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Towards an integrative model of place identification: Dimensionality and predictors of intrapersonal-level place preferences☆

Orestis Droseltis, Vivian L. Vignoles*

Department of Psychology, University of Sussex, Falmer, Brighton, East Sussex, BN1 9QH, UK

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ABSTRACT

Research on place identity has been hampered by confusion in defining the concept and lacks an integrated account of social and motivational processes underlying people's identification with places. We used multilevel modelling ($N = 141$) to investigate the dimensionality and predictors of intrapersonal variance in place identification, drawing on psychological and anthropological literatures. Confirmatory factor analysis distinguished three dimensions of place identification (attachment/self-extension, environmental fit, and place-self congruity), and each was predicted by a somewhat different combination of needs and motives (e.g., self-esteem, continuity, distinctiveness, belonging, meaning, security, control, aesthetic pleasure) and social/symbolic links to places (e.g., genealogy, economics, loss, narrative, spiritual significance, special events). Satisfaction of needs and motives partially accounted for effects of social/symbolic links.

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1. Introduction

What is it that leads people to identify strongly with particular places, even seeing these places as 'part of themselves'? Place identity is a central construct for environmental psychologists, and yet research has been hampered over the past couple of decades by a lack of consensus about both the structure of this construct and the processes associated with it (see Manzo, 2003). Meanwhile, research into other domains of identity has grown steadily and is becoming more integrated (e.g., Ashmore, Deaux, & McLaughlin-Volpe, 2004; Vignoles, Dittmar, Spencer, Langhorne, Wright, & Anderson, in preparation; Vignoles, Regalia, Manzi, Golledge, & Scabini, 2006).

In this article, we have two aims, both of which are intended to contribute to better integration within the place identity literature. First, we consider briefly the dimensionality of place identification. However, our main aim is to test the strength of various predictors of people's identification with places, derived from psychological and anthropological literatures. Both tasks involve a novel methodological approach focusing on variance among places at an intrapersonal level of analysis.

1.1. Dimensions of place identification

Definitions of place identity vary widely, especially in terms of the presumed structure of the construct. For example, Low and Altman (1992) defined place identity as a unitary construct: an "integrating concept… not composed of separate or independent parts, components, dimensions or factors" (p. 4), whereas Proshansky (1978) defined it as a complex and multidimensional construct comprising "those dimensions of the self that define the individual's personal identity in relation to the physical environment by means of a complex pattern of conscious and unconscious ideas, beliefs, preferences, feelings, values, goals[, …] behavioral tendencies and skills" (p. 155). Reviewing the many, and sometimes nebulous, definitions of place identity in the literature, we have identified four major conceptualisations which we believe are worth distinguishing on theoretical grounds (see Fig. 1).[1]

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* Correspondence to: Vivian L. Vignoles, Department of Psychology, University of Sussex, Falmer, Brighton, East Sussex, BN1 9QH, UK. Tel.: +44 (0) 1273 873635.
E-mail address: v.l.vignoles@sussex.ac.uk (V.L. Vignoles).
URL: http://vignoles.socialpsychology.org

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[1] What these four conceptualisations have in common is that each of them refers to a sense in which a person can be said to *identify with* a particular place. More precisely, one might refer to these as dimensions of 'place identification'. We recognise that the term place identity also might be conceptualised quite differently as referring to the *identity of* a place—i.e., the qualitative characteristics of its symbolic meaning to the people who are connected with it. In principle, the identity of a place might be a reflection of any number of dimensions of meaning and there is no particular reason to suppose that these dimensions should cluster together, nor that a common set of dimensions would be appropriate for characterising the identities of different kinds of places. In the current paper, our focus is on predicting identification *with* places; nevertheless, we recognise that some of the predictors in our study might also be understood as components of the identities *of* places.

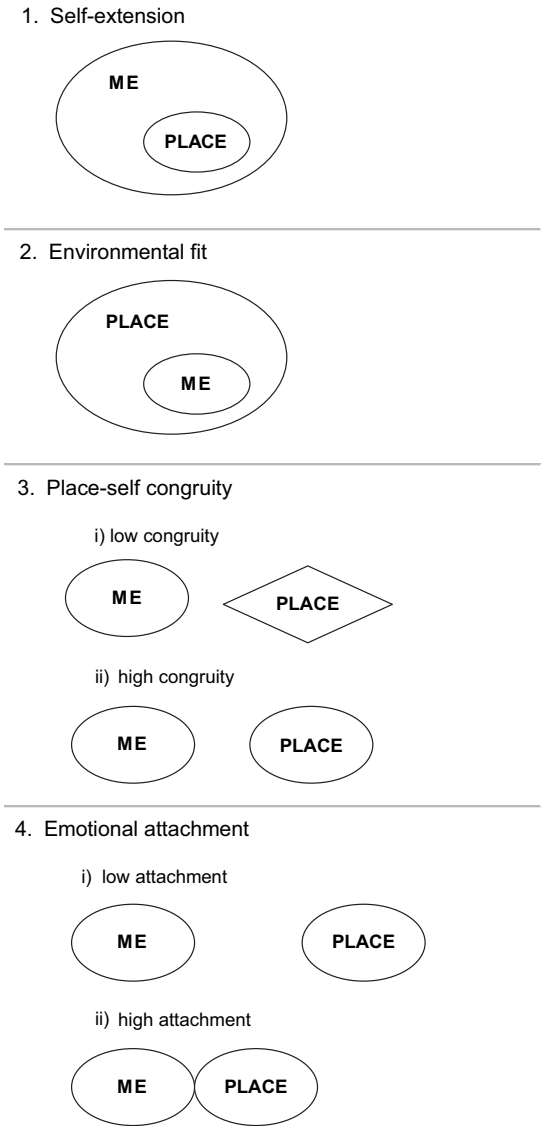

Fig. 1. Four theoretical dimensions of place identification.

A first axis in the literature has been the notion of 'extended self'—the idea that places are experienced cognitively as 'part of the self' (e.g., Belk, 2000; Proshansky, Fabian, & Kaminoff, 1983). The validity of this conceptualisation appears to be supported empirically: for example, people who have had their spatial territory violated by burglary report a qualitatively similar profile of psychological distress, albeit somewhat less intense, to that of people who have experienced bodily violations such as rape or assault (Wirtz & Harrell, 1987; see also Burris & Rempel, 2004). However, Proshansky and colleagues' (1983) speculative claim "…that what is true of self-identity is also generally true of its substructure, place identity" (p. 60) has yet to be investigated fully. Here, we use the term *self-extension* to refer to the cognitive sense of a place as being part of the extended self-concept.

A second axis revolves around the notion of 'ecological self' (Bragg, 1996), also captured in the concept of 'environmental identity' (Clayton & Opotow, 2003), whereby individuals develop a subjective sense of fitting into, or being part of their physical environment (be it 'natural' or otherwise). This has some resonance also with the concept of 'rootedness', which has been examined in the context of residential settings (McAndrew, 1998), in terms of attachment to place (Hidalgo & Hernández, 2001; cf. Hay, 1998), or as a multidimensional construct associated with place belongingness and length of stay (Moore, 1999). Thus, if the previous dimension refers to the sense of a place as fitting into, or belonging to the self, we use the term *environmental fit* to denote the ecological/environmental sense of the self as fitting into, or belonging to a place.

A third axis has been the notion of congruity between self and place, reflecting the idea that the place is in some way similar to, or matches, the values and personality of the individual (e.g., Sirgy & Su, 2000). Place-self congruity has been examined in relation to travel destination choices (Beerli, Meneses, & Gil, 2007), residents' attachment to their geographical area (Twigger-Ross & Uzzell, 1996), and in the context of architectural design (Hull, 1992). We should acknowledge that this dimension has sometimes been viewed as a correlate rather than a component of place identity. Nevertheless, to the extent that congruity implies some sense of equivalence in meaning between the self and the place, we believe it is appropriate to view it as a component of people's identification with places, just as social identity researchers view similarity to the group stereotype as one important dimension of people's identification with groups (e.g., Leach et al., 2008). Hence, we refer to *place-self congruity* as the sense that the image one has of a place is similar to, or consistent with, the image one has of one's characteristics as an individual.[2]

A fourth and final approach has been to conceptualise place identity in terms of attachment (e.g., Twigger-Ross & Uzzell, 1996). Following the seminal work of humanistic geographers (e.g., Relph, 1976) and social anthropologists (see Altman & Low, 1992), emotional links to places have been treated as one of the most definitive aspects of people–place bonds, as demonstrated by the literature on 'place attachment'. Nevertheless, the relationship between place identity and place attachment has aroused much controversy. For example, it has been argued that affective attachment and place identity are distinct constructs (e.g., Hernández, Hidalgo, Salazar-Laplace, & Hess, 2007), that affective attachment to place subsumes place identity (e.g., Hinds & Sparks, 2008; Kyle, Graefe, & Manning, 2005), and that both place identity and affective attachment to place are subsumed by another construct such as sense of place (e.g., Jorgensen & Stedman, 2001; see also Pretty, Chipuer, & Bramston, 2003). Moreover, the blurring of the semantic differentiation between emotional attachment and place identity in measures of these constructs (e.g., Félonneau, 2004) has not helped to clarify the relationship, rendering these two terms almost interchangeable in practice. Here, we use the term *emotional attachment* to refer exclusively to strong emotional bonds or positive affect towards places, notwithstanding the plethora of different descriptions or meanings attached to 'place attachment' in the literature (see Hidalgo & Hernández, 2001).

1.2. Predictors of place identification

Beyond these concerns about dimensionality, our main aim was to examine whether recent advances in modelling processes underlying the construction of other domains of identity (e.g., Vignoles et al., in preparation; Vignoles et al., 2006) could successfully be transposed to the domain of place identity. Here, we

[2] Note that place-self congruity, as defined here, is quite distinct from the similar-sounding concept of person-environment congruence or compatibility, which is defined as the degree to which an environment affords satisfaction of individual needs and goals (e.g., Greenberger, Steinberg, & Vaux, 1982; Kaplan, 1983; Meir & Melamed, 2007). The latter may be an important predictor of psychological well-being, but it is not a dimension of place identification.

Table 1
Items used in the place ratings.

Construct	Item
Dimensions of identification	
Self-extension	I feel this place is part of who I am.
	If this place no longer existed, I would feel I had lost a part of myself.
Environmental fit	I feel this is the place where I fit.
	This place allows me to "connect with myself".
Place-self congruity	This place reflects the type of person I am.
	This place reflects my personal values.
Emotional attachment	I feel a sense of emotional attachment to this place.
Psychological needs and motives	
Self-esteem	This place make me feel positively about myself.
Continuity	This place gives me a sense of continuity between past, present and future in my life.
Self-efficacy	This place makes me feel competent and effective.
Meaning	This place gives me a sense of "meaning" in my life.
Distinctiveness	Being linked to this place distinguishes me from other people.
Belongingness	This place makes me feel close to, or accepted by, other people.
Control	This place makes me feel that I am in control.
Security	This place gives me a sense of security.
Aesthetic satisfaction	I find this place beautiful.
Social links to places	
Genealogical links	My origins are in this place.
Economic links	This place has financial importance for me.
Sense of loss/dislocation	There is a sense of 'loss' when I think of this place.
Narrative links	I know a lot of stories about this place.
Spiritual Significance	This place has spiritual significance to me.
Links to special events	This is a place to go to on special occasions.

Note. All statements were rated in a 10-point scale. Scale anchors were 0 = not at all true of this place; 10 = completely true of this place.

extend the range of predictors considered in those previous studies, considering two broad groups of predictors which may account theoretically for people's identification with places: (1) individual motives and needs, and (2) social and symbolic links to places (see Table 1).

1.2.1. Individual motives and needs

The first group of predictors is derived from social and personality psychology and focuses on constructs of identity motives (e.g., Breakwell, 1988, 1993) and basic human needs (e.g., Maslow, 1954/1970).

Identity process theory (Breakwell, 1988, 1993) proposes that identity processes are guided by four 'principles': people construct and defend their identities so as to maintain desired end-states of *self-esteem*, *continuity*, *distinctiveness* and *efficacy*. According to the theory, these 'identity principles' have a motivational or need-like character. When feelings of self-esteem, continuity, distinctiveness or efficacy cannot be achieved, this constitutes a 'threat' to identity and people may adopt a wide variety of coping strategies in order to restore satisfaction. Even in the absence of such threats, it is predicted that people will typically perceive as especially central and self-defining those aspects of their identities which satisfy the four identity principles (see Vignoles, Chryssochoou, & Breakwell, 2002).

These four identity principles have been examined in two previous studies into place identity and attachment, although neither draws attention to their motivational character, treating them as components rather than predictors of place identity. In a small-scale interview study about attachment to the London Docklands area, Twigger-Ross and Uzzell (1996) found that participants reporting high rather than low attachment to the area were more likely to associate the area with feelings of self-esteem, continuity, distinctiveness and efficacy. Knez (2005) found similar results in a large-scale survey study about attachment to the city of Gothenburg. In his study, feelings of self-esteem, continuity, distinctiveness and efficacy were significantly associated with place attachment, but he did not test whether each motive contributed uniquely to predictions of place attachment.[3]

Recently, Vignoles et al. (2006) have expanded on identity process theory, proposing that motives for self-esteem, continuity, distinctiveness, efficacy, *belonging*[4] and *meaning* are implicated in the construction of individual, relational and collective identities. In a series of studies using both correlational and prospective longitudinal methodologies, they showed that all six motives are involved in identity construction; however, each motive shows a different profile of effects across dimensions of identity construction and identity-related affect. Further studies have explored the effects of these six identity motives on the construction of desired and feared possible selves (Vignoles, Manzi, Regalia, Jemmolo, & Scabini, 2008), as well as people's identification with material possessions (Vignoles et al., in preparation) and with consumer brands (Kreuzbauer, Vignoles, & Chiu, 2008).

Despite its application across various identity domains, no previous research has directly applied Vignoles and colleagues' expanded model of motivated identity construction to the prediction of people's identification with places. Supporting the potential role of the belonging motive in place identity processes, research has shown that the quality of relationships with neighbours is one of the strongest predictors of people's attachment to the place where they live (e.g., Bonaiuto, Aiello, Perugini, Bonnes, & Ercolani, 1999). Although we are aware of no empirical evidence for this point, it also seems intuitively likely that people would identify especially strongly with places which give them a sense of

[3] In contrast with our perspective, Knez (2005) explicitly theorised these four dimensions as outcomes rather than predictors of place attachment. In all likelihood, the true effects are bidirectional, but these complex processes cannot be untangled using the correlational approach used by Knez or in the current study.

[4] Note that belonging refers here to social inclusion and acceptance and not to the sense of 'belonging to a place', which is part of our definition of environmental fit.

meaning in their lives. Moreover, Vignoles et al. (2006) argued that their list of identity motives was not necessarily exhaustive. We considered three other possible motives for place identity here, derived from psychological theorising about basic and higher human needs, as well as studies into the restorative benefits of people–place contact.

We felt that places might be important because they fulfilled basic human needs for *security* and for *control* (Deci & Ryan, 2000; Maslow, 1954/1970), which were not covered within Vignoles and colleagues' model of identity motivation. Some evidence suggests that people report feelings of both security and control as a result of their contact with natural environments and favourite places, and feelings of insecurity and lack of control as a result of contact with those places they would prefer to avoid (Korpela, 1989; Korpela, Hartig, Kaiser, & Fuhrer, 2001; see also Hartig, Mang, & Evans, 1991).

We were also interested in the idea that places might be important because they fulfilled people's *aesthetic needs* (after Maslow, 1996; see also Averill, Stanat, & More, 1998). Although the concept of aesthetic needs has received very little systematic theoretical or empirical attention in psychological research (for rare exceptions see Sirgy, Efraty, Siegel, & Lee, 2001; Wikström, 2002), we felt that it would be appropriate to include aesthetic needs in our list of possible motives underlying place identification, given the self-evident importance of the aesthetic dimension both as a core principle of architectural design and as a key component of people's reactions to both natural and built environments. Indeed, in a study of place attachment among inhabitants of Rome, Bonaiuto et al. (1999) found that perceived aesthetic pleasantness was a significant and substantial unique predictor of attachment to one's local neighbourhood, even after controlling for effects of various other social and contextual features.

1.2.2. Social and symbolic links to places

The second group of predictors we examined comes from the social anthropological literature on place identity. Reviewing this literature, Low (1992) identified six different ways in which individuals and communities may be linked socially and/or symbolically to significant places. These are *genealogical links* (e.g., links to family, places of origin); *loss or destruction of community* (e.g., places that were lost due to migration or catastrophes); *economic linkage* (e.g., owning property, workspaces); *cosmological links* through religious, spiritual or mythological relationship (e.g., sacred spaces like Machu Picchu, religious temples, or Stonehenge); *pilgrimage and celebratory cultural events* (e.g., Mecca, or even stadiums or concert halls such as Earl's court or Wembley arena in London); and finally *narrative linkage* through story telling and place naming (e.g., mediated narratives about New York city, Tolkien's Middle-Earth and so forth).

Each of these social and symbolic links—with the arguable exception of 'loss or destruction'—might be expected to foster a psychological sense of identification with the place in question. Nevertheless, empirical studies pertinent to Low's (1992) typology are very scarce in the psychological literature and they tend to centre around the role of spirituality. Mazumdar and Mazumdar (1993), for example, discussed the role of spirituality in place attachment and argued that sacred spaces facilitate the development and expression of identity. Similarly, West (2003) pointed out how conscious experience of places can be related to place cosmology and well-being in traditional native American cultures. Thus there is a notable gap in the previous literature for a systematic exploration of the relationship of these six different kinds of social and symbolic people–place bonds with place identification.

1.3. The current study

Considering the number and variety of place-related constructs and discrepant accounts, Giuliani and Feldman (1993) postulated that the greatest challenge in place identity research would be the successful integration of all previous viewpoints and perspectives (see also Lalli, 1992). As a response to this, we embarked on a novel attempt to integrate previous research angles on place identity research.

Most existing studies into place identity focus on an individual level of analysis, examining differences between lower and higher identifiers or between weakly and strongly attached participants, usually in relation to one particular place which is specified by the researcher. Although consistent with common practice in psychological research, it can be difficult to infer anything generic about place identity processes from these studies for several reasons. Firstly, the results may be coloured by particular characteristics of the places chosen for the study. Secondly, the focus on individual differences is not well-adapted to the elucidation of general, nomothetic psychological principles: for example, are the lower identifiers in a given study people who do not identify strongly with places in general, or would they have identified more strongly if the researchers had focused the study on some different place which happened to be more relevant to them?

Here, we adopted a very different approach, focusing on intrapersonal variance in identification with different places, specified by the participants themselves. Thus, the focus of our study was not on predicting *who* would identify more or less strongly with a given place, but on predicting *which places* an individual would seek to identify with more or less strongly, among those available and relevant to them. We asked participants to specify their own samples of places in an open-ended fashion, thus sampling widely among the variety of places which people might or might not identify with. By focusing on intrapersonal variance, we were able to examine statistical trends which participants might have in common, rather than being forced to focus on what divided them—thus improving the prospect of identifying general principles underlying people's place identification preferences.

Our first aim was to develop carefully worded items to measure the four different conceptualisations—or components—of place identity we had identified theoretically, in order to see whether they could be distinguished empirically as separate facets of the construct. We then sought to identify the best predictors of each facet based on the psychological and anthropological literatures, including the typological features presented by Low (1992), the identity motives theorised by Vignoles et al. (2006), as well as needs for security, control and aesthetic satisfaction (Deci & Ryan, 2000; Korpela et al., 2001; Maslow, 1954/1970, 1996).

We were interested to consider two possible models of the main pattern of relationships between these various constructs (see

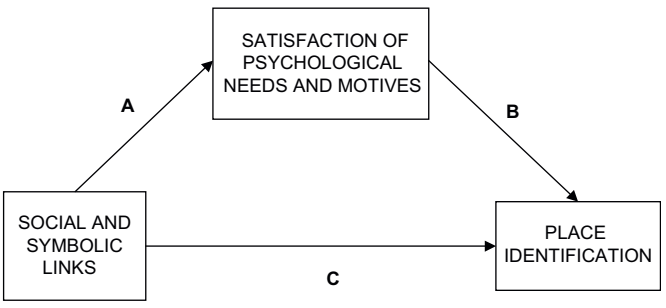

Fig. 2. Possible generic relations between the three groups of measures.

Fig. 2). One possibility was that psychological need satisfactions would largely mediate the effects of social linkage on place identity: that is, particular ways of relating to places would allow for the satisfaction of particular psychological needs, which in turn would lead to aspects of place identification (paths A and B in the figure). An alternative possibility was that psychological and anthropological predictors would make largely separate and independent contributions to place identity (paths B and C in the figure).[5]

2. Method

2.1. Participants and procedure

Participants ($N = 141$) completed questionnaires in three formats: in hard-copy ($N = 18$), in an e-mailed Word document ($N = 29$), and in a .php format mounted on a website ($N = 94$). Participants were sourced via snowballing tactics (i.e., e-mail recipients were encouraged to forward the e-mail to prospective participants in their contact list).

All 141 participants in the sample were adults ($M = 36$ years and two months, $SD = 12$ years and 8 months); 100 were female and 41 were male. With regard to declared occupation, 41 participants identified themselves as students (including part-time, full-time and postgraduate), 25 identified themselves as teachers, and most of the remaining participants referred to white-collar occupations, such as 'researcher', 'manager', 'clerical assistant', 'administrator', 'doctor', etc. Eighty participants identified themselves as British nationals, followed by 32 Hellenic nationals, whilst others declared a range of other, predominantly European, nationalities. In terms of ethnicity, the vast majority of responses provided could be categorised as Caucasian (127 participants) whilst the very limited, albeit diverse, remaining responses on ethnicity occurred at minimal frequencies.

2.2. Questionnaire

2.2.1. Demographic information

At the beginning of the questionnaire, we asked participants to fill in some personal details related to their age, sex, occupation, nationality and ethnicity.

2.2.2. Listing self-relevant places

Participants were then asked to specify freely up to 10 places to which they felt they were linked in some way. All subsequent ratings were made in relation to these 10 places. Participants' responses were very diverse, and examples included planets (e.g., 'planet Earth', 'Jupiter'); continents (e.g., 'Africa'); countries (e.g., 'the USA', 'UK'); counties or states (e.g., 'Cornwall' in England or 'California' in the US); islands (e.g., 'Maldives', 'Tobago'); cities (e.g., 'Glasgow', 'New York'); geographic locations (e.g., 'the beach', 'the cliffs of Moher in Ireland'); streets (e.g., 'Eagle's Close', 'Hythe Road'); buildings or venues (e.g., 'airports', 'train station', 'cinema'); rooms or the home environment (e.g., 'meditation room', 'my bedroom'); various other places (e.g., 'fetish clubs', 'on the bus', 'sky'); historical and imaginary places (e.g., '18th century England', 'fantasia', 'ancient Rome', 'Neverland', 'Spring', 'Berlin 1936', 'planet B612', 'Middle-Earth'); and many more. All participants listed 10 places except for one who listed 8 places only.[6]

2.2.3. Categorisation of places

Participants were asked to respond to three yes/no questions concerning their relationship to each place: Out of the 1408 places provided, 1199 were categorised as places where participants had been, 464 as places where participants expected to go in the future, and 58 as imaginary ones. (Note that these were not mutually exclusive categories.)

2.2.4. Rating of places

Participants were then requested to rate each of their listed places against a series of 22 statements reflecting the theoretical constructs of place identification, satisfaction of needs and motives, and social/symbolic links to places. Exact wordings of these statements appear in Table 1, and all ratings were made using a scale from 0 (not at all true of this place) to 10 (completely true of this place). In order to avoid excessive load or boredom effects, it was necessary to use just one or two carefully worded items to measure each theoretical construct, resulting in a total of 220 ratings made by each participant (22 items $\times$ 10 places). Previous research had shown this method to be effective in research designs for studies on identity processes (Vignoles et al., 2006), self-esteem (Robins, Hendin, & Trzesniewski, 2001), and in diary studies when participants are required to provide many repeated measures for each dimension (e.g., Reis, Sheldon, Gable, Roscoe, & Ryan, 2000).

3. Results

3.1. Dimensionality of place identity

We ran a series of multilevel confirmatory factor analyses using the Mplus software package (Muthén & Muthén, 1998–2007) to test whether our measures successfully distinguished between the four dimensions of place identity we had identified on theoretical grounds. Mplus decomposes the variance in each measure into intrapersonal (within) and interpersonal (between) components for multilevel analyses. Since our empirical focus in the current study was on modelling intrapersonal variance among different places, we compared possible structural models at the within-level, while allowing items to covary freely at the between level. By specifying a saturated model at the between level, we were thus able to ensure that our model comparisons were driven by within-level covariance only.

Based on the theoretical dimensions identified in Fig. 1, we first tested a model with 4 separate factors at the individual level. Self-extension, environmental fit and place-self congruity were measured with two items each. Because there was only a single-item to measure emotional attachment, this factor was measured as a single-indicator latent variable (Bollen, 1989); we set the residual variance on this item

[5] We also measured the time orientation of places, which could be past, present, future, and whether the invoked places were real or imaginary. We identified this time-related and real vs. imaginary dimensionality based on what Proshansky et al. (1983) argued to be the case with regards to the "environmental past" (p. 59) as the core structure of place-related cognitions (see also Kyle et al., 2004). This also relates to Low's (1992) argument that "place attachment can apply to mythical places that a person never experiences" (p. 166; see also Kyle et al., 2005) and to Milligan's (1998) hypothesis that place attachment is a function of both interactive past and interactive potential that are associated with places.

[6] This open-ended task aimed at reducing any possible demand characteristics which might inadvertently constrain participants' choice of places as it was located at the very beginning of the questionnaire. Had we specified pre-determined places or types of places to participants, it is possible that not all of the given places would have applied equally to all participants and this would then introduce spurious individual differences into the analyses. Our method required participants to tap into their own subjectivities, and the required number of 10 places allowed enough scope for variance of ratings between places for each participant without rendering intolerable the burden of the subsequent rating scales.

Table 2
Pooled within-participant correlations between place-level variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Place identification																		
1. Attachment/self-extension	–																	
2. Environmental fit	.79	–																
3. Place-self congruity	.64	.71	–															
Needs and motives																		
4. Self-esteem	.62	.71	.66	–														
5. Continuity	.67	.61	.48	.46	–													
6. Distinctiveness	.57	.50	.45	.43	.41	–												
7. Belonging	.64	.63	.48	.52	.56	.49	–											
8. Efficacy	.54	.63	.51	.59	.47	.43	.52	–										
9. Meaning	.73	.74	.62	.63	.64	.54	.58	.59	–									
10. Control	.55	.66	.50	.57	.43	.42	.51	.68	.57	–								
11. Security	.71	.73	.57	.60	.60	.49	.53	.59	.65	.67	–							
12. Aesthetics	.42	.50	.47	.56	.29	.31	.29	.27	.44	.26	.36	–						
Social/symbolic links																		
13. Genealogical	.50	.31	.30	.21	.40	.32	.29	.18	.33	.18	.38	.07	–					
14. Economic	.27	.24	.20	.18	.29	.18	.24	.30	.29	.29	.33	−.02	.12	–				
15. Sense of loss	.40	.29	.26	.19	.26	.26	.22	.18	.25	.10	.18	.20	.33	−.02	–			
16. Narrative	.56	.41	.36	.29	.45	.38	.40	.30	.40	.29	.42	.13	.45	.25	.29	–		
17. Spiritual significance	.61	.59	.56	.52	.46	.40	.40	.39	.55	.37	.46	.45	.35	.07	.35	.40	–	
18. Special occasions	.21	.26	.25	.30	.16	.16	.19	.11	.21	.10	.16	.38	.07	−.11	.18	.10	.25	–

Note. Listwise $N = 1291$. Correlations were calculated using participant-mean centred scores for all variables.

at 2.20 to match the average residual variance of the other items in the model. The 4-factor model showed excellent fit indices: $\chi^2(9) = 33.2$,[7] CFI = .996, TLI = .982, RMSEA = .047, $SRMR_{within} = .013$, $SRMR_{between} = .005$. This model fit the data significantly better than a single-factor model: $\Delta\chi^2(5) = 436.6, p < .001$. However, the correlation between the two of the latent factors, emotional attachment and self-extension, was estimated at .98, clearly suggesting that these items did not form two distinct factors.

Therefore, we computed a revised model with 3 separate latent factors for self-extension/attachment, environmental fit and place-self congruity. Fit indices for this model remained excellent: $\chi^2(11) = 34.4$, CFI = .996, TLI = .986, RMSEA = .042, $SRMR_{within} = .014$, $SRMR_{between} = .005$; and this model showed no significant loss of fit compared to the 4-factor model: $\Delta\chi^2(2) = 1.2$, $p = .55$. Correlations between the latent factors ranged from .74 to .90, indicating that all three factors were very closely related. Nonetheless, the three factors were statistically distinguishable: we tested the three possible 2-factor models which could be created by combining these factors further, but even the best of these models showed a significant loss of fit compared to the 3-factor model, $\Delta\chi^2(2) = 166.3, p < .001$, and unsatisfactory values for several other fit indices: TLI = .90, RMSEA = .11 (Hu & Bentler, 1999). Hence, for the analyses which follow, we decomposed place identity into three closely related subfacets, calculating separate scores for self-extension/attachment (3 items: $\alpha = .90$), environmental fit (2 items: $r = .67$), and place-self congruity (2 items: $r = .73$).[8]

3.2. Testing predictors of the three facets

To test predictive relations with the three dimensions of place identity, we ran a series of multilevel models, using the HLM 6.04 software package (Raudenbush, Bryk, & Congdon, 2007). To account for the very strong correlations between the three facets of place identity, we ran fully multivariate multilevel models with the three outcomes (level 1) nested within places (level 2) nested within participants (level 3). To avoid confounding our within-participant regression weights with between-participant covariance, all predictors were participant-mean centred for these analyses. For all analyses, we used full maximum likelihood estimation with convergence criterion of .000001. Given the large sample size at place-level, we used a conservative alpha level of .001 for all significance tests. Table 2 shows pooled within-participant correlations between all variables.

As a baseline for statistical comparisons, first we computed a *null model*, predicting the three facets of place identity as a function of separate intercepts, randomly covarying at levels 2 and 3. This model had a deviance of 16,833, which we used to test the incremental fit of subsequent models. Within-participants residual variance estimates were 8.23, 7.52 and 5.41, respectively, for self-extension/attachment, environmental fit and place-self congruity. These estimates were used as a baseline for estimating modelled variance within participants (R^2_W) in subsequent models.[9]

We then tested three theoretical models including different combinations of predictors of the three facets of place identity. A *needs and motives model* included satisfaction ratings for the six identity motives with the addition of control, security and aesthetic needs from the psychological literature. A *social and symbolic links model* included ratings of the six forms of social links and practices identified in anthropological research. Finally, a *combined model* included both of these sets of predictors together. Model parameters and statistics are summarised in Table 3.

[7] Although this value of χ^2 represents a statistically significant level of misfit, it is very common to find a significant χ^2 in studies with large sample sizes, even in a well-fitting model (Bentler & Bonett, 1980). Here, the sample size at level 1 (place-level) was 1209, making it extremely unlikely in practice to find a non-significant χ^2 in anything less than a saturated model.

[8] Further supporting the choice of a 3-factor structure, we should note that initial tests of our predictive models based on our 4-factor model showed an almost identical pattern of significant predictors of emotional attachment and inclusion in the self, but somewhat different patterns for the other two dimensions. We also tested models setting the residual variance on emotional attachment in the 4-factor model at lower and upper bounds of 1.7 and 2.8; model comparisons were identical to those reported here. Moreover, alternative 3-factor models combining emotional attachment with environmental fit or with place-self congruity provided a notably poorer fit to the data, compared to the model with emotional attachment combined with inclusion in self. Thus, it seems unlikely that the combination of these two factors is purely a statistical artefact of having used only one item to measure emotional attachment.

[9] R^2_W was defined as the proportional reduction in residual variance within participants by using a given model in comparison with the null model (after Hox, 2002). For a discussion of alternative definitions and formulae, see Snijders and Bosker (1994). Note that R^2 estimates in multilevel modelling cannot be used for statistical inferences as in traditional multiple regression. Nevertheless, we include them here as an aid to interpreting effect sizes.

Table 3
Standardized multilevel regression parameters predicting within-participant variance in self-extension/attachment (SEA), environmental fit (EF), and place-self congruity (PSC) (paths B and C in Fig. 2).

	Needs and motives model						Social/symbolic links model						Combined model					
	SEA		EF		PSC		SEA		EF		PSC		SEA		EF		PSC	
	β	*p*	*β*	*p*	*β*	*p*	*β*	*p*	*β*	*p*	*β*	*p*	*β*	*p*	*β*	*p*	*β*	*p*
Needs and motives																		
Self-esteem	**.10**	**<.001**	**.17**	**<.001**	**.31**	**<.001**	–	–	–	–	–	–	**.08**	**<.001**	**.15**	**<.001**	**.28**	**<.001**
Continuity	**.22**	**<.001**	**.10**	**<.001**	.06	.034	–	–	–	–	–	–	**.13**	**<.001**	**.08**	**<.001**	.01	.804
Distinctiveness	**.15**	**<.001**	.01	.729	.06	.013	–	–	–	–	–	–	**.08**	**<.001**	−.01	.445	.03	.250
Belonging	**.13**	**<.001**	**.11**	**<.001**	.02	.527	–	–	–	–	–	–	**.12**	**<.001**	**.10**	**<.001**	.01	.688
Efficacy	−.04	.081	.06	.008	.03	.322	–	–	–	–	–	–	−.04	.069	.06	.012	.03	.324
Meaning	**.21**	**<.001**	**.17**	**<.001**	**.18**	**<.001**	–	–	–	–	–	–	**.16**	**<.001**	**.15**	**<.001**	**.13**	**<.001**
Control	.01	.626	**.14**	**<.001**	.04	.204	–	–	–	–	–	–	.05	.018	**.15**	**<.001**	.06	.069
Security	**.23**	**<.001**	**.21**	**<.001**	.10	.003	–	–	–	–	–	–	**.17**	**<.001**	**.21**	**<.001**	.07	.030
Aesthetics	.05	.009	**.14**	**<.001**	**.12**	**<.001**	–	–	–	–	–	–	.06	.003	**.11**	**<.001**	**.10**	**<.001**
Social/symbolic links																		
Genealogical	–	–	–	–	–	–	**.20**	**<.001**	.04	.098	.06	.037	**.12**	**<.001**	−.01	.469	.04	.122
Economic	–	–	–	–	–	–	**.17**	**<.001**	**.18**	**<.001**	**.16**	**<.001**	.01	.434	−.01	.442	.03	.119
Sense of loss	–	–	–	–	–	–	**.13**	**<.001**	.07	.008	.04	.114	**.12**	**<.001**	**.07**	**<.001**	.04	.110
Narrative	–	–	–	–	–	–	**.23**	**<.001**	**.13**	**<.001**	**.10**	**.001**	**.12**	**<.001**	.02	.390	.04	.119
Spiritual	–	–	–	–	–	–	**.37**	**<.001**	**.45**	**<.001**	**.44**	**<.001**	**.10**	**<.001**	**.11**	**<.001**	**.17**	**<.001**
Special events	–	–	–	–	–	–	**.08**	**<.001**	**.14**	**<.001**	**.13**	**<.001**	−.01	.363	.02	.242	.02	.335
R^2_W	70.3%		73.5%		53.2%		57.0%		43.0%		37.6%		76.9%		74.9%		55.9%	
Deviance	14,736						15,666						14,376					

Note. Analysis is based on data for 1292 places within 135 participants. Parameters in bold face were statistically significant at the .001 level. For ease of interpretation, we have calculated standardized *β* weights for each parameter. These have been estimated by multiplying the unstandardized B weights by the standard deviation of the predictor and dividing by the standard deviation of the outcome (Hox, 2002); since between-participant variance was excluded from these analyses by within-participant centring, we used the standard deviations of participant-mean centred variables.

The *needs and motives model* provided a highly significant reduction in deviance compared to the null model, $\Delta\chi^2(27) = 2097, p < .001$, and accounted for a large proportion of the within-participants variance in all three facets of place identity (53.2–73.5%). On all three dimensions of place identity, participants identified more strongly with those places which provided a greater sense of self-esteem and of meaning. In contrast, the other motives and needs showed a more differentiated pattern in predicting the different facets of place identity. Self-extension/attachment showed a similar pattern of predictors to other domains of self-definition, reflecting a combination of feelings of self-esteem, continuity, distinctiveness, and meaning (see Vignoles et al., in preparation; Vignoles et al., 2006), here with the addition of feelings of belonging and security. Environmental fit showed a slightly different pattern, predicted also by feelings of control and aesthetic satisfaction, but not by distinctiveness. On the other hand, place-self congruity was predicted solely by self-esteem, meaning and aesthetic satisfaction. Feelings of efficacy did not predict any dimension of place identification.

The *social/symbolic links model* also provided a highly significant reduction in deviance compared to the null model, $\Delta\chi^2(18) = 1166$, $p < .001$, and accounted for a smaller but still very substantial proportion of the within-participants variance in all three facets of place identity (37.6–57.0%). Four of the six social links were robust predictors of all three dimensions of place identity: identification was higher with those places which were linked to participants by economic, narrative and spiritual links, and by special occasions. In addition, both genealogical links and loss were significant predictors of self-extension/attachment, but not of the other two dimensions.

The *combined model* provided a highly significant reduction in deviance compared to both the needs and motives model, $\Delta\chi^2(18) = 360$, $p < .001$, and the social links model, $\Delta\chi^2(27) = 1290, p < .001$. Within this model, all effects from the needs and motives model remained significant, and a majority were of similar magnitude; moreover, the combined model provided a substantial increase in modelled variance in all three facets of place identity compared to the social links model (ΔR^2_W from 18.3% to 31.9%), showing that psychological needs and motives made a significant and substantial direct contribution to predictions of place identification, even when controlling for the social links to places.

In contrast, most effects from the social links model were reduced in magnitude and many were no longer significant in the combined model, and this model provided only a relatively small increase in modelled variance compared to the needs and motives model (ΔR^2_W from 1.4% to 6.6%). This provided initial support for our idea that effects of social links to places on place identification might be partially or fully mediated by psychological needs and motives (see Baron & Kenny, 1986). However, to test this idea properly, we needed to run another model using social links to places to predict motive and need satisfactions. Hence, we now ran a fully multivariate multilevel model with feelings of self-esteem, continuity, meaning, distinctiveness, belonging, security, control and aesthetic satisfaction as multivariate outcomes and the six measures of social links to places as predictors. We excluded efficacy from this model, since it had shown no direct predictive effects on any of the three dimensions of place identity, and hence it could not be a mediating variable between social links and place identity.

Table 4 shows parameters of this model, which reveals a complex pattern of predictive effects of social links on motive and need satisfactions. Spiritual significance was a strong predictor of all eight motives and needs, which accounts for the substantial reduction in its direct effects on the three facets of place identity once motives and needs were controlled for in the combined model. Economic linkage also predicted all motive satisfactions except for aesthetic needs, which accounts for its loss of significance as a predictor of all three facets in the combined model. Linkage through special events predicted feelings of self-esteem, belonging, meaning, security and aesthetic satisfaction (but not the other needs), which accounts for its loss of significance as a predictor of all three facets in the

Table 4
Standardized multilevel regression parameters predicting within-participant variance in needs and motives as a function of social/symbolic links to places (paths A in Fig. 2).

	Self-esteem		Continuity		Distinctiveness		Belonging		Meaning		Control		Security		Aesthetics	
	β	p	β	p	β	p	β	p	β	p	β	p	β	p	β	p
Genealogical	.03	.310	**.20**	**<.001**	**.14**	**<.001**	**.10**	**.001**	**.10**	**<.001**	.02	.438	**.20**	**<.001**	−.07	.015
Economic	**.15**	**<.001**	**.20**	**<.001**	**.11**	**<.001**	**.17**	**<.001**	**.23**	**<.001**	**.23**	**<.001**	**.25**	**<.001**	−.01	.689
Sense of loss	−.02	.464	.03	.172	.07	.008	.03	.350	.03	.235	−.05	.069	−.05	.045	.04	.133
Narrative	.04	.128	**.17**	**<.001**	**.16**	**<.001**	**.19**	**<.001**	**.10**	**<.001**	**.11**	**.001**	**.16**	**<.001**	−.04	.215
Spiritual	**.42**	**<.001**	**.27**	**<.001**	**.23**	**<.001**	**.23**	**<.001**	**.39**	**<.001**	**.29**	**<.001**	**.30**	**<.001**	**.39**	**<.001**
Special events	**.19**	**<.001**	.07	.003	.07	.007	**.10**	**<.001**	**.11**	**<.001**	.04	.184	**.08**	**.001**	**.27**	**<.001**
R^2_W	31.8%		36.3%		39.2%		25.3%		26.4%		21.1%		36.5%		27.2%	
Deviance	46,238															

Note. Analysis is based on data for 1292 places within 135 participants. Parameters in bold face were statistically significant at the .001 level. For ease of interpretation, we have calculated standardized β weights for each parameter. These have been estimated by multiplying the unstandardized B weights by the standard deviation of the predictor and dividing by the standard deviation of the outcome (Hox, 2002); since between-participant variance was excluded from these analyses by within-participant centring, we used the standard deviations of participant-mean centred variables.

Table 5
Significant indirect paths from social/symbolic links to place identification (combined paths A + B in Fig. 2).

Social/symbolic link		Motive/need		Identity facet	Sobel *z*
Genealogical	→	Continuity	→	Self-extension/attachment	4.84
Economic	→	Continuity	→	Self-extension/attachment	5.04
Narrative	→	Continuity	→	Self-extension/attachment	4.46
Spiritual	→	Continuity	→	Self-extension/attachment	5.37
Economic	→	Meaning	→	Self-extension/attachment	5.56
Spiritual	→	Meaning	→	Self-extension/attachment	6.24
Special events	→	Meaning	→	Self-extension/attachment	3.69
Economic	→	Belonging	→	Self-extension/attachment	4.33
Narrative	→	Belonging	→	Self-extension/attachment	4.27
Spiritual	→	Belonging	→	Self-extension/attachment	4.66
Spiritual	→	Distinctiveness	→	Self-extension/attachment	3.76
Genealogical	→	Security	→	Environmental fit	5.55
Economic	→	Security	→	Environmental fit	6.52
Narrative	→	Security	→	Environmental fit	4.63
Spiritual	→	Security	→	Environmental fit	6.72
Economic	→	Control	→	Environmental fit	5.22
Spiritual	→	Control	→	Environmental fit	5.47
Economic	→	Meaning	→	Environmental fit	5.00
Spiritual	→	Meaning	→	Environmental fit	5.48
Economic	→	Esteem	→	Environmental fit	4.38
Spiritual	→	Esteem	→	Environmental fit	5.98
Special events	→	Esteem	→	Environmental fit	4.90
Economic	→	Belonging	→	Environmental fit	3.83
Narrative	→	Belonging	→	Environmental fit	3.79
Spiritual	→	Belonging	→	Environmental fit	4.06
Spiritual	→	Aesthetic	→	Environmental fit	5.08
Special events	→	Aesthetic	→	Environmental fit	4.84
Economic	→	Esteem	→	Place-self congruity	4.95
Spiritual	→	Esteem	→	Place-self congruity	7.74
Special events	→	Esteem	→	Place-self congruity	5.74
Economic	→	Meaning	→	Place-self congruity	3.76
Spiritual	→	Meaning	→	Place-self congruity	3.94

Note. All *z* values are significant at an adjusted alpha level of .00035 (= .05/144).

combined model. Both genealogical and narrative links predicted feelings of continuity, distinctiveness, belonging, meaning and security; these motives seem to have partially mediated the effects of both genealogical and narrative links on self-extension/attachment, and fully mediated the effects of narrative links on environmental fit and place-self congruity. Finally, sense of loss did not significantly predict any of the motive satisfactions, and correspondingly its effects remained unchanged in the combined model.

We used parameters from this new model together with the predictive effects of needs and motives from the combined model to run a series of Sobel tests, estimating the indirect effects of each of the six social links through each of the eight remaining needs and motives on each of the three facets of place identity. The Sobel test is a relatively conservative criterion for inferring the presence of indirect effects in a correlational design (see MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002); yet, given the exploratory nature of these analyses and the large number of tests conducted (6 social links × 8 motives and needs × 3 facets of place identity = 144 tests), we made these tests more conservative still by adopting an adjusted alpha level of .05/144 = .000347. Indirect effects which achieved this very stringent test of statistical significance are summarised in Table 5.

4. Discussion

4.1. Dimensions of place identification and attachment

Until now, research into place identity has been hampered by confusion over the dimensional structure of the construct. One

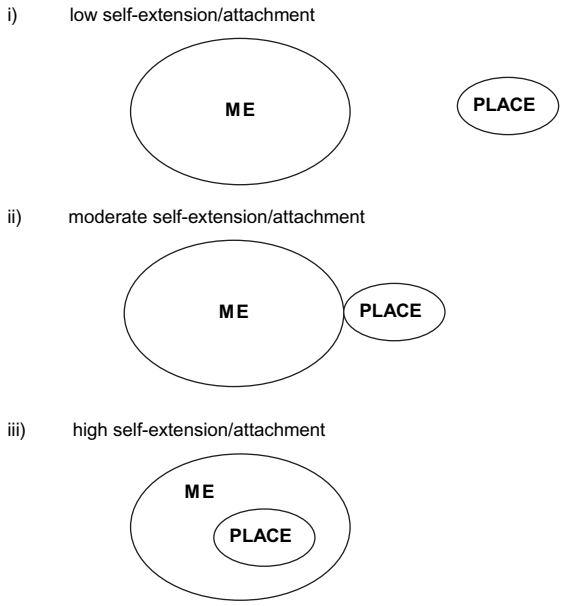

Fig. 3. Place attachment and self-extension conceptualised as a single dimension.

aspect of this has been the protracted debate over the relationship between place identity and place attachment (Jorgensen & Stedman, 2001; Kyle et al., 2005). In the current study, we were able to identify three closely related but distinguishable dimensions of place identification—self-extension, environmental fit, and place-self congruity—and one of these, but not the others, was empirically indistinguishable from our measure of place attachment.

We were unable to distinguish between emotional attachment to places and self-extension in our confirmatory factor analyses, nor did we find any difference between the results for these two measures in initial tests of our predictive models (see footnote 8). Thus, despite their different shades of theoretical meaning, it seems that these constructs were effectively one and the same thing in our participants' minds: those places which participants experienced as part of themselves, they also felt emotionally attached to, and vice versa. Interestingly, this finding is consistent with data from many other studies: in fact, items such as "This place is like a part of myself" are often included in measures of place attachment, and they typically load together with the other items (e.g., Félonneau, 2004). Hence, we suggest that it may be appropriate to view *self-extension/attachment* as a unified dimension reflecting both the concept of places as parts of the extended self-concept and also the emotional attachment which people feel towards those places (see Fig. 3).

However, this is not to say that all aspects of place identification and attachment are reducible to a single dimension. On the contrary, we identified two other dimensions which distinguished between places at the intrapersonal level, namely *environmental fit* and *place-self congruity*. Both dimensions were distinguished from self-extension/attachment in our confirmatory factor analysis, and each of the three dimensions was predicted by a somewhat different pattern of social and psychological variables in our multilevel regression analyses.

These results may help to clarify the confusing relationship between place identity and place attachment in previous studies. Perhaps those previous studies which have failed to distinguish between these constructs have been measuring place identification largely in terms of self-extension, whereas those which have found separable dimensions of attachment and identification may have been measuring the latter largely in terms of dimensions other than self-extension.

Both self-extension/attachment and environmental fit were predicted by a rich variety of psychological needs and motives, as well as social and symbolic links. Yet, there were some notable differences in emphasis. In particular, self-extension/attachment but not environmental fit was predicted by feelings of distinctiveness and by genealogical links to places, with the effect of genealogical links being partially accounted for by feelings of continuity; this is consistent with the idea that both distinctiveness and continuity are essential components of the basic sense of self-identity (Codol, 1981; Erikson, 1968; Vignoles, Chryssochoou, & Breakwell, 2000). In contrast, places providing feelings of control and places perceived as beautiful were associated with greater environmental fit but not self-extension/attachment—people may feel 'at home' in such places, but they do not necessarily become 'part of the self'.

The dimension of environmental fit indicates the adaptive importance of transactions between people and their environments. Salient places appear to constitute not solely an aspect of the cognitive-affective self; they are interactive spaces which encapsulate and accommodate people. This resonates with what leisure researchers have termed *place dependence*, referring to the functional link between people and places in moving towards goal achievement (e.g., Jorgensen & Stedman, 2001; Kyle, Mowen, & Tarrant, 2004; Williams & Vaske, 2003). This indication that self-extension/attachment is not the only important aspect of people's relatedness to places is also supported by other studies, such as Giuliani, Ferrara, and Barabotti (2003) who provided evidence that feeling attached to a place does not necessarily imply that one would want to live there.

In contrast, place-self congruity was predicted by just four variables: people felt a sense of congruity with those places which provided a sense of self-esteem, meaning, beauty and spiritual significance. This suggests that place-self congruity may be a much narrower construct than the other two dimensions, although it taps into the key predictors associated with feelings of meaning and value.

4.2. Relationship between psychological and anthropological predictors

The main goal of our research was to explore the relative contributions of, and the relationships between, psychological and anthropological predictors of these dimensions of place identification. Initially, we were interested in exploring two possible theoretical scenarios: either needs and motives would mediate effects on place identification of the social and symbolic links that people have with places (paths A and B in Fig. 2), or social/symbolic links with places and psychological needs and motives would show relatively independent effects on place identification (paths B and C in Fig. 2). In reality, the results seemed to lie somewhere in between these two original possibilities (see Tables 3 and 5). Effects of economic linkage and special events on place identification appeared to be fully accounted for by the extent to which these kinds of link were also associated with satisfaction of a variety of psychological needs and motives. Narrative, spiritual significance and genealogical links also appeared to influence place identification through psychological needs and motives, but direct effects on some dimensions of place identification still remained after psychological needs were accounted for. Finally, people identified more strongly with places they associated with a sense of loss, irrespective of the satisfaction of psychological needs and motives—or at least those we measured here.

By and large, findings in the study seem to support the predictive value of psychological needs and motives in relation to place identity, as the level of variance explained was only slightly increased when social links were also taken into account. However,

the needs and motives that we measured did not fully explain the role of social links to places in the construction of place identification. One possibility is that these social links may give rise to place identification through the operation of additional psychological needs and motives not measured here. Yet our inclusion of nine needs and motives in this study, derived from a review of theories of identity and theories of needs in social and personality psychology as well as previous work on place identity, suggests that our coverage of psychological needs and motives may have been reasonably theoretically comprehensive.

Alternatively, these links may give rise to feelings of place identification as a direct consequence of the social processes that they entail, which are not reducible to individual needs and motives. For example, places with spiritual significance may give rise to identification in part because of the wide range of motives and needs these places satisfy (see Table 5), but in part also because such places tend to be frequented for collective activities, such as acts of worship, which link individuals directly to these places; similarly, genealogical or narrative links to places may give rise to identification in part because of the feelings of continuity, belonging and security that such places provide, but also through the social process of going to and telling stories about these places. In this sense, we suggest that feelings of place identification are in a very direct sense socially and not just individually constructed.

Especially interesting is the role of loss as a predictor of place identification, which was largely independent of the measured motives and needs–even increasing in statistical significance as a predictor of environmental fit once the effects of motives and needs were controlled. We should note that loss is a very different kind of construct from the other social/symbolic links identified by Low (1992), referring to the absence or disruption of a link, rather than its continuing presence. Nevertheless, the importance of 'loss' resonates with previous research which has identified the sense of loss as a dimension of place attachment among dislocated immigrants (Nanistova, 1998, as cited in Williams & Vaske, 2003).

Sense of loss was the only anthropological variable which failed to predict any of the psychological needs or motives in the study. This suggests that sense of loss may facilitate place identification via processes other than the fulfilment of psychological needs. However, another possibility is that loss does derive its importance from psychological needs, but via a different and more complex mechanism—that of threat/frustration rather than fulfilment. Indeed, thinking about 'lost' places might in some cases provoke a sense of *dis*continuity between past and present, leading to feelings of nostalgic yearning for the lost place as the individual attempts to reconnect with the place as a means of re-connecting with his/her past self (Sedikides, Wildschut, Routledge, & Arndt, in preparation; see also Gustafson, 2001; Lestrange, 1998). Yet, there is little or no current theoretical basis for predicting under what circumstances losing a place will lead to nostalgic identification, and under what circumstances to disidentification (cf., Dixon & Durrheim, 2000, 2004).

Certain patterns in the effects were unexpected, such as the consistent lack of significant effects of self-efficacy, considering that the role of this motive in identity construction has been previously supported in the literature (e.g., Vignoles et al., 2006), including studies into place identity (Knez, 2005; Twigger-Ross & Uzzell, 1996). However, we should note that neither of the latter studies involved using identity motive ratings as competitive predictors of place attachment or identification. Consistent with those studies, feelings of efficacy were in fact quite strongly associated with all three dimensions of place identity (all $r > .5$); however, feelings of efficacy made no incremental contribution to predictions of place identity when pitted against the other motives and needs in our model. Thus, feelings of efficacy provided by places may have contributed indirectly to identification, for example through their contribution to feelings of self-esteem (see Vignoles et al., 2006).

4.3. Limitations and future directions

Despite the strong level of statistical control in this study, we should emphasise that the correlational design does not allow us to make strong inferences about causal direction of the findings. Our analyses presuppose that social links and psychological need satisfactions influence place identification and not vice versa. Yet, in reality, it is likely that these effects will be bidirectional, at least to some extent. Future studies using longitudinal and/or experimental methods will be needed to give greater certainty about the causal direction of our main findings. We should also note that our investigation of possible mediation relationships from social links through need satisfactions to identification was largely exploratory and was not guided by prior hypotheses about which kinds of social link were most likely to satisfy which of the motives and needs we measured. Although we used a highly conservative statistical correction for multiple probability tests, and although many of the paths reported in Table 5 make good theoretical sense, these paths remain post hoc findings and they should be replicated in a future study to give greater confidence.

An additional limitation is our reliance on single-item measures of most of the constructs measured. Inevitably, a single-item cannot capture the full complexity of any particular theoretical construct and this may have been especially the case for the social links to places examined in the current study. Nevertheless, single-item measures have been used successfully in many previous studies of psychological needs and motives, especially when participants are required to provide repeated measures for the same dimension (e.g., Reis et al., 2000; Vignoles et al., 2006). In the current study, each participant had to rate 10 places on each of the 22 items listed in Table 1—a total of 220 ratings. Had we used more rating scales to measure each construct, we could not have represented the breadth of constructs addressed in this study without the likelihood of fatigue or boredom setting in. Future studies might use more detailed measures of each construct, but would need to focus on a smaller range of constructs rather than reflecting the integrative approach of the current study.

Also, in this paper we did not examine the content of places which participants listed, and a follow-up study could potentially perform a content analysis on these data in order to explore place typologies. It is possible that certain types of places could be associated with specific types of effects in our list of predictors; for example, 'home' or 'work' environments might be expected to provide different kinds of social links and fulfill different psychological needs and motives. Participants listed places from their past, present, future or imaginary places. One might expect to find some differences between these different types of places; however, we did not explore this here given the complexity of the analyses already presented in this paper.

Finally, although the simultaneous testing of 15 different predictors is more than in any other study we know of in this domain, we do not wish to claim that this study provides a comprehensive summary of the antecedents of place identification or attachment. For example, we did not include measures of demographic variables such as (duration of) residence in the place, which have been shown to be important predictors of attachment and identification in previous studies (e.g., Hernández et al., 2007). We should note that our coverage of psychological predictors does not represent an exhaustive list of human needs which have been proposed in the psychological literature (cf. Deci & Ryan, 2000; Maslow, 1954/1970) and we acknowledge that our coverage of

social anthropological literature was largely restricted to Low's (1992) typology of social/symbolic links.

4.4. Conclusions

Nevertheless, we believe that these findings provide valuable first steps towards developing a more integrative theoretical understanding of place identity processes. This could be seen to provide a delayed response to Proshansky's (1976) vehement critique of social psychological theory and methods of enquiry which "manage to make sows' ears out of silk purses" (p. 363) whereby "it doesn't matter what happens to the integrity of the problem or the phenomenon as long as one can establish basic principles of process" (p. 362). Proshansky's arguments are radical but still powerful, yet it is important to acknowledge that progress in identity theory and research since the late 1970s has offered a much improved understanding of psychological processes which do contribute to an enriched picture of human subjectivity. Proshansky's maverick outlook could be seen as an attempt to urge the scientific community to devise novel theoretical paradigms and epistemological approaches. However, his initial endeavour to introduce place identity as a concept in environmental psychology has since been adopted by researchers in various disciplines alongside social psychology in an effort to make scientific predictions focused on processes. Amidst all these developments and ongoing debates, our approach aimed at making a first step towards restoring the 'integrity of the phenomenon' which Proshansky might have felt was undermined.

Certainly, we are still some way short of an integrated theory of place identity, but we believe that this study has helped to show the potential viability of constructing such a theory. Firstly, the method we have introduced makes it possible for the first time to start exploring nomothetic principles of people's relationships with places, rather than being restricted to 'case studies' of particular communities, responses to specific places. Secondly, this method makes it possible to test the joint effects of, and the relationships between, large numbers of predictors—which has allowed us here to combine insights from both psychological and anthropological literatures, and explore the relationships between them. Thirdly, we have been able to show significant points of similarity between the motivational predictors of place identification and those which have been identified in other identity domains (e.g., Vignoles et al., 2006, 2008), helping to reconnect research into place identity with the more general social psychological literature on identity processes.

Nevertheless, social psychological theories of identity were not developed in order to explain people's relations with places, and these efforts for integration should be accompanied by continuing attempts to provide a more in-depth understanding of isolated processes and mechanisms. If we are to achieve an integrative understanding of place identity processes, we need to aim for an holistic understanding of the complexity of human existence in context. The extent to which individual transactional or social interactional processes are more definitive in place identity remains yet to be further examined. Cross-fertilization from other disciplines, as well as qualitative research to understand the meanings of place-related constructs for participant groups, should further contribute to enhance our understanding of place identity as a critical and perplexing but still very intriguing concept.

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