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What predicts well-being: connectedness to oneself, nature, others, or the transcendent?

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ABSTRACT

Well-being is essential for all people. Therefore, important factors influencing people's well-being must be investigated. Well-being is multifaceted and defined as, for example, psychological, emotional, mental, physical, or social well-being. Here, we focus on psychological well-being. The study aimed to analyze different aspects of connectedness as potential predictors of psychological well-being. For this purpose, we conducted a study examining the psychological well-being of 184 participants (130 women, 54 men, age: $M = 31.39$, $SD = 15.24$) as well as their connectedness with oneself (self-love), with others (prosocialness), with nature (nature connectedness), and with the transcendent (spirituality). First, significant positive correlations appeared between psychological well-being and self-love, nature connectedness, and spirituality. Furthermore, correlations between the four aspects of connectedness were significant, except for the relationship between self-love and prosocialness. A regression analysis revealed that self-love and nature connectedness positively predicted participants' psychological well-being, while spirituality and prosocialness did not explain any incremental variance. The strong relationship between self-love and well-being was partly mediated by nature connectedness. Hence, self-love, understood as a positive attitude of self-kindness, should be considered in more detail to enhance psychological well-being. Besides this, a more vital connectedness to the surrounding nature could benefit people's well-being.

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Introduction

Nobody would deny that well-being is essential for almost everyone, but it is still unclear what exactly well-being is. There are many different definitions of the concept. According to Diener (1984), well-being is defined by evaluating one's life in favorable terms, external criteria such as virtue or holiness, and as a predominance of positive affect over negative affect. In some studies, well-being is used interchangeably with happiness (Oishi et al., 2007). Besides happiness or well-being, other concepts like flourishing or satisfaction with life exist.

Ryan and Deci (2001) state that well-being is a complex construct. It has been defined (among other definitions) as subjective or psychological well-being or as hedonic or eudaimonic well-being. In the present study, we focus on psychological well-being, which includes self-acceptance, purpose in life, environmental mastery, positive relations, autonomy, and personal growth (Ryff & Keyes, 1995). Subjective well-being includes the components of positive affect, the relative absence of negative affect, and life satisfaction (Diener et al., 1985; Koydemir et al., 2021). According to Joshanloo (2023), who uses hedonic and subjective well-being interchangeably, subjective and psychological well-being are positively and strongly correlated. Therefore, the literature review of this study is based mainly on subjective and psychological well-being.

Well-being can also be seen from two different perspectives: the hedonic and the eudaimonic approach (e.g., Ryan & Deci, 2001). Lucas and Diener (2009, p. 75) defined hedonic well-being as "the extent to which people think and feel that their life is going well." Ryan and Deci (2001, p. 141) defined well-being in the eudaimonic approach as "the degree to which a person is fully functioning." Other models understand subjective well-being as the hedonic and psychological well-being as the eudaimonic approach to well-being (Koydemir et al., 2021).

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Furthermore, thriving is defined as a state of mental, physical, and social positive functioning (Su et al., 2014). It is measured with the core psychological well-being dimensions (subjective well-being, relationship, meaning, engagement, mastery, optimism).

Many studies have investigated factors that influence well-being. They found that well-being is associated with optimism and emotion-focused coping (Karademas, 2007). Moreover, self-efficacy and a positive approach were significant predictors of positive well-being, while neuroticism and stress predicted negative well-being (Karademas, 2007). Another study could show that social support, emotional intelligence, and an interaction of both predicted subjective well-being (Gallagher & Vella-Brodrick, 2008). One meta-analysis examined personality factors as related factors of subjective well-being and found that conscientiousness and neuroticism predicted subjective well-being (DeNeve & Cooper, 1998). Another meta-analysis determined predictors of the cognitive (life satisfaction) and hedonic (happiness) facet of subjective well-being across 97 nations (Minkov, 2009): Life satisfaction could be explained by the perception of life control and wealth, whereas happiness was predicted by perceived life control, the importance of leisure, and importance of thrift.

Next to these psychological factors, aspects that have a transformational quality play a role: In Australian adults (Trigwell et al., 2014), nature connectedness and spirituality were correlated to all aspects of eudaimonic well-being (autonomy, environmental mastery, purpose in life, self-acceptance, positive relations with others, personal growth). Moreover, spirituality mediated the relationship between nature connectedness and five of the six aspects of eudaimonic well-being (all dimensions except environmental mastery). In a study with US students as participants, gratefulness predicted social connectedness, which predicted subjective well-being (Liao & Weng, 2018). However, connectedness is more than connectedness to nature and something higher ("spirituality"); it also includes connectedness to other people (prosocialness) and connectedness to oneself (self-love). In this study, we wanted to investigate the inner transformational quality of connectedness and its relation to well-being in more depth while focusing on the following four transformational factors: Connectedness with oneself (self-love), with others (prosocialness), with the surrounding nature (nature connectedness), and with the transcendent (spirituality).

Self-love (connectedness with oneself)

The construct of self-love has often been misunderstood in a way that it is understood as selfishness (Fromm, 1939) or narcissism (Brown & Bosson, 2001; Campbell et al., 2002). However, from early on, Fromm (1939) postulated that self-love is a prerequisite for well-being. This aligns with a more recent empirical study by Hernandez et al. (2016), who interviewed Spanish-speaking adults from the US and found that self-love was associated with well-being. In that study, participants were asked about their conceptions of happiness, psychological well-being, and life satisfaction.

Henschke and Sedlmeier (2023) defined self-love as an attitude of self-kindness, which includes the aspects of self-contact, self-acceptance, and self-care. Self-contact is understood as giving attention to and awareness of oneself. Self-acceptance is defined as being at peace with oneself. Self-care means being protective of and caring for oneself (Henschke & Sedlmeier, 2023). Corral-Verdugo et al. (2021) found positive associations between self-care and altruism, a part of prosocialness, and proecological behavior. Torres-Soto et al. (2022) found that sustainable behavior was related to human well-being and contains the aspects of self-care and altruism. In that study, human well-being was measured with questionnaires assessing subjective and psychological well-being. A recent study showed that self-love was positively correlated with flourishing and nature connectedness (Rahe & Jansen, 2023).

There are only a few studies on self-love, but the association between self-compassion (Neff, 2003) and well-being has been explored more extensively. Self-compassion is defined as an openness to one's suffering, not wanting to avoid it, the desire to heal oneself with kindness, and offering a non-judgmental understanding of one's failures (Neff, 2003). Many studies, a meta-analysis (Zessin et al., 2015), and theoretical considerations (Neff, 2003; Neff & Germer, 2017) suggest that self-compassion is associated with aspects of well-being. Self-compassion is positively linked to psychological well-being (Hollis-Walker & Colosimo, 2011), hope, and life satisfaction (Yang et al., 2016) and is negatively associated with anxiety, stress, and negative affect (Bluth et al., 2016). Furthermore, aspects of self-compassion are also linked to prosocial behavior (Yang et al., 2021), spiritual experiences (Akin & Akin, 2017), and nature exposure (Swami et al., 2019).

Prosocialness (connectedness with others)

Prosocial behavior or prosocialness is defined as everyday kindness and inspiring acts of heroism (Smith & Mackie, 2007). It has been found (Martela & Ryan, 2016) that prosocial behavior positively affects different aspects of people's well-being (vitality, meaningfulness, positive affect). Considering altruism as a specific form of prosocialness, altruism is related to life satisfaction (Becchetti et al., 2016) and nature connectedness (Otto et al., 2021). The autonomous motive for helping is related to subjective well-being and autonomous help, compared to no help, and controlled help leads to higher subjective well-being in the helper (Weinstein & Ryan, 2010). Moreover, prosocial behavior was predicted by spirituality in undergraduate college students (Anderson & Costello, 2009).

Nature connectedness (connectedness with the nature)

Nature connectedness can be defined as "an individual's subjective sense of their relationship with the natural world" (Pritchard et al., 2020, p. 1145). Nisbet and Zelenski (2013) found relationships between nature connectedness and aspects of well-being (vitality, autonomy, positive affect, personal growth), self-love (self-acceptance), and prosocialness (altruistic concerns). Another study could show that nature connectedness positively correlated with psychological and social well-being (Howell et al., 2011). Connectedness to nature was positively correlated to psycho-physical well-being (measured with the WHO-5, Topp et al., 2015), prosocial behavior, empathy, and life satisfaction in students (Pirchio et al., 2021). After participation in environmental programs, students had more positive outcomes on well-being, connectedness to nature, and prosocial behavior than a control group without intervention. Besides, two meta-analyses found correlations between nature connectedness and hedonic and eudaimonic well-being (Pritchard et al., 2020) and positive affect, vitality, and life satisfaction as aspects of happiness (Capaldi et al., 2014).

Spirituality (connectedness with the transcendence)

Villani et al. (2019) defined spirituality, according to King and Boyatzis (2015), as the human desire for transcendence, introspection, interconnectedness, and the quest for meaning in life and found a substantial impact on subjective well-being. In a sample of Israeli adolescents, Kor et al. (2019) showed that spirituality was associated with higher subjective well-being and prosociality. Subjective well-being was measured using the positive affect subscale of the PANAS-C (Ebesutani et al., 2012) and the Satisfaction with Life Scale (Diener et al., 1985). Comparable results were found in undergraduate students, showing that spirituality was positively correlated to satisfaction with life and prosocial behavior (Anderson & Costello, 2009). Wills (2009) found that spirituality was positively correlated to personal well-being (using the Personal Well-being Index, Cummins, 1996) and life satisfaction. Contrary to these results, some studies showed that aspects of spirituality were negatively correlated to satisfaction with life and happiness (Lun & Bond, 2013) and personal well-being (measured with the Australian Unity well-being index, Cummins et al., 2003) and life satisfaction (Highland et al., 2022). Besides these negative relationships, Highland et al. (2022) could also show that belief in a spirit positively predicted life satisfaction and personal well-being over time. Next to the correlations mentioned above between spirituality and aspects of eudaimonic well-being, spirituality is also associated with nature connectedness (Trigwell et al., 2014). de Jager Meezenbroek et al. (2012) emphasized that spirituality is understood along two approaches: A religious, theistic understanding on the one hand and a nontheistic approach based on secular, humanistic, and existential elements on the other hand. They developed a questionnaire (Spiritual Attitude and Involvement List, SAIL) containing the three aspects of connectedness with oneself, the environment, and the transcendent.

The goal of the study

The study's primary goal is to investigate relationships between the aspects of connectedness and psychological well-being. The following hypotheses will be investigated in detail: (1) The four aspects of connectedness (self-love, prosocialness, nature connectedness, and spirituality) are correlated to each other and psychological well-being. (2) The four aspects of connectedness (self-love, prosocialness, nature connectedness, and spirituality) predict psychological well-being. (3) The relationship between self-love and psychological well-being is mediated through prosocialness, nature connectedness, and spirituality.

Methods

Participants

Participants were 184 German adults (130 women, 54 men) between 17 and 74 years old ($M = 31.39$, $SD = 15.24$). People in the sample had a high level of education; 132 participants had a high school leaving diploma. G*Power (Faul et al., 2007) analyses were conducted a priori: For the first hypothesis, medium effect sizes for the correlations between the four aspects of connectedness and well-being were assumed to determine the sample size. Due to the multiple testing of ten correlations, p was set to .005 (Bonferroni corrected). The G*Power analysis resulted in 122 participants ($1 - \beta = 0.80$). For the second hypothesis, a medium effect size of $f^2 = 0.15$ was assumed for the multiple regression analysis ($1 - \beta = 0.80$, $\alpha = .05$). Therefore, 85 participants were required for the second hypothesis.

Material

Well-being

The Brief Inventory of Thriving (BIT; Su et al., 2014, German version: Hausler et al., 2017) was used to measure psychological well-being. The questionnaire comprised ten items (example item: My life has a clear sense of purpose). Participants rated each item on a 5-point answer scale, ranging from 1 = *strongly disagree* to 7 = *strongly agree*. Hausler et al. (2017) supported the reliability and validity of the German scale. In our sample, two items had to be eliminated because of low corrected Item-Total Correlations (below .3). Internal consistency for the remaining eight items was good (Cronbach's Alpha = .80, McDonald's Omega = .80). A mean score of the remaining eight items was calculated for well-being.

Self-love (connectedness with oneself)

Self-love was measured with the Self-love questionnaire (Henschke, 2022). It consists of 27 items (example item: I feel fine the way I am) and must be answered on a 5-point rating scale ranging from 1 = *not true at all* to 5 = *completely true*. Internal consistency was excellent in a recent study (Cronbach's alpha = .92) (Jansen et al., 2024). In the present study, internal consistency was excellent (Cronbach's Alpha = .93, McDonald's Omega = .93). A mean score of the 27 items was calculated for self-love.

Prosocialness (connectedness with others)

Prosocial behavior was investigated with the Prosocialness Scale for Adults (Caprara et al., 2005). The questionnaire contains 16 items that must be answered on a 5-point rating scale ranging from 1 = *never/almost never true* to 5 = *almost always/always true* (example item: I try to console those who are sad.). The questionnaire was developed using item response theory (IRT). Reliability ($\alpha = .91$), difficulty parameter, and discrimination parameter were suitable, and the results of IRT analyses support effectiveness and sensitivity (Caprara et al., 2005). For the German version, the questionnaire was forward and backward-translated. Internal consistency was good in a recent German study (Cronbach's alpha = .84) (Jansen et al., 2024). In the present sample, internal consistency was good (Cronbach's Alpha = .87, McDonald's Omega = .87). A mean score of the 16 items was calculated for prosocialness.

Nature connectedness (connectedness with nature)

Nature connectedness was measured with the Connectedness to Nature Scale (CNS, Pasca et al., 2017). It consists of 13 items, answered on a 5-point scale ranging from 1 = *strongly disagree* to 5 = *strongly agree* (example item: Like a tree can be part of a forest, I feel embedded within the broader natural world.). Internal consistency was good in a recent German study (Cronbach's alpha = .84) (Jansen et al., 2024). In our sample, three items had to be eliminated because of low corrected Item-Total Correlations (below .3). Internal consistency for the remaining ten items was good (Cronbach's Alpha = .86, McDonald's Omega = .87). A mean score of the remaining ten items was calculated for nature connectedness.

Spirituality (connectedness with the transcendent)

Connectedness with the transcendence was measured with the subscales *Spiritual Activities* and *Transcendent Experiences* of the Spiritual Attitude and Involvement List (SAIL, de Jager Meezenbroek et al., 2012). Transcendent Experiences were measured with five items, and spiritual activities with four items. All items were answered on a 6-point rating scale ranging from 1 = *not at all* or *never* to 6 = *to a very high degree* or *very often*. The questionnaire was validated, and all subscales had acceptable internal consistency (de Jager Meezenbroek et al., 2012). Internal consistency for *Transcendent Experiences* (Cronbach's Alpha = .76, McDonald's Omega = .74) and *Spiritual Activities* (Cronbach's Alpha = .78, McDonald's Omega = .80)

were acceptable. A mean score of all nine items was calculated for spirituality (Cronbach's Alpha = .81, McDonald's Omega = .81).

Procedure

The survey was conducted using SoSciSurvey (Leiner, 2019). Participants received an email with the link to the study. First, all participants gave their informed consent. Then, they filled out questionnaires regarding socio-demographics (sex, age, education), psychological well-being, connectedness to nature, prosocialness, self-love, and spirituality. They were then thanked for their participation. The study was preregistered at osf (see also for data) (https://osf.io/dg7nk/?view_only=f41659bab0aa4b898b41242998f39e1e), conducted according to the ethical guidelines of the Helsinki declaration, and approved by the Ethic Research Board of the University (no. 22-3059-101).

Statistical analyses

First, correlations were calculated between the four aspects of connectedness, self-love, prosocialness, nature connectedness, and spirituality and psychological well-being. For the second hypothesis, a multiple regression analysis with the criterion of well-being and the predictors of self-love, prosocialness, nature connectedness, and spirituality was calculated. A mediation analysis was conducted to determine whether prosocialness, nature connectedness, and spirituality were possible mediators of the relationship between self-love and well-being.

Results

Correlations for the four aspects of connectedness and psychological well-being are shown in Table 1. Well-being significantly correlates with self-love, nature connectedness, and spirituality but not with prosocialness. Significant correlations between the aspects of connectedness appeared between self-love and nature connectedness, self-love and spirituality, prosocialness and nature connectedness, prosocialness and spirituality, and between nature connectedness and spirituality. The correlation between self-love and prosocialness was not significant.

A regression analysis with enter method with the criterion psychological well-being and the predictors self-love, prosocialness, nature connectedness, and spirituality revealed two significant predictors: Self-love and nature connectedness (see Table 2).

Table 1. Correlations between psychological well-being, self-love, prosocialness, nature connectedness, and spirituality.

	Well-being	Self-love	Prosocialness	Nature connectedness
Self-love	.621**			
Prosocialness	.114	.041		
Nature connectedness	.395**	.331**	.298**	
Spirituality	.263**	.229**	.258**	.324**

Note. **$p < .01$.

Table 2. Regression analysis: Predictors of psychological well-being.

	ß	*t*	*p*
Constant		4.251	<.001
Self-love	.542	8.942	<.001
Nature connectedness	.186	2.902	.004
Spirituality	.075	1.217	.225
Prosocialness	.017	0.286	.775

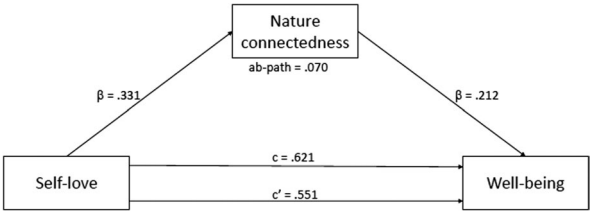

Figure 1. Mediation effect of nature connectedness on the relation between self-love and psychological well-being (all effects are standardized). Psychological well-being is predicted by self-love. This connection is partly mediated by nature connectedness.

Prosocialness and spirituality were non-significant predictors. All aspects of connectedness predicted 43% of the variance of well-being, $R^2 = .431$, $F(4, 179) = 33.925$, $p < .001$.

Because spirituality and prosocialness were non-significant predictors of psychological well-being, a mediation analysis was calculated with well-being as the criterion, self-love as a predictor, and nature connectedness as a possible mediator (Figure 1). Model 4 of Hayes Process v 4.2 (Hayes, 2022) was used. First, self-love significantly predicted nature connectedness, $\beta = .331$, 95% CI [0.224, 0.543]. Second, self-love, $\beta = .551$, 95% CI [0.394, 0.608] (direct effect), and nature connectedness, $\beta = .212$, 95% CI [0.074, 0.259], predicted well-being. The total effect of self-love on well-being was $\beta = .621$, 95% CI [0.461, 0.670]. The indirect effect of nature connectedness was $\beta = .070$, 95% CI [0.019, 0.132].

Discussion

To summarize the results, zero-order correlations between psychological well-being and the four aspects of connectedness (self-love, prosocialness,

nature connectedness, and spirituality) showed significant positive correlations between well-being and self-love, nature connectedness, and spirituality but not between well-being and prosocialness. Regarding the correlations between the aspects of connectedness, nature connectedness was positively related to self-love, spirituality, and prosocialness. Furthermore, spirituality was positively associated with all other aspects of connectedness (self-love, prosocialness, and nature connectedness). Only the correlation between self-love and prosocialness was not significant. The regression analysis revealed self-love and nature connectedness as significant positive predictors of psychological well-being. A mediation analysis found that nature connectedness partly mediated the association between self-love and well-being.

The association between self-love and psychological well-being aligns with the literature (Hernandez et al., 2016). People who give attention to themselves and are at peace with and protective of themselves report higher subjective well-being. Self-love seems to be a prerequisite for moderate well-being (Hernandez et al., 2016). Nature connectedness was also related to well-being (Capaldi et al., 2014; Pritchard et al., 2020). If people are connected to the surrounding nature and care about the natural world (Pritchard et al., 2020), they could benefit from this with higher well-being (Pirchio et al., 2021).

Zero-order correlations showed that spirituality was also related to psychological well-being (Kor et al., 2019). However, besides self-love and nature connectedness, spirituality was not a significant predictor of well-being. A reason for these findings could be that spirituality was correlated with nature connectedness (Trigwell et al., 2014) and self-love as well as with well-being (Kor et al., 2019). Both self-love and nature connectedness showed stronger associations with well-being than spirituality. People who desire transcendence reported slightly better well-being but were also more connected to nature and showed more self-love than people with less spirituality. Hence, spirituality could not explain any incremental variance in people's well-being. Other research showed that spirituality fully mediated the relationship between nature connectedness and psychological well-being (Dillon & Lee, 2023). This was not tested in the present study.

Prosocialness was not associated with psychological well-being. Other studies showed a positive relationship between prosocial behavior and positive affect (Martela & Ryan, 2016). However, a computer game experimentally influenced prosocial behavior in that study. People either got points for a correct answer in the game or were told that each correct answer would lead to a rice donation to the United Nations World Food Program. Hence, in the present study, we assessed participants' trait prosocialness whereas Martela and Ryan (2016) experimentally influenced people's state prosocial behavior. It could be assumed that a prosocial state or mood only affects someone's positive affect or well-being for a short time.

Regarding the relationships within the aspects of connectedness, self-love was associated with nature connectedness (Corral-Verdugo et al., 2021; Rahe & Jansen, 2023) and spirituality, but not with prosocialness. The construct of self-love, as defined by Henschke and Sedlmeier (2023), is rather new, though little research is known about correlations between spirituality and self-love. The non-significant correlation between self-love and prosocialness is in line with another study using the same methods (Rahe & Jansen, 2023). It could be assumed that self-love leads to love for others (Campbell et al., 2002), but again, this would depend on the definition of self-love. The results of the present study suggest that self-love and love or kindness for others are unrelated.

Significant correlations were found between the aspects of connectedness to others, to nature, and the transcendent. A positive relationship between prosocialness and nature connectedness is in line with other studies (Otto et al., 2021). Being connected to others and the surrounding nature seems to be related. Prosocial behavior (Pursell et al., 2008) and nature connectedness (Di Fabio & Kenny, 2021) are both related to agreeableness. Hence, helping others and being related to nature seems to be a personality trait. Prosocialness is also connected to spirituality (Anderson & Costello, 2009). One definition of spirituality concerns the human desire for interconnectedness (Villani et al., 2019), so the association with prosocialness makes sense.

Spirituality was also positively correlated with nature connectedness. This is in line with the study conducted by Trigwell et al. (2014). They found that nature connectedness was correlated with spirituality and all six aspects of eudaimonic well-being. Here, it has to be pointed out that Su et al. (2014) made no reference from psychological well-being to eudaimonia. Furthermore, spirituality mediated the association between nature connectedness and five of the six dimensions of eudaimonic well-being. In the present study, the mediation effects of spirituality and nature connectedness on the relationship between self-love and well-being could only be analyzed for nature connectedness because spirituality was not a significant predictor of well-being. Results

showed that nature connectedness partly mediated the association between self-love and well-being. More vital self-love was correlated with more nature connectedness, which in turn was correlated with higher well-being. Therefore, part of the association between self-love and well-being can be explained by nature connectedness.

The study's results give first hints about what aspects of connectedness could be trained to enhance people's well-being. As self-love is strongly correlated with psychological well-being, people should be guided to give more attention to themselves, accept themselves, and be more protective and caring for themselves. Besides self-love, a more vital connectedness to the surrounding nature could enhance human well-being. People could be encouraged to spend some time in natural, non-urban surroundings to strengthen their connection with nature and—through that connection—their well-being.

The study's limitations are that it is a relatively young sample with a mean age of 31 years and a high level of education. Furthermore, to ensure good reliability, some items had to be eliminated in the well-being and the nature connectedness scale. We carried out the study with a correlational design; thus, no conclusions about causality can be made. Further studies should be conducted as interventions or longitudinal studies to analyze whether aspects of connectedness influence well-being or if higher well-being could also predict people's connectedness to themselves, others, nature, or the transcendent.

To conclude, the concept of self-love as a positive attitude of self-kindness (Henschke & Sedlmeier, 2023) is strongly associated with people's psychological well-being. Besides self-love, nature connectedness positively predicts well-being and mediates the association between self-love and well-being. Furthermore, people who felt more connected to the transcendent reported a higher psychological well-being. A solid connectedness for oneself, to nature, and the transcendent seems essential for someone's psychological well-being, while the connectedness to others seems less critical. These three aspects of connectedness could be approaches to enhance people's psychological well-being. It should be emphasized that results could differ depending on the definition and operationalization of well-being.

Disclosure statement

No potential conflict of interest was reported by the authors.

Ethics statement

The Ethic Research Board of the University of Regensburg (no. 22-3059-101) reviewed and approved this study involving human participants. The participants provided their written informed consent to participate in this study.

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About the authors

Martina Rahe is an experimental psychologist. Her research interest includes spatial cognition and well-being.

Petra Jansen is an experimental psychologist who also works in sports science. Her main research interests include investigating the relationship between motor, emotional, and cognitive aspects. She is also interested in the role of inner sustainability in well-being and sustainable behavior.

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