

## Predictive Linkages between Recreation Specialization and Place Attachment

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### Abstract

The theory of recreation specialization indicates that as recreationists become more specialized into a recreation activity, they become more dependent on particular resources along a continuum of specialization. Previous empirical studies examining bivariate relationships have not provided a comprehensive understanding of the predictive linkages between recreation specialization and place attachment. This paper employed three sub-dimensions of recreation specialization to investigate the hypothesized connections to place attachment and examined the intermediate effects of experience preferences and consumptive orientation. Results provided empirical evidence that recreation specialization was associated with place attachment and other intervening variables also influenced the effects of recreation specialization on place attachment. Recreation specialization and the other accrued concepts when taken together provided substantial insights to predicting place attachment.

*KEYWORDS: Recreation specialization, experience preferences, consumptive orientation, place attachment, recreational fishing*

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Acknowledgment: We thank Yung-Ping Tseng, Nathan R. Wolber, and Robert B. Ditton for data collection and two anonymous reviewers and the associate editor for valuable review comments.

## Introduction

To understand recreationists' within-group differences in a recreation activity, recreation specialization has provided a well-developed conceptual framework and empirical support (e.g., Chipman & Helfrich, 1988; McFarlane, 2004). It is known that recreationists are not a homogeneous group, and subgroups vary in terms of behavior, experience, skill, and the importance of an activity (Bryan, 1977; Ditton, Loomis, & Choi, 1992). Strong relationships have been found between recreation specialization and various dependent variables such as recreationists' attitudes toward and preferences for particular recreation settings and environments (McIntyre & Pigram, 1992; Virden & Schreyer, 1988).

Because the process of recreationists' attachment to a specific place can be better understood using associated behavioral and affective elements, recreation specialization can serve as a useful framework for understanding how recreationists perceive, prefer, and choose a specific recreation setting (Bricker & Kerstetter, 2000). It is known that recreation specialization is closely associated with experience preferences and consumptive orientation (e.g., Oh & Ditton, 2008). The fundamental logic placed on a relationship between recreation specialization and place attachment is summarized as follows: as level of specialization increases, the importance of non-activity specific experience preferences (i.e., general motivations of a recreation activity) increases and that of consumptive orientation diminishes (Ditton et al., 1992; Salz, Loomis, & Finn, 2001). Further, because highly specialized recreationists tend to have a higher resource dependency than their counterparts, they are likely to show greater appreciation of and support for particular resource places and settings.

Previous empirical studies have examined a relationship between various behavioral or psychological constructs similar to recreation specialization and place attachment (e.g., Hammitt, Backlund, & Bixler, 2006; Kyle, Bricker, Graefe, & Wickham, 2004; Moore & Graefe, 1994). Those studies generally showed a positive association with attachment to a specific setting but study methods that tested the bivariate relationships did not provide a holistic picture of the interconnected linkages between recreation specialization and place attachment. While other intermediate concepts and variables are inevitably excluded in those bivariate analyses, a multivariate model is advantageous in that those variables associated with recreation specialization can be also incorporated in a conceptual framework.

By integrating recreation specialization and place attachment with interconnected and associated concepts, this paper aims to provide a more comprehensive framework to determine whether recreation specialization is an important explanatory factor that contributes to predicting an attachment to recreation sites or places in the context of recreational fishing. In other words, we intend to understand the fostering process of place attachment using recreation specialization as a predictive variable, and by testing the direct and indirect predictive relationships of multiple explanatory elements that are associated with place attachment. To examine the effect of the individual components that comprise recreation specialization on place attachment, this paper makes use of the three individual sub-dimensions of recreation specialization (namely, behavior, skill-and-knowledge,

and commitment) suggested by McIntyre and Pigram (1992) and Scott and Shafer (2001). This conceptual model is also beneficial because other intervening elements that are linked with recreationists' behavioral and emotional facets can be included simultaneously (Oh & Ditton, 2008). The objectives of this study are to (1) assess how recreation specialization is directly connected with place attachment and (2) understand how recreation specialization is indirectly associated with place attachment via the intermediate concepts of attitudinal and motivational elements.

## **Literature Review**

### **Recreation Specialization**

Since Bryan's work (1977) that defined recreation specialization as a continuum of behavior reflecting differences in personal development and socialization, numerous studies have employed the concept as a useful tool for understanding recreationists' behavioral and attitudinal orientations. Various underlying dynamics including preferences for environmental and management attributes, and motivations for participation have been predicted by recreation specialization (e.g., Graefe, 1980; Viriden & Schreyer, 1988). A number of studies (e.g., Bricker & Kerstetter, 2000) have mainly focused on segmenting and identifying recreationists' within-group diversity with respect to their motivations, preferences, opinions, and behavior. However, less attention has been paid to examining the predictive relationships between level of recreation specialization and other intervening variables, including preferences for recreational settings and surroundings in an interconnected manner. Bryan (2000) stressed that "the independent variable, specialization, has both behavioral and attitudinal components that affect such dependent variables as ... preferences for certain settings" (p. 19). This statement proposes that recreation specialization provides a strong theoretical framework to identify associations with recreationists' psychological attachment to a particular setting.

To examine the multiple associations between recreation specialization and other dependent variables, a three dimensional approach of recreation specialization consisting of behavioral (e.g., past experience, equipment investment), cognitive (e.g., skill, knowledge), and affective system (e.g., enduring involvement, centrality to lifestyle, importance) has been more commonly applied, based on McIntyre and Pigram (1992) and Scott and Shafer (2001) accounts of the advantages of multidimensional measurement of the concept. Further, investigating the effects of each sub-dimension individually can be more advantageous because progress in one sub-dimension does not necessarily trigger mutual development in the other sub-dimensions (Thapa, Graefe, & Meyer, 2006). Each dimension of recreation specialization is likely to have unique influences on diverse behavioral and attitudinal concepts (Kuentzel & McDonald, 1992). Accordingly, this multidimensional approach is more appropriate to evaluate predictive relationships between recreation specialization and other dependent variables.

As recreationists become more specialized into a recreation activity, they become more dependent on particular resources associated with a continuum of

specialization. Likewise, as recreationists become more familiar with on-site resource conditions, they are likely to place more emphasis on the activity's particular nature and settings (Bryan, 1977; Ditton et al., 1992). However, this formation process between recreation specialization and place attachment may not be straightforward, because there can be other direct and indirect effects of different intermediate constructs such as experience preferences and consumptive orientation. It is expected that in an interconnected predictive framework, recreation specialization has direct and indirect influences on place attachment via intermediate concepts.

### **Intermediate Variables**

When participating in outdoor recreation activities, recreationists are likely to seek a variety of recreation experiences (Hendee, 1974). Recreation experiences are generally understood as motivations that provide recreationists with meaning of the activities. These motives, typically measured using recreation experience preferences (REP) scale, are divided into two dimensions; non-activity specific experience preferences such as experiencing the outdoors and seeking relaxation and activity specific experience preferences such as catching fish and interacting with other fishermen (Driver & Knopf, 1976). As Bryan (1977) pointed out, the focus of more specialized recreationists tends to shift from activity specific to non-activity specific experience preferences compared to less specialized recreationists.

It is important to include experience preferences in the predictive framework of place attachment. According to Warzecha and Lime (2001), some facets of recreation experience preferences such as escaping physical pressure, autonomy/leadership, and introspection are intimately associated with place attachment. Anderson and Fulton (2008) showed that experience preferences played an important role as a mediator between recreation participation and place attachment. By including the two sub-domains of experience preferences, additional relationships can be further incorporated to predict recreationists' functional bond (i.e., place dependence) and emotional affinity (i.e., place identity) with a particular place.

Consumptive orientation is defined as "the degree to which an angler values the catch-related outcomes of the angling experience" (Sutton & Ditton, 2001, p. 52). Whereas experience preferences are understood as motivations and benefits of recreation activities (Anderson & Fulton, 2008), consumptive orientation is an attitudinal domain that explains an angler's inclination towards fishery resources. It is generally known that anglers who place low importance on activity specific preferences but high importance on non-activity specific preferences are less likely to be consumptive oriented (Aas & Kaltenborn, 1995; Fedler & Ditton, 1986). Relatively, little attention has been paid to the relationship between consumptive orientation and place attachment but a few studies have implied that place attachment can be, at least partially, accounted for by a variety of attitudinal domains such as consumptive orientation. For example, Kyle, Norman, Jodice, Graefe, and Marsinko (2007) segmented anglers into four homogenous groups based on consumptive orientation and found that an angler group with low preferences for catching fish exhibited the strongest relationships with affective attachment to a place.

### **Place Attachment**

According to Iso-Ahola (1980), a particular recreation setting where recreation and leisure activities are experienced can be one of the most important components for recreationists' satisfaction. In this respect, recreationists tend to develop emotional attachment such as a sense of familiarity and dependence on recreation settings, and these particular places can become "their place" or "a favorite place" for their recreation pursuits (Hammitt, Backlund, & Bixler, 2004). It is known that recreation specialization has an intimate linkage to the meanings of specific surroundings and places (e.g., Bricker & Kerstetter, 2000; Moore & Graefe, 1994). As the level of recreation specialization increases, recreationists are likely to show stronger preferences for and dependence on particular recreation settings. In other words, more specialized recreationists tend to become increasingly habitual in use of a certain geographic site and, consequently, be less willing to use alternative sites (Hammitt et al., 2004).

Place attachment refers to an emotional or affective bond between an individual and a particular place as well as a functional tie that occurs in repeated people-place interactions. While several different models of place attachment have been used with a varying number of sub-dimensions, we employed the conventional measurement model with two sub-dimensions, namely, place dependence and place identity, because it captures the universal meanings of place attachment (Hammitt, Kyle, & Oh, 2009). Place dependence refers to the degree to which an individual perceives himself/herself to be functionally dependent on a specific place (Stokols & Shumaker, 1981). Thus, level of the attachment tends to be enhanced when a place is located near enough to visit frequently (Williams & Vaske, 2003). The dimension also includes the characteristic of resource specificity, where an individual relies on just one or a few places sufficient for his/her needs (Hammitt et al., 2006).

On the other hand, place identity describes "a potpourri of memories, conceptions, interpretations, ideas, and related feelings about specific physical settings" (Proshansky, Fabian, & Kaminoff, 1983, p. 60). Whereas the majority of previous studies considered place identity as a dimension of place attachment, some researchers have viewed it as an integrating concept in that the notion is composed of cognitive clusters of physical settings (Chow & Healey, 2008). Extended from this perspective, it is logically supposed that advances in place identity in recreation settings can take a longer time than the development of place dependence because the former is closely connected with emotional and symbolic implications and the latter with functional meanings (Moore & Graefe, 1994). As a consequence, a predictive relationship was postulated that place dependence affects place identity.

### **Study Hypotheses**

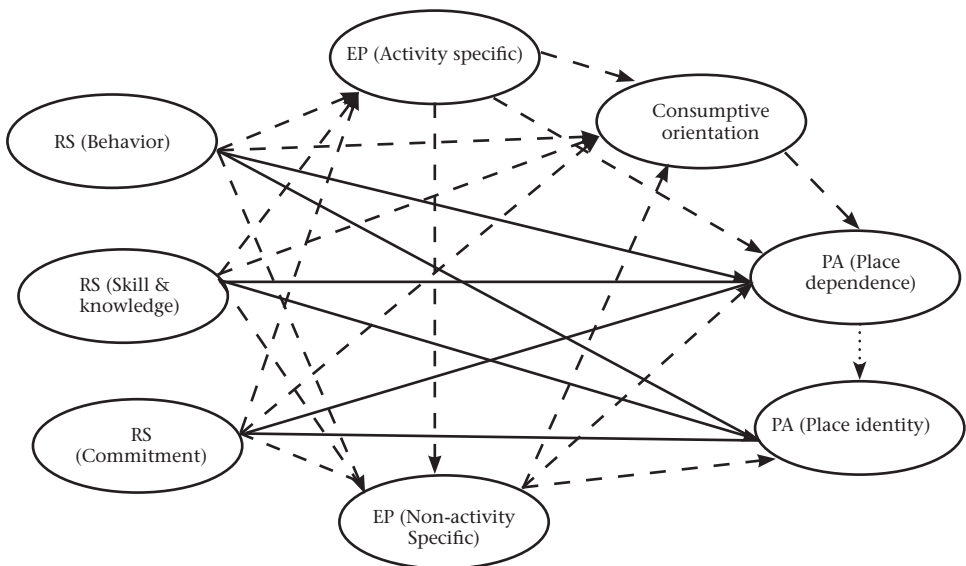
This study pursues a comprehensive understanding of hypothesized connections between recreation specialization, intervening variables, and place attachment. In order to test the hypothesized set of connections, a conceptual framework was constructed based on a sequential mental element process (e.g., Ajzen & Fishbein, 1980; Manfredi & Shelby, 1988) in the following order: recreation spe-

cialization → experience preferences → consumptive orientation → place attachment. As a result, motivational (i.e., experience preferences) and attitudinal (i.e., consumptive orientation) domains are expected to sequentially intervene in the relationship between recreation specialization and place attachment as intermediate variables. Figure 1 demonstrates the overall theoretical model. The following three key hypotheses are developed:

H1: The three sub-dimensions of recreation specialization (i.e., behavior, skill-and-knowledge, and commitment) will directly contribute to fostering the two sub-dimensions of place attachment (i.e., place dependence and place identity);

H2: The three sub-dimensions of recreation specialization will indirectly facilitate the formation of the two sub-dimensions of place attachment via experience preferences and consumptive orientation;

H3: There will be a positive association between place dependence and place identity.



**Figure 1.** Hypothesized model between recreation specialization and place attachment. Solid lines indicate H1 (recreation specialization [RS] is directly connected with place attachment [PA]). Dashed lines indicate H2 (recreation specialization [RS] is indirectly connected with place attachment [PA] via other intermediate concepts). Dotted line indicates H3 (the two domains of place attachment [PA] are closely associated with each other). RS – Recreation specialization; EP – Experience preferences; PA – Place attachment

## Methods

### Sampling

Of approximately 1.5 million licensed anglers in Texas during the 2004 fiscal year, 3,554 were selected using a computer-generated stratified random sampling procedure. The sample used was proportionally selected based on different types of fishing licenses (i.e., saltwater and freshwater licenses). During a two-month period (May to June 2005), mail questionnaires including three mailings with a personalized letter and a postcard reminder were sent to the anglers using a modified Dillman total design survey method (Dillman, 2000). A total of 1,205 questionnaires were returned. After 515 nondeliverables were deleted, an effective response rate was 39.7% (For more details on data collection, see Tseng, Wolber & Ditton [2006]). Further, the study analyses were confined to freshwater anglers only. Examining predictive relationships that explain place attachment is less suitable for saltwater anglers who are likely to change fishing spots frequently. Given the fact that the quality of a fishing site is known to affect anglers' perception of place dependence (e.g., Hammitt et al., 2006; Stokols & Shumaker, 1981), saltwater anglers, particularly charter and head boat anglers, are not likely to build strong place attachment to certain fishing sites. Accordingly, 453 saltwater respondents were additionally dropped. After deleting 346 cases with missing values in at least one of the sub-scales used in model estimation, the final data set included 406 responses.

### Measurement of Variables

Prior to testing the proposed model, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were performed to reduce the number of variables in underlying constructs. As a result, the underlying structure was determined for latent factors such as recreation specialization and experience preferences. The measurement of each factor is as follows.

To measure recreation specialization, a three-dimensional approach was used consisting of behavior, skill-and-knowledge, and commitment measures, as proposed by McIntyre and Pigram (1992) and Scott and Shafer (2001). First, the behavior dimension was composed of two items of past fishing behavior or participation: total number of days fishing in freshwater in the last 12 months and total number of days of fishing in the last 12 months. While past fishing behavior may be also considered an indicator of commitment, we differentiated behavior as actual action taken, and commitment as an attitudinal measure. Two items also were used to measure the level of skill-and-knowledge: anglers were asked to compare their general fishing knowledge to that of other anglers and general fishing skills to those of other anglers. To determine the degree of the commitment dimension, four items were asked to anglers: "If I stopped fishing, I would probably lose touch with a lot of my friends," "Fishing says a lot about who I am," "I find that a lot of my life is organized around fishing," "If I couldn't go fishing, I'm not sure what I would do." The CFA supported the three-dimensional approach of the concept and the Cronbach's alpha coefficients displayed satisfactory reliabilities (0.91 for the behavioral, 0.86 for the skill-and-knowledge, and 0.82 for the commitment dimension).

The measurement items of experience preferences were modified from the scale originally developed by Driver and Knopf (1976) and further refined by Graefe (1980) and Fedler and Ditton (1986). The concept was divided into the two dimensions of activity specific experience preferences and non-activity specific experience preferences with 18 scale items. Each item used a 5-point Likert format scale ranging from (1) *not at all important* to (5) *extremely important*. Activity specific experience preferences consisted of two subscales: interacting with fish (e.g., “for the fun of catching fish”) and achievement (e.g., “to win a trophy or prize”) and non-activity specific experience preferences also had two subscales: escaping individual stressors (e.g., “to get away from the demands of other people”) and being in a natural environment (e.g., “to experience unpolluted natural surroundings”). The results of the EFA indicated the existence of these four subscales and the reliability coefficients were acceptable between 0.64 and 0.78.

The concept of consumptive orientation was evaluated by a modified version of Graefe’s (1980) original scale items. This scale had 14 items that were measured on a 5-point Likert format scale ranging from (1) *strongly disagree* to (5) *strongly agree* and intended to measure four subscales of catching fish (e.g., “when I go fishing, I’m not satisfied unless I catch at least some fish”), catching a trophy fish (e.g., “I’m happiest with the fishing trip I catch a challenging game fish”), keeping fish (e.g., “I’m just as happy if I release the fish I catch”), and number of fish caught (e.g., “the more fish I catch, the happier I am”). The EFA suggested the four sub-constructs of consumptive orientation and the Cronbach’s alpha coefficients between 0.63 and 0.79 revealed satisfactory reliabilities of subscales.

Place attachment was measured with eight items using Williams and Roggenbuck’s (1989) scale. The scale was developed to measure the two dimensions of place dependence (e.g., “no other waterbody can compare to this one”) and place identity (e.g., “I feel this waterbody is a part of me”). Each item used a 5-point rating scale ranging from (1) strongly disagree to (5) strongly agree. The reliabilities of place dependence and place identity represented 0.84 and 0.88, respectively, and the CFA confirmed the theorized links between the factors and the scale items used.

### **Data Analysis Procedures**

For the structural equation modeling (SEM) analyses, a two-step modeling approach was used as recommended by Anderson and Gerbing (1988) to identify an acceptable fit of the measurement model and to assess the validity of the structural model. Subscale scores were computed by summing scores for individual sub-dimensions and were converted to indicators for further analyses to decrease multicollinearity or error variance correlations among indicators (Bollen, 1989). The SEM analyses began with evaluating the measurement model. The measurement model specified the associations between the latent factors and the observed variables (i.e., indicators). Once the CFA indicated an acceptable fit of the measurement model, the structural model with the specification of predictive relationships between the latent variables was tested.

To assess the degree of fit of the measurement and structural models, five different fit indices were employed: chi-square/degree of freedom ratio value,



Normed Fit Index (NFI), Comparative Fit Index (CFI), Goodness-of-Fit Index (GFI), and Root Mean Square Error of Approximation (RMSEA). A chi-square/degree of freedom ratio value of less than 3 and the indices of NFI, CFI and GFI of greater than 0.9 are recommended for an acceptable model fit. Similarly, a RMSEA value of less than 0.08 indicates an acceptable fit (Browne & Cudeck, 1993).

## Results

### Descriptive Statistics

All data analyses were conducted using SPSS 16.0 and EQS 6.1. In brief, the majority of respondents were males (85.9%) with a mean age of 44.7. Over half of them (50.8%) reported an annual household income of more than \$60,000, and the highest household income group was above \$100,000, which comprised about 21.5% of the total respondents. Most respondents (92.2%) were Anglo, followed by Hispanic (3.3%) and African American (2.4%). Nonresponse bias was not checked due to time and financial constraints. Alternatively, compared to a national survey conducted by U.S. Fish and Wildlife Service (2007), our respondents seemed to be older, earn a higher household income, and represent a lower percentage of Hispanic and African American. Accordingly, the results are not intended to be generalized to all freshwater anglers.

### Measurement Model and Structural Model

As indicated above, this study followed a two-step hierarchical modeling approach. The measurement model was tested with the free correlations, (i.e., two-headed arrows) between latent factors. The ratio of chi-square/degree of freedom as well as other fit indices ( $\chi^2/df = 2.99$ ; NFI = 0.98; GFI = 0.88; CFI = 0.99; RMSEA = 0.07) indicated an acceptable model fit to the data. All of the constructs were shown to be fairly reliable with construct reliabilities greater than 0.7. The highly significant t-values of indicator coefficients, which ranged from 4.23 to 40.37, suggested the convergent validity of the indicators was satisfactory. In order to examine discriminant validity, we performed a test that compared the measurement model with an alternative measurement model in which the two sub-dimensions of place attachment were combined to one (Bagozzi, 1980). The fit of the original measurement model was significantly better ( $\Delta\chi^2 = 167.51$ ,  $\Delta df = 7$ ,  $p < 0.001$ ) than the alternative measurement model with a single dimension of place attachment. Thus, the chi-square difference test revealed discriminant validity. The results of the measurement model are reported in Table 1.

The initial hypothesized structural model and the measurement model were compared to assess nomological validity. The chi-square difference test ( $\Delta\chi^2 = 58.5$ ,  $\Delta df = 2$ ,  $p < 0.001$ ) indicated that the initial structural model was not acceptable. Accordingly, a Wald test was performed to modify the hypothesized structural model. It is known to be more effective to delete insignificant paths rather than adding new ones because a more parsimonious model is generally favored (Bentler & Chou, 1987). As a result, three paths linking from each construct of recreation specialization to non-activity specific experience preferences were deleted from the original structural model. The revised model was re-estimated and compared

**Table 1***Results of the Measurement Model between Recreation Specialization and Place Attachment*

Constructs and indicators	Mean	S.D.	Construct reliability	Factor loading	t-value	Error variance
<b>Recreation specialization</b>						
<i>Behavior</i>						
Number of days freshwater fishing last 12 months (V1)	24.09	38.20	.95	.90	-	.43
Number of days fishing last 12 months (V2)	31.67	45.23		.99	40.37*	.12
<i>Skill-and-knowledge</i>						
General skill to that of other anglers (V3)	1.81	.61	.94	.85	-	.53
General knowledge to that of other anglers (V4)	1.87	.62		.88	11.88*	.47
<i>Commitment</i>						
If quitting fishing, I would lose touch with friends (V5)	2.09	.85	.84	.53	-	.85
Fishing says a lot about who I am (V6)	3.05	1.01		.70	9.82*	.71
I find that a lot of my life is organized around fishing (V7)	2.42	.94		.89	10.83*	.45
If I couldn't go fishing, I'm not sure what I would do (V8)	2.33	1.01		.80	10.50*	.60
<b>Experience preferences</b>						
<i>Activity specific experience preferences</i>						
Interacting with fish (V9)	2.01	.84	.76	.73	-	.68
Achievement (V10)	3.89	.75		.68	9.31*	.74
<i>Non-activity specific experience preferences</i>						
Being in a natural environment (V11)	4.03	.72	.78	.66	-	.76
Escaping individual stressors (V12)	3.84	.61		.66	7.85*	.66
<b>Consumptive orientation</b>						
Keeping fish (V13)	2.71	.84	.79	.30	-	.95
Catching something (V14)	2.60	.72		.86	5.53*	.51
Catching a trophy fish (V15)	3.10	.72		.32	4.23*	.95
Number of fish caught (V16)	3.26	.79		.83	5.57*	.57
<b>Place attachment</b>						
<i>Place dependence</i>						
No other waterbody can compare to this one (V17)	2.57	.84	.88	.68	-	.94
This is the best place for what I like to do (V18)	3.23	.93		.67	12.41*	.74
I wouldn't substitute any other waterbody for doing the type of things I do here (V19)	2.61	.94		.82	14.83*	.57
I get more satisfaction out of visiting this waterbody than any other (V20)	2.80	.97	.90	.91	16.02*	.42
<i>Place identity</i>						
I feel this waterbody is a part of me (V21)	2.91	.97		.82	-	.57
This waterbody means a lot to me (V22)	3.57	.91		.72	16.03*	.69
Visiting this waterbody says a lot about who I am (V23)	2.71	.94		.87	20.74*	.50
I am very attached to this waterbody (V24)	2.97	1.02		.87	20.80*	.49

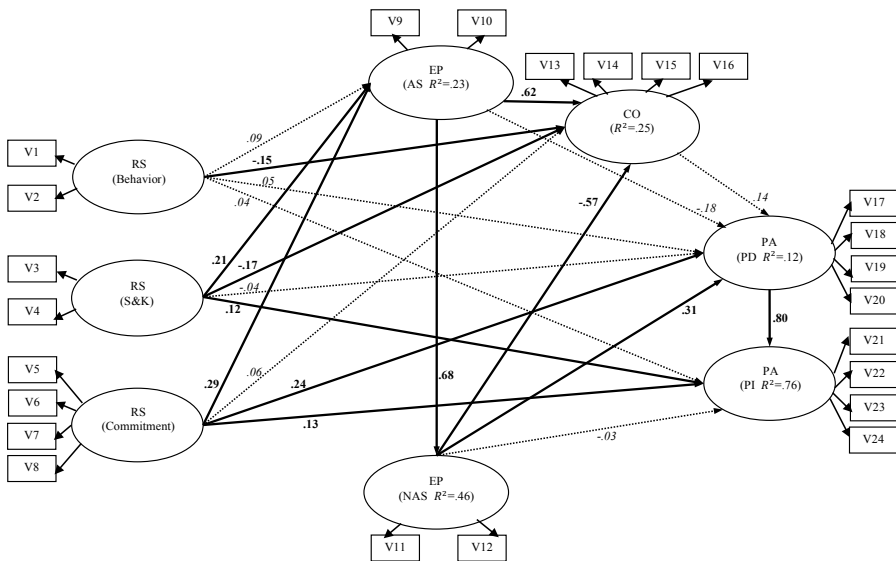
\* indicates significant at 0.05 level.

with the measurement model. The nonsignificant chi-square difference ( $\Delta\chi^2 = 2.8$ ,  $\Delta df = 5$ ,  $p = 0.73$ ) as well as other fit indices (NFI = 0.98; GFI = 0.88; CFI = 0.99; RMSEA = 0.07) suggested the revised model was acceptable to account for the hypothesized relationships between latent variables (Hatcher, 1994).

**Hypothesized Relationships between Latent Variables**

The standardized regression coefficients and squared multiple correlations ( $R^2$ ) of the revised structural model are presented in Figure 2. Overall, the results indicated that two sub-dimensions of recreation specialization were directly associated with at least one sub-dimension of place attachment. Whereas behavior had no significant connections to the two sub-dimensions of place attachment, commitment and skill-and-knowledge directly affected place identity ( $\beta = 0.13$ ,  $t = 2.91$ ;  $\beta = 0.12$ ,  $t = 2.96$ , respectively). Likewise, commitment had a direct influence on place dependence ( $\beta = 0.24$ ,  $t = 3.31$ ) (H1).

It was unexpected that the behavioral dimension of specialization was not associated with any endogenous variables except for a direct connection with consumptive orientation ( $\beta = -0.15$ ,  $t = -2.25$ ). With respect to indirect mediating associations, the dimensions of skill-and-knowledge and commitment were also indirectly connected with place dependence via activity specific preferences ( $\beta = 0.21$ ,  $t = 3.11$ ;  $\beta = 0.29$ ,  $t = 3.89$ , respectively) and non-activity specific preferences ( $\beta =$



**Figure 2.** Final structural model between recreation specialization and place attachment. Solid lines indicate hypothesized paths with standardized coefficients that were significant at the 0.05 level. Dotted lines indicate hypothesized paths with standardized coefficients that were not significant at the 0.05 level. RS – Recreation specialization; EP – Experience preferences; PA – Place attachment; S&K – Skill-and-knowledge; AS – Activity specific; NAS – Non-activity specific; CO – Consumptive orientation; PD – Place dependence; PI – Place identity

0.68,  $t = 7.17$ ). Consumptive orientation was associated with activity specific ( $\beta = 0.62$ ,  $t = 3.28$ ) and non-activity specific preferences ( $\beta = -0.57$ ,  $t = -3.17$ ), but there were no indirect linkages between experience preferences and place attachment via consumptive orientation (H2). Finally, a strong positive relationship between the two sub-dimensions of place attachment ( $\beta = 0.80$ ,  $t = 12.79$ ) was revealed (H3).

### **Magnitude of Relationships**

In order to assess the secondary effects, total effects were decomposed into direct and indirect effects. Of three sub-dimensions of recreation specialization, commitment showed relatively strong total effects on place identity (0.34). It is worth noting that the indirect effects (0.21) of commitment on the dependent variable (i.e., place identity) were stronger than the direct effect (0.13). In brief, the results together likely supported the use of diverse intermediate variables to provide a more comprehensive understanding of the predictive linkages between recreation specialization and place attachment. However, the behavioral dimension of recreation specialization did not show any significant indirect effects through other endogenous variables.

Squared multiple correlations ( $R^2$ ) were calculated to assess the magnitude of associations between the latent variables. Briefly, the three sub-dimensions of recreation specialization accounted for 23% of the variance in activity specific preferences. Likewise, 46% of the variance in non-activity specific preferences was explained mainly by recreation specialization and activity specific preferences. While 12% of variance in place dependence was explained, commitment and activity specific and non-activity specific preferences were key variables that accounted for the magnitude of associations between recreation specialization and place dependence. Finally, 76% of variance in place identity was mainly explained by the two sub-dimensions of recreation specialization (i.e., skill-and-knowledge, commitment), non-activity specific preferences, and place dependence.

## **Discussion and Conclusion**

We attempted to investigate some hypothesized linkages between the three sub-dimensions of recreation specialization and the two sub-dimensions of place attachment through the intermediate concepts of experience preferences and consumptive orientation. Overall, study results provided empirical evidence, although moderate, that recreation specialization was associated with place attachment. In terms of study hypotheses, although the behavioral component of recreation specialization was not significantly associated with either sub-dimension of place attachment, the two sub-dimensions of recreation specialization (i.e., skill-and-knowledge and commitment) were directly associated with place identity (H1). There was no mediated relationship between recreation specialization and place attachment through consumptive orientation. However, the two sub-dimensions of recreation specialization, namely, skill-and-knowledge and commitment, showed indirect influences on place attachment through two sub-dimensions of experience preferences (i.e., activity specific and non-activity specific experience preferences) (H2). Finally, the two domains of place attachment (i.e., place de-

pendence and place identity) were significantly associated with each other (H3). Thus, the first two hypotheses were partially supported and the last hypothesis was strongly supported.

Based on these study findings, several discussion points emerge. While the behavioral sub-dimension was not significantly connected with place attachment, skill-and-knowledge showed a significant association with place identity, and commitment was closely connected with both domains of place attachment (H1). These findings suggested intimate linkages between anglers' skill levels and an emotional attachment to a recreation place as well as between commitment and place attachment. As anglers invest more time and economic resources in fishing and develop their skill levels, they express a higher degree of affective attachment to recreation sites (Buchanan, 1985). As a result, recreationists with high commitment tend to gradually foster functional meanings to their favorite sites and successively develop preferred identities to the places.

With respect to indirect paths to place attachment, the two sub-dimensions of recreation specialization, namely, skill-and-knowledge and commitment, were associated with place attachment through both activity specific and non-activity specific experience preferences (H2). This sequential process may not be understood in the traditional mechanism of "focus shift." The focus shift phenomenon in previous specialization literature indicates that the importance of activity specific experience preferences decreases but that of non-activity specific experience preferences increases along a continuum of recreation specialization. Our study findings signified that highly specialized anglers are likely to place importance on activity specific experience. The significant and positive route from activity specific to non-activity specific experience preferences suggested that anglers gradually shift their focus to noncatch elements of the experience as their levels of catch-related motivations increase. This study also discovered that two sub-dimensions of recreation specialization (i.e., skill-and-knowledge and commitment) indirectly influenced place attachment via the two elements of experience preferences. Thus, highly committed and/or skilled anglers who are satisfied with activity specific elements of the fishing experience are more likely to seek noncatch motivations and, ultimately, acquire a strong tie with a specific place.

Among the three sub-dimensions of recreation specialization, the behavioral component, however, was not a significant independent variable that predicted the concept of place attachment (H1; H2). Conceptually, this finding might be explained by the fact that place attachment is defined as more of an emotional than behavioral construct and thus is more closely associated with the skill-and-knowledge and commitment dimensions of recreation specialization. The major component of place attachment, identity, deals with the emotional/symbolic meaning of places rather than the behavioral/functional elements. The specialization process of developing one's fishing skills and knowledge defines who and what they are as an angler, and their identity as anglers and with the places where they can express that identity. Although it is true that place dependence might be more related to the behavioral/functional meaning of place attachment, previous studies (e.g., Chow & Healey, 2008) have shown identity to be the dominant and more robust of the two attachment components. From a measurement standpoint,

our behavioral measure of specialization was number of days fished in the last 12 months. Although days fished is a behavioral measure of specialization, it is not a measure of dependence on a fishing place or the functions that a place can provide for specialized angling and anglers.

A positive connection between non-activity specific experience preferences and place dependence indicated that anglers who attach more importance to non-catch experience are likely to place more value on the unique qualities of places (H2). As discussed earlier, place dependence primarily relies on the specificity and functionality of a recreation setting. The concept of place dependence is related to the functional capability of a specific place to fulfill an individual's desire (Stokols & Shumaker, 1981). Accordingly, highly noncatch motivated anglers are more likely to put importance on a place's functional qualities.

Place dependence showed a strong association with place identity (H3). In contrast to place dependence, which demonstrates how efficiently a recreationist's activity is facilitated from a specific setting, place identity is believed to form through "a deep-seated familiarity" with a location (Dixon & Durrheim, 2004). Place identity is based on personal psychological bonds that result from individual habituation to a specific setting. Also, due to the characteristic of emotional investment, according to Vaske and Kobrin (2001), place identity is likely to develop more gradually over time. Consequently, some studies (e.g., Chow & Healey, 2008; Lalli, 1992) have regarded place identity as a more comprehensive element of place attachment than place dependence because emotional attachment consists of cognitive and affective mixtures of physical settings. In terms of the inclusive characteristics, the high degree of variation explained in place identity ( $R^2 = 0.76$ ) was a priori expected. The analysis of stepwise regression, conducted separately but not reported here, supported an intimate connection between the two sub-dimensions of place attachment. The change of  $R^2$  values from 0.18 to 0.76 indicated that the substantial explanatory power of place identity results from a strong correlation with place dependence. According to a meta-analytic study by Backlund and Williams (2004), the two sub-dimensions typically showed a strong correlation, ranging from 0.50 to 0.88. Nevertheless, several studies (e.g., Williams & Vaske, 2003) provided empirical evidence that the two sub-dimensional approach used here is preferred to the single dimensional model because the former can better reflect the construct validity of place attachment.

Recreation specialization and the other accrued concepts such as experience preferences, when examined together, provide a more comprehensive understanding of the predictive mechanisms of place attachment. Increasing concerns about and interests in resource conservation require managers to also efficiently deal with recreationists' functional and emotional attachment to a specific recreation setting from the stage of recreation management planning (Moore & Graefe, 1994). The evidence that recreation specialization is an important predictor contributing to place attachment suggests an important management implication: tailored management regimes by specialization level are expected to increase angler support for fisheries management and site management by providing quality fishing experiences (Chipman & Helfrich, 1988; Salz et al., 2001).

While the proposed conceptual framework was fairly well supported in this study, future research derived from several study limitations here will be beneficial to test and generalize the proposed model and findings in other recreational activities and settings. First, only freshwater anglers in Texas were sampled, and any potential nonresponse bias was not checked. Thus, this paper leaves several questions about generalizability across different angler groups and other recreation activities unanswered. Second, the use of a cross-sectional study design is not likely to provide a complete picture of the predictive relationships from recreation specialization to place attachment. A longitudinal study particularly using panel surveys would be advantageous to examine when and how more specialization recreationists foster functional and emotional attachments to specific recreation places and settings. Finally, we specified the path model with only single directional linear relationships due to the analytical nature of structural equation modeling. Even though predictive relationships that are nonlinear are not easily included in SEM (Bollen, 1989), the linear relationships were only supported by the data used here and the inclusion of nonlinear relations may be beneficial.

In conclusion, this study attempted to provide a more in-depth understanding of the formative and predictive processes of how recreation specialization is connected with place attachment. We conclude, based on our model analysis, that it is the focus on the skill-and-knowledge and the commitment components of recreation specialization that relate to a greater identity with recreation places. It seems that highly skilled, knowledgeable, and/or committed anglers who are satisfied with activity specific elements of the fishing experience are more likely to seek non-activity specific outcomes and, ultimately, acquire a strong bond with a specific place, primarily in terms of place identity. It is suggested that as anglers become more skilled, knowledgeable, and committed to fishing, they develop a history with specific fishing sites and become attached to them as significant places in their lives.

## References

- Aas, Ø., & Kaltenborn, B. (1995). Consumptive orientation of anglers in Engerdal, Norway. *Environmental Management, 19*, 751-761.
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice Hall.
- Anderson, D. H., & Fulton, D. C. (2008). Experience preferences as mediators of the wildlife-related recreation participation: Place attachment relationship. *Human Dimensions of Wildlife, 13*(2), 73-88.
- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin, 103*(3), 411-423.
- Backlund, E. A., & Williams, E. R. (2004). A quantitative synthesis of place attachment research: Investigating past experience and place attachment in: L. J. Murdy (Ed.), *Proceedings of the 2003 Northeastern Recreation Research Symposium*. (Gen. Tech. Rep. NE-317) pp. 320-325. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northeastern Research Station.

- Bagozzi, R. P. (1980). *Causal models in marketing*. New York: John Wiley & Sons.
- Bentler, P. M., & Chou, C. P. (1987). Practical issues in structural modeling. *Sociological Methods and Research*, 16, 78-117.
- Bollen, K. A. (1989). *Structural equation with latent variables*. New York: Wiley & Sons.
- Bricker, K. S., & Kerstetter, D. L. (2000). Level of specialization and place attachment: An exploratory study of whitewater recreationists. *Leisure Sciences*, 22, 233-257.
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 445-455). Newbury Park, CA: Sage.
- Bryan, H. (1977). Leisure value systems and recreational specialization: The case of trout fishermen. *Journal of Leisure Research*, 9, 174-187.
- Bryan, H. (2000). Recreation specialization revisited. *Journal of Leisure Research*, 32(1), 18-21.
- Buchanan, T. (1985). Commitment and leisure behavior: A theoretical perspective. *Leisure Sciences*, 7(4), 401-420.
- Chipman, B. D., & Helfrich, L. A. (1988). Recreational specializations and motivations of Virginia river anglers. *North American Journal of Fisheries Management*, 8, 390-398.
- Chow, K., & Healey, M. (2008). Place attachment and place identity: First-year undergraduates making the transition from home to university. *Journal of Environmental Psychology*, 28, 362-372.
- Dillman, D. A. (2000). *Mail and internet surveys: The tailored design method*. New York: Wiley.
- Ditton, R. B., Loomis, D. K., & Choi, S. (1992). Recreation specialization: Re-conceptualization from a social world perspective. *Journal of Leisure Research*, 24, 33-51.
- Dixon, J., & Durrheim, K. (2004). Dislocating identity: Desegregation and the transformation of place. *Journal of Environmental Psychology*, 24(4), 455-473.
- Driver, B. L., & Knopf, R. C. (1976). Temporary escape: One product of sport fisheries management. *Fisheries*, 1(2), 21-29.
- Fedler, A. J., & Ditton, R. B. (1986). A framework for understanding the consumptive orientation of recreational fishermen. *Environmental Management*, 10(2), 221-227.
- Graefe, A. (1980). *The relationship between level of participation and selected aspects of specialization in recreational fishing*. (Unpublished doctoral dissertation). Texas A&M University, College Station.
- Hammitt, W. E., Backlund, E. A., & Bixler, R. D. (2004). Experience use history, place bonding and resource substitution of trout anglers during recreation engagements. *Journal of Leisure Research*, 36(3), 356-378.
- Hammitt, W. E., Backlund, E. A., & Bixler, R. D. (2006). Place bonding for recreation places: Conceptual and empirical development. *Leisure Studies*, 25(1), 17-41.
- Hammitt, W. E., Kyle, G. T., & Oh, C. (2009). Comparison of place bonding models in recreation resource management. *Journal of Leisure Research*, 41(1), 57-72.



- Hatcher, L. (1994). *A step-by-step approach to using the SAS systems for factor analysis and structural equation modeling*. Cary, NC: SAS Institute.
- Hendee, J. C. (1974). A multiple-satisfaction approach to game management. *Wildlife Society Bulletin*, 2(3), 104-113.
- Iso-Ahola, S. E. (1980). *The social psychology of leisure and recreation*. Dubuque, IA: William C. Brown.
- Kuentzel, W. F., & McDonald, G. D. (1992). Differential effects of past experience, commitment, and lifestyle dimensions on river use specialization. *Journal of Leisure Research*, 24(3), 269-287.
- Kyle, G., Bricker, K. S., Graefe, A., & Wickham, T. (2004). An examination of recreationists' relationships with activities and settings. *Leisure Sciences*, 26, 123-142.
- Kyle, G., Norman, W., Jodice, L., Graefe, A., & Marsinko, A. (2007). Segmenting anglers using their consumptive orientation profiles. *Human Dimensions of Wildlife*, 12(2), 115-132.
- Lalli, M. (1992). Urban-related identity: Theory, measurement and empirical findings. *Journal of Environmental Psychology*, 12, 285-303.
- Manfredo, M. J., & Shelby, B. (1988). The effect of using self-report measures in tests of attitude-behavior relationships. *Journal of Social Psychology*, 128(6), 731-743.
- Manning, R. E. (1999). *Studies in outdoor recreation: Search and research for satisfaction*. Corvallis, OR: Oregon State University Press.
- McFarlane, B. L. (2004). Recreation specialization and site choice among vehicle-based campers. *Leisure Sciences*, 26, 309-322.
- McIntyre, N., & Pigram, J. J. (1992). Recreation specialization reexamined: The case of vehicle-based campers. *Leisure Sciences*, 14, 3-15.
- Moore, R. L., & Graefe, A. (1994). Attachments to recreation settings: The case of rail-trail users. *Leisure Sciences*, 16, 17-31.
- Oh, C., & Ditton, R. B. (2008). Using recreation specialization to understand conservation support. *Journal of Leisure Research*, 40(4), 556-573.
- Proshansky, H. M., Fabian, A. K., & Kaminoff, R. (1983). Place-identity: Physical world socialization of the self. *Journal of Environmental Psychology*, 3(1), 57-83.
- Salz, R., Loomis, D. K., & Finn, K. L. (2001). Development and validation of a specialization index and testing of specialization theory. *Human Dimensions of Wildlife*, 6(4), 239-258.
- Scott, D., & Shafer, C. S. (2001). Recreational specialization: A critical look at the construct. *Journal of Leisure Research*, 33(3), 319-343.
- Stokols, D., & Schumaker, S. A. (1981). People in places: A transactional view of settings. In J. Harvey (Ed.), *Cognition, social behavior and the environment*. NJ: Erlbaum.
- Sutton, S. G., & Ditton, R. B. (2001). Understanding catch-and-release behavior among U.S. Atlantic Bluefin Tuna anglers. *Human Dimensions of Wildlife*, 6(1), 49-66.
- Thapa, B., Graefe, A. R., & Meyer, L. A. (2006). Specialization and marine based environmental behaviors among SCUBA divers. *Journal of Leisure Research*, 38(4), 601-615.

- Tseng, Y. P., Wolber, N. R., & Ditton, R. B. (2006). *Demographic, participation, attitudes, and management preferences of Texas anglers* (Human Dimensions of Fisheries Research Laboratory Technical Document HD-631). College Station, TX: Texas A&M University.
- U.S. Fish and Wildlife Service. (2007). *National survey of fishing, hunting, and wildlife-associated recreation*. Washington, DC: US Department of the Interior.
- Vaske, J. J., & Kobrin, K. C. (2001). Place attachment and environmentally responsible behavior. *Journal of Environmental Education*, 32(4), 16-21.
- Virden, R., & Schreyer, R. (1988). Recreation specialization as an indicator of environmental preference. *Environment and Behavior*, 20, 721-739.
- Warzecha, C. A., & Lime, D. W. (2001). Place attachment in Canyonlands National Park: Visitors' assessment of setting attributes on the Colorado and Green Rivers. *Journal of Park and Recreation Administration*, 19(1), 59-78.
- Williams, D. R., & Roggenbuck, J. W. (1989). Measuring place attachment: Some preliminary results. In *Proceedings of the National Recreation and Parks Association Symposium on Leisure Research*, San Antonio, TX.
- Williams, D. R., & Vaske, J. J. (2003). The measurement of place attachment: Validity and generalizability of a psychometric approach. *Forest Science*, 49(6), 830-840.