PLACE ATTACHMENT AND RECREATION DEMAND ON THE WEST BRANCH OF THE FARMINGTON RIVER

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Abstract.—This paper analyzes the effect of place attachment on recreation demand for the West Branch of the Farmington River. Data were collected via on-site and optional mail-back questionnaires administered to river recreationists during the summer of 2001. A total of 247 respondents (51 percent response rate) returned complete questionnaires. Questions concerned respondents' functional and emotional attachments to the river, visit frequency, and trip expenditures. Confirmatory factory analysis was utilized to identify the two distinct constructs of place identity and place dependence. These variables were then incorporated into a travel cost model of recreation demand. Analyses revealed that individuals' emotional/affective dependence on the river was a significant and positive predictor of recreation visitation levels; their functional attachments, however, were not. These findings reaffirm previous studies reporting that place identity is a stronger influence on behavior than place attachment. Possible explanations for the findings are explored.

1.0 INTRODUCTION

During the past 20 years, a substantial body of literature has accumulated concerning recreationists' development of special bonds to the sites where they recreate. The majority of this literature has attempted to discern the various dimensions of individuals' attachments to recreation areas (e.g., Hammitt et al. 2009, Hammitt et al. 2006, Kyle et al. 2005). However, very few empirical studies have attempted to examine how these bonds affect recreation behavior. Understanding this connection can be important for both recreation managers and scholars as it moves the place attachment literature out of theory-driven psychometric scale development to connect it with actual recreation behavior. As Hammit et al. (2009) note, "a perfectly fitted scale measure to a theoretical model is quite limited in utility if the theoretical model is not related and/or predictive of recreational behavior" (p. 58).

In this paper, we address this gap in the literature by incorporating the place attachment construct into a travel-cost model of recreation demand. This analysis not only furthers the understanding of the relationship between recreation behavior and place attachment, but also expands the traditional use of the travel cost model to incorporate psychological measures. In sum, this paper makes unique contributions to both the place attachment literature and the travel-cost modeling approach.

2.0 RELATED LITERATURE

2.1 Models of Recreation Demand

Travel cost models of recreation demand are usually calculated by estimating demand functions at the level of the individual (Freeman III 2003). To estimate demand functions, researchers assume that an individual's utility depends on the total number of visits they take to the site and the monetary cost of those trips given socioeconomic constraints. These assumptions raise numerous questions about the determinants of recreation behavior. Several scholars have attempted to discern the impacts of directly measurable socio-economic attributes such as age, education, gender, and income on recreation demand (Ward and Beal 2000). Other, more recent research has argued that various social-psychological constructs like place attachment and motivations may significantly affect behavior (Hailu et al. 2005, Hammitt et al. 2009, Smith et al. 2009).

In this article, we explicitly incorporate place attachment into a model of recreation demand and contend that the theoretical robustness of the traditional travel cost model can be increased by incorporating the enduring psychological values that individuals attach to recreation areas.

2.2 Place Attachment

Place attachment is a social-psychological construct that originated in the fields of environmental psychology and human geography and concerns the complex functional and emotional connections that develop between people and geographically locatable spaces (Low and Altman 1992, Stokols and Shumaker 1981, Tuan 1980). Numerous scholars have argued that individuals become attached to specific places through a variety of mechanisms. As a result, place attachment is widely believed to be a multi-dimensional construct. While considerable debate has emerged over the exact number of dimensions in the place attachment construct (Hammitt et al. 2009, Hammitt et al. 2006, Kyle et al. 2005), the two nearly universally agreed-upon dimensions are place dependence and place identity.

2.2.1 Place Dependence

Place dependence is best described as the extent to which individuals perceive themselves to be associated with and dependent upon a particular place or a category of functionally similar places (Moore and Graefe 1994). Recreation settings can facilitate goal achievement in outdoor recreation by enabling individuals to participate in specific activities. Given this, place dependence is a function of how well a setting facilitates an individual's recreational goals (Williams et al. 1992). Previous research indicates that place dependence is not strongly, if at all, linked to recreation demand (Hailu et al. 2005, Smith et al. 2009). Given this, we expect no relationship between place dependence and recreation demand in this study.

2.2.2 Place Identity

While recreation settings can facilitate the attainment of personal goals, they can also be described as "special" because recreationists attach symbolic and emotional meaning to them (Williams and Roggenbuck 1989). The emotional and symbolic attachments recreationists form with places are believed to play a unique role in shaping their personal identity. Given this, place identity refers to the dimensions of the self that define an individual's personal identity in relation to their physical environment (Proshansky 1978). Previous research has shown that place identity has consistently stronger predictive validity relative to other place concepts (Williams and Vaske 2003), and previous research linking place identity to recreation demand has yielded similar conclusions (Hailu et al. 2005, Smith et al. 2009). Given this, we expect place identity to be significantly and positively related to recreation demand in this study.

3.0 METHODS

Data for this study were collected along the West Branch of the Farmington River in northwestern Connecticut. River recreationists were contacted on the river during systematically determined sampling periods. A total of 516 contacts were made, and 433 people (90 percent) agreed to receive a mail-back questionnaire. Of these individuals, 247 (51 percent) returned a completed survey. Included in the survey was a 15 item place attachment scale designed to assess the strength of respondents' place identity and place dependence. The survey also solicited other information about the number of times the person had visited the river in the previous 12 months and information about their income, gender, and age.

Using data collected from the mail surveys, we conducted a confirmatory factor analysis (CFA) with a generalized least squares estimation procedure on the 15 place attachment items. The process of model reduction resulted in a measurement model which fit the data correlation covariance structure relatively well (χ^2= 56.325, df = 19, χ^2/df = 2.964, p = 0.000, RMR = 0.086, GFI = 0.942, AGFI = 0.889, NFI = 0.712, CFI = 0.778, RMSEA = 0.090)[1]. The CFA led to the concept of place dependence being composed of four

[1] Schumacker and Lomax (2004) suggest that a χ^2/df value < 5.0 and GFI values near 0.95 indicates a good model fit.

items (α = 0.89) and the concept of place identity being composed of four items (α = 0.88). The CFA procedure also reveals the expected high correlation (0.77) between place dependence and place identity. Factor scores were calculated for each latent variable for use in the subsequent regression analysis. The reduced scales as well as basic descriptive statistics of the variables used in the analysis are shown in Table 1.

4.0 ANALYSIS AND RESULTS

The dependent variable in this analysis, recreation trips, is a nonnegative count variable, so the appropriate analysis is a Poisson regression. However, the frequency of trips to the study river are overdispersed (M = 31.3, SD = 60.6). Because of this, the negative binomial model was used as it allows for more variability in the probability distribution (Hilbe 2007). Since recreation surveys are prone to oversample frequent visitors, we also controlled for endogenous stratification by modifying the response from y to $y–1$ (Englin and Shonkwiler 1995, Martinez-Espineira et al. 2006). The regression estimates proceeded with recreation demand modeled as a function of individuals' average trip costs, their income, age, gender, and their levels of place dependence and place identity.

Our first analysis included all of the variables in the model. However, gender was an insignificant predictor of recreation behavior and was subsequently dropped from the analysis. The regression coefficients from the final model are shown in Table 2. Our findings support previous research on recreation demand and place attachment. Similar to Hailu et al. (2005) and Smith et al. (2009), we found that place dependence is an insignificant predictor of recreation behavior. Our findings also support previous research efforts that have found that place identity is significantly and positively related to recreation behavior.

5.0 DISCUSSION

Given the paucity of research that has linked the construct of place attachment to recreation demand, this research represents a step toward gaining a more complete knowledge of how social-psychological factors influence behavior in outdoor recreation settings. The three existing studies that have linked place attachment and recreation demand have all come to the same conclusion regarding the apparent dominance of place identity in influencing behavior while place dependence appears to play a negligible role. We suggest there may be two distinct explanations for this pattern. First, place dependence

Table 1.—Descriptive statistics

Variable	*M*	*SD*	Factor Loading
Past Trips	31.30	60.60	—
Avg. Trip Cost[a]	$128.20	$311.00	—
Income (modal category)	$40,000-$50,000	—	—
Age	47.70	13.80	—
Gender (percent Female)	15.40	—	—
Place Identity (α = 0.88)			
I identify strongly with this river	3.41	1.33	0.85
I am very attached to this river	3.51	1.35	0.89
I find that a lot of my life is organized around this river	2.44	1.27	0.72
This area means a lot to me	3.78	1.29	0.81
Place Dependence (α = 0.89)			
This area is the best place for what I like to do	3.48	1.21	0.86
I enjoy doing the type of things I do here more than any other area	3.22	1.22	0.83
No other area can compare to this one	2.84	1.32	0.80
Doing what I do here is more important to me than doing it in any other place	2.90	1.24	0.84

[a] Avg. trip cost was derived as: P = [(d × 0.145) + (w × h × 0.33)] × 2 + f, where:
d = One-way distance to the river in miles (as reported by the respondent) multiplied by $0.145 per mile for fuel and upkeep (American Automobile Association 2009).
w = Hourly wage rate, calculated as income divided by 2080 annual work hours. The fraction of the imputed wage rate to time value is 0.33.
h = Hours spent traveling to the river (as reported by the respondent).
f = Average personal costs per trip to the river over the past 12 months.

Table 2.—Results of negative binomial regression analysis with endogenous stratification (n=170)

Variable	Coefficient	Standard Error	Z-score
Place Identity	0.722***	0.158	4.58
Place Dependence	0.061	0.146	0.42
Average Trip Costs	-0.005***	0.001	-4.41
Income	-6.57e-06***	1.60e-06	-4.11
Age	0.026***	0.007	3.81
Summary Statistics: Wald chi2(5) = 128.27			

*** Significant at .001 level

reflects the ability of a site to meet the functional demands of recreationists' goals. Therefore, it is inherently related to the availability of other nearby areas that could fulfill recreationists' needs. In large river systems, recreationists may simply believe that there are adequate substitutes for the places they were on the day of the interview. The second plausible factor in explaining why place identity is such a strong predictor of recreation behavior is that it likely takes a long time to develop and is closely tied to an individuals' beliefs and values, and is therefore closely linked to their actual behavior. Moore and Graefe (1994) suggest that place identity may be such a strong indicator of individuals' preferences because "a person who participates in a recreation activity frequently at a particular site would tend to become dependent on that site and value it more highly" (p. 21). Given that our model controlled for endogenous stratification, one might expect that the highly significant influence of place identity would be somewhat assuaged; however, that was obviously not the case. It appears that just as place identity has a consistently high predictive validity when regressed on other constructs (Williams and Vaske 2003), it also has a significant influence on recreation behavior.

Given the findings of our analysis, future research should continue to explore the relationship between social-psychological constructs and recreation behavior. On this point, we offer several suggestions. First, our analysis employed only two place attachment dimensions; future research may find it beneficial to explore other dimensions already discussed in the literature. Second, there is a readily apparent endogeneity issue when modeling recreation behavior and place attachment. Neither place attachment nor recreation behavior is likely to exist without the other; existence values are a notable exception. Future research could explicitly and empirically examine the causal structure behind various place constructs. Finally, while place attachment has come to dominate a large portion of the recreation literature, other concepts like motivations, constraints, or commitment also should be considered within the broad spectrum of social-psychological constructs that can theoretically and empirically be linked to recreation behavior through formal models of recreation demand.

6.0 LITERATURE CITED

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