

QUESTIONING THE CONTINUUM: SPECIALIZATION IN ROCK CLIMBING

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Abstract.—Recreation specialization was originally conceived as a behavioral continuum ranging from general to more particular behaviors within an activity. It was assumed that an individual progressed from one subactivity to another in a hierarchical order. In recent years the practicality of such ordering has come under doubt; it may be possible to specialize in individual subactivities without progressing through a hierarchy. The objective of this research was to examine specialization in the activity of rock climbing by testing whether the arrangement of subactivities along a continuum was appropriate or whether an alternate conception of specialization should be employed. In the summer of 2006, a sample of rock climbers was surveyed on site at the Mohonk Preserve near New Paltz, NY. Climbers were asked to define their own style of climbing and to answer questions about their level(s) and type(s) of specialization based on length and frequency of participation in climbing, skill level, and commitment to climbing. Analysis of variance showed that specialization differed significantly between traditional climbers and top-rope climbers. Implications for specialization theory and rock climbing management are discussed.

1.0 INTRODUCTION

Specialization theory predicts that as recreationists progress in an activity, their attitudes and behaviors change in patterned ways. Different levels of specialization are expected to correspond to changes in motivation (Ewert, 1985), environmental

preference (Viriden & Schreyer, 1988) and attitudes towards management (McIntyre & Pigram, 1992). Scott and Shafer (2001) suggest that specialization is characterized by “(a) a focusing of behavior; (b) the acquiring of skills and knowledge; and (c) a tendency to become committed to the activity such that it becomes a central life interest” (p. 326). This definition makes use of behavioral components, such as past experience and frequency of experience, but differs from that used by McIntyre and Pigram (1992) in the addition of skill and the inclusion of both side bets and affective attachment in commitment. Lee and Scott (2004) used a confirmatory factor analyses to show the validity of Scott and Shafer’s behavior, skill, and commitment framework among birdwatchers.

Past research has also found different styles corresponding to different levels of specialization in various recreational pursuits. Kuentzel and Heberlein (1997) found that novice sailors were less likely than expert sailors to participate in open-water cruising or overnight sailing. Miller and Graefe (2000) found that different types of hunters differed in their level of specialization; however, they used a composite index that included equipment as a measure, which may have contributed to increased specialization levels for some styles of hunting. Bryan (1977) posited that as recreationists specialized, they would tend toward a particular style of participation within an activity that was the end-product of the sport; in his research, this end was fly-fishing, the most specialized form of angling.

In other research, the hierarchy with a well defined end product is in doubt. Kuentzel (2001) proposed that there might be multiple trajectories to specialization, where recreationists specialize in behaviors traditionally associated with more general practice. Scott and Shafer (2001) increase the scope even further, suggesting that people may specialize in outdoor recreation as a whole, rather than in particular

activities. They also suggest that the very portrayal of specialization as a continuum with hierarchical styles of activities has become problematic (Scott & Shafer, 2001).

Knowing whether specialization functions across styles of activities or within them is important to specialization theory. To generate a complete understanding of specialization and the process of how recreationists specialize, it is necessary to understand the model that we are attempting to explain. Does specialization entail nonhierarchical horizontal differentiation where activity styles are all capable of reaching high degrees of specialization, or does it proceed by vertical differentiation in which a hierarchy can be identified for entry-level, transitional, and peak styles? Knowing these details is also important in practice. If specialization differentiates vertically, managers can identify specialization levels and corresponding preferences based on activity style. If it differentiates horizontally, visitors in different styles need to be managed in similar ways.

2.0 PURPOSE OF THE RESEARCH

This research focuses on the different styles of rock climbing that may be associated with different levels of specialization. The purposes of the research are twofold: 1) to investigate whether particular styles of an activity can be hierarchically placed on a specialization continuum; and 2) to give managers at the Mohonk Preserve and other recreational sites information about their rock-climbing visitors. Kuentzel (2001) and Scott and Shafer (2001) suggest that there may be multiple paths to specialization, while Bryan (1977) suggests a hierarchical continuum. Therefore the following hypothesis is proposed:

The variance of specialization components will not be significantly different across activity styles.

If the hypothesis is supported, it implies that specialization is nonhierarchical in nature. If it is rejected then specialization is hierarchical and styles can be arranged on a continuum according to their level of specialization.

3.0 METHODS

An on-site survey of climbers was conducted at the Mohonk Preserve on the Shawangunk Ridge, close to New Paltz, NY, from May 22 to August 13, 2006. To obtain a representative sample of users, sampling was conducted at multiple locations throughout the Preserve. Convenient on-site sampling has previously been effective in surveying the attitudes of climbers (Schuster et al., 2001).

Specialization was measured through questions about climbers' behaviors, skills, and commitment, following the method employed by Lee and Scott (2004). Behavioral measures included years and frequency of participation, both in general and at the Mohonk Preserve. Climbing skill was measured using self-reported ability on the Yosemite Decimal System (YDS) scale. YDS is an ordinal scale used to rate the difficulty of roped climbing done on routes. It currently ranges from 5.0 (easiest) to 5.15 (most difficult). For one style of climbing, bouldering, the widely accepted V-scale was used, which rates bouldering problems on a scale from V0 (easy) to V15 (hard). Commitment was measured on a seven point Likert-type scale through agreement or disagreement with statements adapted from Lee and Scott (2004). Attempts to define the specialization continuum were made by asking respondents to identify which style of climber they primarily considered themselves to be; possible climbing styles included top rope, bouldering, sport climbing, and traditional.

Skill level for each climbing style was changed into standardized scores. These values were then cross-referenced with climbers' self-selected climbing styles, yielding a standard score for skill level across types. Such transformations were necessary because of the difference in the scales used between boulderers (V Scale) and other climbers (Yosemite Decimal System).

Factor analyses were conducted on the 10 specialization items for each activity. Factors were extracted using principle components analysis (PCA) with varimax rotation. Extraction criteria were set at eigenvalues greater than or equal to one. Factors that

lacked cross loading, had a minimum of two items, and achieved a Cronbach's alpha of .50 or higher were retained. Individual items with loadings of less than .40 were dropped. For specialization, the individual raw scores were multiplied by the relevant factor loading coefficient and added together to form a composite index for each factor.

The hypothesis was tested using analysis of variance. Participants were sorted by climbing style. Variances for the specialization factors were compared between these categories to determine if there were significant differences. Differences in the variance would lead to a rejection of the hypothesis because it would mean that specialization factors differ according to activity style. Analysis of variance is dependent on equal variances in each category of the factor variable. Levene's Test for Homogeneity was used to test the variance. Tamhane's T2, which does not require equal variances, was used as a post hoc test to determine differences between climbing styles.

4.0 RESULTS

Responses related to climbing style are in Table 1. PCA conducted on the 10 specialization items for climbers identified three factors; this model accounted for 67.7 percent of the variance. All factors had Cronbach's alpha values greater than .60. This analysis isolated different components than was predicted in the literature. As discussed above, past research models have typically divide specialization into behavior, skills, and commitment (based on Scott & Shafer, 2001). However, PCA identified a different factor structure. Skill was combined with the number of days climbing in 2005, the percentage of those days spent at the Preserve, and the number of climbing areas visited. This mixed factor was named Skill/Days. The items for the total years of climbing experience and the number of years climbing at the Preserve were assigned their own factor, called Years. Table 2 displays the results of the factor analysis.

The specialization components obtained from the factor analysis were entered into an ANOVA as the dependent variables to test the hypothesis.

Table 1.—Climbers by style

Style	N	% of sample
Boulderer	26	8.4
Top-roper	62	20.1
Sport climber	18	5.8
Traditional climber	202	65.6

Table 2.—Factor analysis of climbing specialization

	Factor 1 "Commitment"	Factor 2 "Skill/Days"	Factor 3 "Years"
Years	—	—	.936
Days	—	.851	—
Days at Preserve	—	.554	—
Years at Preserve	—	—	.929
Skill	—	.675	—
Areas visited	—	.643	—
Lack of interest in other activities	.765	—	—
Unsure of how else to fill leisure time	.842	—	—
Loses friends if activity stopped	.751	—	—
Rather do activity than anything else	.730	—	—
% of variance	25.40	21.878	20.448
Cronbach's alpha	.849	.649	.932

Respondents were asked to identify their own style of climbing as top rope, bouldering, sport climbing, and traditional and these categories were used as the independent variables. The results of the ANOVA are displayed in Table 3. Because the factor of Skill/Days was a conglomerate of specialization factors that were used in hypotheses, Table 3 also displays the components of Skill/Days (total days of climbing, days of climbing at the Preserve, skill, and areas visited).

Traditional and top-ropings were always different from each other for each factor, with traditional climbers being a higher degree of specialization. Sport climbing

Table 3.—ANOVA for specialization

Climbing Factors	N	Mean [†]	Levene	df	F
Commitment			.95	304	12.42*
Boulder ^a	26	4.32			
Sport ^{ab}	18	1.38			
Top rope ^b	62	-2.32			
Traditional ^a	199	1.71			
Years			3.54*	298	8.72*
Boulder ^a	26	9.20			
Sport ^a	17	7.66			
Top rope ^a	58	11.08			
Traditional	198	21.03			
Skill/Days			1.17	279	43.94*
Boulder ^{ab}	24	9.74			
Sport ^a	16	8.14			
Top rope	58	5.72			
Traditional ^b	182	11.11			
Days			1.52	302	19.72*
Boulder ^a	26	5.39			
Sport ^a	18	4.89			
Top rope	59	2.93			
Traditional ^a	200	5.27			
Days at Preserve			2.23	302	26.58*
Boulder ^a	26	1.71			
Sport ^a	18	1.32			
Top rope ^a	59	1.61			
Traditional	200	3.05			
Skill			1.63	284	20.59*
Boulder ^a	24	.45			
Sport ^a	16	.00			
Top rope	61	-.57			
Traditional ^a	184	.12			
Areas Visited			9.44*	301	11.25*
Boulder ^{ab}	26	2.20			
Sport ^a	18	1.93			
Top rope ^a	58	1.75			
Traditional ^b	200	2.67			

*p<.05

[†]Means have been adjusted by factor analysis^aDifferent superscripts denote significant difference between groups

and bouldering showed no differences from each other. The research hypothesis is rejected based on these findings since there are specialization variables that are consistently significantly different across styles of climbing. However, it should be noted that the two categories of sport climbing ($N=26$) and bouldering ($N=18$) have less than 50 respondents in them.

5.0 DISCUSSION AND CONCLUSIONS

The factor analysis of specialization variables was inconsistent with theory. Scott and Shafer (2000) and Lee and Scott (2004) suggest that specialization consists of the components behavior, skill and knowledge, and commitment. In this analysis, variables that measured skill were found to load on the same factor as behavioral variables such as the number of different areas visited and the number of days spent climbing. Behavioral variables were also split from each other. Years of participation loaded strongly with years of participation at the Mohonk Preserve, but not with frequency of participation or frequency of participation at the Preserve. These findings suggest two points. The first is that studies that use only one behavioral variable are missing crucial information and that it cannot be assumed that length of participation is tied to frequency of participation. Second, since the site-specific indicators are not grouped with each other, it suggests that site-specific experience is less important than experience in general. This finding supports the work of Schreyer and Lime (1984) who found similar results.

Investigation of the framework of the specialization continuum was based on several premises. First, there is variation in the characteristics of a sample. For instance, respondents generally did not climb for an identical number of days. The second premise is that this variation can be grouped into categories; it can be partitioned into a hierarchy of high, medium, and low, or similar such groupings. The third premise is that these categories will not correspond to different styles of an activity; the styles will not fit the hierarchy. This premise was the basis for the hypothesis

The traditional climbing style had significantly higher specialization than top-rope style in each of the seven components analyzed. Bouldering and sport climbing were never significantly different from each other, but varied in whether they were different from top-ropers or traditional climbers. Sport climbers were only different from both traditional climbers and top-ropers in one component: the mixed factor of Skill/Days. The hypothesis was thus rejected; climbing styles can be arranged hierarchically.

This analysis suggests that traditional climbers and top-ropers can be seen as distinct segments of the climbing population. Bryan's (1977) initial conception of specialization is thus correct when only these groups are taken into account. Scott and Shafer (2001) questioned whether it was possible to specialize in outdoor recreation as a whole, and Kuentzel (2001) stated that it might be possible to specialize in styles of activities that are often considered less specialized. The current research does not support these notions. Specialization was not simply a description of commitment or skill, but indicated a change in style as well. However, it should be noted that this is only a general description of a population. It is entirely possible that someone who identifies himself or herself as a top-rope climber could still be highly specialized, but such an occurrence is not the norm. Nor does it mean that someone who commonly engages in highly specialized activities will never engage in styles associated with lower levels of specialization (Bryan, 1977; Dawson et al., 1992).

While the existence of a specialization hierarchy has been previously found in hunters (Miller & Graefe, 2000), this paper differs in important ways from past examinations. Miller and Graefe (2000) employed equipment as a measure of specialization, but other researchers (Ditton et al., 1992; McIntyre and Pigram, 1992) have questioned such use. In addition, the study of hunters measured specialization as a composite index, which Kuentzel and McDonald (1992) and Lee and Scott (2004) showed to be inferior to multidimensional measures. This research avoided both of these problems. All past studies on the hierarchical nature of specialization have examined whether styles or sub-activities of a particular activity can be arranged on a continuum. Future research may investigate whether such categorization is possible for each activity as a whole. For example, one might ask whether kayaking is more specialized than mountain biking. Such an investigation would require the development of new measurements in order to appropriately compare activities.

An important limitation to these findings is the low numbers of sport climbers ($N=18$) and boulderers ($N=26$) that were obtained in the sample. The validity of any conclusion regarding these groups is called into question because of the small sample size. Repeating the survey at a location, or several locations, that had more sport routes available could yield a bigger sample of climbers who use these styles.

The findings for the specialization continuum show that managers can predict specialization level from activity style in some cases. At the very least, they can tell that traditional climbers tend to be more committed and skilled, and participate more than top-ropers. They can also look to past studies on specialization to determine the likely preferences and motivations of top-ropers and traditional climbers. For instance, top-ropers are least specialized, and Ewert (1985) found that lower specialized recreationists tend to set activity-specific goals, whereas highly specialized recreationists have goals that are not specific to the activity. Thus, the goal of top-ropers may be to reach the top of a climb, while the goal of traditional climbers is to challenge themselves. Oh and Ditton (2006) found that highly specialized recreationists were more in favor of management practices aimed at conserving the resource they were dependent upon, even if this meant that success in the activity was harder to obtain. If this applies to specialization in all activities, then traditional climbers should be expected to favor management regulations that preserve resources, while top-ropers can be expected to disapprove of such rules.

This research has added to the body of knowledge on recreation specialization by showing quantitatively that the structure of specialization differentiates across activity styles in a way that was initially predicted by Bryan (1977). What still needs to be determined is whether specializations function hierarchically across multiple activities, rather than simply within them. For example, it might be possible that backpacking, skiing, angling, and climbing could be arranged on a specialization continuum. New measures would be needed to compare these activities.

6.0 CITATIONS

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