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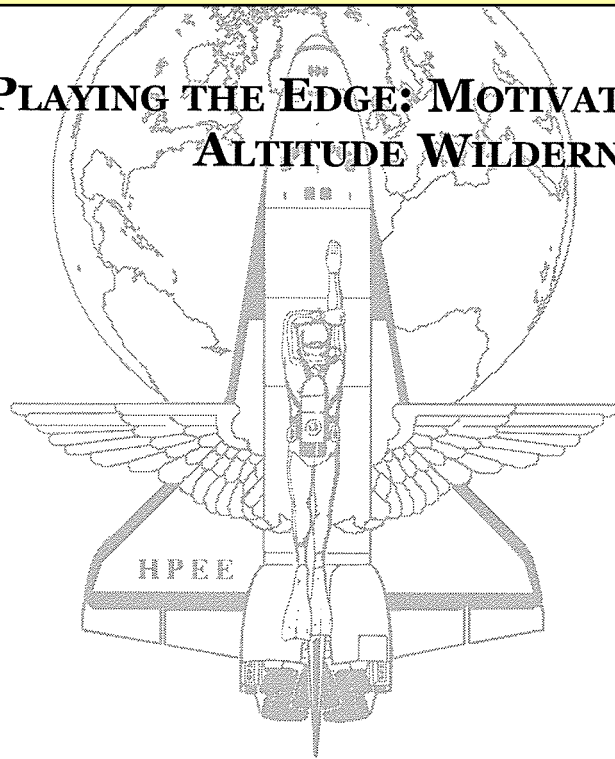
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PLAYING THE EDGE: MOTIVATION AND RISK TAKING IN A HIGH-ALTITUDE WILDERNESS-LIKE ENVIRONMENT



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ABSTRACT

Activities in a natural environment that involve risk and danger to the participant have become more popular over the last decade. This article describes a study on the motivations for high-altitude mountaineering at Mount McKinley in Denali National Park, Alaska. Using a principal components factor analysis, five factors emerged, accounting for 92% of the explained variance. Overall, scale items such as exhilaration, excitement, and accomplishment appeared as important motivating variables. Risk taking as a motivating variable did not generate a high level of motivational importance. Based on experience levels in mountaineering, a number of differences were observed in the patterns of motivational importance. The findings suggest that participants in risk recreation report different patterns of motivations that are contingent on their levels of experience. The deliberate seeking of adventure and risk in a natural environment setting continues to be an interesting research and managerial challenge. Although some people would look upon glaciated and steep mountain landscapes as places for experiencing high-quality recreation opportunities, others would view the same terrain as far removed from anything representing an enjoyable outing. Reasons for participation in activities such as mountaineering are often not fully understood by resource managers or the public (Dunn & Gulbis, 1976; Moser, 1991). This lack

of understanding is, in part, propagated by the belief that recreation behavior is often based on anticipated rewards, and, in a recreational context, what reward could be worth risking one's health or life (Heimer, 1988)? What is often overlooked is that for many individuals, the goals of working as a team and being in close contact with a natural environment while striving to accomplish a difficult and challenging goal (e.g., reaching the summit) may well be worth facing the danger (Iso-Ahola, LaVerde, & Graefe, 1988; Wankel & Berger, 1990).

Natural environment managers are often faced with decisions involving access and site development, both of which have important ramifications for the public (Ewert & Schreyer, 1990; Mackay, 1988). From a theoretical perspective, risk recreation offers an interesting array of research topics such as: What motivates people to seek out dangerous or risky environments? What are the expectations surrounding such an encounter? Are certain types of people more prone to seek out dangerous environments through recreation than others? Is risk taking critical or incidental to the overall experience?

The purpose of this study is to identify the motivational patterns of one group of risk recreators (mountain climbers) and determine if these patterns changed as a function of experience in the activity. In this study, the sample consisted of high-altitude mountaineers attempting to climb Mount McKinley in Denali National Park, Alaska.

THEORETICAL BACKGROUND OF RISK RECREATION

Risk recreation can be defined as recreational activities containing elements of risk or danger that are experienced in a natural environment, in which the actions and abilities of the participant play important roles in the final outcome of the experience (Ewert, 1989). Examples of these types of activities include rock climbing, white-water boating, Scuba, wilderness backpacking, and spelunking (caving). Although risk recreation can be distinguished from other endeavors by the deliberate seeking out of situations in which there is an element of danger, there is not a complete loss of control. Rather, risk recreation involves a deliberative process in which individual skills and abilities are weighed against projected requirements and possible negative outcomes (Bernard, 1968; Ewert, 1989). Ball (1972) supports this argument, noting that in some recreational situations, players are control oriented. By virtue of their skills and behaviors, they display a substantial amount of control and influence over outcomes. As a consequence, risk taking per se may play a less central role in explaining why individuals choose to engage in risk recreation activities and dangerous environments.

Theoretical Approaches

From a research perspective, what motivates people to seek out risk in a recreational environment has generally involved two approaches: (a) personality predisposition and (b) goal-directed behavior. The personality predisposition approach emerged from the earliest efforts to explain voluntary risk-taking behavior (Lyng, 1990) and is based on the assumption that there are two polar personality types: those who value and seek out risky environments and those who avoid such encounters. The terms *stress-seekers* (Klausner, 1968), *sensation-seekers* (Zuckerman, 1979) and *Big T* (thrill-seeking) personality (Farley, 1986) have been used in this type of research approach. Knopf (1983) reports that past research has also suggested participants in high-risk activities, such as mountaineering, also have a strong need for dominance and control of events. Using this framework, motivations for participation might include items such as for the risks, for the excitement, or for a sense of control. The principal shortcoming of this approach is that it fails to provide a multidimensional explanation (other than individual personality) for voluntary risk-taking behaviors.

The primary assumption underlying the second approach is that risk seeking is a goal-directed set of behaviors. Within the risk recreation context, these goals have included the need for arousal (Ellis, 1973; Klausner, 1968; Loy & Donnelly, 1976); frontier values such as autonomy and individualism (Deci & Ryan, 1985; Howard, 1976; Klein, 1978); and optimal arousal or flow (Berlyne, 1966; Csikszentmihalyi, 1975; Csikszentmihalyi & Csikszentmihalyi, 1988; Hebb, 1966). Under this line of inquiry, participation in risk recreation activities and corresponding environments is a way to achieve certain goals or desired outcomes, such as to feel a sense of accomplishment, to reach the summit, or to be engaged in mountaineering activities.

As suggested by Mitchell (1988), transcendental states such as flow are only possible when real, meaningful, and fateful outcomes are contingent upon the skills and actions of the participant.

Achieving flow or optimal arousal can be difficult in activities that have trivial outcomes (e.g., video games) or outcomes that are independent of the skill of the participant.

Activities such as mountaineering can offer opportunities where the outcomes are fateful, challenging, and dependent upon the actions of the participant. The risk recreationist may be seeking an optimally arousing experience in an environment that demands a full measure of personal commitment, decision making, uncertainty of outcome, and intrinsically important outcomes (i.e., survival). Considering the previous work in human attraction to situations involving complexity, uncertainty of outcome, and novelty (Fiske & Maddi, 1961), it is not surprising that some people seek out environments that are challenging and dangerous. In the goal-driven approach, participation in risk recreation is driven by an individual desire to achieve a high level of arousal or to satisfy a host of other needs and goals.

Because of the broad spectrum of potential goals, the goal directed approach to risk-taking endeavors would suggest that risk recreationists would have a wide range of motives for participation. These motives would not necessarily be constant across time, space, or setting (Lyng, 1990; Schreyer, Knopf, & Williams, 1984). Within this context, several questions remain unanswered. First, what are the levels of importance that individuals place on different motivations for participation? Second, do these motivations change depending on the experience levels of the individual? Although previous research has been conducted on the influence of past experiences in other outdoor recreation settings (Schreyer, Lime, & Williams, 1984; Watson, Roggenbuck, & Williams, 1991; Williams, Schreyer, & Knopf, 1990), much less is known about the mediating role experience plays in environments involving risk and danger. Third, how important is risk taking for participation in these types of activities? If risk taking is an important reason for participation, would it be reasonable to expect that this level of importance would be maintained across experience levels, even if the more experienced climber would have a better understanding of the nature of the environment and a higher level of skill to deal with it?

The Environment

In this study, the participant is in a mountain environment far removed from quick evacuation or medical aid. Weather is a constant concern, with high winds, low temperatures, and low visibility often the norm. Juxtaposed to these conditions are threats of falling (either from steep slopes or into crevasses), avalanches or rock fall, and life-threatening problems of high-altitude pulmonary edema, cerebral edema, and other high-altitude-related illnesses often present above 8,000 feet. As is typical of many risk recreation activities, and was true in this study, high-altitude mountaineering demands a substantial level of commitment and involvement (McIntyre, 1992; Mitchell, 1983, 1988). Engaging in this activity necessitates substantial expenditure in terms of money, time, and personal skills. Participants are often in relative isolation for periods of several weeks to months and are constantly faced with demands on their physical condition, equipment, and emotional stability. Taking into consideration these and other potential prob-

lems, this activity represents an extreme form of recreation, both in terms of environment and consequent behaviors.

High-altitude mountaineering is a useful study medium, in that skill and experience can be objectively measured through well-established rating scales. Both routes (rated I to VI, with I being the easiest) and specific moves (rated 1 to 6, with 1 being the easiest) are graded to provide common standards of difficulty. These rating scales allow for a relatively objective determination of climbing skill and experience. Compared to earlier works on specialization (Bryan, 1979), the environment/behavior interaction (Little, 1987), and the linkage between motives and environment (Kaplan & Kaplan, 1989; Schreyer, Knopf, & Williams, 1984), not a great deal of empirical data is available concerning the influence of experience and skill upon motivations in the risk recreation environment.

MOTIVATION AND LEVEL OF EXPERIENCE

Previous research has reported that the experience level of a participant can play an important role in the motivations for participation (Driver & Brown, 1975; Schreyer & Beaulieu, 1986; Schreyer & Lime, 1984; Watson et al., 1991). According to cognitive development theory (Moore, 1976; O'Keefe, 1990; Williams et al., 1990), as people experientially gain knowledge about a particular activity, their level of understanding about that activity becomes more comprehensive and complex. Research suggests that experience serves to alter this cognition by developing useful cues, heuristics (i.e., rules of thumb), and knowledge that is grounded in past personal events. This grounding allows the more experienced individual to develop a more complete range of expectations and motivations for participation (Carroll & Johnson, 1990; Hogarth, 1980).

Being experienced in high-altitude mountaineering implies that a participant will have a more accurate understanding of what the environment will be like (e.g., mountain storms, cold temperatures) and how difficult the challenges will be. Watson et al. (1991) report that experienced recreationists make finer distinctions among similar activities and choices than those of less experience. Related to the basic assumption of expectancy theory (Driver & Brown, 1975; Lawler, 1973), the recreationist chooses specific activities and settings to achieve expected outcomes. Following this line of reasoning, the more experienced climbers should report a higher number of cognitive attributes and a greater range of motivations for participation in high-altitude mountaineering than less experienced climbers. For example, when compared to less experienced climbers, more experienced individuals may climb to be with long-time climbing partners or to revisit routes or mountains they climbed earlier in their climbing careers.

Based on literature review, past research findings, and personal observations, three research questions were developed for empirical testing. These questions included:

1. What is the overall motivational structure for participation in high-altitude mountaineering?
2. How does the motivational structure of experienced climbers differ from that of less experienced individuals?
3. How important is risk taking relative to the other motivational

items?

METHODS

Location

Mount McKinley is located in south central Alaska and rises to an elevation of 20,320 feet. Unlike the situation in other major mountain chains such as the Andes or Himalayas, getting to Mount McKinley is not generally a serious logistical problem. For this reason, plus the overall difficulty of the mountaineering challenges (i.e., high altitude, steep terrain, extensive glaciation, and severe storms), Mount McKinley is considered an important mountaineering objective for climbers worldwide (Waterman, 1988).

Mountaineering expeditions on Mount McKinley typically last up to 1 month in length and involve extensive travel over glaciers. Even the easiest climbing routes necessitate negotiating steep terrain, with periods of extreme temperatures (+50 and greater to -60s, Fahrenheit) and high winds. These factors coupled with the relative lack of medical aid or quick evacuation put any climber of McKinley in a situation involving a substantial potential for undesirable outcomes (i.e., hardship, injury; or death).

Instrument

Upon completion of their expedition, climbers are required to go through a checkout procedure with National Park officials. During the months of June and July, 1990, as part of the checkout procedure, individuals were given a 50-item questionnaire. Of these 50 items, 31 were specifically designed to elicit motivational responses relative to climbing at Mount McKinley. Twenty-five of the 31 items used in this study were similar to those used in an earlier study by Ewert (1985). The items were selected on the basis of their ability to measure recreation-based motivations as identified in previous research (Crandall, 1980; Driver, 1977; Manning, 1986). Participants were asked to place a slash (/) across a 10 cm line at the place that best represented the level of importance they felt about a particular scale item. The 10 cm line was anchored (from left to right) by the statements *Not Important* (0 cm) and *Very Important* (10 cm). From this mark, a metric of 0-100 was measured (left to right), depending on the location of the slash.

One potential problem with this data collection method is that the reported motivations were recorded after the experience. The outcome of the trip may have influenced the reported motivations (Ewert, in press; Stewart, 1992). On the other hand, Stewart and Hull (1992) suggest that post-hoc analysis tend to evaluate the individual's overall perception of the total recreational experience and may have greater utility in studies involving long-term benefits and future behaviors. The danger with this approach is that it relies on recall and is subject to some inaccuracy when compared to measurements taken during the experience. In this study, before-trip and after-trip comparisons were not possible because of Park Service limitations placed on the data collections. That is, only after-trip data collection was allowed, as the Park Service believed that also collecting data before the trip would be too burdensome on the perspective climbers. Because the instrument was administered after the climbing experience, the motives identified could not be considered as antecedent conditions (Manfredo, Driver, &

Brown, 1983; Stewart & Carpenter, 1989).

Previous research has suggested that the person/environment interface needs to be studied from a multidimensional framework (Houts, Cook, & Shadish, 1986). Within this person/environment context, the individual's level of experience was considered an important variable in explaining the types of environments and activities an individual chooses to enjoy (Hammit, Knauf, & Noe, 1989; Schreyer, Lime, & Williams, 1984; Williams et al., 1990). In this study, past experience was measured using both an objectively formed experience index and a user-determined index of experience and skill.

Experience and Skill Index

The experience and skill index for this study was formed by having individuals respond to the following categories: beginner (little or no mountaineering experience), novice (first major expedition but some glacier travel experience), intermediate (has participated in two to five extended expeditions, much glacier travel, and winter climbing experience), and highly experienced (has participated in over five major expeditions involving technical challenges, high altitude, and arctic-like conditions). Individuals were then asked to report the three most difficult mountaineering routes they had climbed. If individuals reported themselves as being highly experienced but had not participated in any mountaineering routes that are traditionally considered challenging, they were not included in the analysis. This procedure was adopted to eliminate individuals who reported levels of experience and skill that were not congruent with their actual accomplishments.

Finally, participants were asked to rate themselves according to their mountaineering skills. These skills were classified as follows: novice (beginner snow and ice climber), intermediate (can lead 5.6 rock and ice climbs at Grade III under alpine conditions), and advanced (can lead 5.9 or above rock and Grade IV ice climbs under alpine conditions). If a respondent reported an advanced level of mountaineering skills but had not accomplished a difficult mountaineering route, the questionnaire was discarded from the analysis.

RESULTS

Of the climbers going through the checkout procedure ($n = 368$), 98% agreed to fill out the questionnaire. Of this group, 360 climbers responded to the questionnaire. The average age of this group was 32.3 years (mode = 29 years, standard deviation = 7.6). Within this sample, the youngest climber was 18 and the oldest was 62. With respect to gender, 327 climbers were male (90.3%) and 35 were female (9.7%). The demographic data are similar to those from other studies at Mount McKinley (Robert Siebert, Mountaineering Ranger, Denali National Park, personal communication, 1990).

Experience/Skill Levels

After a review of the 360 questionnaires returned, 14 (4%) were rejected as not providing enough congruence between the actual climbs completed and level of self-reported mountaineering experience and climbing skills. After this correction the following

breakdowns were generated for mountaineering experience: beginner (13, 3.6%), novice (108, 30.1%), intermediate (185, 51.5%), and highly experienced (40, 14.5%). When correlated with mountaineering skills, a moderately strong association (Kendall tau) was obtained between skill and experience levels: $t = .57$, $p < .000$. These data suggest that respondents were fairly congruent with their past climbing experience and level of perceived skills. Using the previously described criteria for classification, individual levels of mountaineering experience were organized into three categories; novice (novice + beginners), intermediate, and highly experienced (highly experienced + advanced-climbing skills).

Motivational Structure

To determine the patterns of motivational importance generated by the various scale items, an initial factor structure using a principal component factor analysis with varimax rotation was used. An eigenvalue of 1.0 or greater was the criterion used to determine factor extraction. A minimum factor loading of .40 was the criterion used to identify individual items belonging to a specific factor. Using this criterion, 19 items, loaded into four factors having eigenvalues of 1.0, were generated and resulted in 86% of explained variance (See Table 1). These factors were labeled Exhilaration/Excitement (1), Social Aspects (2), Image (3), and Aspects of Climbing (4). Following the suggestion by Rummel (1970), a fifth factor having an eigenvalue of .99 was included in the analysis because it represented a series of scale items that have traditionally been associated with many forms of outdoor recreation. This factor was labeled Catharsis/Escape and included five scale items such as "to slow my mind down," "to disengage from normal life," and "to get away from authority." All five factors produced a Cronbach's alpha of .72 (range = .68 to .75).

TABLE 1
Combined Factor Structure of Motives for High-Altitude Mountaineering

Scale Items	Rotated Factor Loadings				
	Exhilaration/ Excitement (1)	Social Aspects (2)	Image of Climbing (3)	Aspects of Climbing (4)	Catharsis/ Escape (5)
Exhilaration	79				
Accomplishment	76				
Excitement	78				
Risk	42				
Use physical skills	54				
To help others		57			
Express creativity		44			
Use my mind		52			
To be part of team effort		67			
For the friendship		63			
Recognition			67		
Competition			69		
To show others			69		
To be a "mountaineer"			57		
To make decisions				51	
Develop climbing skills				56	
Gain control over self				47	
To use my climbing skills				57	
Personal testing				46	
Solitude					53
Disengage from normal life					61
Slow mind down					64
Personal values					42
Get away from authority					54
Eigenvalues	6.5	2.4	2.2	1.0	.99
% Variance	44	16	15	11	07
Cumulative variance (percent)	44	60	75	86	92

NOTE: Decimal points were omitted. Only items loading with .40 or higher were included.

The Influence of Experience

Past level of experience can influence motivational patterns through a cognitive restructuring (Williams et al., 1990), phenomenological reinterpretation of reality (Spinelli, 1989), or development of a more defined form of specialization on the part of the participant (Little, 1987). It was surmised that based on the experience levels of high-altitude mountaineers, differences would be observed in the motivations for participation. To accomplish this, both factors and individual items comparisons were made.

A number of factor comparison techniques exist, including: correlation of factor loadings, correlation of factor scores, the s-index, the root mean square, and the coefficient of congruence (Allen &

Buchanan, 1982; Levine, 1977). Rummel (1970) reports that these techniques usually involved comparing one aspect (usually factor loadings). To counteract this one-dimensional approach, Rummel (1970) advocates a broader set of comparisons by including the configuration of the factors, the relative complexity of the structures, the total variance, and the total number.

Accordingly, factor structures were generated using additional factor analysis with varimax rotation for each level of experience. (See Table 2.) Results of this analysis revealed that the factor of Exhilaration/Excitement was common to all three groups; adding support to the idea that these are important variables for the high-altitude mountaineer whatever the experience level.

A different picture emerges of the three climbing groups when the first two factors of each group are examined. In this case, the beginners reported being motivated by factors involving the aspects of Climbing and Image. The intermediate-level climbers seem to be motivated by Decision-Making and Exhilaration/Excitement. The highly experienced climbers reported that the items related to the factors of Exhilaration/Excitement and Self-Expression were important motivating forces. The data suggest that as climbers grow in experience, they appear to move along a continuum of motivating factors from items relatively mechanical (e.g., learning how to climb) to those items that have greater intrinsic and autotelic meaning (exhilaration and self-expression).

Consistent with previous findings (Williams et al., 1990), the highly experienced climbers reported the greatest number and complexity of motivational factors. Two findings support this claim (see Table 2). First, the highly experienced group reported the greatest number of factors, with seven factors being generated, compared to six for the beginner/novice group and five for the intermediate group. Second, even with a greater number of factors, the highly experienced group analysis accounted for the lowest amount of explained variance (76%). One explanation for this difference is that there are more unidentified items left out of the analysis of the highly experienced group. In sum, it would appear that the highly experienced group developed a more comprehensive set of factors that could describe motivations for participation than either other group. Does this difference hold up when individual scale items are compared, and how important is risk taking in motivational importance?

TABLE 2
Comparison of Factor Composi
of Motives for High-Altitude Mounta

<i>Beginner/Novice</i>	<i>Intermediate</i>
Aspects of Climbing (6.7, 35%) 1. Use climbing skills 2. Develop climbing abilities 3. Make decisions 4. Sense of control 5. Personal testing Image (3.2, 17%) 1. To show others 2. Competition 3. Recognition 4. Be known as a "mountaineer" Exhilaration/Excitement (2.5, 13%) 1. Sense of accomplishment 2. Exhilaration 3. Excitement 4. Use physical skills 5. Risk Nature (1.9, 10%) 1. Scenery 2. To be close to nature 3. Experience the wilderness Self-Expression (1.2, 7%) 1. Self-expression 2. Use my mind Social Aspects (1.1, 6%) 1. Friendship 2. To be part of a team effort	Decision Making/Team Effort (6.0, 37%) 1. Make Decisions 2. Use my mind 3. To be part of a team effort 4. Friendship 5. Sense of control over self Exhilaration/Excitement (2.6, 16%) 1. Accomplishment 2. Exhilaration 3. Excitement 4. Use physical skills 5. Personal testing Image (2.6, 16%) 1. Competition 2. To show others 3. Recognition 4. Be known as a "mountaineer" Nature (1.8, 11%) 1. Scenery 2. To be close to nature 3. Photography 4. Experience the wilderness Catharsis (1.2, 7%) 1. Slow mind down 2. Disengage from normal life 3. Solitude 4. Get away from authority
Number of factors 6 Total explained variance 87%	Number of factors 5 Total explained variance 87%

NOTE: Factors listed in order of explained variance. Eigenvalues ≥ 1 . Varimax rotation, factor loading explained variance).

Mean Comparisons and Importance of Risk Taking

Past research has suggested that items such as image are extrinsically motivating and will become less important as a participant gains in experience (Ewert, 1985). Significant differences were observed only on the factor of Social Aspects (Table 3). Individual scale items were disaggregate across experience levels and analyzed using a one-way ANOVA with a Scheffé procedure (.05) as the post hoc comparison. Six scale items and one factor produced significant differences between the various comparisons. Based on the values generated through the 0-100 scale, all of these six items and one factor produced significant differences between the two extremes in experience levels (beginners and highly experienced) (Table 3). It appears that highly experienced climbers are more interested in helping others, expressing creativity, using the mind, and self-expression than either the intermediate or beginner-level climbers. Conversely, those climbers with less experience gave more motivational importance to disengagement from normal life, competition, developing climbing skills, and climbing the highest peak in North America.

Finally and consistently, the scale item related to risk taking generated low levels of importance for all three groups. This finding suggests that the level of risk perceived by the participant may be fundamentally different than the level of risk seen by the non-climbing public. On the other hand, items related to self expression were much more important to those more highly experienced climbers.

DISCUSSION

Based on the theories of optimal arousal and flow, it is not surprising that exhilaration and excitement appear to be important components for the high-altitude mountaineer. This finding contrasts with the suggestion that social motives are the most important reasons for outdoor recreation participation (Schreyer, Knopf, & Williams, 1984) and suggests that motivations for participation depend on the level of experience of the individual. The findings are supportive of collateral work in sports psychology, which suggests that the excitement of the activity, personal accomplishment, and personal testing are of primary importance (Wankel & Berger, 1990; Wankel & Kreisel, 1985).

On the other hand, personality-driven motivations such as risk taking did not achieve a high level of importance. In this study, each group of respondents in all levels of experience rated the item "because of the risk" as having low motivational power. That is, the pursuit of risk in an activity regarded as risk recreation was apparently not very important. According to the data, the pursuit of risk has little to do with the reasons for being there. Carney (1971)

and Houston (1968) validate this point, stating that a person engaged in the activity does not necessarily view it as risky or dangerous. Based on these data a more appropriate term for these activities may be adventure or challenge recreation rather than the more daredevil connotation, risk recreation. In sum, it would appear that high-altitude climbers, and especially highly experienced ones, are climbing for very different reasons than risk or danger. It should be noted, however, that the data were generated after the experience. Risk and risk-taking may not have assumed as high a level of importance to the individual when the experience and potential for loss were over. Furthermore, because of the lack of specificity in terms of what motivation belongs under what general theoretical rubric (i.e., is seeking excitement a personality-driven or goal-seeking motivation), discarding one theoretical foundation in favor of another is premature.

Finally, one cannot help but to be struck by the very quintessential nature of the mountaineering environment: to be engaged in an exciting and challenging activity, in a demanding natural setting, while relying on both personal abilities and those of the other team members. Management actions that seek to safeguard the climber often only serve to inhibit the very reasons for participation. One

TABLE 3
Means and Standard Deviations for Scale Items

Scale Item	Combined	Means (Standard Deviations)			Significant Differences (A,B,C) ^a
		Beginners/ Novices (A)	Intermediate (B)	Highly Experienced (C)	
Exhilaration/Excitement	60.1 (18.2)	61.0 (17.7)	60.2 (17.5)	58.8 (20.8)	
Exhilaration	65.7 (26.1)	67.1 (24.8)	64.9 (26.2)	66.9 (28.1)	
Accomplishment	73.6 (21.7)	74.7 (20.7)	74.6 (20.2)	67.9 (28.2)	
Excitement	65.6 (24.8)	67.4 (24.4)	64.4 (24.1)	66.3 (28.0)	
Risk	29.2 (25.6)	30.7 (26.4)	30.1 (25.1)	23.7 (25.0)	
Use physical skills	65.6 (24.3)	63.9 (25.3)	66.7 (22.4)	68.7 (26.3)	
Catharsis/Escape	40.0 (21.2)	37.4 (20.1)	42.4 (20.1)	39.0 (20.4)	
Solitude	35.3 (30.5)	33.5 (29.8)	36.7 (30.7)	35.5 (32.1)	
Disengage from normal life	51.1 (32.1)	49.2 (32.2)	55.7 (31.3)	41.2 (32.8)	$p = .01, (A,C), (B,C)$
Slow mind down	29.3 (27.6)	26.6 (26.0)	31.1 (27.8)	30.3 (31.4)	
Personal values	62.2 (30.0)	59.4 (29.6)	62.9 (30.4)	67.8 (29.9)	
Get away from authority	22.8 (27.5)	20.4 (25.5)	23.9 (27.8)	26.5 (31.5)	
Image	22.3 (19.1)	23.1 (20.0)	22.1 (19.0)	21.9 (17.3)	
Recognition	26.9 (26.3)	27.5 (26.0)	26.0 (26.0)	29.6 (28.5)	
Competition	16.4 (21.2)	17.1 (23.1)	17.9 (21.7)	9.4 (11.5)	$p = .05, (A,C)$
To show others	15.8 (21.4)	16.7 (20.8)	14.0 (19.5)	21.8 (28.8)	

continued

TABLE 3 continued

Scale Item	Combined	Means (Standard Deviations)			Significant Differences (A,B,C) ^a
		Beginners/ Novices (A)	Intermediate (B)	Highly Experienced (C)	
To be a "mountaineer"	29.9 (30.4)	30.3 (30.7)	30.6 (30.7)	27.0 (29.0)	
Social Aspects	45.0 (21.3)	40.9 (20.3)	45.8 (20.8)	52.7 (23.6)	$p = .01, (A,C)$
To help others	29.0 (29.0)	27.9 (28.6)	26.3 (27.1)	42.5 (33.8)	$p = .00, (A,B), (A,C)$
Express creativity	32.8 (27.5)	27.6 (25.4)	33.0 (26.4)	44.6 (33.8)	$p = .00, (A,B), (A,C)$
Use my mind	45.1 (30.4)	38.8 (28.6)	47.9 (30.6)	52.8 (31.0)	$p = .01, (A,B), (A,C), (B,C)$
To be part of a team effort	53.4 (31.8)	51.5 (32.2)	53.3 (31.8)	58.1 (31.5)	
For the friendship	60.3 (28.2)	55.1 (28.7)	62.7 (27.0)	64.4 (30.6)	
Aspects of Climbing	59.2 (20.7)	58.8 (21.3)	60.5 (20.0)	56.8 (21.3)	
To make decisions	47.6 (30.3)	42.8 (29.3)	49.8 (30.2)	52.7 (30.8)	
Develop climbing skills	60.6 (28.5)	66.2 (26.9)	65.5 (26.9)	53.1 (30.1)	$p = .01, (A,C), (B,C)$
Gain control over self	48.5 (31.2)	48.1 (30.9)	48.5 (31.5)	50.8 (30.8)	
To use my climbing skills	63.8 (27.8)	56.1 (29.5)	64.5 (26.1)	59.5 (31.4)	
Personal testing	63.2 (26.8)	63.8 (27.2)	63.5 (26.1)	61.3 (27.6)	

NOTE: Scale = 0-100 (higher scores indicate higher levels of importance).

a. One-way ANOVA, with Scheffé post hoc ($\alpha = .05$)

example of this is the placing of fixed ropes on specified mountaineering routes. Although useful for increasing the overall level of safety, the hidden price is often reducing the uncertainty of the route, thereby taking away from the overall sense of adventure. For some, this loss of challenge can be a painful degradation in the overall experience. Management actions that provide obtrusive development and regulation in the natural environment may damage the experience of this group of recreationists. The risk recreation experience can be preserved by minimizing site development and protecting the challenging nature of the landscape.

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REFERENCES

- Allen, L., & Buchanan, T. (1982). Techniques for comparing leisure classification systems. *Journal of Leisure Research, 14*, 307-322.
- Ball, D. (1972). What the action is: A cross-cultural approach. *Journal for the Theory of Social Behavior, 2*, 121-143.
- Berlyne, D. (1966). Exploration and curiosity. *Science, 153*, 25-33.
- Bernard, J. (1968). The Eudaemonist. In S. Klausner (Ed.), *Why*

- men take chances* (pp. 6-47). New York: Anchor.
- Bryan, H. (1979). *Conflict in the great outdoors* (Bureau of Public Administration, Sociological Studies No. 4). University, AL: University of Alabama.
- Carney, R. (1971). *Risk-taking behavior*. Springfield, IL: Charles C Thomas.
- Carroll, J., & Johnson, E. (1990). *Decision research: A field guide*. Newbury Park, CA: Sage.
- Crandall, R. (1980). Motivations for leisure. *Journal of Leisure Research*, 12, 45-54.
- Csikszentmihalyi, M. (1975). *Beyond boredom and anxiety*. San Francisco: Jossey-Bass.
- Csikszentmihalyi M., & Csikszentmihalyi, I. (Eds.). (1988). *Optimal experience: Psychological studies of flow in consciousness*. New York: Cambridge University Press.
- Deci, E., & Ryan, R. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.
- Driver, B. (1977). *Item pool for scales designed to quantify the psychological outcomes desired and expected from recreation participation*. Ft. Collins, CO: USDA Forest Service Rocky Mountain Forest and Range Experiment Station.
- Driver, B., & Brown, P. (1975). A socio-psychological definition of recreation demand, with implications for recreation resource planning. In *Assessing demand for outdoor recreation* (pp. 62-88). Washington, DC: National Academy of Sciences.
- Dunn, D., & Gulbis, J. (1976). The risk revolution. *Parks and Recreation*, 11, 12-16.
- Ellis, M. (1973). *Why people play*. Englewood Cliffs, NJ: Prentice-Hall.
- Ewert, A. (1985). Why people climb: The relationship of participant motives and experience level to mountaineering. *Journal of Leisure Research*, 17, 241-250.
- Ewert, A. (1989). *Outdoor adventure pursuits: Foundations, models and theories*. Scottsdale, AM Publishing Horizons.
- Ewert, A. (in press). Differences in the level of motivational importance based on trip outcome, experience level and group type. *Journal of Leisure Research*.
- Ewert, A., & Schreyer, R. (1990). Risk recreation: Trends and implications for the 1990's. In J. O'Leary & D. Fesenmaier (Eds.), *Proceedings of the Outdoor Recreation TRENDS Symposium III*, Indianapolis, IN.
- Farley, F. (1986). The Big T personality. *Psychology Today*, 4, 44-52.
- Fiske, D., & Maddi, S. (1961). *Functions of varied experience*. Homewood, IL: Dorsey.
- Hammit, W., Knauf, L., & Noe, F. (1989). A comparison of user vs. researcher determined level of past experience on recreation preference. *Journal of Leisure Research*, 21, 202-213.
- Hebb, D. (1966). *The organization of behavior*. New York: John Wiley.
- Helmer, C. (1988). Social structure, psychology and the estimation of risk. *Annual Review of Sociology*, 14, 491-519.
- Hogarth, R. (1980). *Judgment and choice: The psychology of decision*. New York: John Wiley.
- Houston, C. (1968). The last blue mountain. In S. Klausner (Ed.). *Why men take chances* (pp. 49-58). New York: Doubleday.
- Houts, A., Cook, T., & Shadish, W. (1986). The person-situation debate: A critical multiplist perspective. *Journal of Personality*, 54, 52-105.
- Howard, D. (1976). Multivariate relationships between leisure activities and personality. *Research Quarterly*, 47, 226-237.
- Iso-Ahola, S., La Verde, D., & Graefe, A. (1988). Perceived competence as a mediator of the relationship between high risk sports participation and self-esteem. *Journal of Leisure Research*, 21, 32-39.
- Kaplan, R., & Kaplan, S. (1989). *The experience of nature: A psychological perspective*. New York: Cambridge University Press.
- Klausner, S. (Ed.), (1968). *Why men take chances*. New York: Anchor.
- Klein, D. (1978). Work, leisure and recreational risk: Some prospects for the future. In R. Bury (Ed.), *Risk and accidents in outdoor recreation areas* (information Report 80-1). College Station, TX Department of Recreation and Parks, Texas Agricultural Experiment Station, Texas A&M University.
- Knopf, R. (1983). Recreational needs and behavior in natural settings. In I. Altman & J. Wohlwill (Eds.), *Behavior and the natural environment* (pp. 205-240). New York: Plenum.
- Lawler, E. (1973). *Motivations in work organizations*. Monterey, CA: Brooks/Colo.
- Levine, M. (1977). *Canonical analysis and factor comparison*. Beverly Hills, CA: Sage.
- Little, B. (1987). Specialization and the varieties of environmental experience. In S. Wapner, S. Cohen, & B. Kaplan (Eds.), *Experiencing the environment* (pp. 85-99). New York: Plenum.
- Loy, J., & Donnelly, P. (1976). Need for stimulation as a factor in sport involvement. In T. Craig (Ed.), *Humanistic and mental health aspects of sports, exercise, and recreation* (pp. 80-89). Chicago: American Medical Association.
- Lyng, S. (1990). Edgework: A social psychological analysis of voluntary risk-taking. *American Journal of Sociology*, 95, 851-886.
- Mackay, S. (1988, Spring). Risk recreation in wilderness areas: Problems and alternatives. *Western Wildlands*, pp. 32-38.
- Manfredo, M., Driver, B., & Brown, P. (1983). A test of the concepts inherent in experience based setting management for outdoor recreation areas. *Journal of Leisure Research*, 15, 263-283.
- Manning, R. (1986). *Studies in outdoor recreation*. Corvallis: Oregon State University
- McIntyre, N. (1992). Involvement in risk recreation: A comparison of objective and subjective measures of engagement. *Journal of Leisure Research*, 24, 64-71.
- Mithchell, R. (1983). *Mountain experience: The psychology and sociology of adventure*. Chicago: University of Chicago Press.
- Mitchell, R. (1988). Sociological implications of the flow experi

- ence. In M. Csikszentmihalyi & I. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 36-59). New York: Cambridge University Press.
- Moore, G. (1976). Theory and research on the development of environmental knowing. In G. Moore & R. Golledge (Eds.), *Environmental knowing* (pp. 138-164). Stroudsburg, PA: Dowden, Hutchinson, & Ross.
- Moser, S. (1991, April). A tenuous hold. *Outside Business*, pp. 26-29.
- O'Keefe, D. (1990). *Persuasion: Theory and research*. Newbury Park, CA: Sage.
- Rummel, R. (1970). *Applied factor analysis*. Evanston, IL: Northwestern University Press.
- Schreyer, R., & Beaulieu, J. (1986). Attribute preferences for wild land recreation settings. *Journal of Leisure Research*, 18, 231-247.
- Schreyer, R., Knopf, R., & Williams, D. (1984). Reconceptualizing the motive/environment link in recreation choice behavior. In G. Stankey & S. McCool (Comp.), *Proceedings-Symposium on recreation choice behavior* (pp. 9-18). Ogden, UT: U.S. Department of Agriculture, Forest Service.
- Schreyer, R., & Lime, D. (1984). A novice isn't necessarily a novice—the influence of experience use history on subjective perceptions of recreation participation. *Leisure Sciences*, 6, 131-150.
- Schreyer, R., Lime, D., & Williams, D. (1984). Characterizing the influence of past experience on recreation behavior. *Journal of Leisure Research*, 16, 34-50.
- Spinelli, E. (1989). *The interpreted world: An introduction to phenomenological psychology*. Newbury Park, CA: Sage.
- Stewart, W. (1992). Influence of the onsite experience on recreation experience preference judgments. *Journal of Leisure Research*, 24, 185-198.
- Stewart, W., & Carpenter, E. (1989). Solitude at Grand Canyon: An application of expectancy theory. *Journal of Leisure Research*, 21, 4-17.
- Stewart, W., & Hull, R. B. (1992). Satisfaction of what? Post hoc versus real-time construct validity. *Leisure Sciences*, 14, 195-209.
- Wankel, L., & Berger, B. (1990). The psychological and social benefits of sport and physical activity. *Journal of Leisure Research*, 22, 167-182.
- Wankel, L., & Kreisel, P. (1985). Factors underlying enjoyment of youth sports: Sport and age group comparisons. *Journal of Sports Psychology*, 7, 51-64.
- Waterman, J. (1988). *High Alaska: A historical guide to Denali, Mt. Foraker, and Mt. Hunter*. New York: American Alpine Club.
- Watson, A., Roggenbuck, J., & Williams, D. (1991). The influence of past experience on wilderness choice. *Journal of Leisure Research*, 23, 21-36.
- Williams, D., Schreyer, R., & Knopf, R. (1990). The effect of the experience use history on the multidimensional structure of motivations to participate in leisure activities. *Journal of Leisure Research*, 22, 36-54.
- Zuckerman, M. (1979). *Sensation-seeking: Beyond the optimal level of arousal*. Hillsdale, NJ: Lawrence Erlbaum.