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Measuring Specialization Among Birders: Utility of a Self-Classification Measure

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This article sought to determine the efficacy of a self-classification measure of recreation specialization, relative to two-multi-item approaches, in predicting other aspects of recreation participation (in this case, motivations). The sample was drawn from birders who traveled to the Platte River (Nebraska) to experience the annual crane migration. The self-classification measure had birdwatchers categorize themselves as a committed birder, an active birder, or a casual birder. Factor analysis of six behavior, skill, and commitment items resulted in a single factor solution; thus, an index of recreation specialization was created by summing respondents' standardized scores for these items. Respondents were divided into categories of high, medium, and low specialization. Also, cluster analysis was used to create another multi-item indicator of specialization. Each of the three measures was significantly related to motivations. The self-classification measure of specialization was somewhat stronger in predicting activity-specific motivations; there was little difference among measures in predicting more generic birdwatching motives.

Keywords birding, birdwatching, recreation specialization

Introduction

According to the *2001 National Survey of Fishing, Hunting and Wildlife-Associated Recreation,* approximately 22% of American adults reported they participated in birdwatching at least once during the previous 12 months (U.S. Department of Interior, Fish and Wildlife Service and U.S. Department of Commerce, U.S. Census Bureau, 2002). Results from the *National Survey of Recreation and the Environment* (2000–2002) reported an even higher rate (33%) of birdwatching participation. It is important to note most birdwatchers (74%) can identify less than 20 birds by sight or sound (U.S. Department of Interior, Fish and Wildlife Service and U.S. Department of Commerce, U.S. Census Bureau, 2002). Nevertheless, many birders are highly skilled and serious about their avocation. Many enjoy counting bird species and keep "life lists" of all the birds they have identified in their home state and elsewhere. Thus, to effectively serve the birdwatching population,

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resource managers, community leaders, and business entrepreneurs must develop manager and marketing strategies based on knowledge of *different styles of birdwatching*.

Literature Review

The recreation specialization framework has been used extensively to study within-activity differences among outdoor recreationists. Bryan (1977) defined recreation specialization as "a continuum of behavior from the general to the particular, reflected by equipment and skills used in the sport, and activity setting preferences" (p. 175). Bryan identified four types of participants along an angling continuum: occasional fishermen, generalists, technique specialists, and technique-setting specialists. Recreationists' motivations, resource preferences, and attitudes about management practices were predicted to vary from one level of participation to another.

The recreation specialization framework dovetails nicely with the social world perspective. Borrowing from Unruh (1979, 1980), Ditton, Loomis, and Choi (1992) argued that the specialization continuum reflects an ordered arrangement of recreation subworlds. The low end included "the least specialized subworld and its members" whereas the high end included "the most specialized subworld and its members" (p. 39). The middle of the continuum included "any number of subworlds having intermediate levels of specialization" (p. 39). Distinct subworlds along the specialization continuum could be identified by examining recreationists' orientations, experiences, relationships, and commitment (Ditton et al., 1992). Studies of birdwatchers and wildlife watchers have assessed participants' motivations (Hvenegaard, 2002; McFarlane, 1994), socialization influences (McFarlane, 1996), participation in conservation activities (McFarlane & Boxall, 1996), and preferred setting attributes (Cole & Scott, 1999; Martin, 1997; Scott & Thigpen, 2003) using specialization as a segmentation tool.

Definitional Challenges

There are two major conceptual and methodological issues regarding specialization. One pertains to the measurement of the construct. Researchers generally concur that the construct is multidimensional and should be measured in terms of both behavioral and attitudinal indicators. Beyond this, there is little agreement about how precisely to characterize and measure the construct (Kuentzel & McDonald, 1992; Scott & Shafer, 2001). The second issue concerns the classification of recreationists along the specialization continuum. Some have treated specialization as a continuous variable (e.g., Martin, 1997; Miller & Graefe, 2000); others have argued that such an approach ignores that dimensions of specialization may not co-vary (Kuentzel & McDonald, 1992). Table 1 summarizes, in chronological order, approaches used by different researchers for measuring the construct and classifying recreationists.

Defining and measuring specialization. Researchers have defined and measured specialization using an array of dimensions and variables (Table 1). Some behavioral indicators include participation (Donnelly, Vaske, & Graefe, 1986), past experience (Dyck, Schneider, Thompson, & Virden, 2003; McFarlane, 1996; Wellman, Roggenbuck, & Smith, 1982), *general* experience and *recent* experience (Virden & Schreyer, 1988), experience use history (Ewert & Hollenhorst, 1994), and frequency of participation (Ditton et al., 1992; Scott & Thigpen, 2003). Indicators of devotion and attachment include commitment (Kuentzel & Heberlein, 1997; Scott & Thigpen, 2003), economic investments (Chipman & Helfrich,

Table 1
Summary of Specialization Measures

Author information	Activity	Sample frame	Measurement of specialization	Index/Classification of respondents
Bryan (1977)	Fishing	263 anglers in Idaho, Montana, and Wyoming	Four multi-item dimensions: 1) Fishing preferences 2) Orientation toward the stream resource 3) History of interest and activity in the sport 4) Relationship of activity to other areas of life	• Specialization indicators were cross-tabulated with four angler types: 1) Occasional anglers 2) Generalists 3) Technique specialists 4) Technique-setting specialists
Wellman, Roggenbuck, and Smith (1982)	Canoeing	624 canoeists on Classes 1-III rivers in Virginia	Three multi-item dimensions: 1) Canoeing investments 2) Past experience 3) Centrality to lifestyle	• All items were standardized and summed to create a single index of specialization. • Index scores were used to assign respondents to one of two groups: Low specialists (lowest quartile) and High specialists (highest quartile).
Donnelly, Vaske, and Graefe (1986)	Motor boating and sailing	1,534 registered boaers in Maryland	Four multi-item dimensions: 1) Participation 2) Equipment 3) Skill 4) Boating related interests	• Two variables within each dimension were divided into low and high values. Vales for each variable were then cross-tabulated such that respondents were assigned a score of a 1 (low on both variables), a 2 (a high on one of the two variables), or a 3 (high on both variables). Overall specialization index was created by summing scores from the four dimensions. • Mean specialization scores were compared among participants in three types of boating (day boating, overnight cruising, and racing).

Continued

Table 1
Continued

Author information	Activity	Sample frame	Measurement of specialization	Index/Classification of respondents
Chipman and Helfrich (1988)	Fishing	377 anglers on two Virginia rivers	Four multi-item dimensions: 1) Resource use 2) Experience 3) Investments 4) Centrality	• Values within each dimension were standardized and summed. • Cluster analysis of four specialization indices produced six angler profiles: 1) Occasional anglers (12%) 2) Generalists (15%) 3) Experienced generalists (21%) 4) Committed generalists (27%) 5) Specialists (13%) 6) Advanced specialists (12%)
Virden and Schreyer (1988)	Back-country hiking	420 visitors to 3 primitive areas in Arizona, Wyoming, and Utah	Four multi-item dimensions: 1) General experience 2) Recent experience 3) Equipment and economic commitment 4) Centrality to lifestyle	• All items were standardized and summed to create a single index of specialization. • Index was treated as a continuous variable.
McIntyre (1989)	Beach campers	347 ORV-campers in Cooloola National Park (Queensland, Australia)	Three multi-item dimensions: 1) Attraction 2) Self-expression 3) Centrality	• Factor scores were calculated for the three specialization/involvement measures. • Factors were treated as continuous variables.
Ditton, Loomis, and Choi (1992)	Fishing	4,215 salt water anglers in Texas	One variable: Number of days spent fishing during the previous 12 months	• Respondents were assigned to four groups (high to low), of roughly equal size, based on how often they fished.

Table 1
Continued

Author information	Activity	Sample frame	Measurement of specialization	Index/Classification of respondents
McIntyre and Pigram (1992)	Vehicle-based camping	682 campers at Cooloola National Park and Fraser Island Recreation Area (Queensland, Australia)	Five multi-item dimensions: 1) Composite index of prior experience 2) Composite index for familiarity 3) Attraction 4) Self-expression 5) Centrality	• Factor scores and standardized variables were cluster analyzed. Procedure produced four types of campers. • No information was provided about how many respondents fell within each cluster.
Kuentzel and Heberlein (1992)	Goose hunting	277 goose hunters in Wisconsin	Five multi-item dimensions: 1) Past experience in hunting 2) Commitment 3) Media involvement 4) Hunting organizations 5) Hunting style	• Separate index scores were created for each dimension by summing standardized scores. • Index scores were treated as continuous variables.
Kuentzel and McDonald (1992)	White water kayaking and canoeing	132 users of the Ocoee River (Tennessee)	Three multi-item dimensions: 1) Past experience 2) Commitment 3) Lifestyle	• Separate index scores were created for each dimension by summing standardized scores. • Index scores were treated as continuous variables.
Ewert and Hollenhorst (1994)	Rock climbing and white water boating	329 rock climbers in West Virginia, and 257 white water boaters in Eastern United States.	Four multi-item dimensions 1) Experience use history 2) Skill level 3) Involvement 4) Locus of control	• Index scores were created for each dimension by combining standardized scores for each variable. • Index scores were treated as continuous variables.

Continued

Table 1
Continued

Author information	Activity	Sample frame	Measurement of specialization	Index/Classification of respondents
Watson, Niccolucci, and Williams (1994)	Hiking and stock users	330 hikers and 185 stock users of the John Muir Wilderness (California)	Four multi-item dimensions: 1) Intensity of activity style 2) Activity-associated status 3) General past wilderness experience 4) Importance of solitude to activity enjoyment	• Items within each dimension were added together to create multiple-item summative scales. • Scales were used as continuous variables.
McFarlane (1994); McFarland (1996); & McFarlane and Boxall (1996)	Birding	787 birders in Alberta Canada	Three multi-item dimensions: 1) Past experience 2) Economic commitment 3) Centrality to lifestyle	• Index scores were created for each dimension by summing standardized scores. • Cluster analysis of index scores produced four types of birders: 1) Casual (43%) 2) Novice (38%) 3) Intermediate (12%) 4) Advanced (7%)
Shafer and Hammitt (1995)	Day hiking and back-packing	361 users of Cohutta Wilderness (Southeastern United States)	Measured in terms of attitudes ("purism") toward wilderness ideals	• Index score created by summing 14 attitude items. • Respondents were divided into three categories of participants: 1) Strong purist (16%) 2) Semi-purist (69%) 3) Non-purist (15%)

Table 1
Continued

Author information	Activity	Sample frame	Measurement of specialization	Index/Classification of respondents
Fisher (1997)	Fishing	5,213 anglers in Texas	Six variables: 1) Total years of fishing experience 2) Total days fishing in the previous 12 months 3) Importance of number of fish caught 4) Importance of size of fish caught 5) Importance of catch disposition 6) Importance of catching something	• Variables were cluster analyzed. This procedure produced seven angler groups (not named). • Smallest cluster included 9% of respondents; largest group included 19% of respondents.
Kuentzel and Heberlein (1997)	Sailing	397 boaters along the Apostle Islands National Seashore (Wisconsin)	Four multi-item dimensions: 1) Experience and frequency of participation 2) Specialized boating behaviors 3) Evaluations of the sailing experience 4) Commitment to sailing	• Individual items within each dimension were treated as continuous variables. • Mean scores of specialization items were compared across two typologies of sailing. One was based on social status and included three groups. The other was based on a developmental model and included seven groups.

Contniued

Table 1
Continued

Author information	Activity	Sample frame	Measurement of specialization	Index/Classification of respondents
Martin (1997)	Wildlife watching	2,216 visitors to Montana	Four dichotomous variables 1) Took 10 or more wildlife-viewing trips in the previous year 2) Studied or made notes about the behavior, habitat, or other such aspects of the wildlife seen on past wildlife-viewing trips 3) Used specialized equipment on past wildlife-viewing trips 4) Participated in an organized survey or count of wildlife in the past year	• Respondents were classified into three groups: 1) Novices (70%)—answered no to all four items 2) Intermediates (20%)—answered yes to one of four items 3) Specialists (10%)—answered yes to two or more items
Cole and Scott (1999)	Birding/ wildlife watching	400 Texas Conservation Passport (TCP) holders and 556 members of the American Birding Association (ABA)	Six variables: 1) Level of skill 2) Number of trips per year 3) Number of months per year gone birding/wildlife watching 4) Yearly expenditures 5) Feed birds at home (yes/no) 6) Watch birds at home (yes/no)	• Mean scores and percentages were calculated for each specialization variable. • TCP holders and ABA members were chosen, a priori, to represent the views of casual wildlife watchers and serious birders, respectively. The two groups were compared in terms of the six specialization indicators.

Table 1
Continued

Author information	Activity	Sample frame	Measurement of specialization	Index/Classification of respondents
Bricker and Kerstetter (2000)	White water rafting and kayaking	1,1226 users of the South Fork of the American River (California)	Five multi-item dimensions: 1) Level of experience 2) Skill level and ability 3) Centrality to lifestyle 4) Equipment and investments 5) Enduring involvement	• Values for variables within each of dimension were scored from 1 (low) to 3 (high). Index scores for each dimension were then created by summing scores for recoded variables. • For each of the five dimensions, respondents were classified as being low, medium, or high in level of specialization.
Miller and Graefe (2000)	Hunting	1,006 hunters in Pennsylvania	Four multi-item dimensions: 1) Level of experience 2) Skill level and ability 3) Centrality to lifestyle 4) Equipment and investments	• All items were standardized and summed to create a single index of specialization. • Index was treated as a continuous variable.
Salz, Loomis, and Finn (2001)	Fishing	1,411 anglers in Massachusetts	Four items derived from Unruh's (1979) ideas about social worlds: 1) General orientation to fishing 2) Experiences during fishing 3) Relationship with other anglers 4) Commitment to fishing	• Values for each of the four items were scored from 1 (low) to 4 (high). The four items were summed to create a single index of specialization that ranged from 1 to 16. • Index scores were used to assign respondents to one of four groups: Least specialized (4 to 6) (1%), moderately specialized (7 to 10) (33%), very specialized (11 to 13) (42%), and highly specialized (14 to 16) (24%).

Continued

Table 1
Continued

Author information	Activity	Sample frame	Measurement of specialization	Index/Classification of respondents
Hvenegaard (2002)	Birding	137 Visitors to Doi Inthanon National Park (Thailand)	Two multi-item dimensions 1) Economic commitment 2) Centrality to lifestyle	• Cluster analysis of factor scores for the two dimensions produced three types of birders: 1) Advanced-experienced (10%) 2) Advanced-active (50%) 3) Novices (40%)
Dyck, Schneider, Thompson, and Virden (2003)	Mountaineering	270 members of Mazamas	Four dimensions: 1) Past experience 2) Economic and equipment investments 3) Skill level 4) Centrality to lifestyle	• Index scores were created for each dimension by summing standardized item responses. Overall specialization index was created by summing index scores for each of the four dimensions. • Respondents were assigned to three groups (low, medium, and high), roughly of equal size, based on their overall specialization scores.
Scott and Thigpen (2003)	Birding	517 visitors to the 7th Annual Hummer/Bird Celebration (Texas)	Three multi-item dimensions: 1) Behavior 2) Skill 3) Commitment	• Cluster analysis of six variables produced four types of birders: 1) Casual (35%) 2) Interested (42%) 3) Active (13%) 4) Skilled (10%)

1988, Hvenegaard, 2002; McFarlane, 1996), centrality to lifestyle (Miller & Graefe, 2000; McIntyre, 1989; Kuentzel & McDonald, 1982; Wellman, et al., 1982), enduring involvement (McIntyre, 1989; McIntyre & Pigram, 1992), and purism values (Shafer & Hammit, 1995). Other dimensions include media involvement (Kuentzel & Heberlein, 1992), skill (Cole & Scott, 1999; Donnelly et al., 1986; Miller & Graefe, 2000; Scott & Thigpen, 2003), resource use (Chipman & Helfrich, 1988), and evaluation of recreation experience (Kuentzel & McDonald, 1992).

Definitional conundrums are aggravated by the uncertainty of the relationships among dimensions and whether specific measures reflect one dimension of specialization or another (Kuentzel & McDonald, 1992). McIntyre (1989), for example, considered commitment and involvement as synonymous and centrality as a dimension of involvement. Other have treated commitment and centrality as two distinct dimensions (e.g., Dyck et al., 2003; Hvenegaard, 2002; Kuentzel & McDonald, 1992). The variable "club memberships" has been defined as an indicator of lifestyle centrality (Chipman & Helfrich, 1988; Wellman et al., 1982), activity-related interests (Donnelly et al., 1986), and commitment (Kuentzel & Heberlein, 1992). Identification skills in birdwatching have been conceived as both an indicator of skill itself (Scott & Thigpen, 2003) and past experience (McFarlane, 1994, 1996).

Scott and Shafer (2001) argued that specialization should be understood as (a) a focusing of behavior, (b) the acquiring of skills and knowledge, and (c) personal and behavioral commitment. Behavior implied years of involvement, frequency of participation, and equipment owned. Skill included ability at identifying birds by sight and sound, skill at navigating white water rapids, and knowledge of appropriate equipment for backpacking, bicycling, and fishing. Finally, commitment represented personal and behavioral investments that recreationists make over time. Personal commitments may include a strong affective attachment and "inner conviction that the activity is worth doing for its own sake" (Scott & Shafer, 2001, p. 329). Behavioral commitments, in contrast, are investments (e.g., friendships, equipment purchases, and memberships in clubs) that make cessation difficult because it could lead to the loss of a strongly held identity, friends, and resources to pursue other activities (Buchanan, 1985).

Classification of recreationists. Early specialization studies situated recreationists along a linear continuum. Some researchers used single measures (Ditton et al., 1992) or added multiple measures to create composite indices (e.g., Donnelly et al., 1986; Martin, 1999; Miller & Graefe, 2002; Virden & Schreyer, 1988; Wellman et al., 1982). These indices were treated as either continuous variables (e.g., Virden & Schreyer, 1988) or discreet categories of participants defined "high," "medium," or "low" specialization (e.g., Donnelly et al., 1986; Ditton et al., 1992; Shafer & Hammit, 1995).

The additive approach assumes that the specialization dimensions do not co-vary. A study of canoeists and kayakers (Kuentzel & McDonald, 1992), however, found that experience was correlated with a commitment dimension and a lifestyle dimension, *but only among inexperienced paddlers*. Among experienced paddlers, there was virtually no relationship among these dimensions. According to Kuentzel and McDonald, experience, commitment, and lifestyle choices do not necessarily increase in a linear fashion. A similar argument was put forth by Scott and Shafer (2001), who noted some recreationists "participate in activities on a regular basis and accrue commitments but exhibit little evidence of skill development . . . [while] other individuals may participate in leisure activities infrequently but demonstrate a high level of skill development and personal commitment" (p. 338).

Cluster analysis has also been used to create empirically based groupings of anglers (Chipman & Helfrich (1988), campers (McIntyre & Pigram, 1992), and birdwatchers (McFarlane, 1994; Hvenegaard, 2002; Scott & Thipgen, 2003). This methodology does not assume that indicators of specialization co-vary and is a potentially effective tool for identifying and describing classes of recreationists within a given leisure social world.

A Simplified Approach?

Resource managers want user-friendly tools to identify birder types, market products, and services for different segments of birdwatchers. Long surveys and cluster analyses are not always feasible in policy deliberations. Bryan (1977), for example, initially offered specialization as an uncomplicated framework for understanding "within-sport" variability. He considered the continuum "a useful heuristic tool" for comparing behavior, motivations, and attitudes among anglers. Unfortunately, supporting these early hypotheses and applying the resultant knowledge to management has proven difficult at best.

The purpose of this study was methodological. The goal was to determine the efficacy of a *self-classification measure* of recreation specialization, something that has not been attempted previously. In particular, the authors wanted to see how well it did, relative to the two aforementioned multi-item approaches, in terms of its ability to predict other facets of recreation participation.

Methods

Wildlife watchers in an eighteen-county study area along the Middle Platte River in Nebraska were surveyed. Each spring, people come to view the 500,000-plus Sandhill Cranes that migrate through the area on their way to their nesting grounds in Canada, Alaska, and Siberia. The annual gathering of Sandhill Cranes and the chance to see an endangered Whooping Crane make this a major wildlife spectacle and visitor attraction. The area has been rated as one of the 10 best places to bird in the United States (Pasquier, 1997).

Seven populations of birders and general wildlife watchers comprised the sampling frame: (1) crane watchers at Fort Kearney State Historical Park and Recreation Area, (2) visitors reserving viewing blinds at the Lillian Annette Rowe Sanctuary, (3) visitors reserving blinds at the Crane Meadows Sanctuary, (4) Nebraska members of the National Audubon Society, (5) members of the Nebraska Ornithologists' Union, (6) registrants at the Spring River Conference, a three-day birding event held in Kearney, Nebraska, and (7) registrants at the Wings over the Platte Festival held in Grand Island, Nebraska.

To sample birders who annually visit the Platte to view the cranes but may have been absent during the survey period, two birder organizations in the area were contacted. Membership and visitor lists were available for all of the aforementioned groups except for birders at Ft. Kearney. Here interviewers randomly selected birdwatchers on-site on weekend days and weekdays between March 1 and April 15, 1996. Surveyors explained the purpose of the study, solicited birders' cooperation, and collected name and address information for a follow-up questionnaire mailing to visitors. The survey methodology was the same for all birder groups.

The goal was to sample 300 persons per group. After eliminating duplicates, 1,963 individuals were contacted. Four highly personalized, deliberately timed first class mailings were used. All persons received the same 10-page self-administered questionnaire. Individuals were queried about their birding participation in general as well as at the study site,

including their previous birding experience, birding participation patterns, self-assessed level of specialization, and motivations for birding.

Telephone surveys of non-respondents were conducted to test for non-response bias (Filion, 1980; Fisher, 1996). The phone survey included 11 questions from the mail survey and questions about their general birding activity and their most recent trip to the Platte River area.

Three measures of birding specialization were developed to ascertain the best predictor of birder motivations. The first had respondents indicate whether they were a *committed* birder, an *active* birder, or a *casual* birder. The three categories were defined as:

1. A *committed* birder: in *general*, a person who is willing to travel on short notice to see a rare bird, who subscribes to a number of birding magazines (such as *Birding*) that specialize in the identification of birds and places where they may be seen, who leads field trips or seminars for local birding clubs, who keeps a detailed life list as well as a daily journal, who purchases ever-increasing amounts of equipment to aid in attracting, recording, and seeing birds, and for whom birding is a primary outdoor activity.
2. An *active* birder: in *general*, a person who travels infrequently away from home specifically to bird, who may or may not belong to a local birding club, who subscribes to general interest bird magazines (such as *Wild Bird* or *Birdwatcher's Digest*), who participates in but does not lead local field trips or seminars, who keeps a general list of birds seen, and for whom birding is an important but not exclusive outdoor activity.
3. A *casual* birder: in *general*, a person whose birding is incidental to other travel and outdoor interests, who may not belong to a formal birding organization, who may read an article on birds in a local newspaper but does not subscribe to birding magazines, who keeps no life list, and for whom birding is an enjoyable yet inconsistent outdoor activity.

This self-classification measure of recreation specialization was based on past research (e.g., McFarlane, 1994) and a co-author's personal experiences.

Two multi-item measures of birding specialization were created by combining responses from six questionnaire items. Following Scott and Shafer (2001), these items reflected behavior, skill, and commitment. Two items measured behavior: the number of birding trips taken and the number of days spent birding watching during the last 12 months. Response categories were open-ended. Skill was measured using a single questionnaire item. Respondents compared their birding skill to that of other birders: less skilled (1), equally skilled (2), and more skilled (3). Three items were used to measure commitment. The first asked respondents whether they belonged to any local, state, national, or international birding or conservation organizations (dummy coded, 1 = yes, 0 = no). The second commitment item asked respondents to indicate how important birding was to them relative to other outdoor recreation activities (coded as 1 = only one of many outdoor activities, 2 = your third most important outdoor activity, 3 = your second most important outdoor activity, and 4 = your most important outdoor activity). The third commitment item had respondents estimate the total replacement cost for all their birdwatching equipment combined (including binoculars, scope and trip, camera and lenses, tape recorder, books and field guides, and other equipment). Response categories were open-ended.

Because the frequency distributions for the three open-ended specialization items were highly skewed, responses for each variable were recoded into four categories of roughly equal size. Data from the six specialization indicators were then standardized for subsequent analysis (mean = zero; standard deviation = 1).

A principal component factor analysis (with varimax rotation) of the six items resulted in a single factor that explained 45.5% of the total variation. Factor scores ranged from .79 to .48. Multi-item indices of recreation specialization were created using standardized scores from individual questionnaire items. The Cronbach's alpha for the six items was .83, indicating a high degree of reliability. A composite index was created by summing respondents' scores for each of the six items. Respondents were divided into three categories (of roughly equal size) of specialization. The high group included 30.0% of respondents (standardized scores ranging from 0.51 to 1.31); a medium group included 31.7% of respondents (standardized scores ranging from −.029 to 0.50) and a low group (38.3% of respondents, standardized scores = −1.36 to −0.30).

A second multi-item indicator of specialization was created using cluster analysis. Using SPSSx (1988), a series of K-means cluster analyses were performed, ranging from 2 to 7 clusters. A three-cluster solution was ultimately selected. For this solution, 27.5% of respondents fell in a cluster with uniformly low scores. A middle group included 32.6% of respondents and had intermediate responses on five of the six specialization indicators. The one exception pertained to belonging to birding or conservation organizations where respondents had roughly equal z-scores as those in the high group. The high group included 39.9% of respondents and had high scores on all specialization indicators.

The three measures of recreation specialization were then compared in terms of their ability to predict respondents' motivations to participate in birding. Respondents were presented with 12 items and asked to indicate how important each item was as a reason for birding. Items ranged from activity-general experiences (e.g., to be alone, to be with friends) to activity-specific motivations unique to birding (e.g., to see bird species that I have not seen before). Response categories included "not at all important" (1), "slightly important" (2), "moderately important" (3), "very important" (4), and "extremely important" (5). Analysis of variance was then used to test whether birders, as defined by each of the specialization measures, differed in terms of their motives.

Results

Sample Characteristics

Of the 1,963 surveys mailed, 1,259 were returned. After removing non-deliverables, the effective response rate was 70%. Most respondents were crane watchers at the Fort Kearney State Historical Park and Recreation Area (35%) and visitors reserving blinds at the Lillian Annette Rowe Sanctuary (20%). When non-respondents were asked a limited number of survey questions, there were no significant group differences.

Table 2 summarizes responses to the specialization indicators. For the self-classification measure, only 16% of respondents described themselves as committed birders. The rest depicted themselves as either active (46%) or casual birders (39%). The other six items in Table 2 were used to create a composite index and cluster analysis groupings. Nearly one-quarter (23%) of respondents reported taking either zero or just one birding trip during the last 12 months. Twenty-six percent of respondents took 8 or more birding trips in the previous year; 27% spent 5 or fewer days birdwatching during the previous year, a quarter (26%) birdwatched 54 or more days during the last 12 months.

A small fraction (11%) of respondents felt they were more skilled at birding than other birders in general. Over half (53%) felt they had less skills than other birders. Roughly equal proportions of respondents either rated birding as the most important activity (36%) or one of many outdoor activities (38%) in which they participated. Most respondents

Table 2
Descriptive Statistics for Specialization Indicators

If you participate in birding, which best describes you?		
	N	%
Casual	820	38.5
Active	971	45.6
Committed	339	15.9
In the past 12 months, how many trips away from home did you expressly take to bird?		
	N	%
0 to 1	474	23.1
2 to 3	602	29.4
4 to 7	441	21.5
8 or more	533	26.0
In the past 12 months, how many days did you bird in total?		
	N	%
1 to 5	530	26.6
6 to 18	447	22.4
19 to 53	502	25.2
54 or more	514	25.8
How do you compare your birding ability to that of other birders in general?		
	N	%
Less skilled	1120	53.1
Equally skilled	749	35.5
More skilled	239	11.3
Compared to your other outdoor recreational activities (such as hiking, camping, hunting, fishing), how would you rate birding?		
	N	%
Only one of many outdoor activities	805	37.9
Third most important outdoor activity	189	8.9
Second most important outdoor activity	377	17.7
Most important outdoor activity	754	35.5
Are you a member of any local, state, national, or international birding or conservation organizations?		
	N	%
No	602	28.1
Yes	1538	71.9
If you had to replace all of the equipment you used for birding with similar equipment, how much would the replacements cost?		
	N	%
$375 or less	527	25.1
$376 to $980	525	25.0
$981 to $2245	519	24.7
$2246 or more	529	25.2

(72%) belonged to a birding or conservation organization. About half of all respondents reported that the replacement costs for all their birding equipment were less than $1,000. One of four respondents, however, reported their replacement costs would exceed $2,245.

Relationship between Specialization and Motivations

Table 3 summarizes, in rank order, the mean scores for the 12 birdwatching motivation items. The two most important motivations were *to enjoy the sights, smells, and sounds of nature* (M = 4.42) and *to be outdoors* (M = 4.31). Moderate importance was assigned to activity-specific motivations, including *to see bird species I have not seen before* (M = 3.62) and to see as many bird species as possible (M = 3.02). Respondents assigned very low importance *to be alone* (M = 2.12), *to get away from the family for a while* (M = 1.46), and *to gain respect from other birders* (M = 1.42).

Table 3 also summarizes the relationship of the three specialization measures (the self-classification measure, the additive index, and the cluster analysis solution) to the different motive scales. Three observations emerge from these results. First, the strongest relationships observed were among those motives that were specific to birding (*to improve my birding skills and abilities*, *see bird species I have not seen before*, and *see as many bird species as possible*). Second, the self-classification measure was somewhat stronger in predicting these motives than the multiple-item indicators. Third, there was little difference among the three specialization measures in their ability to predict generic motives (e.g., *to be alone, to be outdoors, and enjoy the sights, smells, and sounds of nature*).

Table 4 provides mean scores for each of 4the motivation items by the three specialization indicators. The relationship between specialization and motivations were similar for each of the three indicators. For all motivation items except one (*for family recreation*), the importance of a motive increased significantly with level of specialization. For the *family recreation* item, the opposite was true. Moreover, for each of the three specialization indicators, committed or advanced birders had significantly different mean scores for *all* motivation items than those who were casual or low in specialization. There were significant differences among all birder types for each of the motives specific to birding (*to improve my birding skills and abilities*, *see bird species I have not seen before*, and *see as many bird species as possible*). Mean differences were somewhat higher for the self-classification measure than they were for the additive index and cluster analysis indicators.

Discrimination Classification of Birders

Discriminant analysis was used to determine how well the six specialization measures predicted responses to the self-classification measure (Table 5). Function 1 explained 96.4% of the variance whereas Function 2 explained less than 3.6% of the variance. The square of each of the Canonical Correlations for the two functions are .653 and .065, respectively. Because these results suggest that Function 2 explains little beyond that accounted for by Function 1, only information from Function 1 was included for further examination.

Table 5 also provides information about the standardized coefficients for each of the six predictor variables in order of importance. The two variables with the most discriminating ability were importance of birding (.534) and skill at birding (.366). Organizational involvement was of moderate value in discriminating among birder types (.278). The number of birding trips (.217), replacement value of equipment (.179), and number of days birding (.144) were of somewhat less value in predicting group membership. The Group Centroids (Table 5) suggest that Function 1 effectively discriminated casual birders

Table 3
Relationship of Specialization Measures to Motive Items

Motive	Overall *Mean*	Overall *SD*	Self-Classification Measure		Additive Index		Cluster Analysis	
			F	*P*	*F*	*P*	*F*	*P*
Enjoy the sights, smells, and sounds of nature	4.42	0.79	24.10	.000	28.91	.000	28.63	.000
To be outdoors	4.31	0.84	38.83	.000	44.17	.000	39.92	.000
See bird species I have not seen before	3.62	1.09	118.81	.000	94.26	.000	87.04	.000
To get away from demands of life	3.30	1.30	5.29	.005	6.03	.002	6.27	.002
To improve my birding skills and abilities	3.23	1.23	387.77	.000	347.27	.000	309.13	.000
See as many bird species as possible	3.02	1.29	77.04	.000	56.26	.000	49.10	.000
For family recreation	2.99	1.33	9.72	.000	5.79	.003	5.21	.006
To be with friends	2.76	1.13	20.86	.000	18.34	.000	10.59	.000
To do something creative	2.52	1.26	18.99	.000	20.57	.000	18.01	.000
To be alone	2.12	1.32	10.22	.000	7.36	.001	7.72	.000
To get away from the family for a while	1.46	0.86	6.49	.002	4.04	.018	4.26	.014
To gain respect of other birders	1.42	0.80	82.30	.000	65.19	.000	67.89	.000

Table 4
Mean Scores of Motive Items by Specialization Indicators

	Self-classification measure			Additive index			Cluster analysis		
Motive	Casual	Active	Committed	Low	Moderate	High	Casual	Active	Advanced
Enjoy the sights, smells, sounds of nature	4.27_{a}	4.50_{b}	4.55_{b}	4.26_{a}	4.48_{b}	4.55_{b}	4.21_{a}	4.44_{b}	4.55_{c}
To be outdoors	4.11_{a}	4.39_{b}	4.50_{b}	4.10_{a}	4.38_{b}	4.49_{b}	4.05_{a}	4.33_{b}	4.48_{c}
See bird species that I have not seen before	3.19_{a}	3.82_{b}	4.09_{c}	3.24_{a}	3.72_{b}	3.99_{c}	3.25_{a}	3.49_{b}	4.01_{c}
To get away from the demands of life	3.19_{a}	3.33_{ab}	3.45_{bc}	3.19_{a}	3.31_{ab}	3.43_{bc}	3.14_{a}	3.31_{a}	3.40_{b}
To improve my birding skills and abilities	2.44_{a}	3.57_{b}	4.11_{c}	2.47_{a}	3.45_{b}	3.92_{c}	2.37_{a}	3.16_{b}	3.90_{c}
To see as many bird species as possible	2.62_{a}	3.18_{b}	3.54_{c}	2.68_{a}	3.11_{b}	3.38_{c}	2.65_{a}	2.93_{b}	3.35_{c}
For family recreation	3.11_{a}	2.98_{a}	2.72_{b}	3.11_{a}	2.95_{ab}	2.87_{bc}	3.13_{a}	2.94_{ab}	2.89_{bc}
To be with friends	2.67_{a}	2.70_{a}	3.12_{b}	2.65_{a}	2.68_{a}	2.99_{b}	2.66_{a}	2.66_{a}	2.91_{b}
To do something creative	2.36_{a}	2.53_{b}	2.86_{c}	2.31_{a}	2.56_{b}	2.74_{c}	2.28_{a}	2.44_{a}	2.70_{c}
To be alone	2.02_{a}	2.10_{a}	2.36_{b}	2.01_{a}	2.13_{ab}	2.24_{bc}	1.95_{a}	2.12_{ab}	2.22_{bc}
Get away from the family for a while	1.41_{a}	1.45_{a}	1.61_{b}	1.40_{a}	1.47_{ab}	1.53_{bc}	1.39_{a}	1.46_{ab}	1.54_{bc}
Gain respect of other birders	1.23_{a}	1.42_{b}	1.88_{c}	1.23_{a}	1.39_{b}	1.70_{c}	1.22_{a}	1.29_{ab}	1.69_{bc}

$_{abc}$Groups with different subscripts are significantly different at .05 level of confidence.

Table 5
Results of Discriminant Analysis

Function	Eigen-value	Relative percent	Canonical correlation	Wilks' Lambda	Chi-square	DF	Significance
1	1.89	96.4	.808	.32	2043.22	12	.000
2	0.07	3.6	.255	.94	121.88	5	.000

Function 1 Statistics

Discriminant Variables	*Standardized Coefficients*
Importance of birding	.534
Skill at birding	.366
Organizational involvement	.278
Days birding in the last 12 months	.217
Replacement value of equipment	.179
Birding trips in the last 12 months	.144
Birder Group	*Group Centroids*
Casual birders	–1.659
Active birders	.616
Committed birders	2.043

(–1.659) and committed birders (2.043) compared to active birders (.616). Altogether, the discriminant analysis correctly classified 71% of cases. Eighty-eight percent of casual birders were correctly classified whereas 81% of committed birders were correctly classified. Only 54% of active birders were correctly classified.

Discussion

The self-classification measure, where respondents self-classified themselves as a *committed birder*, an *active birder*, or a *casual birder*, performed as well, if not better, than two other multi-item approaches in predicting birders' motivations. The results were surprising in light of the general belief that specialization is multidimensional (Scott & Shafer, 2001) and that different dimensions of recreation specialization have varied in their ability to predict motivations (Kuentzel & McDonald, 1992; McFarlane, 1994) and other aspects of involvement, including preferences for physical and social setting attributes (Kuentzel & Heberlein, 1992). and place attachment (Bricker & Kerstetter, 2000).

On the other hand, results were not surprising given that the self-classification measure used in this study embodied multiple dimensions of recreation specialization. Behavioral aspects of recreation specialization are reflected in the statements: *a person who is willing to travel on short notice to see a rare bird* (committed birder); *a person who travels infrequently away from specifically to see a bird* (active birder); and *a person whose birding is incidental to other travel and outdoor interests* (casual birder). Likewise, an orientation to skill development is evidenced in statements such as: [a person] *who subscribes to a number of birding magazines . . . that specialize in the identification of birds* (committed birder), [a person] *who subscribes to general interest bird magazines* (active birder), and [a person] *who may read an article on birds in a local newspaper but does not subscribe to birding magazines* (casual birder). Finally, commitment is reflected in the

statements: [a person] *for whom birding is a primary outdoor activity* (active birder), [a person] *for whom birding is an important but not exclusive outdoor activity* (active birder), and [a person] for whom birding is an enjoyable yet inconsistent outdoor activity (casual birder). Importantly, there was a strong association between the self-classification measure and the six questionnaire items used to create the other specialization measures. In the discriminant analysis, these items correctly classified 71% of all cases, suggesting the self-classification measure may be a valid indicator of specialization.

The factor analysis of the six individual recreation specialization items resulted in a single factor solution. These items were used because they were thought to be valid and reliable measures of behavior, skill, and commitment. Moreover, cluster analysis of the items resulted in a three-cluster solution that resembled the results obtained by creating an additive index of these items. Other studies of birdwatchers (Hvenegaard, 2002; McFarlane, 1994; Scott & Thigpen, 2003) have reported much more complex groupings than those reported here. It could be that the factor and cluster solutions would have been different had we employed additional indicators of behavior, skill, and commitment. It is also worth noting that most other previous birder studies have studied particular birding subpopulations; by focusing on seven birder sub-populations in this study, we sought to capture as much of the diversity of the birding population as possible. This diversity of participants may have played a role in the single factor and cluster analysis solutions achieved.

Nevertheless, there are some real advantages of using a thoughtfully designed self-classification approach to measure specialization. One is that it is user friendly and relatively *easy to administer and analyze*. Also, the categories are rather intuitive and have currency among service providers and birdwatchers (*item non-response was not a problem with this question*). It yielded results that were as good, if not better, than more traditional approaches. Finally, the self-classification measure provides a simple tool for comparing level of specialization across different birding destinations and events. This could offer both researchers and practitioners a standard by which to measure birders' level of specialization among visiting birders.

Three potential limitations of this research effort are worth noting. First, three of the items used in the index and cluster analysis may be related to household income (number of trips and days birding the previous 12 months and replacement value of equipment). Hence, the study may be more likely measuring the effects of differences in discretionary household income than in recreation specialization. But if there is a problem in this regard, it exist in every other paper on recreation specialization dating back to Bryan (1977). This needs to be dealt with in the future by standardizing various participation and ownership variables by controlling for income. Second, much would seem to depend on how the specialization self-classification statements are worded; it could be argued that a different statement could produce different results. Also, the self-classification measure seems to avoid economic biases by getting the respondent to focus on the overall differences between scenarios.

A third limitation pertains to the sample frame. It included individuals who traveled to the Platte River to see Sandhill Cranes. Even if it is assumed that the sample included a fair representation of birders who visit this birding hotspot, the extent to which the self-classification measure would accurately reflect the views of birdwatchers who did not travel and who were more narrowly focused on single species of birds (e.g., hummingbirds, bluebirds, and purple martins) is not known. Many of these individuals are highly committed birdwatchers but not at all oriented to listing or traveling to view birds. Their skills may also be different than those birders who are oriented to listing. Individuals who focus their attention primarily on hummingbirds may have detailed knowledge about one or two

species but know little or nothing (including the identity) about other bird species close to home. Thus, it is possible that the self-classification measure employed in this study *may be used to assess level of specialization only among those people who travel away from home to observe birds*.

Efforts to de-compose the multiple dimensions of recreation specialization and understand the best predictor variables and methods for their derivation should continue to be the first priority in this research area. Also, added emphasis needs to be given to exploring self-classification measures of recreation specialization to facilitate their application and use by managers, marketers, and other decision makers.

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