Positive Rational Acceptance of Body Image Threats Mediates the Association between Nature Exposure and Body Appreciation

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Abstract

Mounting evidence suggests that exposure to natural environments is associated with more positive body image, but mechanistic pathways are not fully understood. Here, we tested one such indirect pathway involving positive rational acceptance (i.e., an adaptive body image coping strategy). A total of 401 participants from the United Kingdom completed measures of nature exposure, positive rational acceptance, and body appreciation (i.e., a facet of positive body image). Correlational analyses indicated positive, albeit weak-to-moderate associations, between all three constructs. Mediation analysis supported the hypothesis that positive rational acceptance mediates the association between nature exposure and body appreciation. These findings were robust in the total sample, as well as in women (n = 200) and men (n = 197) separately. These results highlight the potential benefit of nature exposure in terms of promoting adaptive body image coping strategies, which in turn are associated with more positive body image.

Keywords: Nature exposure; Positive body image; Positive rational acceptance; Body appreciation; Body image coping

Introduction

Mounting evidence suggests that *nature exposure* (i.e., living close, to, frequenting, or looking at the continuum of environments from wild nature to designed green spaces; Abraham et al., 2010) is associated with a range of benefits for physical and psychological well-being (for reviews, see Frumkin et al., 2017; Jimenez et al., 2021; Li et al., 2021). These effects include positive psychological functioning (Bratman et al., 2021), which extends to body image outcomes. In particular, a growing body of evidence suggests that nature exposure is reliably associated with more *positive body image*, which refers to "overarching love and respect for the body" that includes appreciation of the body and its functions, acceptance of the body despite its imperfections, and body-protective behaviours (Tylka, 2018, p. 9). From this perspective, positive body image is not simply the polar opposite of negative body image, but rather a distinct construct that is uniquely associated with a raft of downstream outcomes, including improved psychological well-being and healthy weight-related behaviours (for a review, see Tylka & Wood-Barcalow, 2015a).

The suggestion that nature exposure is associated with more positive body image has been demonstrated using a wide variety of study designs, including cross-sectional cohort approaches (Swami, Barron et al., 2016, 2019, 2020), experience sampling (Stieger et al., 2021), field experiments (Swami, 2020a; Swami, Mohd. Khatib et al., 2020), and controlled laboratory experiments (Swami, Barron et al., 2018). The association has also been tied to different forms of nature exposure, including immersion in a range of natural (versus built) environments (Swami, Barron et al., 2018; Swami, Mohd. Khatib et al., 2020) and viewing nature images and films (Rygal & Swami, 2021; Swami, 2020b; Swami, Barron et al., 2018; Swami, Pickering et al., 2018). Some evidence also suggests that the impact of nature exposure on positive body image varies by characteristics of the exposure, with blue spaces being more effective than green spaces (Rygal & Swami, 2021; Stieger et al., 2021).

The link between nature exposure and positive body image has generally been explained by drawing on what has been termed a "promotion of positive pathway" (Bratman et al., 2021, p. 2). More specifically, natural environments promote a sense of "being away" (i.e., being separate and apart from one's usual thoughts and concerns), "soft fascination" (i.e., where one's attention is held without effort), and "extent" (i.e., immersion and engagement; Kaplan, 1995; Kaplan & Kaplan, 1989), all of which are thought to help restrict negative body- and appearance-related related thoughts and promote speedier recovery from threats to body image, thus resulting in more positive body image (Swami, 2020c; Swami, Barron et al., 2018). These features of natural environments also help to shift attention away from an aesthetic view of the body toward greater appreciation for the body's competencies and functionality (Swami, Barron et al., 2019), promote holistic self-care attitudes and behaviours that include greater respect, appreciation, and love for one's body (Hennigan, 2010; Swami, 2020c).

The "promotion of positive pathway" *vis-à-vis* body image may also involve indirect routes, with studies showing that connectedness to nature and self-compassion, respectively, mediate associations between nature exposure and positive body image (Swami, Barron et al., 2019, 2020; see also Swami, von Nordheim et al., 2016). Another construct that has been hypothesised (Swami, Barron et al., 2018), but not empirically tested, as an important mediator is body image coping. Coping refers to the cognitions, emotions, and behaviours that individuals use to manage situations or feelings that are perceived as threatening (Folkman & Lazarus, 1988). In the domain of body image specifically, Cash and colleagues (2005) identified three coping strategies that individuals rely on when body image thoughts and feelings are experienced as unwanted or distressing: experiential avoidance (i.e., avoiding situations, cognitions, or emotions that are perceived as a threat to body image), appearance-fixing (i.e., attempts to alter aspects of one's physical appearance that are

perceived as flawed), and positive rational acceptance (cognitive and behavioural activities that emphasise the use of positive self-care, rational self-talk, and acceptance of one's experiences).

Positive rational acceptance in particular has been conceptualised as an adaptive affect regulation style when exposed to body image challenges (Cash et al., 2005), such as being teased about weight, experiencing pressure to alter one's appearance, viewing unrealistic appearance-related images, or comparing one's appearance to attractive others (Webb et al., 2014). Broadly speaking, positive rational acceptance involves positive self-talk (e.g., reminding oneself of the transience of experiencing negative body image-related feelings in the aftermath of a threat) and has been shown to be positively associated, albeit weakly, with more general adaptive emotional regulation strategies (Hughes & Gullone, 2011). As such, positive rational acceptance may play a unique role in shaping the link between nature exposure and positive body image. More specifically, it is possible that nature exposure facilitates or enhances positive rational acceptance by allowing one to distance themselves from the source of threats to body image and by allowing for a restoration of emotional balance (Kaplan, 2001) that promotes adaptive coping. Moreover, nature exposure may facilitate positive rational acceptance by promoting less impulsive cognitive and behavioural responses to perceived threats (see Berry et al., 2020) or by facilitating more rational appraisals of threats (Gladwell & Brown, 2016). Indeed, previous work has shown that nature exposure is associated with adaptive coping strategies (for a review, see Sadick & Kamardeen, 2020), though we are not aware of any previous work assessing associations with positive rational body image coping specifically.

Importantly, positive rational coping has been conceptualised as a facet of positive body image in its own right (Webb et al., 2015). While such a perspective may make conceptual sense, positive rational coping is sufficiently distinct from other facets of positive

body image (e.g., functionality appreciation; Linardon et al., 2020) and it is also highly likely that positive rational coping facilitates the development and maintenance of other facets of positive body image, such as body appreciation. In this sense, positive rational coping could be viewed as a "protective filter" (Mohiyeddini, 2017) that allows nature exposure to exert a positive effect on positive body image outcomes. To date, however, few studies have assessed associations between positive rational coping and facets of positive body image, despite calls by researchers to do so (Bailey et al., 2016), and we are not aware of any study that has assessed the possibility that the construct mediates the association between nature exposure and positive body image.

In the present study, therefore, we tested a mediation model in which positive rational coping mediates the association between nature exposure and positive body image, which we operationalised as body appreciation. As defined by Tylka and Wood-Barcalow (2015b, p. 53), *body appreciation* refers to "accepting, holding favorable opinions toward, and respecting the body, while also rejecting media-promoted appearance ideals as the only form of human beauty". It is a core facet of positive body image (Swami, Furnham et al., 2020; Webb et al., 2015) and has been shown to be directly associated with nature exposure in previous research (Swami, Barron et al., 2019, 2020). Based on the literature review above, we expected positive and moderately-sized correlations between all three variables. Additionally, we expected that positive rational coping would significantly mediate the association between nature exposure and body appreciation. Finally, given that gender differences have largely been null in previous work (Swami, Barron et al., 2016, 2019, 2020), we expected this mediation model to be robust across both women and men; that is, we expected that associations between the three variables would be stable across gender.

Method

Participants

Participants were an online sample (N = 401; women n = 200, men n = 197, other n = 4) of residents and nationals of the United Kingdom, predominantly from England (83.5%; Scotland = 8.1%, Wales = 5.2%, Northern Ireland = 1.8%). Participants ranged in age from 18 to 76 years (M = 31.76, SD = 11.55). The majority of participants self-reported their ethnicity as White (87.8%; Asian = 5.0%, Black = 2.2%, mixed race = 3.5%, other = 1.5%) and their sexual orientation as heterosexual (82.0%; bisexual = 9.2%, gay/lesbian = 6.5%, other = 2.2%). In terms of educational qualifications, 28.4% had completed secondary education, 11.2% were in full-time education, 41.6% had an undergraduate degree, 12.7% had a postgraduate degree, and 6.0% had another qualification.

Measures

Positive body image. Participants were asked to complete the 10-item Body Appreciation Scale (BAS-2; Tylka & Wood-Barcalow, 2015b), which measures one's body appreciation (i.e., acceptance of one's body, respect and care for one's body, and protection of one's body from unrealistic beauty standards; sample item: "I respect my body"). All items were rated on a 5-point scale (1 = *never*, 5 = *always*) and an overall score was computed as the mean of all items, with higher scores reflecting greater body appreciation. BAS-2 scores have been shown to have a unidimensional factor structure and have adequate indices of internal consistency, test-retest reliability after three weeks, and convergent and discriminant validity in college and community samples of English-speaking adults (Tylka & Wood-Barcalow, 2015b). In this study, McDonald's ω and Cronbach's α for BAS-2 scores was .93 (95% CI = .92, .94).

Nature exposure. To assess nature exposure, we used the 4-item Nature Exposure Scale (NES; Kamitsis & Francis, 2013), which measures an individual's level of exposure to

nature in everyday life and activities, and levels of exposure to nature outside of everyday environments (sample item: “How much do you notice the natural environments in your everyday life?”). Response anchors varied depending on the item, but all included 5-point scales. An overall score of nature exposure was computed as the mean of all four items, with higher scores reflecting greater nature exposure. Scores on the NES have been shown to have a unidimensional factor structure (Swami, Barron et al., 2016) and adequate internal consistency and criterion validity in English-speaking adults (Kamitsis & Francis, 2013). In this study, McDonald’s ω and Cronbach’s α for NES scores was .70 (95% CI = .67, .73).

Positive rational acceptance. Participants were asked to complete the 11-item Positive Rational Acceptance (PRA) subscale of the Body Image Coping Strategies Inventory (BICSI; Cash et al., 2005). This subscale assesses the extent to which individuals rely on cognitive and behavioural activities that emphasise the use of positive self-care, rational self-talk, and acceptance of one’s experiences in the face of threats to body image (sample item: “I remind myself of my good qualities”). All items were rated on a 4-point scale, ranging from 1 (*definitely not like me*) to 4 (*definitely like me*). An overall score was computed as the mean of all 11 items, with higher scores reflecting greater positive rational acceptance. Scores on the BICSI have been shown to have adequate factorial and construct validity, as well as adequate internal consistency (Cash et al., 2005). In the present study, McDonald’s ω and Cronbach’s α for PRA scores was .85 (95% CI = .83, .87).

Demographics. Participants were asked to provide their demographic details consisting of age, gender identity, nation of residence within the United Kingdom, ethnicity, sexual orientation, and highest educational qualification.

Procedures

Ethics approval was obtained from the first author’s institution and all data were collected via the Prolific website on August 16, 2021. At the time of data collection, all

COVID-19 restrictions had been lifted in the United Kingdom. The project was advertised as a study on "psychological well-being and nature exposure" with an estimated completion time (12 min). Potential participants were eligible to complete the survey if they were residents and nationals of the United Kingdom (to ensure a culturally homogeneous sample), of adult age, and able to complete a survey in English. Prolific ID codes and IP addresses were checked to ensure that no participant completed the survey more than once. After providing digital informed consent, participants were asked to complete the scales described above, which were presented in a counter-balanced order in Qualtrics™. The survey was anonymous and participants were paid £1.30 upon completion. All participants received debriefing information at the end of the survey.

Results

Descriptive Statistics and Preliminary Analyses

All analyses were conducted using SPSS v.28, with mediation analyses utilising the PROCESS macro v.3.5. A total of eight data-points were missing in the entire data; these were missing completely at random (MCAR), $\chi^2(143) = 165.55$, $p = .095$, as determined by Little's (1988) MCAR test and were replaced using mean replacements. Descriptive statistics for all variables are reported in Table 1. We first examined gender differences (women *vs*. men) on all three variables using Bonferonni-corrected ($\alpha = p = .05/3 = .017$) independent-samples *t*-tests. The results showed that there was no gender difference in terms of nature exposure, whereas men had significantly higher body appreciation and positive rational acceptance than women, albeit with small effect sizes (see Table 1).

Next, we examined inter-scale bivariate correlations between all variables, separately for women and men. As can be seen in Table 1, in both women and men, greater nature exposure was significantly associated with greater body appreciation and positive rational

acceptance. Associations between nature exposure and the two other variables were weak, whereas the association between body appreciation and positive rational acceptance was moderate. Fisher's *z* comparisons indicated that none of these associations differed in strength as a function of gender (all *z*s ≤ 0.94, all *p*s ≥ .173).

Mediation Analyses

To test the possibility that positive rational acceptance mediates the association between nature exposure and body appreciation, we used the bootstrap method (Hayes, 2017) with 5,000 bootstrap samples drawn from the dataset to calculate indirect and direct effects, as well as bias-corrected 95% CIs (Preacher & Hayes, 2008). Effects were considered to be significant if the respective CI did not overlap zero (Mallinckrodt et al., 2006). All scores were within limits of normality and met assumptions for mediation analysis (Curran et al., 1996). Using the total sample, all standardised direct effects were significant (see Figure 1), the standardised indirect effect was .09 (95% CI = .04, .15), and the standardised total effect was .23 (R^2 = .05). The same pattern of findings was found in men: all standardised effects were significant, the standardised indirect effect was .09 (95% CI = .02, .16), and the standardised total effect was .27 (R^2 = .04). When the mediation was run with women only, the direct effect between nature exposure and positive rational acceptance remained significant (.15, p = .003), as did the direct effect between positive rational acceptance and body appreciation (.73, p < .001). The direct link between nature exposure and body appreciation was no longer significant (.08, p = .221), though the standardised indirect effect (.10, 95% CI = .03, .18) was still suggestive of mediation (standardised total effect = .19, R^2 = .03).[1]

Discussion

In the present study, we tested the hypothesis that positive rational acceptance – an adaptive body image coping strategy – mediates the association between nature exposure and body appreciation. Our results indicated that all three constructs were significantly and positively associated, and that mediation was supported in the total sample, as well as in women and men separately. In broad outline, these results are consistent with previous work showing that nature exposure is significantly associated with more positive body image (e.g., Swami, Barron et al., 2019, 2020), but also extend previous results by proposing a hitherto unexamined mechanistic pathway through which nature exposure exerts an effect on positive body image. Here, we consider our results in more detail before discussing potential practical applications of our work.

First, consistent with previous cross-sectional work (Swami, Barron et al., 2019, 2020), as well as the broader literature focused on psychological well-being (for reviews, see Bratman et al., 2021; Frumkin et al., 2017; Jimenez et al., 2021; Li et al., 2021), we found a significant direct effect between nature exposure and body appreciation. As we noted above, this finding likely reflects the restorative qualities of natural environments (i.e., being away, soft fascination, and extent; Kaplan, 1995; Kaplan & Kaplan, 1989), which may help individuals to turn negative body image states into positive ones. Being in nature may also allow one to escape from appearance-focused societal contexts and instead focus one's attention on the body's functionality and competencies (Swami, Barron et al., 2019). However, in contrast to previous work where a moderate association has been reported, the link between nature exposure and body appreciation in the present study was weak(er). It is difficult to know why this was the case, though one possibility is that it reflects changes in the frequency and time spent in nature post-COVID-19-related restrictions in the United

Kingdom, as well cognitions associated with being in nature (e.g., fear or discomfort with being outdoors in the post-coronavirus era; for a review, see Labib et al., 2021).

Second, we found that greater nature exposure was directly associated with more positive rational acceptance, which in turn was associated with higher body appreciation. In the first instance, it is possible that being in natural environments facilitates or enhances opportunities for adaptive body image coping strategies. The most direct way in which this might occur is through a physical and mental distancing from the source of body image threats (e.g., unrealistic appearance standards, mirrors, etc.). The restorative qualities of natural environments may also allow for more adaptive body image coping strategies by promoting healthier cognitive processes, including greater self-control and elongated time perception (Berry et al., 2015, 2020), thus allowing individuals to develop more rational appraisals of body image threats and their future consequences.

A broader framework for understanding the effects of nature exposure and positive rational acceptance is provided by the broaden-and-build theory of positive emotions (Frederickson, 2004). Accordingly, nature exposure is known to be associated with more positive affect (for a review, see Bratman et al., 2021), which in turn is associated with adaptive traits including higher self-esteem and optimism. Positive affect also increases access to physical and cognitive resources (e.g., improved attention) that directly support adaptive coping strategies and reduce maladaptive coping (Gloria & Steinhardt, 2016). Being able to adaptively cope with body image threats may thus help individuals to build resilience, which further strengthens the link between nature exposure and positive rational acceptance over time. In short, the evidence presented here suggests that there may be a positive association between nature exposure and positive rational acceptance.

In turn, greater positive rational acceptance was found to be significantly associated with higher body appreciation. That is, being able to adopt an adaptive body image strategy

likely provides a springboard for the development of greater acceptance of, and respect and care for, one's body, as well as a rejection of body image threats. For instance, it may be that those who are high in positive rational acceptance are more adept at invoking positive body-related memories or experiences that prompt greater body care (Mohiyeddini, 2017). It is also possible that those with higher positive rational acceptance are more adept at relying on intra-individual skills (e.g., rational self-talk) to focus on non-appearance-related qualities of their bodies or identities. As a simple example, greater exposure to nature may facilitate gratitude for one's physical health; in the face of threats to body image, individuals may rely on self-schemas associated with physical health as a means of coping, which in turns promotes greater body appreciation.

Limitations

The main limitation of the present study is its cross-sectional design: although we have interpreted our results based on available theory, any causal claims should be treated with caution. For instance, although we treated positive rational coping as an antecedent of body appreciation, other scholars have theories that both constructs are facets of positive body image (Webb et al., 2015). As such, it is possible to conceive of alternative modelling of our data in which positive rational coping leads to greater nature exposure and thus more positive body image; that is, individuals who have more positive body image coping mechanisms may be more likely to spend time in nature, which in turns may impact body image outcomes directly. While we do not discount such a possibility, it should also be noted that our treatment of positive rational acceptance as a mediator is in keeping with its conceptualisation in previous work (e.g., Tod & Edwards, 2015). Even so, more work could be done to better understand the (causal or otherwise) associations between positive rational acceptance and facets of positive body image. More generally, we repeat our caveat that the

present results are limited in terms of what they are able to tell us about causal associations because of the cross-sectional nature of the data.

Additionally, we only included the Positive Rational Acceptance subscale of the BICSI in the present study. As such, we are unable to determine whether nature exposure is associated with lower maladaptive body image coping strategies (i.e., experiential avoidance and appearance-fixing), which in turn may also be associated with positive body image. Including the full BICSI instrument in future research would provide a fuller accounting of the possible ways in which nature exposure may be associated with both adaptive and maladaptive body image coping strategies. In a similar vein, although scores on the BICSI have been shown to have adequate validity, some research has suggested that scores on the Positive Rational Acceptance may have less-than-adequate test-reliability after two weeks (Cash & Grasso, 2005). This may be suggestive of some temporal variability in the way in which individuals use adaptive body image coping strategies, which could be assessed in the future using an experience sampling design. Relatedly, it may also be useful to examine associations between nature exposure, body image outcomes, and the construct of *body image flexibility*, which refers to an individual's ability to willingly embrace present-moment experiences of their body in a non-judgmental manner (Sandoz et al., 2013) and which grew from conceptualisations of positive rational acceptance (Rogers et al., 2018).

Related to our instrumentation, we measured nature exposure using the 4-item Nature Exposure Scale, which contains items on both exposure and noticing natural environments. Although this measure demonstrates adequate indices of face and criterion-related validity (e.g., Swami, Barron, 2019) and offers good trait coverage of nature exposure, it has also been critiqued on accounts of its brevity and failure to consider nature exposure holistically (e.g., Wood et al., 2019). In future research, therefore, it may be worthwhile utilising alternative methods of operationalising nature exposure and contact, such as measures of

surrounding greenness, green space access, or time spent in natural environments, or through the use of Global Positioning Systems (GPS) tracking (for a review, see Holland et al., 2021). Finally, it should also be noted that the reliance on an online sample means that our findings may not be representative of the wider population in the United Kingdom. More importantly perhaps, the reliance on adaptive body image strategies is likely to vary across cultures (Dhurup & Nolan, 2014), which means that our work will need to be replicated in different cultural groups.

Conclusion

The results of the present study suggest that greater nature exposure promotes more positive body image, possibly by promoting greater positive rational acceptance. These findings are especially important in light of the evidence indicating that positive body image brings wide-ranging benefits, including in terms of psychological well-being and healthy weight-related behaviours (Tylka & Wood-Barcalow, 2015a). As such, beyond merely extending scholarly understanding of these issues, the present results also highlight the importance of ensuring that all citizens have access to natural environments. However, access to natural environments is often unequal – being affected by gender, race, and socioeconomic class – which means that those social identity groups that would most benefit from the body-image related outcomes of nature exposure are often marginalised from such spaces (Murdock, 2019). Therefore, emphasising social justice concerns in the development of nature-based interventions aimed at promoting healthier body image remains an important concern for scholars and practitioners.

Declarations of Interest

The authors declare no conflicts of interest.

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Table 1

Descriptive Statistics, the Results of Independent Samples t-Tests Examining Gender Differences, and Bivariate Correlations between All Variables for Women (Top Diagonal) and Men (Bottom Diagonal).

		(1)	(2)	(3)
(1) Nature exposure			.18*	.21*
(2) Body appreciation		.27**		.50**
(3) Positive rational acceptance		.20*	.50**	
Women	*M*	3.72	3.04	2.54
	SD	0.71	0.76	0.50
Men	*M*	3.64	3.25	2.65
	SD	0.73	0.76	0.50
	t	1.01	2.79[a]	2.27[a]
	d	0.10	0.28	0.23

Notes. * $p < .05$, ** $p < .001$, [a] significant at Bonferroni-corrected $p = .017$.

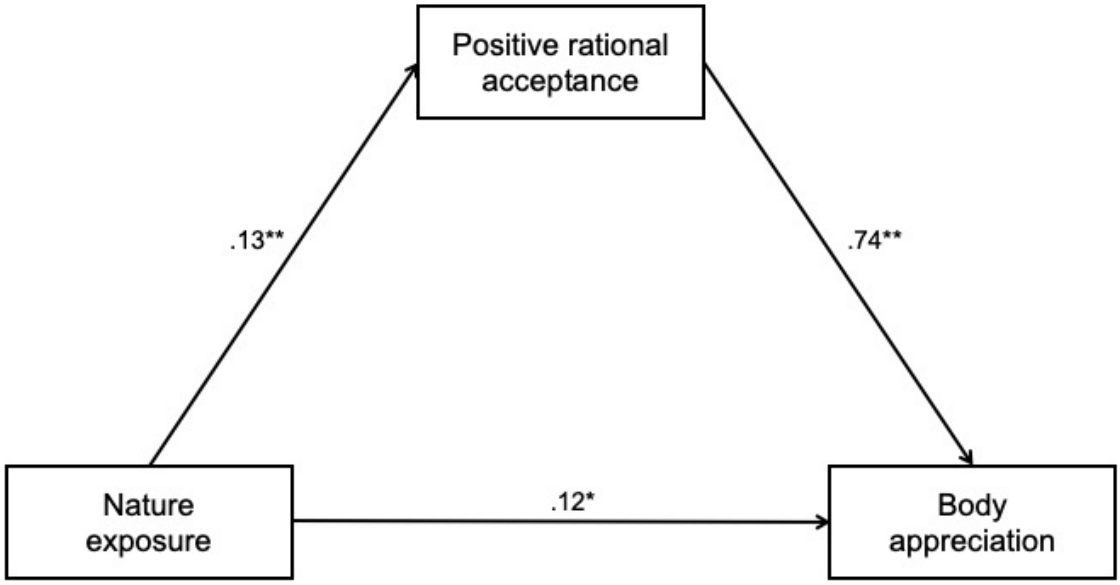

Figure 1

Standardised Direct Effects of the Mediation Model in the Total Sample. $*p < .05$, $**p < .001$.