one again after a long time or unexpectedly receiving a great kindness of someone are examples of communal sharing relationships (Fiske, 1991, 1992). In these moments, people experience kama muta (Sanskrit, "being moved by love"; Fiske et al., 2019; Seibt et al., 2017; Zickfeld et al., 2019). Although many researchers are still unfamiliar with the concept of this particular social relational emotion, kama muta might be one of the most relevant social relational emotions in the contexts of social connectedness. Kama muta is often evoked by the perception of a sudden intensification of a communal sharing relationship with another human being. However, the theory explicitly suggests that these encounters could occur with another being such as an animal, deity or even an abstract entity such as the earth or the cosmos.
The role of social relational emotions in nature experiences

In this section, we are raising awareness for the fact that aspects of social relational emotions have been associated with psychological inspired research on nature experiences since the last 50 years, but rarely empirically. By pointing to some current empirical research in this field, we highlight the potential that social relational emotions offer for understanding the gateways to nature-connectedness and the associated outcome variables such as well-being.

Although not explicitly termed like this, social relational emotions have long been recognised strongly associated with in the philosophical literature on environmental ethics. Naess (1977), who builds his theoretical considerations regarding deep ecology upon the ideas of Spinoza, views emotions to be fundamental to the complex inter-relationships that the natural world exists of. Early philosophically inspired researchers looking into psychological aspects of connecting experiences in nature tended to ascribe emotional characteristics to into the overall nature experiences without separating them from other aspects of the experience. For instance, based on the concept of peak experiences by Maslow (2013, p. 59), a study with a sample of 1000 Americans showed that 82% of the participants indicated that they had responded to have experienced the beauty of nature in a deeply moving way (Wuthnow, 1978). A study by DeMares (2000) found similar emotional responses. According to the informants of the interview-based study, interview respondents, the encounter with cetaceans led to feeling connecting with the animal, and was sometimes described as a life-changing peak experiences. Expanding on the concept of peak experiences, the ecopsychologist Davis (1998) proposed the term transpersonal experiences in nature, which includes the experience of peace, joy, love, support, inspiration and communion. According to the author, those are aspects of nonreligious spirituality. Later, Trigwell, Francis, and Bagot (2014) identified such non-religious spirituality as a mediator of the-nature connectedness and eudaimonic well-being. Additionally, Marshall (2005) refers to mystical experiences in which people feel, when describing that the natural world evokes a sense of unity, knowledge, self-transcendence, eternity, light, and love. The notion of emotions as part of some form of spirituality have taken a wide-ranging place in the literature when trying to explain processes of nature connectedness. However, a more recently published paper by Lumber et al. (2017), investigated whether the nine values of the Biophilia Hypothesis, which represent a combination of different values and emotions, mediate nature-connectedness. Through two online surveys (n= 321) and one walking intervention (n=72) findings indicated they found that contact to nature, emotion, meaning, compassion and beauty are pathways to improving nature connectedness. Another recent paper research project by Anderson, Monroy, and Keltner (2018) used daily diary methods to look at distinct emotions and their mediating role in nature experience for the outcome of well-being. In their first study, they found that awe experienced by 72 military veterans and 52 young people from underserved communities while white-water rafting, above other positive emotions measured, predicted increase changes in well-being and reduction of stress-related symptoms after one week. In the second study, they could showed that the nature experiences of 115 undergraduate students had, during their everyday lives led to more awe, which mediated the effect of nature experience on improvements in well-being. Moreover, gratitude, in addition to awe, also mediated the effect of nature experience on daily life satisfaction. Additionally, gratitude and awe each mediated the effect of nature experience on daily life satisfaction.

Summarising the reviewed literature, in sum, research on social relational emotions and nature-connectedness presents itself as relatively vague. Research on states of nature connectedness showed to include and apparently includes a mix of social relational emotions, often labelled as spiritual aspects. Such a theoretical framing makes it difficult challenging to scientifically investigate...
emotional processes. However, English-speakers’ descriptions of experiences as deeply moving or even love might represent instances of the kama muta emotion. However, descriptions of deeply moving or even love might represent aspects of the emotion kama muta, as this emotion is often described as being moved by English speakers. Moreover, despite some weaknesses in the methodology, single empirical examples reveal that emotions in general, and compassion specifically, could be important for the sense of nature connectedness. Furthermore, the literature suggests that social relational emotions such as awe and gratitude play a direct role for well-being that result from contact to nature.

**Conclusion and implications for future research**

The issue of nature connectedness is a complex one. Shifting focus towards the understanding of emotions that facilitate and strengthen a sense of nature-connectedness has the potential to inform moves to increase human well-being as well as to foster pro-environmental attitudes and pro-environmental behaviour. In Social-relational emotions, especially kama muta, seem to be salient in experiences of connection with nature. This has five implications, this scope, we have explicitly proposed the relevance of social relational emotions and. In the following, we highlight five areas of further investigation and mark brief methodological suggestions.

First, future research should investigate empirically, how single or combinations of social relational emotions such as awe, compassion, gratitude, moral elevation, and kama muta effect connectedness to nature. Researching emotions and relationships is complex. This and the fact that we propose a new area of research invites for multiple methodological approaches. While a phenomenological psychological approach can be suitable to explore the here and now of lived experience on an individual level (Merleau-Ponty, 1962), systematic approaches are needed. While systematic approaches are required to explore the structure of the experienced phenomenon on the individual level, for instance, by applying the descriptive phenomenological method (Giorgi, 2009), systematic approaches on a larger scale are essential to allow for generalisation of findings. In this scope, collecting data though mobile experience sampling method (mESM) could address the fact that emotional states are momentary experiences at particular moments in time. Applying mESM by using smartphone technology, is a method enabling continuous recording of people’s daily life in real time to assess emotional states on a within and between level (Pejovic, Lathia, Mascaro, & Musolesi, 2016). In comparison to traditional self-report, ESM method shows to be less subject to biases introduced by recall and retrieval processes (Shiffman & Stone, 1998; Stone et al., 1998). It is important to recognise that every experience including its underlying emotions is culturally situated and culturally informed. In the same way is connectedness to nature fostered by cultural models of this entity. This fact highlights the importance of cross-cultural research; however, it should also remind future research of the need to methodically consider peoples’ conceptions of nature when investigating the role of social relational emotions in the context of nature-connectedness. For instance, the word nature can have different meanings for people from different cultures (Wohlwill, 1983).

Second, it is important to recognise that every experience, including its underlying emotions, is culturally situated and culturally informed. Connectedness to nature is fostered by cultural models of nature (Wohlwill, 1983). This makes it essential to conduct research across cultures that considers how cultural conceptions of nature enable, limit, and shape social relational emotions. If theory should guide practice, future research in this area should accordingly be based on established and cross-culturally applicable theory-based emotions, such as kama muta, which is labelled with a Sanskrit term in order to avoid the confusions of vernacular lexemes (Fiske, 2019). Validated
measures should be used to facilitate comparison among studies as well as the generalisation of findings. For instance, for kama muta, there exists the KAMMUS-Two scale developed by Zickfeld et al. (2019) across a variety of contexts, in 19 countries and 15 languages. A well-established and valid questionnaire for gratitude is the Gratitude Questionnaire-6 (GQ-6) (McCullough, Emmons, & Tsang, 2002), and for the emotion awe, the Awe Experience Scale (AWE-S) (Yaden et al., 2019).

Second, a theory should guide practice, future research in this area should based on established and cross-culturally applicable theory-based emotions, such as kama muta, which is formulated in Sanskrit in order to avoid vernacular lexeme labelling (Seibt et al., 2017). Valid measures should accompany the emotions studied to facilitate the comparison among studies as well as the generalisation of findings. For instance, for kama muta, we suggest using the KAMMUS-Two. The scale has been developed by Zickfeld et al. (2019) and successfully validated across a variety of contexts, 19 countries and 15 languages. A well-established and valid questionnaire for gratitude is the Gratitude Questionnaire-6 (GQ-6) (McCullough, Emmons, & Tsang, 2002), and for the emotion awe, we suggest the Awe Experience Scale (AWE-S) (Yaden et al., 2019).

Third, given Anderson et al.’s (2018) finding that experiencing the emotion of awe in nature predicts well-being, it will likely be fruitful to explore whether other social relational emotions mediate the effects of nature connectedness with well-being and pro-environmental attitudes and behaviour. Positive emotions initiate a broader range of thoughts and actions than negative emotions do, and have in general been identified as affording well-being and happiness (Cohn, Fredrickson, Brown, Mikels, & Conway, 2009; Diener & Seligman, 2004). However, emotions like grief or guilt about injury to the environment or loss of nature may have substantial effects on people’s sense of responsibility for nature, and may foster care for it. Thus, it would be particularly interesting to compare the effects of negatively perceived social relational emotions, such as grief or guilt, with positively perceived social relation emotions such as compassion, awe, or gratitude.

Third, Anderson et al. (2018) suggested that experiencing the emotion of awe in nature environment predicts well-being. Thus, it is possible that some of the shared variance between connectedness to nature and well-being are mediated by the emotions. We suggest investigating whether social relational emotions mediate downstream consequences such as well-being and pro-environmental attitude and behaviour. Moreover, it would be particularly interesting to compare negatively perceived social relational emotions, such as grief or anger with positively perceived social relation emotions like compassion, awe or gratitude regarding their effects on downstream consequences.

After all, positive emotions initiate a broader range of thoughts and actions than negative emotions do and have in general been identified as indicators of people’s well-being and happiness (Cohn et al., 2009; Diener & Seligman, 2004). This and the fact that humans are motivated to experience positive emotions could points to a higher potential of positive social relational emotions concerning health-related wellbeing, values, attitude and behaviour.

Fourth, despite the fact that current research emphasises the benefits of direct engagement with nature, it simultaneously points to mounting evidence that physical contact with nature is decreasing (Rosa et al., 2018). In this context, Chirico, Ferrise, Cordella, and Gaggioli (2018) compared virtual exposure to nature and actual contact with nature. The results indicate that while browsing nature photographs or watching a nature documentary are likely to improve mood, getting outdoors and connecting directly with nature was associated with better well-being benefits. Along with increasing use of digital technology, Future research needs to address the question of how to maintain and adapt the possibilities for social relational emotions and human-nature connectedness to take place
when technology is the medium to provide virtual exposure to nature. Studies in this area can be realised through experimental settings using virtual reality.

Finally, we have argued that social connectedness and connectedness to nature are underpinned by the same social relational emotions. However, are these emotions enable to satisfy the human needs for belonging to relate in the same way or to the same degree when by connecting to nature compared to connecting to other human beings? In other words, are there social relational emotions and qualities of relating or belonging that can only or more easily be enabled through experiences in nature, or through experiences with other humans? and vice versa? Future research should address such questions in order to provide guidance to practical application such as psychological or environmental therapy for attachment disorders, depression, anxiety, and other conditions. Guiding theory to fields of practical application such as psychological therapy. Generated knowledge could be used to complement professional counselling regarding, for example, attachment disorders.

7.1.6.1 Final remarks

Above we quoted John Muir, “When one tugs at a single thing in nature, he finds it attached to the rest of the world”. Grasping any aspect of nature affords possibilities to ameliorate the well-being of individuals, communities, and the environment – because as we grasp a bit of nature, in turn nature tugs at our heartstrings.

John Muir points in his opening quote to the connectedness of all elements on earth, including humans and nature. He claims that getting in contact with a basic nature element can provide insight into this universal fact. Through this paper, we acknowledge the importance of statement for the well-being of the individual as well as the well-being of the environment. We conclude by stressing the potential that tugging a single thing in nature can have on tugging one’s heartstrings.

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Author Contributions

-EP conceptualised and wrote the first draft and AF & TS contributed with advice. All authors revised the final manuscript.

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