Journal of Leisure Research
2004, Vol. 36, No. 2, pp. 209-231

Effect of Activity Involvement and Place Attachment on Recreationists' Perceptions of Setting Density

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Research examining recreationists' perceptions of setting density in outdoor recreation contexts has illustrated the influence of a number of factors. In this investigation we examined the effect of activity involvement and place attachment on hikers' perceptions of setting density using frameworks offered by social judgment and cognitive development theories. We hypothesized that respondents' perceptions of setting density would involve cognitive evaluations where the condition encountered is compared against the individual's personal standard for that specific context. Additionally, past work operating within this framework has suggested that the activation of ego-attitudes amplifies the processes of assimilation and contrast such that disparate conditions are contrasted and conditions consistent with the respondents' position are assimilated and considered acceptable. The extent to which respondents' ego-attitudes were activated was measured using the activity involvement and place attachment constructs. Past research has also shown that activity involvement and place attachment are correlates of past experience which acts to shift the evaluative standard toward positions previously encountered. Data were collected from 1,561 hikers over the summer and fall of 1999. These results indicated that only place identity and place dependence were significant predictors of respondents' perceptions of setting density. While respondents scoring high on the place identity dimension were more inclined to report feeling crowded, respondents scoring high on the place dependence dimension were inclined to evaluate setting density more favorably. Theoretical implications are discussed.

KEYWORDS: *Leisure involvement, place attachment, perceptions of setting density.*

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Introduction

Crowding related research has been a dominant theme in the social psychology of leisure literature for several decades. It has been acknowledged that perceived crowding is a psychological state arising from an individual's subjective evaluation of setting density for specific environments (Stokols, 1972; Shelby & Heberlein, 1986). Webb and Worchel (1993) have also noted that the experience of crowding is a function of personal and environmental characteristics and that high density, of itself, need not be negatively experienced by the individual. Researchers have sought to identify factors contributing to variation in recreationists' evaluations of setting density in a variety of contexts. Manning's (1999) recent review of the crowding literature identified three broad categories of variables that have been noted for influencing recreationists' perceptions of crowding; (a) personal elements of recreationists such as trip motivations (Absher & Lee, 1981; Ditton, Fedler, & Graefe, 1983), encounter expectations and preferences (Shelby, Heberlein, Vaske, & Alfano, 1983; Webb & Worchel, 1993), and past setting experience (Graefe, Donnelly, & Vaske, 1986; Webb & Worchel, 1993), (b) situational characteristics of the setting which often influence setting density such as time (e.g., peak vs. off peak), the availability of fish and game, resource location and convenience (e.g., proximity to urban centers and the availability of setting substitutes), and setting management practices (e.g., use restrictions) (Shelby, Vaske, & Heberlein, 1989); and (c) characteristics of those encountered, which includes the type and size of the group encountered (McCay & Moeller, 1976), the behavior of other groups (West, 1982), and perceived alikeness of those encountered in the setting (Adelman, Heberlein, & Bonnickson, 1982). This literature illustrates the complexity of issues underlying recreationists' evaluation of setting density and the challenge confronting leisure researchers.

Two constructs that have received considerable attention in the leisure literature over the past two decades, but whose effect on perceived crowding has yet to be addressed, are activity involvement and place attachment. Falling within the "personal characteristics" category of variables discussed above (Manning, 1999), these constructs provide insight on the underlying motivations for engagement in activities (Havitz & Dimanche, 1997) and attraction to specific settings (Williams, Patterson, Roggenbuck, & Watson, 1992). An understanding of their relationship with perceived crowding, however, is complicated by two issues. First, from a social judgment perspective (Sherif & Hovland, 1961), multidimensional conceptualizations of these constructs indicate that the effect of ego-involvement need not be uniform. Studies have shown that the dimensions of involvement and place attachment do not always affect leisure behavior in a uniform or similar manner (Havitz & Dimanche, 1997; Kyle, Absher, & Graefe, 2003).

Second, studies have also shown that both involvement and place attachment are positively correlated with past experience (McIntyre & Pigram, 1992; Moore & Graefe, 1994). While it has been demonstrated that the effect

of past experience on perceived crowding is less than straightforward, Watson, Roggenbuck, and Williams (1991) have added some conceptual clarity to the literature by utilizing theory and research in the area of cognitive development. While some investigations have shown that more experienced recreationists are more sensitive to setting density (Murray, 1974; Graefe et al., 1986; Graefe & Moore, 1992), others have shown that along with increased experience come specific expectations concerning use density for the setting. Consequently, these recreationists are better able to anticipate and psychologically adjust to density for the specific setting and occasion (Shelby et al., 1983). Along similar lines, others have suggested that experienced recreationists have more complex cognitive structures relating to both the activity and related settings and are better able to alter their use in anticipation of increased density (Hall & Shelby, 2000; Hammitt & Patterson, 1991).

Therefore, while there is evidence to suggest that involvement and place attachment are likely to influence recreationists' evaluations of setting density, the nature of this effect remains unclear. With this in mind, we drew on conceptual and empirical work within the context of social judgment and cognitive development theories to examine the effect of involvement and place attachment on perceived crowding among hikers along the Appalachian Trail (AT).

Literature Review

Activity Involvement & Place Attachment

Both activity involvement and place attachment provide insight into the underlying motivations for recreationists' engagement in specific leisure pursuits and visitation to specific recreation settings. Both constructs are comprised of a constellation of attitudes that consist of affect (e.g., emotions), cognition (e.g., knowledge structures), and behavioral (e.g., behavioral intentions or commitments) components (Altman & Low, 1992; Havitz & Dimanche, 1990; Jorgensen & Stedman, 2001). For activity involvement, definitions adapted from the consumer behavior literature have focused on the notion of "personal relevance;" where elements of an activity are related to an individual's identity, values, or needs (Celsi & Olson, 1988; McIntyre, 1989). Based on their review of the leisure involvement literature, Havitz and Dimanche (1997, 1999) have suggested that multi-faceted operations of the construct are best suited. Facets receiving the strongest empirical support include; (a) attraction—the importance and pleasure associated with the activity, (b) centrality—the value of an activity relative to other domains of life (e.g., occupation), and (c) self expression—the expression of one's identity through activity engagement.

Altman and Low (1992) have noted that place attachment is subsumed by a variety of analogous concepts drawn from several fields of knowledge. These include topophilia (Tuan, 1974), place identity (Proshansky, Fabian, & Kaminoff, 1983), place dependence (Stokols & Shumaker, 1981), sense of

place or rootedness (Chawla, 1992), and community attachment (Hummon, 1992). In their synthesis of the literature, Altman and Low identified several common elements of place attachment research that hold relevance for the current investigation; (a) the construct is strongly affective or emotion based, (b) the notion of "place" implies a geographic setting that is the primary attitude object that can vary in scale (e.g., home, street, community), and (c) places often can possess a strong social element given that they are often repositories or contexts within which social relations occur. In the leisure literature, most conceptualizations of the construct have revolved around two components; place identity and place dependence (Moore & Graefe, 1994; Williams & Roggenbuck, 1989). Consistent with earlier work on the construct, place dependence was conceptualized as the instrumental or functional values ascribed to settings for their ability to facilitate desired leisure experiences. Alternately, place identity refers to the symbolic and emotional attachments recreationists form with "special places" (Schreyer, Jacob, & White, 1981). The social characteristic of place attachment discussed by Altman and Low has received little attention in the leisure literature in spite of being well established in the environmental psychology literature (Hidalgo & Hernández, 2001; Mesch & Manor, 1998). This is somewhat surprising given that much of the leisure experience is social in nature (Burch, 1969; Kyle & Chick, 2002; Scott & Godbey, 1992). If meaningful social relationships occur and are maintained in leisure settings, then it should also be likely that these settings share some of this meaning given that they provide the context for these relationships and shared experiences. With this in mind, we have also included a social dimension in our conceptualization of place attachment called "social bonding." These three dimensions of place attachment also represent distinct sources of personal relevance.

To help us understand activity involvement and place attachments' effect on respondents' perceptions of setting density, we drew on work cast within social judgment and cognitive development theories. Social judgment involves a categorization process where the recreationist evaluates new stimuli (e.g., setting density) in reference to an attitudinal anchor. The attitudinal anchor could be considered a personal standard that guides their evaluation of the stimulus or situation. In the absence of a personal standard or internal anchor, recreationists are likely to depend more on external social standards (Eagly & Chaiken, 1993) (e.g., the advice of others in their group) in making assessments of setting density. Research has shown that the intensity of the anchoring effect or strength of the personal standard is contingent on the degree of ego-involvement (Sherif & Hovland, 1961). Prior experience also acts to shift the anchor in the direction of what was previously encountered (Webb & Worchel, 1993). Setting density that is consistent or proximately close to the recreationists' attitudinal anchor is said to be assimilated whereas setting density that is perceived distal to the attitudinal anchor is rejected.

It is our hypothesis that hikers' evaluations of setting density along the AT will be influenced by their degree of activity involvement and place attachment. We contend that both activity involvement and place attachment are attitudinal constructs that, to varying degrees, are connected to the ego.

Sherif and Cantril (1947) suggested that ego-involved attitudes are part of a person's self concept and "have the characteristic of belonging to *me,* as being part of *me*" (p. 93). The link to the self also has important motivational and affective consequences. The social judgment approach suggests that exposure to discrepant attitudinal positions creates little tension or incongruity for the uninvolved person, but a great deal of psychological discomfort for the ego-involved person (Eagly & Chaiken, 1993; M. Sherif & Sherif, 1967). Thus, ego-involvement increases the anchoring property of initial attitudes so that assimilation and contrast effects are amplified.[1] Consequently, for the involved or attached hiker, the issue of setting density is likely to be perceived personally relevant or ego-involving given that the presence of others in the setting has the potential to both inhibit and/or enhance experiential goals.

Complimentary work in the area of cognitive development also supports social judgment theory's processes of categorization. In reviewing several related streams of research, Webb and Worchel (1993) noted that prior experience with stimuli (e.g., setting density) evokes different cognitive categories, but researchers have differed in their conceptualization of how individuals use these categories. For example, categories have been conceptualized as both "anchors" against which the psychological distance of new stimuli are judged (Helson, 1964), and "prototypes" whose features are matched to the features of new stimulus (Herr, Sherman, & Fazio, 1983). They also carry expectations that shape perceptions or evaluations of stimuli from similar categories (Herr, 1986; Manis, Biernat, & Nelson, 1991). A related conceptualization that has received some attention in the leisure literature suggests that recreationists gain knowledge with experience about activities and settings and develop complex cognitive structures that lead them to make finer distinctions among activity and setting attributes (Iwasaki & Havitz, 1998; Pritchard, Havitz, & Howard, 1999; Watson et al., 1991; Williams, Schreyer, & Knopf, 1990). While we did not explicitly examine past experience with the activity or setting, it has been observed that both activity involvement and place attachment are strongly correlated with past experience (Bricker & Kerstetter, 2000; Havitz & Dimanche, 1997; Moore & Graefe, 1994).

Work in the area of cognitive development also provides some insight concerning the valence of respondents' perceptions of setting density. Activity and setting related experience equip recreationists with broader aware-

[1]A component of social judgment theory that was not examined in this investigation concerns individuals' latitudes of acceptance (assimilation) and rejection (contrast). Social judgment theory suggests that a person's attitudinal position lies along an evaluative continuum comprised of three regions; (a) a latitude of acceptance, which includes the person's own attitudinal anchor or reference and other positions considered acceptable, (b) a latitude of rejection, which includes all positions considered unacceptable, and (c) a latitude of noncommitment, which includes positions that are neither acceptable nor unacceptable. Latitude width is also said to vary as a function of ego-involvement. In this investigation, we did not explicitly examine respondents' latitudes. Rather, we used the social judgment framework to understand the processes of assimilation and contrast used by respondents to evaluate setting density along the AT. This approach is consistent with previous research (see Webb & Worchel, 1993).

ness sets (i.e., greater knowledge of activity and setting alternatives), but narrow evoked sets (i.e., strong preferences for only a select number of activity and setting alternatives) (Havitz & Dimanche, 1997, 1999; Watson et al., 1991). Consequently, more experienced recreationists "are thought to be more aware of opportunities available and to make more "informed" choices, but at the same time are more sensitive to negative environmental conditions and changes, are more likely to experience dissatisfaction and conflict, are more prone to be displaced, and yet are less likely to perceive substitutes available" (Watson et al, 1991, p. 33).

Thus, in terms of involvement's effect on respondents' perceptions of setting density, we hypothesized the following relations:

H_1: As respondents' scores on the *attraction* facet increase, their evaluation of setting density will be increasingly negative.

H_2: As respondents' scores on the *centrality* facet increase, their evaluation of setting density will be increasingly negative.

H_3: As respondents' scores on the scores on the *self expression* facet increase, their evaluation of setting density will be increasingly positive.

Empirical research has shown that recreationists who score highest on centrality and attraction are also the most experienced (McIntyre & Pigram, 1992) and, consequently, the most sensitive to setting density. While there is evidence suggesting that experienced hikers are better equipped to cope with high density situations and possibly adjust their definitions of the experience (i.e., product shift) more readily than less experienced users (Hammitt & Patterson, 1991), we would expect this to only occur in situations where they have encountered high density in the past. Involved or experienced hikers will have specific expectations concerning social and environmental characteristics for settings with which they have had previous experience (Schreyer & Beaulieu, 1986). They will also choose less managed, pristine settings where they are less likely to encounter other hikers (McFarlane, Boxall, & Watson, 1998). Linear trails like the AT, however, may require hikers to pass through well used areas. In these situations, we would expect that in most instances experienced hikers would adjust their experience-related expectations to accommodate these variations but still retain their preference for more pristine sections of the trail. While we acknowledge that the effects of past experience have not been consistently observed in the literature, on the weight of this evidence and the paucity of research examining activity involvement's effect (as conceptualized by McIntyre & Pigram, 1992) on recreationists' perceptions of setting density, we feel these hypotheses are the most accurate predictions.

While there is little empirical evidence available to support the hypothesis suggesting that respondents scoring high on the self expression dimension will respond favorably to setting density, conceptual work on identity affirmation and expression suggests that the presence of others in the setting is an important component of involvement for some participants (Dimanche & Samdahl, 1994). Haggard and Williams (1992) observed that an identity

image associated with "backpackers" by a sample of backpackers (i.e., college students in a backpacking class) was "sociable." While they did not examine the effect of involvement on this identity image, it does suggest that social relations and the meaning underlying these relations are an important facet of the activity for some participants. We also observed a distinct social culture among some hikers (particularly those that hike the length of the trail) in several meetings with public land managers, volunteers, and AT hikers during the early planning stages of this project.

With regard to place attachment's effect on respondents' evaluations of setting density, the following hypotheses were tested:

H_4: As respondents' scores on the *place identity* dimension increase, their evaluation of setting density will be increasingly negative.

H_5: As respondents' scores on the *place dependence* dimension increase, their evaluation of setting density will be increasingly negative.

H_6: As respondents' scores on the *social bonding* facet increase, their evaluation of setting density will be increasingly positive.

Consistent with the social judgment framework, it is expected that ego-involved or attached recreationists will have stronger opinions concerning appropriate density for specific settings. Unfortunately, there is little empirical evidence available that provides insight on the valence of this effect. The multidimensionality of our conceptualization also complicates interpretation. For H_4 and H_5, we hypothesize similar effects to that hypothesized in H_1 and H_2. Young, Williams, and Roggenbuck (1990) observed that involved wilderness visitors[2] reported the largest disparity between estimates of their preferences and what they considered unacceptable for items measuring the number of people encountered and length of time for seeing people along trails in a wilderness area. They acknowledge, however, that their results were somewhat inconclusive and may have been affected by their measure of wilderness involvement and the sample analyzed. More specific evidence concerning the directionality of place attachment's effect can be extracted from work cast within a cognitive development framework. Like involved recreationists' who often possess considerable activity experience, research has also shown that setting experience is a strong correlate of both place identity and place dependence (Moore & Graefe, 1994; Vorkinn & Reise, 2001; Williams, Patterson, Roggenbuck, & Watson, 1992). Consequently, we expect that similar psychological processes will guide evaluations of setting density, such that as respondents' scores on these dimensions increase, their perceptions of setting density will be increasingly negative. Prior experience also acts to shift their attitudinal anchor toward positions that they have encountered in the past. Consequently, for experienced hikers, the attitudinal anchor or point

[2]Wilderness involvement was measured using a single summative index comprised of items adapted from measures of activity involvement. Instead of an activity-based attitude object, Young et al. (1990) used "wilderness."

of reference used in their evaluations of setting density are likely to be higher in typically heavily used sections than along more remote sections of the trail (Cole & Stewart, 2002). Violations of experienced hikers' reference point, particularly in more remote or primitive settings, are likely to be evaluated negatively.

For the social bonding dimension, however, we feel that given this dimension's strong social component, respondents scoring high on this dimension are likely to feel less crowded. In fact, for these respondents, we hypothesize that the presence of others in the setting will be evaluated positively. In the context of festivals and community events, it has been observed that high density environments can be evaluated positively and subsequently enhance visitors' experience (Anderson, Kerstetter, & Graefe, 1998; Mowen, Vogelsong, & Graefe, 2003; Wickham & Kerstetter, 2000). In the context of outdoor recreation, however, these observations have been infrequent.[3] Some research has shown that the characteristics of those encountered can also impact respondents' perceptions of setting density.[4] Overall, like respondents scoring high on self expression, we expect setting density will be evaluated positively by respondents scoring high on social bonding.

There is also indirect evidence suggesting that activity involvement is an antecedent of place attachment. For example, Moore and Graefe (1994) observed that activity importance was a significant predictor of both place dependence[5] and place identity. Bricker and Kerstetter (2000) also observed that level of involvement[6] increased congruently with place identity and place dependence. Finally, Vorkinn and Riese (2001) reported that activity related variables such as use intensity (number of days used last year), use experience (number of years used), and engagement in recreational activities were significant predictors of the strength of place attachment. Combined, these variables accounted for between 40 and 64 percent of the variance in place attachment across several different settings. Consequently, we hypothesized the following relationship between activity involvement and place attachment:

H_7: As respondents' scores on the facets of activity involvement (attraction, centrality, and self expression) increase, so too will their scores on the dimensions of place attachment (place identity, place dependence, and social bonding).

Figure 1 depicts the hypothesized relations examined in this investigation.

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[3]See Ditton et al. (1983) and Graefe and Moore (1992) for notable exceptions.

[4]Examples of these characteristics include; (a) type of group encountered (McCay & Moeller, 1976), (b) the behavior or other recreationists (West, 1982), and (c) perceptions of alikeness (Adelman, Heberlein, & Bonnickson, 1982).

[5]Moore and Graefe's (1994) data were collected from users of three different rail-trails. The effect of activity importance on place dependence was observed at only two rail-trails. Activity importance was measured with a single item.

[6]Bricker and Kerstetter's (2000) measure of involvement used a summative index.

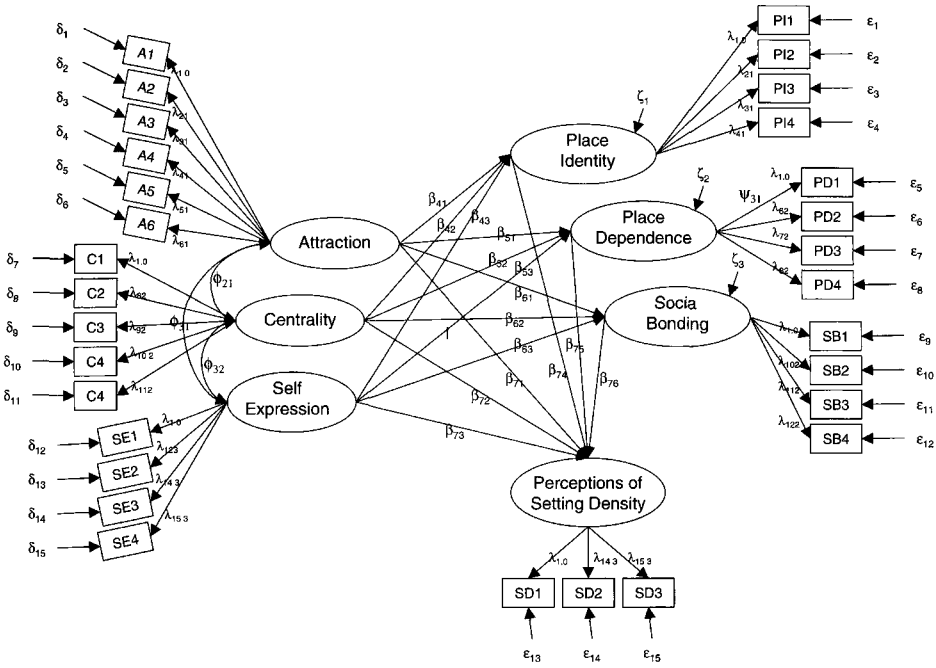

Figure 1. Hypothesized Model

Methods

Data Collection

Data were collected from users of the Appalachian Trail (AT) over the summer and fall of 1999. Sampling occurred along the entire length of the trail. A stratified sampling technique was employed to obtain a representative sample of all AT hikers (Babbie, 1995). To accomplish this, the length of the trail was segmented into 22 sections based on use estimates provided by the various associations charged with maintaining the trail (i.e., maintenance and management). As a consequence, some sections were quite long (see Appendix A.). Respondents were intercepted along the trail by volunteers and paid staff and requested to provide their name and address to be sent a survey instrument. Every third trail user over the age of 18 was approached. When encountering groups, data collectors were instructed to request a volunteer. They were, however, also instructed to attempt to vary the age (as long as they were at least 18 years of age) and gender of respondents. By requesting a volunteer, however, we acknowledge a potential for bias within our sample (e.g., predominance of group leaders).

A total of 2,847 AT visitors agreed to participate in the study and were mailed a questionnaire two weeks after their visit. Two weeks after the initial mailing, visitors were mailed a reminder/thank you postcard. Visitors who

did not return a completed questionnaire within three weeks of the initial mailing were mailed a final copy of the questionnaire. This sampling procedure yielded 1,879 completed questionnaires (66% response rate). Through ("Thru") hikers were also purposively over-sampled at the end of the trail (n = 318), but were excluded from these analyses on the basis that they represent a distinct minority of AT users.[7] This produced a final subsample of 1,561 completed surveys.

Measures

The three dimensions of activity involvement (i.e., self expression, centrality, and attraction) were measured using items adapted from McIntyre and Pigram's (1992) measure of involvement (see Table 1). For place attachment, eight items were adapted from Williams and Roggenbuck's (1989) measure capturing the dimensions of place identity and place dependence. Four additional items measured social bonding. All of these items were measured using a five-point response format. Finally, perceptions of setting density were measured using three items including Heberlein and Vaske's (1977) nine-point crowding item, a nine-point item requesting respondents to indicate the acceptability of the number of people seen along the AT, and a third item measured on a five point rating scale. Construct reliability estimates were calculated for all scales. While Nunnally (1978) has suggested that Cronbach's alpha coefficients which are equal to or greater than .70 are acceptable, Cortina (1983) has indicated that in scales with a reduced number of items (e.g., six or less), .60 and above may also be acceptable. The alpha values for all constructs ranged between .61 through .90. On the basis of this, we concluded that all scales were reliable.

Analyses and Results

We used covariance structure analysis provided through LISREL (version 8.5; Jöreskog & Sörbom, 2001) to test our hypothesized model. Assessment of model fit was based on Steiger and Lind's (1980) Root Mean Square Error of Approximation (RMSEA), Bentler and Bonnett's (1980) Normed Fit Index (NFI), Bentler's (1990) Comparative Fit Index (CFI), and Bollen's (1989) incremental fit index (IFI). A RMSEA value less than .08 is said to indicate an acceptable model fit (Hu & Bentler, 1995; MacCullum, Browne, & Sugawara, 1996) and NFI, CFI and IFI values over .90 also indicate acceptable model fit.[8]

The *a priori* structure of the measurement component of the model posited that each manifest variable had a nonzero factor loading on only the

[7]National Park Service staff estimate that the AT receives approximately 4,000,000 visitors each year. In 1999, only 376 *thru hikers,* hiking the traditional South to North route, completed hiking the length of the trail. To complete the trail over a single summer (approx. two to three months), most hikers start in the south to avoid potentially cold northern weather and finish in the north to avoid the heat extremes of the south.

[8]NFI, CFI, and IFI values range from 0 to 1.0.

TABLE 1
Factor Loadings, Reliabilities, and Means

Scale Items			α	Factor Loading	*t*-value	M
Involvement[1]						
Attraction			.90			4.24
A1	δ_1	Hiking is important to me		.82	—	4.13
A2	δ_2	Participating in hiking is one of the most satisfying things that I do		.85	38.55	4.04
A3	δ_3	Participating in hiking is one of the most enjoyable things I do		.83	36.88	3.97
A4	δ_4	Hiking interests me		.67	27.55	4.36
A5	δ_5	Hiking is pleasurable		.59	23.66	4.49
A6	δ_6	I really enjoy hiking		.70	29.49	4.46
Centrality			.78			2.98
C1	δ_7	I find a lot of my life is organized around hiking		.93	—	2.83
C2	δ_8	Hiking has a central role in my life		.88	52.88	2.91
C3	δ_9	I find a lot of my life is organized around hiking activities		.88	52.85	2.81
C4	δ_{10}	I enjoy discussing hiking with my friends		.54	22.69	3.71
C5	δ_{11}	Most of my friends are in some way connected with hiking		.43	17.25	2.66
Self expression			.73			3.59
SE1	δ_{12}	Hiking says a lot about who I am		.76	—	3.73
SE2	δ_{13}	You can tell a lot about a person be seeing them hiking		.42	14.83	3.32
SE3	δ_{14}	When I participate in hiking I can really be myself		.65	23.03	3.91
SE4	δ_{15}	When I participate in hiking others see me the way I want them to see me		.62	22.20	3.39

TABLE 1
(Continued)

Scale Items			α	Factor Loading	*t*-value	M
Place Attachment[1]						
Place Identity			.87			3.57
PI1	ε_1	This trail means a lot to me		.75	—	4.01
PI2	ε_2	I am very attached to the Appalachian Trail		.88	34.49	3.38
PI3	ε_3	I identify strongly with this trail		.86	33.64	3.21
PI4	ε_4	I feel no commitment to this trail		.68	26.08	3.68
Place Dependence			.86			2.83
PD1	ε_5	I enjoy hiking along the Appalachian Trail more than any other trail		.85	—	3.19
PD2	ε_6	I get more satisfaction out of visiting this trail than from visiting any other trail		.92	43.94	2.96
PD3	ε_7	Hiking here is more important than hiking in any other place		.82	37.65	2.68
PD4	ε_8	I wouldn't substitute any other trail for the type of recreation I do here		.49	19.39	2.50
Social Bonding			.61			3.75
SB1	ε_9	I have a lot of fond memories about the Appalachian Trail		.69	—	4.04
SB2	ε_{10}	I have a special connection to the Appalachian Trail and the people who hike along it		.78	25.17	3.16
SB3	ε_{11}	I don't tell many people about this trail*		.34	11.89	3.85
SB4	ε_{12}	I will (do) bring my children to this place		.32	11.02	3.93
Perceptions of Setting Density			.81			
SD1	ε_{13}	How acceptable was the number of encounters you saw *along the Appalachian Trail* that day?[2]		.56	—	3.83
SD2	ε_{14}	How crowded did you feel on the Appalachian Trail on that day?		.80	14.69	3.04
SD3	ε_{15}	The number of people on the trail was about right[1]*		.63	15.93	3.31

[1]Measured using a Likert-type format where 1 = Strongly disagree and 5 = Strongly agree
[2]Measured on a scale where −4 = "Very Unacceptable" through to +4 = "Very Acceptable." Item recoded to 1 = "Very Acceptable" through to 9 = "Very Unacceptable"
[3]Measured on a scale where 1 = "Not at all Crowded" through to 9 = "Extremely Crowded."
*Reverse coded

factor it was hypothesized to measure, covariance among exogenous concepts was freely estimated, and the uniqueness associated with each measured variable was initially uncorrelated. The measurement model was respecified after it was observed that model fit could be significantly improved by permitting errors among two manifest variables (δ_5 and δ_6) to correlate (see Figure 1). This decision was based on the similarity in item wording, questionnaire format, and level of measurement. For the structural model, the hypothesized relations suggested that place attachment (i.e., place identity, place dependence, social bonding) would be predicted by activity involvement (i.e., attraction, centrality, and self expression), and visitors' perceptions of setting density was predicted by both involvement and place attachment. Covariance was permitted among exogenous factors and among the disturbance terms for the endogenous variables. The structural model was also respecified after it was observed that several structural paths had nonsignificant effects (β_{42}, β_{51}, β_{52}, β_{62}, β_{71}, β_{72}, and β_{73}). The fit indices for the final structural model are reported in Table 2 and indicate an adequate fit for these data (χ^2 = 2091.11, df = 391, RMSEA = .057, CFI = .93, NFI = .91, IFI = .93).

Relationships between Involvement, Place Attachment and Perception of Setting Density

The results of the final structural model shown in Table 3 and Figure 2 indicate that:

(a) Place identity was predicted by attraction (β = .28, t = 5.53) and self expression (β = .21, t = 3.75) only, and accounted for 22 percent of the variance;
(b) Self expression was the only significant predictor of place dependence (β = .17, t = 5.52), accounting for three percent of the variance;
(c) Social bonding was predicted by attraction (β = .23, t = 3.40) and self expression (β = .32, t = 4.45), accounting for 28 percent of the variance;

TABLE 2
Goodness-of-Fit Indices

	df	χ^2	RMSEA[1]	NFI[2]	CFI[3]	IFI[4]
Measurement	383	2083.74	.058	.91	.93	.93
Structural	391	2091.11	.057	.91	.93	.93

[1]Root mean square error (Steiger & Lind, 1980): Values ≤ .08 indicated acceptable fit
[2]Normed fit index (Benlter & Bonnet): Values ≥ .90 indicate acceptable fit
[3]Comparative fit index (Bentler, 1990): Values ≥ .90 indicate acceptable fit
[4]Incremental fit index (Bollen, 1989): Values ≥ .90 indicate acceptable fit

TABLE 3
Structural Model Analysis

Direct Effects	β	*t*-value*	R^2
Predictors of Place Attachment			
Place Identity			.22
Attraction	.28	5.53	
Self Expression	.21	3.75	
Place Dependence			.03
Self Expression	.17	5.52	
Social Bonding			.28
Attraction	.23	3.40	
Self Expression	.32	4.45	
Predictors of Setting Density[1]			.03
Place Identity	.21	4.16	
Place Dependence	−.25	−4.95	

*Only significant effects are reported.
[1]Indirect effects on Setting Density: Attraction = .06 (t = 3.36) and Self Expression .00 (t = .18).

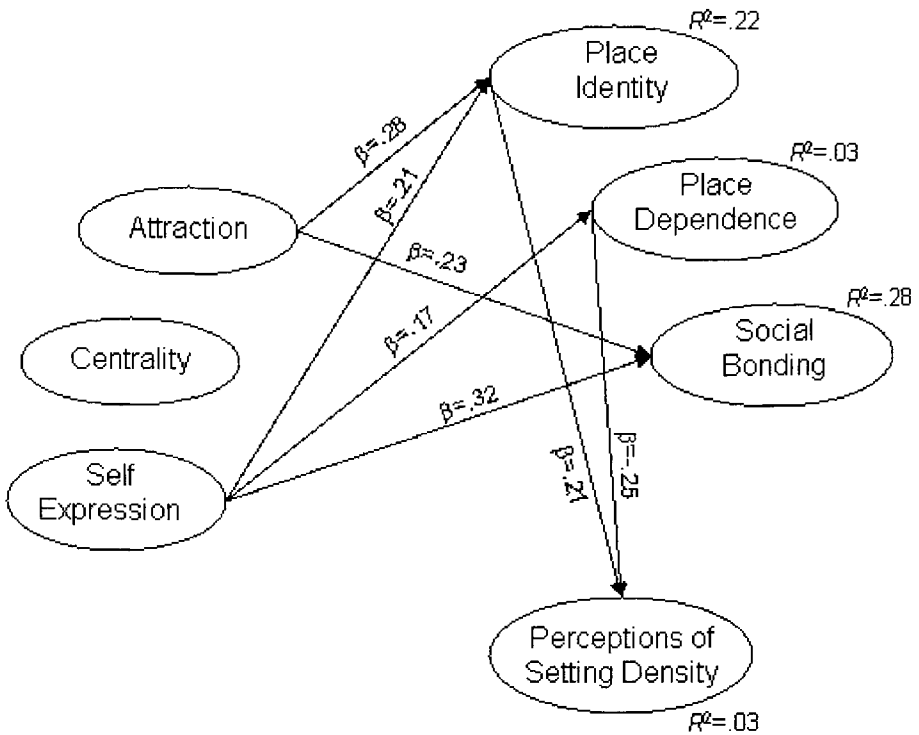

Figure 2. Final Model

(d) Respondents' perception of setting density was predicted by place identity ($\beta = .21$, $t = 4.16$) and place dependence ($\beta = -.25$, $t = -4.95$) which accounted for only three percent of the variance; and
(e) Attraction had a significant indirect effect on respondents' perception of setting density ($\beta = .06$, $t = 3.36$).

Overall, no support was found for the hypotheses related to activity involvement's effect on respondents' perceptions of setting density (H_1, H_2, and H_3). With regard to place attachment's effect on visitor's perception of setting density, support was found for H_4, indicating that as place identity increased, so too did respondents' negative perceptions of crowding. For H_5, the opposite effect to that hypothesized was observed in these data. As place dependence increased, respondents' evaluations of setting density became more favorable. Social bonding was not a significant predictor of respondents' perceptions of setting density (H_6). Finally, partial support was found for activity involvements' effect on place attachment (H_7). Overall, involvement was a stronger predictor of place identity and social bonding than it was of place dependence.

Discussion

The purpose of this investigation was to examine the effect of involvement and place attachment on hikers' perceptions of setting density along the AT. These findings indicated that respondents' attachment to the setting was a stronger predictor of their perceptions of setting density than was their involvement with hiking. While respondents scoring high on the place identity dimension were more inclined to report feeling crowded, respondents scoring high on the place dependence dimension were inclined to evaluate setting density more favorably. Viewing our findings in light of social judgment theory, the association between place identity and perceptions of setting density implied that as respondents' emotional attachment to the setting increased, their latitude of acceptance concerning encounters with other users was more narrowly defined (i.e., they are less able to assimilate positions inconsistent with their own position). In the context of cognitive development theory, this finding also implies that these recreationists have more concrete expectations concerning use along the AT and seek out more remote settings. In so doing, their expectations for encounters in these settings is much lower which results in a greater propensity to negatively evaluate encounters with other recreationists. Alternately, for place dependent respondents, their attitudinal anchor (encounter preferences) was positioned much higher with a wider latitude of acceptance. Consequently, their evaluations of setting density were substantially more liberal allowing for the social conditions (i.e., setting density) encountered along the AT to be assimilated.

The differential effects observed among the dimensions of place attachment suggest that the activation of ego-attitudes does not always produce uniform effects. As discussed earlier, place identity, as conceptualized and measured here, captures respondents' emotional and affective bond with the

AT. To a limited degree, it also examines the connection between recreationists' identity and the setting. Unlike our measure of self expression, however, the identity item used here does not tease apart the different components of identity (i.e., the self to the self, the self to others) that have been previously reported in the literature (Dimanche & Samdahl, 1994). Thus, these findings indicate that place identified respondents are more inclined to seek out solitude and that the presence of others is inconsistent with the value they associate with the setting. Alternately, place dependence examines the value assigned to the setting by recreationists for its ability to facilitate desired leisure experiences. Contrary to what was hypothesized, these results suggest that place dependent respondents do not consider the presence of others to be detrimental to the setting's ability to facilitate desired leisure experiences.

From a cognitive development perspective, these findings also indicate that caution is warranted when inferring recreationists' experience from these constructs. Overall, hikers with the most setting related experience are also likely to be the most attached (Williams & Vaske, 2003). Schreyer, Lime and Williams (1984), however, observed that recreationists with specific setting related experience can represent two distinct types of users; (a) "locals" who have high experience with one particular setting but few experiences with other similar settings, and (b) "veterans" who have high familiarity with the study context in addition to other similar settings. Schreyer et al. also observed that locals tended to be more socially oriented whereas veterans' visit motivations stemmed from activity related factors (e.g., "To develop my skills," "To test and use my equipment") and personal reflection (e.g., "To think about my personal values"). Thus, it is possible that place dependent respondents may be akin to Schreyer et al.'s locals and place identified respondents may more closely represent veterans. Locals whose knowledge of setting alternatives is somewhat limited are more likely to be dependent on the resource for their desired leisure experiences, part of which is motivated by social affiliation. While they are also likely to express strong identification with the setting, it is possible that veterans more strongly identify with a particular class of recreation settings (e.g., rivers, trails) in general, given their broad interest in activities supported by these settings.

The presence of these user segments within the data (e.g., locals and veterans) might also explain place identity and place dependence's opposing effects in spite of their positive and moderate correlation ($r = .64$). Given that past research has shown these two constructs to be moderately and positively correlated (Vaske & Kobrin, 2001; Williams, Anderson, McDonald, & Patterson, 1995; Williams & Vaske, 2003), we did not anticipate that place identity and place dependence would have an opposing effect. It would be interesting to examine the relationship between Schreyer et al.'s (1984) profiles of experience use history and the dimensions of place attachment. This kind of analysis would provide more detailed insight on how elements of past experience influence the development of place identity and place dependence.

The variance in respondents' perceptions of setting density explained by involvement and place attachment was also minimal. We feel that this finding may speak more directly to the limitations of the methods employed in this investigation rather than to the value of these constructs for explaining respondents' perceptions of setting density. For example, Kuentzel and McDonald (1992) observed that past experience did not affect boaters' perceptions of setting density at the "Double Trouble" rapid along the Ocoee River in Tennessee. They suggested that their "non-significant" finding may have been related to the location along the Ocoee from which they drew their sample—a high density setting where use often exceeds capacity. They noted that other work which had drawn samples from low density settings had observed a statistically significant relationship between past experience and crowding (Graefe et al., 1986; Vaske, Donnelly, & Heberlein, 1980). Cole and Stewart's (2002) recent work also supports the notion that recreationists' evaluative standards are subject to spatial variation. That is, encounters with other recreationists are more salient in remote regions. Cole and Stewart also observed temporal variability in respondents' evaluations of encounters with other recreationists. Their sample of backpackers reported that encounters mattered more in the pre- and post-trip phase than when they were actually engaging in the experience. Unfortunately, our ability to control for each of these effects was limited by the scope of this investigation. With almost 2,200 miles of trail, a sample of respondents that passed through a broad range of conditions, and a sampling frame that drew subjects from along the length of the trail, this kind of analysis was beyond our capacity.

These findings also indicated that activity involvement, and attraction and self expression in particular, were stronger predictors of place identity and social bonding than of place dependence. This finding suggests that the affective (i.e., pleasure, satisfaction) and expressive elements (i.e., identity affirmation and identity expression) of respondents' involvement with hiking are also tied to their affective and social bonds with the setting. The relatively low variance accounted for in place dependence may have been the product of our measure of activity involvement which included "hiking" as the primary attitude object. Given that the AT supports a variety of leisure experiences, other sources of personal relevance (e.g., birding, nature viewing, camping, etc.) may also have been operant.

Another issue raised by these findings concerns the social components of self expression and social bonding and their effect on perceived crowding. We hypothesized that each of these components would positively affect respondents' evaluations of setting density on the basis that they each incorporate an association of the self with others. As discussed above, for self expression, items measure the expression of the identity to others, whereas for social bonding the items capture the social bonds with others that are also associated with a particular place. For both components, the "other" or audience is undefined in terms of being "in-group" or "out-group." Not all items specify the nature of the relationship with the audience. For example, in the context of self expression, is it important that the audience be known

or perceived to be similar to the individual or is the expression of the self to any audience equally important? We hypothesized the latter. While we are unable to resolve this issue using these data, the issue remains worthy of further investigation.

In conclusion, while only limited support for our hypotheses were offered by these data, we feel that involvement and place attachment still have much to offer for understanding a variety of leisure behavior. We also encourage other investigators to continue to utilize the analytical frameworks offered by social judgment and cognitive development theories. These theories provide leisure researchers with clear conceptual guidelines for understanding how recreationists' degree of involvement or experience with an activity, setting or service provider can influence their perceptions and behavior related to a variety of stimuli. In the context of social judgment theory, we would also recommend that some consideration be given to utilizing measures that provide more specific indicators of latitude width. Beyond recreationists' perceptions of setting density, these frameworks would also be useful for refining our understanding of concepts related to conflict, visitor resource evaluations and preferences, and visitor evaluations of management actions. For each of these issues, we would expect substantial variation in attitudes and preferences among segments of users, part of which could be accounted for with an understanding of the personal relevance that activities and settings hold for the user.

References

Anderson, M., Kerstetter, D. L., & Graefe, A. R. (1998). The effects of festival attributes upon perceptions of crowding. In *Proceedings of the 1997 Northeastern Recreation Research Symposium,* (GTR NE-241; pp. 182-185). Radnor, PA: USDA Forest Service.

Absher, J. D., & Lee, R. (1981). Density as an incomplete cause of crowding in backcountry settings. *Leisure Sciences, 4,* 231-247.

Adelman, B., Heberlein, T., & Bonnickson, T. (1982). Social psychological explanations for the persistence of a conflict between paddling canoeists and motorcraft users in the Boundary Waters Canoe Area. *Leisure Sciences, 5,* 45-61.

Altman, I., & Low, S. M. (1992). *Place attachment, human behavior, and environment: Advances in theory and research* (Vol. 12). New York: Plenum Press.

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin, 107,* 238-246.

Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin, 88,* 588-606.

Bollen, K. A. (1989). *Structural equations with latent variables.* New York: Wiley.

Bricker, K. S., & Kerstetter, D. L. (2000). Level of specialization and place attachment: An exploratory study of whitewater recreationists. *Leisure Sciences, 22,* 233-257.

Burch, W. (1969). The social circles of leisure: Competing explanations. *Journal of Leisure Research, 1,* 125-147.

Celsi, R. L., & Olson, J. C. (1988). The role of involvement in attention and comprehension processes. *Journal of Consumer Research, 15,* 210-224.

Chawla, L. (1992). Childhood place attachment. In I. Altman & S. M. Low (Eds.), *Place attachment* (pp. 63-86). New York: Plenum Press.

Cole, D. N., & Stewart, W. P. (2002). Variability of user-based evaluative standards for backcountry encounters. *Leisure Sciences, 24,* 313-324.

Cortina, J. M. (1993). What is coefficient alpha? An examination of theory and applications. *Journal of Applied Psychology, 78*(1), 98-104.

Dimanche, F., & Samdahl, D. (1994). Leisure as symbolic consumption: A conceptualization and prospectus for future research. *Leisure Sciences, 16,* 119-129.

Ditton, R., Fedler, A., & Graefe, A. R. (1983). Factors contributing to perceptions of recreational crowding. *Leisure Sciences, 5,* 273-288.

Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes.* New York: Harcourt Brace.

Graefe, A. R., Donnelly, M. P., & Vaske, J. J. (1986). Crowding and specialization: A reexamination of the crowding model. In R. Lucas (Compiler), *Proceedings of the National Wilderness Research Conference: Current Research* (GTR INT-212; pp. 333-338). Ogden, UT: USDA Forest Service.

Graefe, A. R., & Moore, R. (1992). Monitoring the visitor experience at Buck Island Reef National Monument. In *Proceeding of the 1991 Northeastern Recreation Research Symposium* (GTR NE-160; pp. 55-58). Radnor, PA: USDA Forest Service.

Haggard, L. M., & Williams, D. R. (1992). Identity affirmation through leisure activities: Leisure symbols of the self. *Journal of Leisure Research, 24,* 1-18.

Hall, T., & Shelby, B. (2000). Temporal and spatial displacement: Evidence form a high-use reservoir and alternate sites. *Journal of Leisure Research, 32,* 435-456.

Hammitt, W. E., & Patterson, M. E. (1991). Coping behavior to avoid visitor encounters: Its relationship to wildland privacy. *Journal of Leisure Research, 23,* 225-237.

Havitz, M. E., & Dimanche, F. (1990). Propositions for guiding the empirical testing of the involvement construct in recreational and tourist contexts. *Leisure Sciences, 12,* 179-196.

Havitz, M. E., & Dimanche, F. (1997). Leisure involvement revisited: Conceptual conundrums and measurement advances. *Journal of Leisure Research, 29,* 245-278.

Havitz, M. E., & Dimanche, F. (1999). Leisure involvement revisited: Drive properties and paradoxes. *Journal of Leisure Research, 31,* 122-149.

Heberlein, T. A., & Vaske, J. J. (1977). *Crowding and visitor conflict on the Bois Brule River* (Report—WISC WRC 77-04). Madison, WI: University of Wisconsin Water Resources Center.

Helson, H. (1964). *Adaptation level theory: An experimental and systematic approach to behavior.* New York: Harper & Row.

Herr, P. M. (1986). Consequences of priming: Judgment and behavior. *Journal of Personality and Social Psychology, 51,* 1106-1115.

Herr, P. M., Sherman, S. J., & Fazio, R. H. (1983). On the consequences of priming: Assimilation and contrast effects. *Journal of Experimental Social Psychology, 19,* 323-340.

Hidalgo, M. C., & Hernández, B. (2001). Place attachment: Conceptual and empirical questions. *Journal of Environmental Psychology, 21,* 273-281.

Hu, L. T., & Bentler, P. M. (1995). Evaluating model fit. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 76-99). Thousand Oaks, CA: Sage.

Hummon, D. M. (1992). Community attachment: Local sentiment and sense of place. In I. Altman & S. M. Low (Eds.), *Place attachment* (pp. 253-278). New York: Plenum Press.

Iwasaki, Y., & Havitz, M. E. (1998). A path analytic model of the relationships between involvement, psychological commitment, and loyalty. *Journal of Leisure Research, 30,* 256-280.

Jöreskog, K. G., & Sörbom, D. (2001). *LISREL 8: User's reference guide.* Chicago: Scientific Software International.

Jorgensen, B. S., & Stedman, R. C. (2001). Sense of place as an attitude: Lakeshore owners attitudes toward their properties. *Journal of Environmental Psychology, 21,* 233-248.

Kuentzel, W. F., & McDonald, C. D. (1992). Differential effects of past experience, commitment, and lifestyle dimensions on river use specialization. *Journal of Leisure Research, 24,* 269-287.

Kyle, G. T., & Chick, G. E. (2002). The social nature of leisure involvement. *Journal of Leisure Research, 35,* 426-448.

Kyle, G. T., Absher, J. D., & Graefe, A. R. (2003). The moderating role of place attachment on the relationship between attitudes toward fees and spending preferences. *Leisure Sciences, 25,* 33-50.

MacCullum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size. *Psychological Methods, 1,* 130-149.

Manis, M., Biernat, M., & Nelson, T. F. (1991). Comparison and expectancy processes in human judgment. *Journal of Personality and Social Psychology, 61,* 203-211.

Manning, R. E. (1999). *Studies in outdoor recreation.* Corvallis, OR: Oregon State University Press.

McCay, R., & Moeller, G. (1976). *Compatibility of Ohio trail users* (NE-225). Radnor, PA: USDA Forest Service.

McFarlane, B. L., Boxall, P. C., & Watson, D. O. (1998). Past experience and behavioral choice among wilderness users. *Journal of Leisure Research, 30,* 195-213.

McIntyre, N. (1989). The personal meaning of participation: Enduring involvement. *Journal of Leisure Research, 21,* 167-179.

McIntyre, N., & Pigram, J. J. (1992). Recreation specialization reexamined: The case of vehicle-based campers. *Leisure Sciences, 14,* 3-15.

Mesch, G. S., & Manor, O. (1998). Social ties, environmental perception, and local attachment. *Environment and Behavior, 30,* 504-520.

Moore, R. L., & Graefe, A. R. (1994). Attachments to recreation settings: The case of rail-trail users. *Leisure Sciences, 16,* 17-31.

Mowen, A. J., Vogelsong, H. G., & Graefe, A. R. (2003). Perceived crowding and its relationship to crowd management strategies at park and recreation events. *Event Management, 8*(2), 63-72.

Murray, J. (1974). *Appalachian Trail users in the southern National Forests: Their characteristics, attitudes, and management preferences* (SE-116). Asheville, NC: USDA Forest Service.

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hill.

Pritchard, M. P., Havitz, M. E., & Howard, D. R. (1999). Analyzing the commitment-loyalty link in service contexts. *Journal of the Academy of Marketing Science, 27,* 333-348.

Proshansky, H. M., Fabian, A. K., & Kaminoff, R. (1983). Place-identity: Physical world socialization of the self. *Journal of Environmental Psychology, 3,* 57-83.

Schreyer, R. M., & Beaulieu, J. (1986). Attribute preferences for wildland recreation settings. *Journal of Leisure Research, 18,* 231-247.

Schreyer, R., Jacob, G., & White, R. (1981). Environmental meaning as a determinant of spatial behavior in recreation. In J. Frazier & B. Epstein (Eds.), *Proceedings of the Applied Geography Conferences* (pp. 294-300). Binghamton, NY: Dept of Geography, SUNY Binghamton.

Schreyer, R. M., Lime, D. W., & Williams, D. R. (1984). Characterizing the influence of past experience on recreation behavior. *Journal of Leisure Research, 16,* 34-50.

Scott, D., & Godbey, G. C. (1992). An analysis of adult play groups: Social versus serious participation in contract bridge. *Leisure Sciences, 14,* 47-67.

Shelby, B., & Heberlein, T. A. (1986). *Carrying capacity in recreation settings.* Corvallis, OR: Oregon State University Press.

Shelby, B., Heberlein, T. A., Vaske, J. J., & Alfano, G. (1983). Expectations, preferences, and feeling crowded in recreation activities. *Leisure Sciences, 6,* 1-14.

Shelby, B., Vaske, J. J., & Heberlein, T. A. (1989). Comparative analysis of crowding in multiple locations: Results from fifteen years of research. *Leisure Sciences, 11,* 269-291.

Sherif, M., & Cantril, H. (1947). *The psychology of ego-involvements: Social attitudes and identifications.* New York: Wiley.

Sherif, M., & Hovland, C. I. (1953). Judgmental phenomena and scales of attitude measurement: Place of items with individual choice of number of categories. *Journal of Abnormal and Social Psychology, 48,* 135-141.

Sherif, M., & Sherif, C. W. (1967). Attitude as the individual's own categories: The social judgment-involvement approach to attitude and attitude change. In C. W. Sherif & M. Sherif (Eds.), *Attitude, ego-involvement and change* (pp. 105-139). New York: Wiley.

Steiger, J. H., & Lind, J. C. (1980, June). *Statistically based tests for the number of common factors.* Paper presented at the Psychometric Society Annual Meeting, Iowa City, IA.

Stokols, D. (1972). A social-psychological model of human crowding phenomena. *Journal of the American Institute of Planners, 38,* 72-83.

Stokols, D., & Shumaker, S. A. (1981). People in places: A transactional view of settings. In J. Harvey (Ed.), *Cognition, social behavior, and the environment* (pp. 441-488). Hillsdale, NJ: Prentice-Hall.

Tuan, Y. F. (1974). *Topophilia: A study of environmental perception.* Englewood Cliffs, NJ: Prentice-Hall.

Vaske, J. J., Donnelly, M. P., & Heberlein, T. A. (1980). Perceptions of crowding and resource quality by early and more recent visitors. *Leisure Sciences, 3,* 367-381.

Vaske, J. J., & Kobrin, K. C. (2001). Place attachment and environmentally responsible behavior. *The Journal of Environmental Education, 32*(4), 16-21.

Watson, A. E., Roggenbuck, J. W., & Williams, D. R. (1991). The influence of past experience on wilderness choice. *Journal of Leisure Research, 23,* 2-36.

Webb, W. M., & Worchel, S. (1993). Prior experience and expectation in the context of crowding. *Journal of Personality and Social Psychology, 65,* 512-521.

West, P. (1982). Effects of user behavior on the perception of crowding in backcountry forest recreation. *Forest Science, 28,* 95-105.

Wickham, T. D., & Kerstetter, D. L. (2000). The relationship between place attachment and crowding in an event setting. *Event Management, 6,* 167-174.

Williams, D. R., Anderson, B. S., McDonald, C. D., & Patterson, M. E. (1995). Measuring place attachment: More preliminary results. In V. Freysinger & P. Stokowski (Eds.), *Abstracts—1995 Leisure Research Symposium* (p. 78). Arlington, VA: National Recreation and Park Association.

Williams, D. R., Patterson, M. E., Roggenbuck, J. W., & Watson, A. E. (1992). Beyond the commodity metaphor: Examining emotional and symbolic attachment to place. *Leisure Sciences, 14,* 29-46.

Williams, D. R. & Roggenbuck, J. W. (1989). Measuring place attachment: Some preliminary results. In L. H. McAvoy & D. Howard (Eds.), *Abstracts—1989 Leisure Research Symposium* (p. 32). Arlington, VA: National Recreation and Park Association.

Williams, D. R., Schreyer, R., & Knopf, R. C. (1990). The effect of the experience use history on the multidimensional structure of motivations to participate in leisure activities. *Journal of Leisure Research, 22,* 36-54.

Williams, D. R., & Vaske, J. J. (2003). The measurement of place attachment: Validity and generalizability of a psychometric approach. *Forest Science, 49,* 830-840.

Young, J. M., Williams, D. R., & Roggenbuck, J. W. (1990). The role of involvement in identifying users' preferences for social standards in the Cohutta Wilderness. In D. Hope (Ed.), *Proceedings of the Southeastern Recreation Research Conference* (GTR SE-067; Vol. 12; pp. 173-183). Asheville, NC: USDA Forest Service.

APPENDIX A
Trail Sub-Sections and Descriptions

Segment Name	Boundaries	Miles	Sub-Sections	Use Pattern
Deep South				
Georgia	Springer Mountain to Bly Gap	75		Heavy spring use Moderate at Springer Mountain
NC-Nantahala NF	Bly Gap to Fontana Dam	86		
Smoky Mountains	Fontana Dam to Davenport Gap	70		Heavy use throughout park
North of Smokys—Pisgah/Cherokee NF	Davenport Gap to Virginia border	215		
Southwest Virginia				
Mount Rogers	Damascus, VA to Mt Rogers NRH HQ	64	Mt Rogers (63.8 miles)	Heavy
Outing Club of Va.	VA Route 16 to VA Route 620 Trout Creek Tech	157.5	Garden Mtn. (9 miles)	Chestnut Knob & Chestnut Ridge—Moderate
			N. of Garden Mtn. (8 miles)	
			Kimberling Ck. (9 miles)	
			N. of Kimberling (34 miles)	
			Peters Mtn. (19 miles)	Light
			N. of Peters Mtn (45 miles)	
Catawba	VA 620 to US 220 Daleville	32.5		Heavy
Blue Ridge Parkway	US 220 to HWY 64 Rockfish Gap	130.6	N. to 501 (James River) (55 miles) and Hwy 64 (Rockfish Gap) (74 miles)	Moderate/Heavy
Mid-Atlantic				
Shenandoah	Rockfish Gap to Harper's Ferry	161	S. Shenandoah (80 miles) N. Shenandoah/N. Virginia (81 miles)	Moderate/Heavy
Maryland		40		Moderate

APPENDIX A
(Continued)

Segment Name	Boundaries	Miles	Sub-Sections	Use Pattern
Pennsylvania		227	PA/Michaux (38 miles)	Moderate
			Cumberland (62 miles)	Moderate
			N. Cumberland (86 miles)	Light
			Lehigh (41 miles)	Moderate
New Jersey		74		Heavy
New York		88		
New England				
Connecticut	To Jug End Rd. & 20 miles into Massachusetts	63		
Massachusetts	From Jug End Rd to state line	78		
Vermont		103	LT/AT (Mass. Border) to Sherburne Pass	Moderate
		43	Sherburne to Rt 12	Low
NH—South	Pre-White Mtn	53		
NH—White Mountains	Moosilauke to Androscogin River	95		Heavy
NH–Mahoosics	Adroscogin River to Grafton Notch	31		
Western Maine	To Monson	149		Light
100 mile wilderness		102		Light
Baxter State Park		15		Moderate/Heavy