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Place Identity, Place Dependence, and Place-Based Affect: Examining Their Relationship to Participation in Educational and Interpretive Programs at Isle Royale National Park

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Introduction

Study of the person–place relationship is becoming increasingly important to public land managers as they strive to incorporate the public into management plan development and implementation. Place attachment is one dimension of the person–place relationship that can provide information regarding visitors and their connection to particular public lands. Place attachment has been described as "the emotional link formed by an individual to a physical site that has been given meaning through interaction" (Milligan 1998:2). It is generally described as having at least two dimensions: place identity and place dependence. Place dependence is conceptualized as the opportunities a setting provides for goal and activity needs (Stokols and Schumaker 1981), and place identity refers to the symbolic meaning a particular place has to an individual (Kyle et al. 2005). In addition to its cognition and behavioral components, Low and Altman (1992) describe place attachment as primarily an affective construct. However, few previous studies measure affect separate from identity. In this study, place-based affect was constructed to measure that affect and operationalized as the positive or negative feeling one has towards a place (Rosenberg 1960).

With respect to place attachment, researchers have found that individuals are more likely to act in protective ways about places to which they are attached (Vaske and Kobrin 2001). Additionally, researchers have also suggested people become attached as they interact with a place (Jorgensen and Stedman 2002; Moore and Graefe 1984). One method of interacting with a place is through participation in educational or interpretive programs at that place.

The purpose of this study was twofold. In the first part of the study, we separated affect from identity and analyzed the three separate constructs of place identity, place dependence, and place-based affect. For the second part of the study, we examined the relationship of each of these constructs to participation in Elderhostel programs, an educationally based program conducted at Isle Royale National Park, and to participation in National Park Service interpretive programs conducted at Isle Royale National Park.

Study location

Established in 1940, Isle Royale National Park also received designation as an international biosphere reserve in 1980. The park is 99% federally designated wilderness and consists of an archipelago of approximately 44 islands located in the northwestern part of Lake Superior approximately 30 miles off the coasts of Minnesota, U.S.A. and Ontario, Canada.

Visitor centers are located on northeast and southwest ends of the 9-mile-wide and 44-mile-long main island. The island is home to an abundance of small animals such as foxes, beavers, loons, and cormorants, a plethora of wildflowers and insects, and a self-contained wolf and moose population. Isle Royale usually has from 15,000 to 18,000 visitors annually and is one of the least visited parks in the national park system. It is accessible only by seaplane or boat.

Methods

In August 2004, visitors returning from Isle Royale were asked to participate in a survey designed to measure the three constructs of place identity, place dependence, and place-based affect as well as participation in both educational and interpretive programs at the Park. On the return boat trip from Isle Royale visitors were provided with a 30-minute questionnaire. The convenience sampling technique resulted in 254 completed questionnaires, of which 248 were usable.

Results

Women (47%) and men (53%) were relatively equally represented in this survey. Sixty-eight percent of them were from the neighboring states of Michigan, Wisconsin, Illinois, and Minnesota, while the remaining 32% were scattered from California to Arizona to Maine to Florida and twenty other states. Respondents reported permanent residences as well as household incomes that varied relatively equally (see Table 1). They were also highly educated (mean education = 16.1 years of school) and predominantly white/Caucasian (96.1%). While visiting Isle Royale, the majority of respondents camped in the backcountry and participated in activities typical of wilderness-type areas, e.g., wildlife viewing, day-hiking, and camping.

The purpose of the first part of the analysis was to determine the factor structure of the items used to measure place identity, place dependence, and place-based affect. Place dependence, place identity, and place-based affect were all measured on bipolar nine-point scales. Place dependence and place identity were measured with Likert-type scales ranging from strongly agree (9) to strongly disagree (1). Place-based affect was also measured on a nine-point scale. However, based on previous research (Vescio et al. 2003), a semantic differential scale with emotion pairs (9 = strong positive emotion and 1 = strong negative emotion) was used to measure this construct (see Table 2).

Exploratory factor analysis with a varimax rotation was conducted on 15 items (four measuring place identity, five measuring place dependency, and 6 measuring place-based affect). As predicted, the 15 items loaded into three factors (see Table 3). Using Cohen's recommendation of factor loadings acceptable if greater than .60, there were two items of concern. First, item IR_PA5 cross-loaded on both the identity and dependence factors. This item, however, was supported by existing theory to test place dependence and was retained as a place dependence factor in the analysis. The other item was IR_PA3, which had a factor loading of .555. However, this item was again retained in further analysis due to the previous theoretical and empirical support for its inclusion as a measure of place identity.

Characteristic	N	Overall % (n=245)
Gender		
Male		53.0
Female		47.0
Current residence		
Small town or rural		30.8
Large town/small city		17.6
Medium-sized city		26.9
Large city		24.7
Where grew up		
Small town or rural		30.8
Large town/small city		17.6
Medium-sized city		26.9
Large city		24.7
Household income		
<$40,000		24.7
$40,000-79,999		30.9
$80,000-119,999		24.6
$120,000 or more		19.8
Race		
White or Caucasian		96.1
Asian		2.2
American Indian, Alaska Native or First Nation		1.3
Black or African American		0.4

Table 1. Sociodemographic characteristics of participants.

Reliability analyses were then conducted on the items predicted to load on each factor. Each predicted factor exhibited a Cronbach's alpha of greater than .70, which was determined to be an acceptable level of internal consistency (Nunnally 1978). One item, "The things I do at IRNP, I would enjoy doing just as much at a similar place," which was reverse-coded for analysis, would have increased the reliability of the place dependence factor from .806 to .855 if removed. This is consistent with previous research on place using reverse-coded items (e.g., Williams and Vaske 2003; Stedman 2002; Bricker and Kerstetter 2000). However, these items also allow for the testing of the negative aspect of place dependence rather than only the positive. Due to its contribution to the overall measure and the acceptable alpha of all five items as well as support from previous research, the reverse-coded item was retained.

Based on the factor and reliability analyses, the three place constructs were accepted as three distinct factors. Index scores were created for each of the place constructs by calculating the mean of all items contributing to that construct. Index scores were then examined for differences between those who participated and those who did not participate in educational and interpretive programs at Isle Royale National Park. Two null hypotheses were tested. Hypothesis 1: There will not be a significant difference in place identity, place dependence,

Item Code		Factor 1 Place Identity	Factor 2 Place Dependence	Factor 3 Place-based Affect
IR_PA6	(PI) IRNP reflects type of person I am	.796	.104	.270
IR_PA11	(PI) Visiting IRNP says a lot about me and who I am	.795	.095	.140
IR_PA8	(PI) IRNP means a lot to me	.675	.324	.071
IR_PA3	(PI) I feel that I can really be myself at IRNP	.552	.102	.054
IR_PA5	(PD) IRNP is the best place to do the things I enjoy	.565	.555	.054
IR_PA9	(PD) What I do at IRNP is more important than doing it anywhere else	.377	.803	.014
IR_PA12	(PD) I wouldn't substitute any other area for doing what I do at IRNP	.230	.785	–.004
IR_PA2	(PD) I get more satisfaction visiting IRNP than any other place	.369	.670	.033
IR_PA1	(PD) The things I do at IRNP I would enjoy just as much at a similar place*	–.180	.609	.122
IR_PAFF1	(PBA) Happy/Angry at IRNP	.155	.098	.877
IR_PAFF2	(PBA) Calm/Tense at IRNP	.109	.004	.871
IR_PAFF3	(PBA) Relaxed/Worried at IRNP	.079	.063	.825
IR_PAFF4	(PBA) Self-assured/Insecure at IRNP	.031	.074	.742
IR_PAFF5	(PBA) Energized/Lethargic at IRNP	.241	–.087	.643
IR_PAFF6	(PBA) Content/Irritated at IRNP	.211	.100	.629

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

(PI) = Place identity, (PD) = Place dependence, (PBA) = Place-based affect.

Place identity and place dependence measured on 9-point Likert-type scale with 1=strongly agree and 9=strongly disagree.

Place-based affect measured on 9-point semantic differential with 1=strong positive affect and 9=strong negative affect.

*Item was reverse-coded.

Table 2. Rotated component matrix for place attachment items measured for Isle Royale National Park.

Item	Mean	SD	if item removed	Index
Place Identity				.787
I feel I can really be myself at IRNP.	6.44	1.85	.784	
IRNP reflects the type of person I am.	6.19	1.88	.692	
IRNP means a lot to me.	6.92	1.85	.739	
Visiting IRNP says a lot about me.	5.82	2.12	.710	
Place Dependence				.806
I get more satisfaction visiting IRNP than elsewhere.	5.12	2.14	.736	
IRNP is the best place to do the things I enjoy.*	5.61	1.93	.756	
What I do at IRNP is more important than elsewhere.	4.71	2.23	.693	
The things I do at IRNP, I would enjoy just as much at a similar place.**	3.64	2.32	.855	
I wouldn't substitute any other area for IRNP to do what I like to do.	4.16	2.22	.727	
Place-based Affect				.868
Relaxed/Worried	7.65	1.41	.867	
Happy/Angry	7.73	1.68	.832	
Energized/Lethargic	7.88	1.46	.817	
Calm/Tense	7.68	1.45	.856	
Content/Irritated	7.41	1.75	.865	
Self-assured/Insecure	7.62	1.61	.815	

Place identity and place dependence items were measured on a 9-point Likert-type scale with 9=strongly agree and 1=strongly disagree.

Place-based affect items were measured on a 9-point semantic differential with 9=strong positive affect and 1=strong negative affect.

* This item factor loaded on both place dependence and place identity.

** This item was reverse-coded for analysis.

Table 3. Means and preliminary reliability analysis for place attachment items and indices.

and place-based affect between visitors to Isle Royale National Park who participated in educational programs related to the park and those who did not participate. Hypothesis 2: There will be no significant difference in place identity, place dependence, and place-based affect between visitors to Isle Royale National Park who participated in park interpretive programs and those who did not participate.

Hypothesis 1 was tested by dividing participants into two groups: those who had participated in Elderhostel and those who had not. Then, using t-test statistics, mean scores of each place construct were tested for differences between the two groups. No significant relationships were found (see Table 4).

Hypothesis 2 was tested in two ways. First, Elderhostel respondents were removed from

Construct	Elderhostel Participant	Mean	F-value	p-value
Place Identity (IRNP)	No	6.41	.610	.436
	Yes	6.23		
Place Dependence (IRNP)	No	4.82	3.32	.070
	Yes	4.28		
Place-based Affect (IRNP)	No	7.65	.005	.945
	Yes	7.67		

Table 4. ANOVA of place construct index scores based on participation in Elderhostel program.

the data set, leaving a sub-sample of n=191. This was done because all Elderhostel participants participated in the same number of programs and this hypothesis was intended, in part, to examine the place constructs relative to the number of programs visitors attended. The total number of interpretive programs in which visitors participated during their most recent visit to the park was correlated with each of the place construct index scores. Place identity was found to correlate positively with the number of park interpretive programs visitors attended; however, the relationship was relatively weak at $r = .147$, $p = .046$. The other two constructs did not significantly correlate to interpretive program attendance.

The second part of testing hypothesis 2 was to test for mean differences in place construct index scores between those who had participated in any interpretive programs and those who had not. Place identity was found to be significantly higher among those individuals who had participated in one or more park interpretive programs (See Table 5). However, no significant relationship was found with place dependence and place-based affect.

Discussion

The first portion of the analysis was to measure and describe three theoretically supported dimensions of the person–place relationship. The three-dimensional factor structure was supported over a unidimensional factor structure. This is consistent with previous literature (Kyle et al. 2005; Jorgensen and Stedman 2002). However, further analysis is warranted to test the relationship between place identity, place dependence, and place-based affect. It is not yet clear how place-based affect relates to place identity and place dependence. It may be a dimension of place attachment, as research suggests place identity and place dependence are, or it may be another dimension of the person–place relationship that is different from place attachment.

With respect to participation in educational and interpretive programs, hypothesis 1 was not supported. This may reflect that these Elderhostel programs, while education-based, were also relatively constrained in terms of requiring participants to attend the educational and interpretive programs selected for them. Unlike individuals who visited Isle Royale individually or in informal groups, Elderhostel participants were required to attend the park interpretive programs. Therefore, the information they receive may have been processed differently. At least, it did not appear to affect their attachment to Isle Royale.

	Interpretive program participant	Mean	F-value	p-value
Place Identity (IRNP)	No	6.20	4.02	.046
	Yes	6.65		
Place Dependence (IRNP)	No	4.73	.33	.567
	Yes	4.89		
Place-based Affect (IRNP)	No	7.57	.71	.401
	Yes	7.72		

Bold items are significant at the p = .05 level.

Table 5. ANOVA of place construct index scores based on participation in park interpretive programs.

Also, no relationships were found between place dependence or place-based affect and participation in park interpretive programs. A positive relationship was found, however, between place identity and program participation. In other words, although the park programs did not influence activity-based attachment (i.e., place dependence) or emotion-based connections (i.e., place-based affect), visitors' self-identification with Isle Royale National Park was enhanced by their participation in park interpretive programs. For those who develop and conduct interpretive programs, this could be considered one measure of success. While we did not specifically measure information retention, it seems likely that information from the park programs was retained in some form. If not, it is unlikely there would have been any significant difference in place identity levels.

There are many opportunities for additional research regarding education and the person–place relationship. For example, it would be helpful to understand how people process information while at Isle Royale National Park or a similar recreation destination. While there is extensive literature regarding information processing in educational settings, e.g., schools and universities, future place attachment studies could include similar measures to identify possible relationships. It would also be helpful to conduct similar studies to this one, but in parks that are not so isolated. Perhaps programs in less-isolated parks are more influential on the process of becoming attached to a particular place. Also, further testing of the three place constructs relative to each other as well as to antecedent behavior could further a clearer understanding of the person–place relationship.

In summary, it is important to continue studying the person–place relationship as well as its antecedents and outcomes. As our public lands receive increasing numbers of visitors, it is likely that management actions will receive more critical examination. Understanding the framework within which people operate while visiting public lands—more specifically, how they become attached to those lands—allows land managers to better appreciate and respond to visitors' needs.

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