
Articles

Evaluating the Construct Validity of Sense of Belonging as a Measure of Landscape Perception

Christopher D. Jones

Department of Leisure Studies, Eastern Kentucky University

Michael E. Patterson

School of Forestry, University of Montana

William E. Hammitt

Department of Parks, Recreation, and Tourism Management and Department of
Forestry, Clemson University

The construct validity of measures of sense of belonging to a recreational landscape is examined. The evaluation of construct validity emphasizes two concerns: (1) the empirical relationship between measures of two theoretically distinct concepts (belonging and visual preference); (2) the empirical relationship between measures of these concepts and theoretically relevant visitor characteristics. Visitor responses to photo-based measures of belonging and visual preference, as well as a verbal measure of belonging, were obtained during on-site interviews at Cumberland Gap National Historic Park, Tennessee. The results suggested that the photo-based measures of visual preference and belonging were highly correlated, but the verbal measure of belonging was not highly correlated with either photo-based measure. Thus, although the convergent validity of the belonging measures was not supported, the results did support the discriminant validity of the verbal measure of belonging. In addition, concurrent validity was supported by the finding that visitor characteristics that were conceptually linked to belonging were related to measures of belonging. Overall, the majority of results supported the construct validity of a verbal measure of belonging. However, unexpected differences between the verbal and photo-based measures suggest several interpretations related to construct validity that focus on the spatial representation of belonging measures and the social context of the landscape.

KEYWORDS: *Construct validity, landscape perception, sense of belonging, visual preference*

The study was the basis of a master's thesis for the first author. Support for the study was provided in part by a grant from the National Park Service. The authors would like to thank Ying-Hung Li, Graduate Research Assistant at Clemson University for assisting with data collection and as a resource for literature during this study.

Correspondence concerning this article should be addressed to Christopher D. Jones, Department of Leisure Studies, Eastern Kentucky University, Richmond, KY 40475, email: jonesch@uvsc.edu.

Introduction

The importance of landscape perception is evidenced by the emergence of new techniques to manage and assess the quality of recreational landscapes (Williams et al., 1992). The need to assess landscape quality is often in response to the number of encroaching land uses that conflict with the mission of recreational agencies such as the National Park Service whose mandate is to conserve the scenery and natural and cultural resources. Strategies to assess landscape quality within the landscape perception literature include two complementary perspectives for describing one's relationship to landscapes. The first perspective adopts a scenic or visual preference framework (McAndrew, 1993) with preference defined as the degree to which an individual likes the specific scene or scenery being viewed (Kaplan, 1987). The second perspective emphasizes affective bonds to landscapes (Kerr, 1995; Tuan, 1971) and assumes that these bonds are acquired through significant social experiences. Thus, the assumptions of this perspective are in contrast to the predominant, traditional visual preference approaches (i.e., Kaplan & Kaplan, 1982, 1989; Zube et al., 1982) that focus on preference related to landscape elements.

Within natural resource management, researchers studying landscape perception have concentrated primarily on visual preference or aesthetic response in evaluating visual resources in wildland areas. Recently, however, the perspective focused on affective bonding has gained more attention. It is grounded in a different conceptual foundation that recognizes that landscapes are not perceived solely on the basis of their visual appearance. This perspective assumes that strong emotional and symbolic ties to the landscape, which influence landscape perceptions, are often assigned to specific wildland settings. Because researchers and planners recognize that the visual scenery alone does not fully represent the context in which landscapes are perceived, they are beginning to consider the issue of emotional bonds in evaluating and managing landscape quality. For example, the Forest Service has tried to incorporate these considerations into its newly developed Scenery Management System (Kerr, 1995) while Schroeder (1996) discusses incorporating this perspective in Forest Service planning in the Black River Opportunity Area.

Currently, because of the ongoing development of the affective bonding perspective of landscape perception, techniques for measuring affective bonds to landscapes are grounded in a mid-range theoretical tradition. In contrast, the visual preference framework has been extensively developed and evaluated. Previous empirical studies have yet to distinguish between constructs that are grounded in the visual preference framework and affective bonding perspective. The purpose of this paper is to explore the construct validity of an attempt to measure landscape perception from the perspective of affective bonding, focusing specifically on "sense of belonging." This discussion of construct validity will focus on whether a measure of belonging is empirically distinct from a measure of visual preference.

Visual Preference

The predominant approaches for evaluating visual preference in natural resource management are the psychological and psychophysical. Research concerning both approaches implies that people have a predetermined capacity to prefer certain types of landscapes (e.g., preference is mechanistically tied to psychophysiological impulses of individuals).

The psychological perspective as outlined by Kaplan and Kaplan (1989) maintains that preference for landscapes can be understood in relation to an evolutionarily determined capacity to evaluate and organize visual information (Kaplan, 1973; Kaplan, 1987). They found that the organization within the landscape mediates between the visible informational properties of a scene and the visual response. Specific organizational properties found to influence visual preference in their research include coherence, complexity, legibility, and mystery (Kaplan & Kaplan, 1982).

The psychophysical approach has strongly influenced research and management techniques concerning visual preference. Although the psychological perspective focuses specifically on the theoretical development of visual preference, the psychophysical approach is primarily descriptive and is not directly tied to an evolutionary explanation for preference. The psychophysical approach seeks to quantify relationships between the physical content of settings and visual responses by analyzing the mathematical relationship between quantified values of specific setting stimuli and visual preference (Daniel & Vining, 1983). The empirical findings from this approach support the assumption of a direct stimulus/response pattern underlying visual preference (Zube et al., 1982). Studies have supported this assumption by identifying some natural features (waterfalls, ridgeline, etc...) that tend to elicit an aesthetic response in individuals (McAndrew, 1993).

An Affective Bonding Approach to Landscape Perception

Some researchers of landscape perception are beginning to consider the perspective focused on affective bonding to landscapes (Williams et al., 1992; Fishwick & Vining, 1992). A number of studies suggest that affective bonds are developed through significant social experiences (Kaltenborn, 1997; Chenoweth, 1991; Tuan, 1974). For example, an assessment of affective bonds to a regional landscape such as the Southern Appalachian mountains may reveal bonds that are acquired from social experiences of families who have hiked and fished together in the Great Smoky Mountains throughout a lifetime. Thus, this perspective moves beyond a pure description of visual preference to examine the emotional significance of landscapes.

The importance of considering the affective bonding perspective is recognized between how non-native visitors versus native visitors perceive landscapes. Chenoweth (1991) discusses that both types of visitors hold a shared emotional significance for the landscape as a result of normative social processes (e.g., awareness of the current public concern for environmental quality). Yet, Bourassa (1991, p. 3) argues that the non-native visitor's perspective

is that of "a detached outsider" who holds less regard for the emotional significance of a landscape, and more for the pleasurable content and appearance. While some argue that the outsider views the landscape with "clarity unavailable to the long-term resident" (Daniel, 1995, p. 36), Kerr (1995) maintains that the view of a native is more complex and suggests that this complexity be considered in Forest Service evaluations of landscape perception. This insider/outsider dichotomy reflects a type of landscape perception that focuses on the affective bonding developed through past experience within a landscape (Relph, 1976; Tuan, 1971).

Sense of Belonging

The concept of sense of belonging is one of a number of similar concepts adopted by researchers to examine affective bonds to landscapes. The concept of belonging can be defined as the sense of feeling at home and/or having a close relationship and affinity for a place (Seamon, 1979). In other words, belonging concerns the overall affective bond that is constructed through significant experiences that occur in landscapes. The concept of belonging has also been described by Norberg-Shulz (1979) who focused on the meaning and significance of architecture. Norberg-Shulz describes the concept of belonging as one of several dimensions that influence the relationship between individuals and their environment. He suggests that meaning of place is structured through concepts of landscape, settlement, space, and character. This person-structure relationship induces feelings of belonging as well as familiarity and identity with a particular place.

Although conceptually similar to belonging, a number of related concepts such as sense of place, place attachment, rootedness, and others have been previously discussed as representing affective bonds to landscapes and should, therefore, be distinguished from belonging. Some researchers state that the concept of sense of place is based on the notion that space becomes place through attaching significance to specific geographic locations and involves a certain distance between self and place. (Williams, 1993; Tuan, 1980). The concept of place attachment has often been described as involving feelings of security associated with a specific attribute or geographic location (McAndrew, 1993). Furthermore, Tuan (1980) suggests that rootedness involves a long habitation at one locality. Although conceptual differences appear subtle within the literature, the concepts of sense of place, place attachment, and rootedness are often discussed in reference to the specific geographic location of the affective bond, while belonging refers more to the boundaries of the bond within the individual. For example, while one may feel place attachment or rootedness within a specific town in which one grew up, one may feel a sense of belonging to any town that looks and feels like home many miles away.

Despite the aforementioned differences, the above concepts are described as sharing a feeling of "at-homeness." Seamon (1979) suggests that the feeling of "at-homeness" is marked by a sense of possession and control,

self renewal, at-easeness and freedom to be, and an atmosphere of friendliness and closeness. Tuan (1980) defines rootedness as feeling at home in an unself-conscious way while Williams (1993) states that sense of place may refer to the specific geographic locale of one's home, neighborhood, or town. Furthermore, place attachment has been defined as a positive affective association between individuals and their residential environments (Williams et al., 1992). Thus, according to the common attribute of at-homeness among place meaning constructs, an understanding of a belonging to landscapes that resemble the "home" environment may be a central issue in the evaluation of affective bonding.

Assessing Construct Validity of Measures

Measures of visual preference are well established and widely accepted (Daniel & Vining, 1983). In contrast, while other affective bonding concepts have been operationalized (e.g., place attachment), there are currently no established measures of belonging. It should be noted that this study refers to the visual preference and affective bonding perspectives as they have been defined within the preponderance of the peer-reviewed literature (see previous sections). However, the assumptions of these perspectives are controversial and the comparison of these frameworks is not the purpose of this study. The purpose of the present study is to assess whether a measure of belonging is empirically distinct from a measure of visual preference.

The measure of belonging is evaluated using an approach of construct validity as described in Churchill's (1979) validity procedure. Churchill states that to evaluate the validity of constructs such as belonging, three different types of validity concepts should be considered including discriminant, convergent, and concurrent validity. This study evaluates three hypotheses based upon each of the three concepts of validity discussed below.

The first two hypotheses are concerned with two types of empirical relationships between the operational measures of belonging and visual preference. First, convergent validity should be analyzed to determine if the measure correlates highly with other measures designed to evaluate the same construct. Thus, the first hypothesis (H_1) in the present study predicts that two operational measures of belonging will be correlated (e.g., a photo-based measure and a verbal measure). Second, Churchill (1979) states that discriminant validity should be analyzed to determine the extent to which the measure is unique and not a replication of some other variable (e.g., visual preference). Thus, the second hypothesis (H_2) predicts that a (photo-based and verbal) measure of belonging will not be correlated with a (photo-based) measure of visual preference.

The next type of relationship of concern focuses on construct validity by examining the issue of concurrent validity. Trochim (1999) discusses concurrent validity as one of a number of concepts to assess construct validity and defines it as the ability of a measure to discriminate between groups according to theoretical expectations. Consistent with this approach, Chur-

chill's (1979) construct validity procedure states that it is important to assess whether the scale score can differentiate the positions of known groups. A number of studies and conceptual discussions identify groups that are related to affective bonds to landscapes. Schreyer, Lime, and Williams (1984) discuss how previous participation is related to the process of perception with the concept of experience use history (EUH). Affective bonds to specific wildland areas have been found to be stronger among groups with higher levels of EUH (Williams et al., 1992). Furthermore, as previously discussed, belonging may be experienced in landscapes that resemble a person's "home" environment. Based upon these distinctions within the affective bonding perspective, three mediating variables, EUH, locality, and region of residence (see Analyses section) were chosen to represent visitor characteristics related to past experience within a "home" environment. Thus, in order to assess concurrent validity, the third hypothesis (H_3) predicts that respondents, who have more experience use history and reside in closer proximity or within landscapes similar to the study site, should express a stronger sense of belonging.

Methods

Sampling

The study site was the Pinnacle Overlook in Cumberland Gap National Historic Park (CGNHP) in Tennessee, which receives more than 100,000 visitors per year and provides panoramic views of the Cumberland Gap and Fern Lake areas, surrounding mountains, and historical towns. This overlook was an appropriate site to evaluate both belonging and visual preference as there is a diversity of scenery representative of natural, historical, and rural town environments. Visitors were approached after viewing the scenery and asked to participate in the study. Approximately fifty respondents over the age of 15 were surveyed from 10:00AM to 4:00PM on each of four days (one per group every 15 minutes). These days were selected on consecutive weekends in the Fall of 1994. The total sample size was 210 visitors.

A questionnaire was administered that asked visitors to rate 15 photographs of scenic landscapes that were taken a week before sampling began from the overlook using a 55mm lens. Sampling schedules were selected to ensure that the foliage was similar to images in the photographs. These photos contained the surrounding scenery in a panoramic fashion rather than images of the overlook itself. The photographs were rated by respondents for the degree of visual preference and the degree of belonging. The operational measure of visual preference asked visitors to rate each scene as to how much they liked it using a 5-point Likert-type scale (1 = not at all to 5 = very much). Belonging was defined as the extent to which they feel a sense of "belonging to" or "being at home in" the type of landscape scene shown in each photograph (e.g., a distant mountain lake or town). The operational measure of belonging asked visitors to rate each scene as to how much they felt "a sense of belonging to the landscape." The response was

also recorded using a 1 to 5 Likert-type scale (1 = I feel like an outsider to this landscape scene to 5 = I feel a sense of belonging to this landscape scene).

Respondents were also asked to rate 10 verbal statements concerning belonging to the scenery viewed from the overlook. Items representing the verbal measure included statements such as "I feel at home in this landscape" or "I feel I belong in these scenes." The concept of belonging was evaluated with these 10 verbal items by asking individuals to respond according to the extent to which each statement describes their general feelings about the scenery/views they saw from the overlook that day (1 = strongly disagree to 5 = strongly agree). Following the rating of this verbal scale, other questions were asked concerning past use history and general demographic information.

Analyses

Churchill's (1979) validity procedure emphasizes the importance of multi-item measures and includes factor analysis and reliability analysis among a series of techniques for purifying multi-item measures. He states that measurement difficulties can be overcome by combining items and thus allow for finer distinctions among respondents. Furthermore, Hammitt (1988) has identified certain dominant themes within landscape scenes (e.g., mountain lakes) which tend to consistently influence landscape perception responses. Thus, in the present study multi-items (photo-based visual preference and belonging) for scenes were determined with factor analysis. Consistent with Churchill's procedure, this procedure was selected to purify the measures by reducing the data in an attempt to remove the uniqueness of photos (i.e., naturalness, ruralness, roaded, etc.). In other words, this study was ideally concerned with validity comparisons that were exclusive of influences of unique landscape content between photos.

Two factor analyses performed for the two photo-based measures of visual preference and belonging were used to define the dimensions that are the basis for subsequent analyses. Visitors rated 15 photos for visual preference and belonging. Principal components factor analysis was used to determine the specific stimuli (photos) used for subsequent analysis. An extraction of factors was determined by eigenvalues ≥ 1 . Varimax Rotation was used to generate the final matrix. Photos were assigned to a specific factor if they displayed a factor loading ≥ 0.40 .

Additionally, the verbal measure of belonging was tested for internal consistency by conducting a reliability analysis and a factor analysis. Factor analysis of items representing the verbal measure of belonging revealed no distinct factors among the ten items. Furthermore, the reliability analysis revealed an alpha of 0.87 suggesting that each of the original ten items should be retained for purposes of subsequent analyses.

The first two hypotheses concerning the construct validity of belonging were addressed by examining correlations among operational measures. In

assessing construct validity for belonging, discriminant validity was evaluated by examining the correlations between the visual preference measure and the two measures of belonging. Convergent validity was evaluated by examining the correlation between the photo-based and verbal measures of belonging. The appropriateness of correlating subjects' ratings of the photo-based measures (a set of scenes) to the verbal measure (global ratings of the view containing those scenes) has been addressed to some degree by Ward and Russell (1981) who suggest that environmental meaning should be examined by considering comparisons of ratings among a variety of scaling methods including verbal and photo-based Likert-type scales.

The second hypothesis concerning the relationship between belonging and visitor characteristics was addressed with a series of ANOVAs. A one-way analysis of variance was performed in each case to determine if there were any significant differences in belonging/visual preference among three respondent attributes. These three respondent attributes consisted of past experience with visiting the overlook, proximity of residence to the overlook (locality), and region of residence (by state) and represented the independent measures while the three measures of landscape perception represented the dependent measures. Results of correlations, ANOVA, and Fisher's LSD were interpreted to be significant at the $p < 0.05$ level.

EUH at Cumberland Gap was defined on the basis of three different measures. The use of multiple measures to define EUH was based on the procedure used by Schreyer et al. (1984), which states that it is important to consider the frequency and duration of participation to evaluate EUH. The measure of EUH in this study consisted of questions that asked, "Was this your first visit to Cumberland Gap National Historical Park?", "How many times per year do you typically visit the Pinnacle Overlook," and "How many total visits have you made to the Pinnacle Overlook in the past three years?"

Four categories of EUH were defined as the following: first time visitors, novices (one or two visits to the overlook), some history (>2 total visits but who did not visit on a regular basis/ <2 visits per year), and regular visitors (≥ 2 total visits per year). Three categories of locality were defined according to the number of miles traveled from home: local (<50), intermediate (50-200), and nonlocal (>200). Categories for region of residence were defined as regional and nonregional. Regional was defined as TN and KY regions within 200 miles of the CGNHP based on the assumption that these regions of residence have landscape types similar to those found in the region of the Cumberland Gap.

Results

Factor Analysis

Two factor analyses revealed the same four factors of photos for the measure of visual preference and the measure of belonging. Visual inspection of the photo contents within each factor suggests that each of these four factors were distinguished by a common theme for both measures. Factor 1

consisted of five photos that shared a common theme of rural town scenes (including small buildings and a highway interchange) and the lowest factor mean [derived by averaging the five photo ratings (visual preference: $M = 2.93$, $\alpha = 0.82$; belonging: $M = 2.91$, $\alpha = 0.82$). Factor 2 was defined as winter photos (brown in color with no leaves) and ranked as the third highest mean for both measures (visual preference: $M = 3.50$, $\alpha = 0.89$; belonging: $M = 3.43$, $\alpha = 0.90$). Predominantly natural photos with some evidence of development (e.g., towns and roads in the far distance) were grouped in Factor 3 and ranked as the second highest mean (visual preference: $M = 4.10$, $\alpha = 0.74$; belonging: $M = 3.91$, $\alpha = 0.77$). Factor 4 consisted of highly natural photos with no evidence of urban development and a mountain lake. These photos generated the highest factor mean (visual preference: $M = 4.20$, $\alpha = 0.63$; belonging: $M = 4.01$, $\alpha = 0.71$). Subsequent analyses that included the photo-based measures (correlations and ANOVAs) were based on scores for each subject within each of the four dimensions of visual preference and belonging. This procedure was consistent with a procedure adopted by Balling and Falk (1982) and Hammitt (1988) who found that landscape themes may influence the subjects' perceptual responses. Furthermore, this procedure allowed for a clearer focus on the question of construct validity according to Churchill's (1979) procedure of purifying measures by attempting to compare validity between measures on similar themes of photo content.

Correlations

H_1 concerned the convergent validity of the two operational measures of belonging. This hypothesis was addressed by examining the correlations between each of the four photo-based dimensions of belonging and the verbal measure of belonging. These four correlations (0.16, 0.24, 0.51, and 0.44, respectively) did not support H_1 and are lower than the correlations between the two photo-based measures for each of the four dimensions.

H_2 concerned discriminant validity and the correlation between measures of visual preference and belonging. The correlations between these measures revealed conflicting findings. Correlations between the photo-based measures of visual preference and belonging did not support H_2 or the discriminant validity of belonging. Correlations between the photo-based measure of visual preference and belonging revealed moderate to high correlations between measures for each of the four photo-based dimensions (0.86, 0.87, 0.82, 0.63, respectively). In contrast, and in support of H_2 and the discriminant validity of belonging, correlations between each of the four photo-based dimensions of visual preference and the verbal measure of belonging revealed low correlations (0.19, 0.16, 0.39, 0.63, respectively).

Visitor Characteristics Related to Landscape Perception

Experience use history. H_3 stated that the three visitor characteristics should be related to measures of belonging. ANOVA results suggested that there was no significant relationship between EUH and each of the four

photo-based dimensions of belonging, thus, indicating less support for H_3 . However, in support of H_3 , when evaluating EUH for the verbal measure of belonging the results of ANOVA suggested that there were significant differences [$F(3, 184) = 6.832, p = 0.000$] between categories of EUH. Visitors with some history of visiting ($M = 4.66$) or a regular history of visiting ($M = 4.34$) had a greater belonging to the Pinnacle Overlook as a whole than both the first time visitors ($M = 4.08$) and novices ($M = 3.99$). Additional consistency with H_3 was indicated by ANOVA results which revealed no significant relationship between EUH and each of the four dimensions of visual preference.

Locality. In support of H_3 , an ANOVA performed for the Rural Town dimension revealed that local visitors ($M = 3.17$) expressed a stronger belonging to rural town scenes than did intermediate ($M = 2.76$) and nonlocal ($M = 2.84$) visitors [$F(2, 201) = 3.337, p = 0.038$]. However, the ANOVA results revealed no significant differences between locality and the remaining three photo-based dimensions of belonging. Additionally, a lack of differences between the categories of locality for the verbal measure of belonging did not support H_3 . When evaluating the relationship between locality and visual preference, an ANOVA revealed no significant difference for three of the four photo-based dimensions. In contrast, similar to the extent of belonging expressed by locals for the rural town scenes, local visitors ($M = 3.21$) responded with a greater visual preference for rural town scenes than did intermediate ($M = 2.84$) and nonlocal ($M = 2.81$) visitors [$F(2, 203) = 3.910, p = 0.022$].

Region of residence. ANOVA results suggested that the photo-based measure of belonging was not significantly related to region of residence for each of the four photo-based measures indicating less support for H_3 . However, ANOVA results related to the verbal measure of belonging supported H_3 revealing significant differences between the two groups for region of residence [$F(1, 167) = 4.697, p = 0.032$]. The mean rating for the verbal measure of belonging for regional residents ($M = 4.25$) was found to be significantly higher than for nonregional residents ($M = 4.04$). Finally, H_3 was again supported by ANOVA results that revealed a lack of a significant relationship between region of residence and the four photo-based dimensions of visual preference.

Discussion

The evaluation of construct validity in this study has been concerned with whether the measures of belonging represent the construct. According to Churchill's (1979) validity procedure, several patterns within the data supported the construct validity of belonging measures. The low correlations between the verbal measure of belonging and three of the four dimensions of visual preference supported the discriminant validity of the verbal measure. Furthermore, the concurrent validity of belonging measures was supported by two of three expected relationships between the verbal measure of belonging and visitor characteristics as well as the relationship between

locality and the Rural Town dimension of belonging. Thus, while the pattern of results supported the discriminant and concurrent validity of the verbal measure, results were less supportive of the discriminant and concurrent validity of the photo-based measure of belonging.

To explain these differences in validity among the verbal and photo-based measures, several unexpected patterns of results are interpreted. The high correlation and the common relationship with locality for the Rural Town dimension suggest that the photo-based belonging and visual preference measures may have been representing similar types of perceptual responses. Furthermore, with the exception of the Highly Natural dimension, low correlations between the verbal and photo-based measures and different relationships with visitor characteristics suggest that the verbal measure of belonging represents a fundamentally different response to the Cumberland Gap landscape. To further analyze this difference, a series of paired t-tests was conducted which revealed that verbal ratings of belonging were significantly higher than ratings of belonging and visual preference for each of the fifteen photos. This pattern of results is consistent with a study conducted by Brown et al. (1988) which revealed that direct verbal ratings of an entire campground scene were higher than ratings for any photos representing the scene. The researchers explain that the emotional significance represented by the temporary "home" shared with family and friends may have elevated the direct response relative to the responses to individual panoramic photos which often contained the surrounding vegetation. Thus, it may be interpreted that Cumberland Gap visitors expressed a stronger belonging to the Pinnacle Overlook area than to individual scenes because the respondent's may have felt more at "home" in the larger Pinnacle Overlook area than to any individual overlook scene.

A final interpretation concerns the social context of a national historical park. Hull & Stewart (1992) report that the context in which subjects' responses are elicited is important because responses (i.e., emotional bonds and scenic beauty evaluations) are conditional on the physical, social, and cultural contexts in which they occur. The finding that visitors who expressed a stronger belonging to the Cumberland Gap landscape also preferred the highly natural scenes suggests the possibility that both measures of landscape perception were influenced by a socially-driven environmental orientation. This orientation may have been related to the social context of the National Park Service (NPS) which directs people's gaze at scenery in specific ways (Chenoweth, 1991). For example, NPS interpreters educate the public according to the agency's mandate to conserve the scenery and natural and cultural resources. Thus, to further assess the empirical distinctions between belonging and visual preference, future research should attempt to identify specific types of social influences and subsequent environmental orientations related to each construct.

References

- Balling, J., & Falk, J. (1982). Development of visual preference for natural environments. *Environment and Behavior*, 14, 5-28.

- Bourassa, S. (1991). *In the aesthetics of landscape*. London: Belhaven Press.
- Brown, T., Daniel, T., Richards, M., & King, D. (1988). Recreation participation and the validity of photo-based preference judgments. *Journal of Leisure Research*, 20(4), 40-60.
- Chenoweth, R. (1991). What is beauty worth in a forest landscape? *Forum for Applied Research and Public Policy*, 6(3), 13-17.
- Churchill, G. (1979). A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research*, 16, 64-73.
- Daniel, J. (1995). A word in favor of rootlessness. *Orion*, 14(4), 34-37.
- Daniel, T., & Vining, J. (1983). Methodological issues in the assessment of landscape quality. In I. Altman and J. Wohlwill (Eds.), *Behavior and the Natural Environment*, (pp. 39-84). New York: Plenum Press.
- Fishwick, L., & Vining, J. (1992). Toward a phenomenology of place. *Journal of Environmental Psychology*, 12, 57-63.
- Hammitt, W. (1988). Visual and management preferences of sightseers. In Noe, F. & Hammitt, W. (Eds.), *Visual preferences of travelers along the Blue Ridge Parkway. National Park Service Scientific Monograph Series*. Washington, D.C.: U.S. Government Printing Office.
- Hull, R., & Stewart, B. (1992). Validity of photo-based scenic beauty judgments. *Journal of Environmental Psychology*, 12, 101-114.
- Kaltenborn, B. (1997). Nature of place attachment: A study among recreation homeowners in Southern Norway. *Leisure Sciences*, 19, 175-189.
- Kaplan, S. (1973). Cognitive maps in perception and thought. In R. Downs and D. Stea (Eds.), *Image and Environment*. (pp. 63-78). Chicago, IL: Aldine Publishing.
- Kaplan, S. (1987). Aesthetics, affect, and cognition: environmental preference from an evolutionary perspective. *Environment and Behavior*, 19, 3-32.
- Kaplan, S., & Kaplan, R. (1982). *Cognition and environment: Functioning in an uncertain world*. New York: Praeger.
- Kaplan, R., & Kaplan, S. (1989). *The experience of nature*. Cambridge University Press.
- Kerr, W. (1995). *Scenery management in ecosystem management*. Unpublished manuscript NR-602, Mid-Atlantic Course, Forest Service.
- McAndrew, F. (1993). *Environmental psychology*. Pacific Grove, California: Brooks/Cole.
- Norberg-Shulz, C. (1979). *Genius loci: Towards a phenomenology of architecture*. New York: Rizzoli.
- Relph, E. (1976). *Place and placelessness*. London: Pion Ltd.
- Seamon, D. (1979). *A geography of the life-world*. London: Crook and Helm.
- Schreyer, R., Lime, D., & Williams, D. (1984). Characterizing the influence of past experience on recreation behavior. *Journal of Leisure Research*, 16(1), 35-51.
- Schroeder, H. W. (1996). *Voices from Michigan's Black River: obtaining information on "special places" for natural resource planning*. (General Technical Report NC-184). North Central Forest Experiment Station, St. Paul, MN: Forest Service.
- Trochim, W. (1999). *The Research Methods Knowledge Base*. Ithaca, New York: Cornell Custom Publishing, Cornell University.
- Tuan, Y. (1971). Study of human nature. *Canadian Geographer*, 15, 181-192.
- Tuan, Y. (1974). *Topophilia: A study of environmental perception, attitudes, and values*. Englewood Cliffs, NJ: Prentice-Hall.
- Tuan, Y. (1980). Rootedness versus sense of place. *Landscape* 24(1), 3-8.
- Ward, L. M., & Russell, J. A. (1981). The psychological representation of molar physical environments. *Journal of Experimental Psychology: General*, 110(2), 121-152.
- Williams, D. (1993). Forest recreation demand and opportunities. *Silviculture in the Appalachian Mountains Workshop Notes*. Blacksburg: Virginia Cooperative Extension Service.

-
- Williams, D., Roggenbuck, J., Patterson, M., & Watson, A. (1992). Beyond the commodity metaphor: examining emotional and symbolic attachment to place. *Leisure Sciences, 14*, 29-46.
- Zube, E. H., Sell, J. L., & Taylor, J. G. (1982). Landscape perception: research application and theory. *Landscape Planning, 9*, 1-33.