

Place Attachment Enhances Psychological Need Satisfaction

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Abstract

Attachment to place may contribute to individuals' well-being. We evaluated whether visualizing a place of attachment (compared with visualizing a nonattached familiar place) could increase the satisfaction of key psychological needs. Place attachment visualizations increased participants' levels of self-esteem, meaning, and belonging. Furthermore, visualizing places at a certain geographical scale helped to improve meaning, self-esteem, and belonging among participants who had been ostracized. This is the first study to treat place attachment as an independent variable in an experimental design, so it broadens the options for internally valid, methodologically diverse place attachment research.

Keywords

place attachment, psychological needs, visualization, geographical scale, experiment

Most people have at least one meaningful place to which they feel emotionally connected; this bond, known as place attachment (Altman & Low, 1992), has received much research interest in the past 40 years across several disciplines (Lewicka, 2011). Along with discussion of definitions, multidimensionality, and measurement (e.g., Raymond, Brown, & Weber, 2010;

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Scannell & Gifford, 2010), research is beginning to investigate the consequences of person–place bonding. For example, place attachment is associated with proximity-seeking behaviors (e.g., Mazumdar & Mazumdar, 1993), disaster preparedness (Mishra, Mazumdar, & Suar, 2010), and pro-environmental behavior (e.g., Ramkissoon, Smith, & Weiler, 2013). Place attachment is also thought to have a number of principles in common with interpersonal attachment (e.g., Giuliani, 2003; Morgan, 2010; Scannell & Gifford, 2013).

One common finding is that, like interpersonal attachment bonds, intact place attachment bonds are frequently associated with greater well-being (e.g., Harris, Werner, Brown, & Ingebritsen, 1995). Fewer studies, however, have investigated the particular psychological mechanisms of this effect or the specific psychological needs that person–place bonds can help to satisfy. Those that have offer correlational, qualitative, and occasionally quasi-experimental evidence that cannot demonstrate a causal relation for the effect. The present study uses an experimental design to examine the effects of place attachment on psychological need satisfaction.

Place Attachment and Well-Being

Ties to place are relevant to well-being (Cattell, Dines, Gesler, & Curtis, 2008; Eyles & Williams, 2008), as has been established in various contexts such as neighborhoods (e.g., Rollero & De Piccoli, 2010), rural communities (Brehm, Eisenhauer, & Krannich, 2004; Theodori, 2001), politically unstable regions (Billig, Kohn, & Levav, 2006), and social housing (Manzo, 2014), as well as among various populations, including children (Jack, 2010), college students (Hornsey & Gallois, 1998), refugees (Sampson & Gifford, 2010), and elderly residents (Gilleard, Hyde, & Higgs, 2007; Wiles et al., 2009). For example, rural residents with greater attachment to the community report greater happiness, life satisfaction, and optimism than those who are less strongly attached (Brehm et al., 2006).

Although most of these studies on place attachment and well-being are correlational, and thus cannot determine whether place attachment is a cause or a consequence of positive psychological outcomes, the few that are quasi-experimental or longitudinal offer initial evidence that supports the notion that place attachment improves well-being. For example, children and youth who lose their homes in a natural disaster are more likely to experience post-traumatic stress disorder than are those who do not lose their homes (Felix et al., 2015; Lonigan et al., 1994). Other studies have similarly demonstrated that following place loss, psychological distress, including grief, nostalgia, and alienation, can ensue (Carroll, Morbey, Balogh, & Araoz, 2009; Fried,

1963; Fullilove, 1996), as can physical health problems and disruptions in work performance and interpersonal relationships (e.g., Hornsey & Gallois, 1998; Windsor & McVey, 2005). Such studies support the directionality of place attachment's influence on well-being, but they cannot rule out other influences, and thus causality cannot fully be established. To validate further the accumulating evidence that place attachment increases well-being, an experimental approach is needed.

Place Attachment and Interpersonal Attachment

Along with the growing empirical support that place attachment contributes to well-being, related theories, such as interpersonal attachment (Ainsworth, 1967; Bowlby, 1969; 1982), can also spur the inquiry into place attachment functioning. Interpersonal attachment is an affective-cognitive-behavioral system that is assumed to have evolved to increase infants' chances of survival through proximity maintenance to a caregiver. This caregiver serves to provide physical safety and comfort, regulate emotional and physical states, and foster exploration of the wider environment.

A number of theorists have compared the principles of place attachment with interpersonal attachment and have revealed overlap in key aspects of their functioning (e.g., Fried, 2000; Morgan, 2010; Scannell & Gifford, 2014). First, both types of attachment involve maintaining physical or symbolic proximity to the important person or place. In the case of interpersonal attachment, infants maintain closeness to a caregiver by crying, clinging, and crawling toward them (Bowlby, 1969; 1982), but for place attachment, proximity may involve purchasing a home in a certain city, displaying objects or photographs of one's important place (Ryan & Ogilvie, 2001), returning to a place year after year (e.g., Kelly & Hosking, 2008), or, on the extreme side, refusing to evacuate when a place is threatened (Donovan, Suryanto, & Utami, 2012; Fried, 2000).

Second, interpersonal attachment offers a perceived sense of safety and security (Bowlby, 1969; 1982), and places appear to provide the same benefit. For example, home can be a haven in the face of threats (Brown, Perkins, & Brown, 2003; Lewicka, 2010). Other studies have similarly found that places are often perceived as less dangerous among those who are attached to them (e.g., Billig, 2006).

Third, secure interpersonal and place attachment bonds also support exploration. The security of an attachment figure can promote an infant's exploration of the broader environment (Feeney & Thrush, 2010) and, similarly, places of attachment can serve as a secure base which one can venture out from and return to (Fried, 2000; Gustafson, 2001).

Finally, separation distress occurs following the loss of an attachment figure, with grief, alienation, and disorientation occurring following the loss of important people as well as important places (e.g., Cox & Perry, 2011; Fried, 1963; Fullilove, 1996). Given this overlap in key principles, the possibility that places satisfy similar psychological needs as do people warrants further investigation.

Place Attachment, Interpersonal Attachment, and Need Satisfaction

Along with other factors, well-being is largely derived from the satisfaction of core psychological needs (Deci & Ryan, 2000; Diener, Oishi, & Lucas, 2003). Although consensus on their relative importance has fluctuated, four needs that frequently emerge as key contributors to well-being include belonging, control, self-esteem, and meaning (Deci & Ryan, 2000; Heine, Proulx, & Vohs, 2006; Sheldon, Elliot, Kim, & Kasser, 2001; Williams, 2007). Interestingly, each of these needs has emerged in the literature on interpersonal attachment, as well as (but less frequently) in the literature on place attachment.

The need to belong, crowned by some as the “king” of all psychological needs (Baumeister & Leary, 1995), is certainly supported by secure interpersonal attachment relationships with parents, romantic partners, or friends, who provide a responsive, reciprocal, and genuine sense of relatedness (La Guardia, Ryan, Couchman, & Deci, 2000). Humans are believed to have evolved sophisticated social systems because group coordination and cohesion brought adaptive advantages in our evolutionary past, including social capital, safety in numbers, and division of labor and child-rearing duties (Neuberg, Kenrick, & Schaller, 2010). Thus, psychologically, belonging is extremely valued and ostracism is extremely aversive (Leary, 2010). Belonging may also be supported by place attachment and identity such as when important places symbolically connect individuals to their ancestors or cultures (e.g., Billig, 2006; Hay, 1998; Low, 1992; Mazumdar & Mazumdar, 2004), reinforce social ties and belonging to the community (Fried, 1963; Hidalgo & Hernández, 2001; Kyle, Mowen, & Tarrant, 2004), or simply provide somewhere to call home (Cuba & Hummon, 1993).

Another important psychological need is self-esteem. It is often discussed in the interpersonal attachment literature, given that close relationships are believed to contribute to internal working models of the self as positive or negative (e.g., Bartholomew & Horowitz, 1991). In addition, self-esteem is influenced by emotional ties to a group and the subsequent internalization of the group's positive and negative attributes (Tajfel, 1981). Place identity is a

type of group membership with implications for self-esteem (Proshansky, 1978; Proshansky, Fabian, & Kaminoff, 1983). Less work has explored place attachment as a source of self-esteem, although some evidence exists (e.g., Droseltis & Vignoles, 2010). For example, concepts such as “place-related distinctiveness” describe how unique features of a place (e.g., architectural, natural) promote a sense of pride that can contribute to self-esteem (Twigger-Ross & Uzzell, 1996).

Meaning in life includes the need for coherence and understanding about life and the world around us (Heine et al., 2006), and it has strong associations with life satisfaction, positive affect, and negative affect (Zika & Chamberlain, 1992). Studies of interpersonal attachment show that securely attached individuals report more meaning in life and that priming individuals with representations of a supportive other can increase this sense of meaningfulness (Mikulincer & Shaver, 2005). Priming individuals with rejection, however, can reduce one’s sense that life is meaningful (Zadro, Williams, & Richardson, 2004). As Tuan (1974) and others have speculated, place attachment may similarly influence one’s sense of meaning in life, given that important places can serve as a center from which the rest of the world becomes coherent (Casakin & Kreitler, 2008). In addition, places of attachment often memorialize past events and people, offering coherence over time, or “place-referent continuity” (Twigger-Ross & Uzzell, 1996). Places also offer self-coherence when they represent a person’s values and preferred lifestyle, that is, “place-congruent continuity.” Place-referent continuity and place-congruent continuity therefore likely contribute to a sense of meaning in life in general, although this link has not yet specifically been examined.

Another expected outcome of a secure attachment relationship is a sense of control and autonomy. Indeed, secure interpersonal attachment relationships tend to be autonomy supportive, allowing individuals to have control over their own life decisions (e.g., La Guardia et al., 2000). Perceived control over one’s immediate physical environment also relates to a variety of outcomes such as workplace satisfaction, productivity, and well-being (e.g., Gifford, 2014). Although control has received relatively less emphasis in the place attachment literature, some have suggested that places of attachment can support individuals’ freedom and control (Droseltis & Vignoles, 2010). For example, control has been identified as a key feature of attachment to local coffee shops; patrons who felt that the owners had solicited and incorporated their feedback into the design and management of the coffee shop were more likely to be attached to it (Waxman, 2006). The ability to alter the space by moving tables and chairs was another instance of control expressed by place-attached patrons.

Ostracism as a Threat to Psychological Needs

Psychological need satisfaction is sometimes investigated in the presence of need threats (e.g., Jamieson, Harkins, & Williams, 2010); if place attachment indeed satisfies several psychological needs, then creating a situation in which needs are not fully satisfied, or are threatened, may be important to reveal the subsequent reliance on place attachment. In some experimental studies, psychological needs have been threatened or depleted in various ways, such as by providing controlling (vs. autonomy supportive) instructions (Sheldon & Filak, 2008), providing false feedback on self-esteem relevant tasks (Stinson, Cameron, & Huang, 2015), altering one's sense of control of the physical environment (e.g., by allowing participants to control lighting levels or not; Veitch & Gifford, 1996), priming need threat through word completion tasks or story excerpts (Proulx & Heine, 2009), or exposing participants to supraliminal or subliminal death-relevant cues such as words or photographs (e.g., Greenberg et al., 1990).

One effective and widely used need-threat paradigm involves socially ostracizing participants. Ostracism increases negative emotions and decreases the satisfaction of psychological needs after only a few minutes (Jamieson et al., 2010), even when participants are aware that the ostracizers are computer-programmed characters, not real people (Zadro et al., 2004), and even when participants are paid for instances of being ostracized by others (Van Baest & Williams, 2006). Unlike some need-threat tasks that target one or two psychological needs, ostracism has been shown to rapidly and simultaneously affect a variety of needs, including belonging, control, self-esteem, meaning, and others (Williams, 2009).

Furthermore, ostracism is relevant to interpersonal attachment. For example, writing about an unconditional (vs. neutral) relationship can buffer the painful effects of ostracism among securely attached individuals (Hermann, Skulborstad, & Wirth, 2014). In addition, individuals who hold an attachment-relevant object (i.e., a Teddy bear) after being excluded show less severe negative impacts of the exclusion on their subsequent prosocial behavior (Tai, Zheng, & Narayanan, 2011). Therefore, ostracism is clearly relevant in the context of interpersonal attachment and, probably, is also a suitable paradigm for place attachment research.

Methods From Interpersonal Attachment Research

The extant literature shows that place attachment is associated with a number of psychological benefits, but the descriptive, correlational, and qualitative nature of these studies limits the internal validity of the claims. Along with

theory building, *interpersonal attachment* research could also advance place attachment research by diversifying the methods and measures used. Interpersonal attachment researchers have activated secure mental representations of attachment figures in numerous ways, ranging from subliminal presentation of pictures or names of one's parent, romantic partner, or other attachment figure, to guided visualization interactions with, or simply the faces of, attachment figures (e.g., Mikulincer, Hirschberger, Nachmias, & Gillath, 2001; Mikulincer & Shaver, 2001).

Both subliminal priming and supraliminal visualization of attachment figures—as compared with nonattachment-relevant friends, colleagues, or scenarios—can effectively reduce threats to self-esteem (Baccus, Baldwin, & Packer, 2004; Mikulincer & Shaver, 2001), decrease the use of self-defensive mechanisms when threatened (e.g., Arndt, Schimel, Greenberg, & Pyszczynski, 2002), and heighten compassion toward others (Mikulincer, Shaver, Gillath, & Nitzberg, 2005). For example, individuals who were primed with mortality salience and then recalled positive memories of their parents showed reduced accessibility of death-related thoughts as assessed by a word stem completion task, and were less likely to rely on their worldview as a means of defense against these thoughts (Cox et al., 2008).

However, to our knowledge, neither visualization, subliminal priming, nor any other method of experimental manipulation has been used in place attachment research. Therefore, the present study evaluated whether a place visualization task could effectively prime the feelings and functions associated with place attachment. If successful, this technique will allow research questions about place attachment to be assessed using experimental designs, which is important for establishing causality.

Geographical Scale

Places of attachment exist at multiple spatial scales, ranging from small spaces such as a room in a house to large spaces such as entire continents. A number of studies have compared attachment strength for places of different geographical scales. For example, place attachment appears to be generally weaker for neighborhoods than cities or residences (e.g., Hernández, Hidalgo, Salazar-Laplace, & Hess, 2007; Hidalgo & Hernández, 2001; Lewicka, 2008; Rollero & De Piccoli, 2010). In another study, place attachment was strongest at the city level, followed by the nation and finally the province (Shamai, 1991). The reasons for these varying strengths are unclear, but they may relate to the different psychological benefits available at places of various spatial scales; for example, some benefits are more common in smaller scale places (e.g., goal pursuit, privacy, and control), whereas others are more common in

larger scale spaces (e.g., positive emotions, comfort, and connectedness to nature; Scannell, 2013). Therefore, the potential moderating effects of a place's geographical scale on psychological need satisfaction are of interest.

Some geographers propose finer categorizations of scale that go beyond the simple distinction of small- or large-scale spaces. Freundschuh and Egenhofer's (1997) taxonomy proposes six types of spaces. *Manipulable object spaces* are small spaces that can be turned or moved, and are experienced without locomotion, such as a chair or a desk. *Nonmanipulable object spaces* are larger than one's body, but smaller than a house, and involve minimal locomotion; a room, private office, or front porch would serve as examples of this type of space. *Environmental spaces* are larger, and involve some locomotion, such as parks, neighborhoods, buildings, or multistory residences. *Geographic spaces* are very large and cannot usually be entirely experienced through locomotion, such as cities, regions, or countries. *Panoramic spaces* are generally large spaces that can be viewed from a single vantage point, and thus do not require locomotion, such as a view from a tower or mountaintop. Finally, *map spaces* are large spaces that have been downscaled and are represented by symbols. This taxonomy offers an alternative categorization of scale that has not yet been applied to place attachment research.

Objectives and Hypotheses

The objective of the present study was to use an experimental design to investigate the ability of place attachment to enhance the satisfaction of four psychological needs (belonging, self-esteem, control, and meaning), and to improve affect. Following research on need satisfaction and ostracism (e.g., Williams, Cheung, & Choi, 2000), as well as work on environment-fostered restoration of negative affective states (e.g., Kaplan, 1995), need satisfaction was investigated following a need-threat state. Specifically, we used an ostracism paradigm together with a place visualization task to assess whether place attachment can help individuals recover from the negative psychological impacts of being ostracized.

We used a 2×2 experimental design with place attachment manipulated using a visualization exercise and ostracism manipulated using a bogus rejection paradigm (e.g., Williams et al., 2000) as the independent variables. The dependent variables were participants' current levels of satisfaction of four psychological needs (belonging, self-esteem, control, and meaning) and their current levels of positive and negative affect. In addition, the moderating effects of the places' geographical scales were examined. Given the above, three hypotheses were proposed:

Hypothesis 1: Visualizing a place of attachment will improve need satisfaction compared with visualizing a neutral place.

Hypothesis 2: Place attachment will exert a greater need-satisfying influence after individuals experience ostracism.

Hypothesis 3: As an exploratory hypothesis, the effects of the place visualization or ostracism may differ by the geographical scale of place visualized by the participant. Scale will therefore be investigated as a possible moderator.

Method

Participants

The participants were 133 undergraduate students from a midsized university, recruited from the psychology research participation pool. This number was selected based on an a priori power analysis for the sample size required to detect a medium-to-large effect size (e.g., $\eta^2 = .08$; Cohen, 1988; Faul, Erdfelder, Buchner, & Lang, 2009).

Ages ranged from 19 to 34 years ($Mdn = 20.00$, $SD = 2.34$) and, as is typical of this population, more participants were female ($n = 91$) than male ($n = 28$), although some participants did not report their gender ($n = 14$). Ethnicities were reported as Caucasian (67.8%), Asian (15.3%), East Indian (3.4%), Middle Eastern (2.5%), unspecified Canadian (5.1%), and Other (5.9%), which generally reflects the proportion of these ethnicities in this population. Approximately 40% of participants were in a romantic relationship, and of those, 23.4% lived in the same residence as their partner.

Measures and Tasks

Ostracism manipulation. The ostracism manipulation is a ball-tossing game called “Cyberball” that is played on the computer (Williams et al., 2000). Although participants are told that the players are other research participants, they are in fact virtual players whose actions are preprogrammed to be either inclusive (by passing the ball to everyone approximately equally) or exclusive (by refraining from passing the ball to the participant). Each game involved two male and two female players represented by cartoon faces (one of whom represented the participant).

Place visualization. A research assistant guided participants to imagine, in as much detail as possible, a place that was familiar to them. Those in the place attachment condition were asked to think of a place to which they felt

especially attached, and those in the neutral place condition were asked to think of a familiar place for which they did not have any strong (negative or positive) emotions. Unlike some research in which a given environment is the assumed place of attachment, participants were free to select whichever type of place that they wished. They visualized various sensory aspects of the place, including sights, smells, and sounds. After this, the participants had five minutes to write a short description of the place and explain why it was (or was not) important to them.

Geographical scale. Participants' descriptions of their places were coded by two trained raters for geographical scale using Freundschuh and Egenhofer's (1997) taxonomy of scale, including manipulable object space, nonmanipulable object space, environmental space, geographic space, and panoramic space. Map space, in which larger spaces have been translated into symbolic guides, was not included as part of the coding.

Place attachment scale. This scale assesses the strength of attachment to a given place (Scannell & Gifford, 2013). In this case, participants answered each question with reference to the place they had just visualized. Items were drawn from three previously published measures of place attachment (Billig et al., 2006; Brown & Perkins, 1992; Jorgensen & Stedman, 2001), and all were answered using 7-point Likert-type response scales that ranged from 1 = *strongly disagree* to 7 = *strongly agree* (see the online appendix). The resulting 20-item scale has demonstrated excellent reliability (Scannell & Gifford, 2013; $\alpha = .94$).¹

Positive and Negative Affect Schedule (PANAS). The PANAS (Watson, Clark, & Tellegen, 1988) is a commonly used measure of self-reported affect that has demonstrated good reliability in previous research on exclusion (e.g., positive affect, $\alpha = .83$; negative affect, $\alpha = .78$; Garris, Ohbuchi, Oikawa, & Harris, 2011). Participants rated the degree to which they were *currently* experiencing 20 different emotions (10 positive and 10 negative), such as "excited," "inspired," "upset," and "nervous." Each item was rated on a 5-point scale ranging from 1 = *very slightly or not at all* to 5 = *extremely*.

Need-Threat Scale. This 20-item scale reliably assesses levels of satisfaction with four central psychological needs (belonging, self-esteem, meaning, and control), using 5-point scales (1 = *not at all* to 5 = *extremely*, Cronbach's $\alpha = .78$; Jamieson et al., 2010; Williams, 2009). Participants answered the questions according to how they currently felt based on the activity they had just experienced. Four items were slightly adapted so that they could be applicable to both the ostracism and place visualization activities. For example, the item "I felt I belonged to the group" was changed to "I felt a sense of belonging."

Procedure

As a cover story, participants were told that the general purpose of the research was to assess the links between personality traits and mental visualization, but they were not initially made aware of the ostracism or place aspects of the study. Upon arrival at the laboratory, participants were seated at a laptop computer and told that the first part of the experiment involved playing an online ball-tossing game with three other students. In actuality, each participant played the game with three preprogrammed players. They were further told that the purpose of the game was to mentally visualize what it would be like if they were really tossing the ball around in a room with the other players. The researcher led participants to believe that the other players were completing the experiment in a different room; this cover story was facilitated by a preplanned text message indicating when those other “players” were ready to begin the game.

When participants received the ball, they passed it to another player of their choice by clicking on that player’s cartoon face. The first 9 tosses allowed an equal probability of each player receiving the ball. Following this, the remaining 33 tosses were distributed according to the participant’s condition. In the ostracism condition, participants received no more tosses. In the inclusion condition, participants were tossed the ball approximately one quarter of the time. After this, participants reported their current (i.e., Time 1) levels of psychological need satisfaction using the Need-Threat Scale and their current moods using the PANAS.

The place visualization activity followed, in which participants were guided to envision a place in as much detail as possible for approximately five minutes, and then to write about it for five additional minutes. Half the participants visualized a place to which they were attached and half visualized a neutral place. Afterward, participants reported the strength of attachment to the place they just described using the place attachment scale, and then again indicated their levels of need satisfaction and current moods (i.e., Time 2). Finally, they provided some demographic information (e.g., age, gender, ethnicity, residential mobility). Participants were then debriefed and compensated for their time with course credits.

Results

Creating and Examining Composite Variables

Less than 0.1% of all questionnaire data were missing, and independent *t* tests demonstrated that the amount of missing data did not differ according to gender, age, or years of university. Negatively worded items were reverse-coded, and composite measures for the appropriate subscales were computed by dividing the total score by the number of available responses. Means and

standard deviations are presented in Table 1, and correlations among key variables are presented in Table 2. Demographic variables were not correlated with the covariates or dependent variables.

The overall Need-Threat Scale was reliable at Time 1 and Time 2, and so were its four subscales (Table 1). One item in the Time 2 subscale (i.e., "I felt I was unable to influence the actions of others") did not correlate well with the scale's total score; however, it was retained because the item did not change the alpha of the scale, and it would allow the scales at Time 1 and Time 2 to be comparable. The PANAS subscales and the place attachment scale were also found to be reliable.

Interrater Reliability for Coding of Geographical Scale

Two trained raters blind to the study's purpose and the participants' conditions used Freundschuh and Egenhofer's (1997) taxonomy to assess the geographical scale of the place participants had visualized. Overall, the free-marginal kappa indicated good agreement, $\kappa = .78$ (Randolph, 2008); the percentage of agreement was 81%. No agreement was reached for determining the scale of 26 participants' places, either because coders interpreted responses differently from one another or because the responses were lacking sufficient description; these participants were therefore excluded from scale-related analyses. Of the remaining places, environmental space was the most common type (51.6%), followed by nonmanipulable object space (45.2%). Examples of nonmanipulable places were a living room, a painting studio, and a kitchen. Examples of environmental places included a park, a house, and a recreation center. Geographic space (1.1%) and manipulable object space (2.2%) were much less common in participants' responses. Because the latter two categories were not represented by an adequate number of cases, the scale variable was dichotomized, and analyses of scale were restricted to environmental space or nonmanipulable object space, leaving a sample size of 90 participants for scale-related analyses. A chi-square analysis revealed that the scale codes did not significantly differ by visualization condition, $\chi^2(1) = 2.43$, $p = .12$.

Manipulation Checks

As a manipulation check of the visualization task, a *t* test was conducted using visualization condition as the independent variable, and place attachment strength as the dependent variable. As expected, participants who visualized a place of attachment reported significantly stronger attachment to that place ($M = 4.99$, $SD = 0.98$) than did those who visualized a neutral place ($M = 2.60$, $SD = 0.98$), $t(117) = -13.31$, $p < .001$.

Table 1. Internal Consistencies, Means, and Standard Deviations for Dependent Variables and Continuous Covariates.

Variable	α	Experimental condition							
		Inclusion/PA		Inclusion/neutral		Ostracism/PA		Ostracism/neutral	
		M	SD	M	SD	M	SD	M	SD
Need-Threat Time 1									
Overall	.96	3.44	0.55	3.51	0.54	1.99	0.67	2.35	0.60
Belonging	.90	3.73	0.65	3.86	0.65	1.95	0.77	2.52	0.72
Self-esteem	.89	3.25	0.73	3.36	0.76	2.10	0.72	2.35	0.74
Meaning	.89	3.76	0.64	3.83	0.60	2.23	0.85	2.61	0.73
Control	.78	3.04	0.60	2.99	0.63	1.71	0.70	1.90	0.60
PANAS Time 1									
Positive affect	.89	2.45	0.61	2.63	0.66	2.22	0.68	2.05	0.68
Negative affect	.85	1.30	0.28	1.25	0.25	1.71	0.62	1.60	0.65
Place attachment	.94	4.98	0.87	2.78	1.09	4.99	1.08	2.39	0.81
Need-Threat Time 2									
Overall	.93	3.87	0.61	3.49	0.62	3.82	0.72	3.31	0.63
Belonging	.80	4.23	0.61	3.82	0.80	4.23	0.65	3.69	0.70
Self-esteem	.85	3.89	0.78	3.32	0.73	3.72	0.90	3.02	0.74
Meaning	.79	4.03	0.61	3.60	0.68	3.91	0.72	3.69	0.76
Control	.70	3.37	0.78	3.23	0.78	3.45	0.92	2.86	0.65
PANAS Time 2									
Positive affect	.89	2.71	0.82	2.56	0.73	2.76	0.75	2.34	0.65
Negative affect	.84	1.22	0.33	1.02	0.33	1.34	0.42	1.37	0.52

Note. All scales ranged from 1 (*not at all*) to 5 (*very much so*), with the exception of place attachment, which ranged from 1 (*not at all*) to 7 (*very much so*). PANAS = Positive and Negative Affect Schedule; PA = Place attachment condition.

Table 2. Intercorrelations Among the Dependent Variables and Continuous Covariates.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Belonging Time 1	1												
2. Self-Esteem Time 1	.82**	1											
3. Meaning Time 1	.87**	.84**	1										
4. Control Time 1	.75**	.72**	.78**	1									
5. Positive Affect Time 1	.40**	.48**	.45**	.46**	1								
6. Negative Affect Time 1	-.47**	-.47**	-.44**	-.33**	-.20*	1							
7. Place attachment	-.09	-.02	-.05	.06	.04	.06	1						
8. Belonging Time 2	-.01	.05	.03	.06	.22*	-.07	.50**	1					
9. Self-esteem Time 2	-.04	.14	.08	.12	.22*	-.04	.50**	.81**	1				
10. Meaning Time 2	-.05	.05	.11	-.02	.25**	-.07	.33**	.72**	.71**	1			
11. Control Time 2	-.18*	-.02	-.02	-.04	.19*	.10	.28**	.62**	.69**	.64**	1		
12. Positive Affect Time 2	-.06	.08	.08	.12	.49**	.12	.35**	.58**	.60**	.55**	.59**	1	
13. Negative Affect Time 2	-.24**	-.29**	-.31**	-.14	-.17	.62**	-.02	-.43**	-.28**	-.37**	-.25**	-.13	1

* $p < .05$ level (two-tailed). ** $p < .01$ level (two-tailed).

To test the effects of the ostracism task on need satisfaction and mood, six *t* tests were conducted using ostracism condition as the independent variable, and Mood at Time 1 (i.e., positive and negative mood) as well as each of the Need Satisfaction Time 1 subscales (i.e., Belonging, Self-Esteem, Control, and Meaning) as the dependent variables. The Benjamini–Hochberg procedure was applied to control for the false discovery rate that is problematic with multiple comparisons (Benjamini & Hochberg, 1995). Ostracism significantly decreased the satisfaction of all four needs and positive affect, and increased negative affect (all $ps < .001$).

The Effects of Ostracism and Place Visualization on Mood and Need Satisfaction

To test the first and second hypotheses (i.e., that visualizing a place of attachment would improve mood and need satisfaction compared with visualizing a neutral place, and that the place attachment could increase such outcomes following ostracism), a MANCOVA was conducted. Specifically, the ostracism and visualization conditions were the independent variables, moods and levels of need satisfaction at Time 1 were the covariates, and moods and levels of need satisfaction at Time 2 were the dependent variables. Assumptions relevant to MANCOVA, including multicollinearity, multivariate normality, and homogeneity of covariance matrices, were met.

In support of the first hypothesis, visualizing a place of attachment improved the multivariate outcome of need satisfaction and moods, Wilks's $\Lambda = .85$, $F(6, 104) = 3.09$, $p < .01$. The strength of this significant effect, as assessed by the multivariate $\eta^2 (1 - \Lambda)$ was large: The place visualization factor accounted for 15% of the variance in the multivariate outcome measures. Ostracism decreased the multivariate outcome of moods and need satisfaction at Time 2 (controlling for Time 1), Wilks's $\Lambda = .83$, $F(6, 104) = 3.64$, $p = .003$.

Follow-up univariate tests on each dependent variable indicated that visualizing a place of attachment increased participants' feelings of belonging, $F(1, 109) = 12.88$, $p = .001$; self-esteem, $F(1, 109) = 14.18$, $p < .001$; and meaning, $F(1, 109) = 5.53$, $p = .02$; but feelings of control and positive or negative mood were not significantly altered (see Figure 1). In addition, ostracism reduced participants' sense of control at Time 2, $F(1, 109) = 10.44$, $p = .002$, but it did not influence other Time 2 variables.

The interaction of ostracism and place visualization on mood and need satisfaction at Time 2 was not significant, Wilks's $\Lambda = .92$, $F(6, 104) = 1.39$, $p = .22$. Therefore, the second hypothesis, that the place attachment visualization would have a greater impact for individuals who had been ostracized, was not supported.

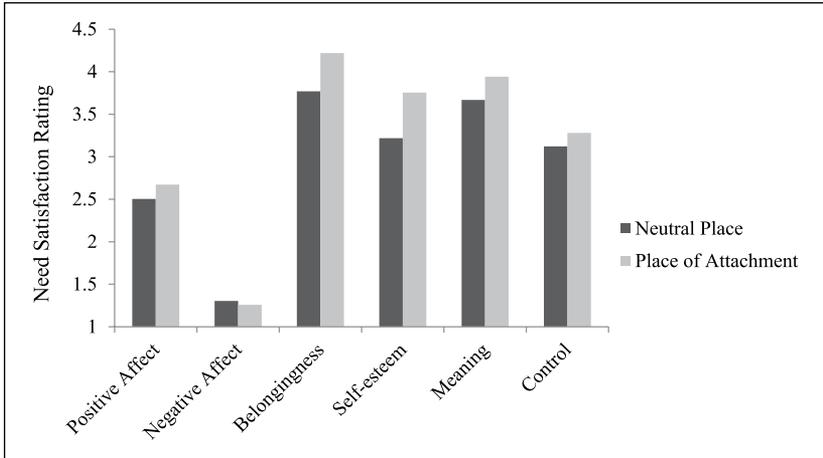


Figure 1. Estimated marginal means of the satisfaction of psychological needs at Time 2 according to place attachment and neutral place visualizations.

Note. Place attachment visualizations significantly increased belonging, self-esteem, and meaning.

To test the third hypothesis, that the effect of place visualization depends on the geographical scale of the place, scale (either nonmanipulable object space or environmental space) was included as an independent variable along with place attachment visualization and ostracism. This was done separately from the initial MANCOVA because of missing data from the geographical scale variable. Despite this, ostracism and visualizing a place of attachment both continued to significantly predict need satisfaction and affect at Time 2; however, the scale of the place visualized was not significant, Wilks's $\Lambda = .88$, $F(6, 71) = 1.69$, $p = .14$, nor did it moderate the effects of the visualization condition on need satisfaction and affect.

Interestingly, however, geographical scale significantly interacted with ostracism, Wilks's $\Lambda = .79$, $F(6, 71) = 3.10$, $p < .01$. Univariate tests revealed that this interaction influenced current levels of meaning, $F(1, 76) = 4.30$, $p < .05$; self-esteem, $F(1, 76) = 8.69$, $p = .004$; and belonging, $F(1, 76) = 5.71$, $p = .02$. Specifically, if participants had been included in the ball-tossing game, visualizing *nonmanipulable object space* had a beneficial effect on need satisfaction at Time 2. For participants who were excluded, visualizing an *environmental space* had a beneficial effect on need satisfaction, particularly for self-esteem and belonging (see Figure 2). Therefore, visualizations of places at certain geographical scales influenced need satisfaction following ostracism.

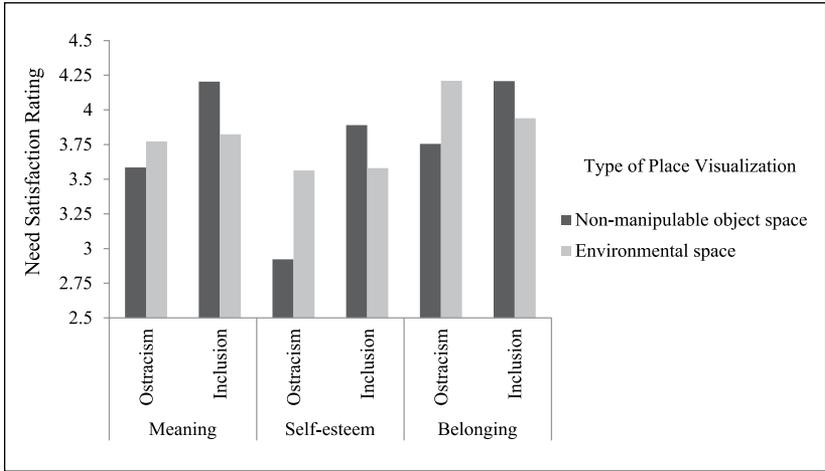


Figure 2. Interaction of geographical scale of place visualization and ostracism condition on the satisfaction of three psychological needs at Time 2 (i.e., meaning, self-esteem, and belonging).

Discussion

This study demonstrated that visualizing a place to which one is attached can facilitate the satisfaction of psychological needs. Thus, it helps to explain why person–place bonds exist, by demonstrating that they are psychologically functional. Furthermore, it is the only study of which we are aware that includes place attachment as a manipulated independent variable, which broadens the options for internally valid, methodologically diverse place attachment research.

Ostracism and Need Satisfaction

This investigation of place attachment–supported need satisfaction was conducted in a need-threat context, using a validated ostracism paradigm (e.g., Jamieson et al., 2010; Williams, 2009; Zadro et al., 2004). Consistent with previous research (Jamieson et al., 2010), ostracism decreased the satisfaction of four needs (belonging, self-esteem, meaning, and control) and positive affect, and increased negative affect. At Time 2, the effects of ostracism dissipated for all of these needs and emotions except the satisfaction of control, which remained lower among those who had been rejected. This extension of the ostracism paradigm further attests to its efficacy, yet suggests that

the effects of this type of rejection partly decay over time and with the introduction of other tasks.

Place Attachment Visualization and Need Satisfaction

The first hypothesis, that visualizing a place of attachment can increase psychological need satisfaction, was supported. Interestingly, the place attachment visualization (relative to the neutral place visualization) enhanced participants' sense of belonging, self-esteem, and meaningfulness, but it did not alter control or affect. This finding is consistent with work showing that interpersonal attachment can enhance belonging (La Guardia et al., 2000), self-esteem (Kumashiro & Sedikides, 2005; Mikulincer & Shaver, 2007), and meaning (Mikulincer & Shaver, 2005), lending further support to the notion that place and interpersonal attachment have a number of common principles, and validating prior speculations and emerging research about place attachment's need-satisfying properties.

However, and in contrast to some previous research linking place attachment to control (e.g., Droseltis & Vignoles, 2010), place attachment visualization did not enhance participants' sense of control relative to neutral places. Control appears to vary among places of attachment and neutral places alike. A grocery store or particular park, for example, could enable participants to act autonomously; interestingly, such neutral places do not equally increase belonging, self-esteem, or meaning. Another possibility is that control may contribute to the formation of place attachment, rather than emerge as an outcome of the bond. For example, homeowners may initially perceive much control following their initial selection, purchase, and set up of the home, but this could vary over time with the addition of new neighbors or bylaws. Further work is needed to determine whether psychological needs are antecedents to place attachment; this knowledge could inform planners, real estate agents, immigrant associations, and other community organizations that wish to encourage place attachment among newcomers.

Finally, and somewhat surprisingly, the place attachment visualization did not significantly improve affect, as assessed by the PANAS. The manipulation check revealed that participants who visualized a place of attachment reported stronger place attachment scores, which are partly comprised of affectively relevant items such as happiness, relaxation, pride, and missing the place when away for too long. However, the PANAS assesses a wider variety of positive states, including not only pride and happiness but also excitement, inspiration, and attentiveness. Thus, place attachment may specifically support some positive states but not others. Also, some of the places of attachment visualized might have evoked negative feelings. Although

research typically assumes the positive implications of place attachment to well-being, person–place bonds can involve ambivalent emotions and experiences (e.g., Chawla, 1992; Manzo, 2003). For some, home is a place of fond childhood memories, whereas for others, it is a place of abuse and oppression (Manzo, 2003). This “shadow side” of place attachment should be investigated in future research on place attachment and well-being. For example, structural equation modeling could be used to take into account the impact of bonds of various valences.

The Interaction of Ostracism and Place Attachment Visualization

The second hypothesis predicted that the place attachment visualization would reduce the negative effects incurred from being ostracized. Although the simple means were in the expected direction, the two variables did not significantly interact. This indicates that place attachment visualization increases need satisfaction somewhat evenly, regardless of whether the individual has previously experienced ostracism or not.

A next step would be to investigate the buffering effects of place attachment; that is, if one’s attachment to place is salient, one may better cope with subsequent stressors. In the interpersonal attachment domain, priming individuals with representations of attachment figures can buffer the negative effects of stress (Mikulincer, Hirschberger, Nachmias, & Gillath, 2001). Therefore, experiencing the visualization task before the ostracism task would be an interesting extension of the present study.

The Role of Geographical Scale

The types of places that participants chose to visualize were diverse, thus encouraging place attachment researchers to extend the range of places they investigate. Among the places that participants chose to visualize were particular rooms, homes, schools, recreation centers, docks, parks, and other outdoor areas, cities, and provinces or regions.

Geographical scale played a role when it was considered in combination with ostracism. The effects of ostracism on participants’ experienced needs at Time 2 differed with scale for meaning, self-esteem, and belonging. Those who visualized environmental space (e.g., a house, a park) showed higher levels of satisfaction with these needs if they had previously been ostracized, but those who visualized nonmanipulable space (e.g., a bedroom, a small office) showed higher levels of satisfaction with these needs if they had not previously been ostracized. This effect may relate to differences in the presence of others found

in each type of place. Environmental spaces are larger and may more often include other people who reduce the negative impacts of ostracism.

Nonmanipulable places may support the pursuit of individual activities, which could be desirable following an inclusive experience. Because scale was not experimentally manipulated (i.e., participants visualized places at scales of their choosing), the links between scale type and need satisfaction are associative rather than causal. Therefore, following ostracism, the selection of the type of place to visualize may have subsequently influenced the satisfaction of various psychological needs or, possibly, one's current levels of need satisfaction may have influenced the type of place one selected to visualize. Yet other differences in place attributes, such as control, stimulation, or nature could also account for this interaction, and, therefore, additional research should examine why scale matters for place-related need satisfaction. At this exploratory stage, scale appears to be an interesting dimension worthy of future study.

Limitations

The place visualization task could benefit from some minor alterations. A few participants in the neutral place visualization condition described places that were somewhat important to them (as revealed by the Place Attachment Strength Questionnaire). If this suppressed the effect of the place attachment visualization, it would partly account for the nonsignificant impacts of place attachment on affect or control. Ensuring that visualizations of neutral places are completely unrelated to places of attachment is difficult, given that they may be proximal, embedded in, or associated with each other. In studies involving visualizations of interpersonal attachment figures, where a similar method is used to generate a control group (e.g., Mikulincer et al., 2005), this limitation is also possible, provided that someone selected a nonattachment figure who was tangentially associated with their primary attachment figure. In the present study, the manipulation check nevertheless demonstrated a clear difference in place attachment strength between groups, although distinguishing the groups as much as possible is important, by further emphasizing to participants that the neutral place should be free from any strong emotion or attachment feelings. Another option could involve preselecting neutral places that participants are likely familiar with, but not attached to (e.g., the university cafeteria).

Also, although sample size was determined through an a priori power analysis, a larger sample size would be able to detect smaller effects. Furthermore, student samples do not always support inferences generalizable to a broader population. Thus, an important direction for future research would be to explore whether similar benefits exist among a larger sample of

individuals with differing ages and place experiences. Nevertheless, the place visualization task contributes a suitable tool and promising results for further investigations of place attachment processes.

Finally, participants' physical distance from their place of attachment precludes an understanding of the benefits that arise in situ. Thus, replicating the results by having participants randomly assigned to visit a place of attachment versus a neutral place would be one possible extension of this study. One benefit of the lab setting, however, is that participants were able to visualize many types of places, some proximal and distal, and they were nevertheless able to reap the benefits of their selected place of attachment through mental access alone. The ability to access place attachment at a distance supports applications of results to place-related meditation or other therapeutic interventions, discussed below.

Applications and Future Research

Despite its relatively uniform methodological development, place attachment research offers a diverse array of practical applications, informing topics such as displacement, proenvironmental behavior, reactions to climate change, social housing, and community design (e.g., Manzo & Devine-Wright, 2014). Findings from the present study may inform additional applications and could certainly open a number of new avenues for future research.

The results could be applied to well-being initiatives in workplaces or more broadly. For example, posters that encourage employees or patrons to take a moment to recall an important place would be expected to heighten states of self-esteem, meaning, and belonging. This may be particularly relevant in settings where psychological enhancement is needed, such as college dormitories or dentist offices (e.g., Berggren & Meynert, 1984; Takahashi & Majima, 1994).

Place-based visualization also holds potential for clinical application, such as among hospital patients or individuals engaging in psychotherapy. For example, guided imagery, in which individuals visualize images or events, is a common stress management technique (Girdano, Everly, & Dusek, 1990). Our results suggest that place attachment visualization could serve as a key technique for guided imagery practices.

Yet another avenue would be to reexamine and further validate previously proposed models of place attachment using an experimental design in which place attachment is manipulated. For example, claims that place attachment is related to private-sphere proenvironmental behaviors (e.g., Vaske & Kobrin, 2001) could be tested experimentally by manipulating place attachment using a visualization technique.

Future research should also consider whether place attachment visualizations (compared with other types of visualizations) can improve physical health-related outcomes, such as coping with painful stimuli or recovering from illnesses. The practical relevance of such work would also depend on the length of time that the visualization can offer its positive psychological effects, which was not investigated in the current study. Indeed, relatively few place attachment studies have incorporated a longitudinal component (but see, for example, Elder, King, & Conger, 1996; Korpela, Ylén, Tyrväinen, & Silvennoinen, 2009; Mesch & Talmud, 2010; Speller, 2000).

Finally, additional work is needed to examine psychological needs beyond these four that may be affected by place attachment. Because qualitative and correlational studies have suggested that place attachment is associated with various psychological benefits, such as relaxation, memory support, and goal setting (e.g., Korpela, Hartig, Kaiser, & Fuhrer, 2001; Kyle, Graefe, Manning, & Bacon, 2003; Lewicka, 2008), expanding the list of needs affected by place attachment is important.

Conclusion

The present study adds experimental evidence to the proposition that place attachment is psychologically functional. It highlights belonging, self-esteem, and meaning as three psychological benefits that may be derived after visualizing a place of attachment. From this, an additional assertion is that we can reap the benefits of place attachment even when we are not immediately in the place.

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Note

1. One week prior to the main study, participants also completed a separate scale assessing stable individual differences in place attachment. However, because the validity of the scale had not yet been established, and problems with internal consistency were detected, it was not retained for further exploratory analyses.

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