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## Differences in Motivation for Participation and Attitudes Toward Management Among Rock Climbing Sub Groups: Implications for the Benefits-Based Management Approach

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**DIFFERENCES IN MOTIVATION FOR PARTICIPATION AND ATTITUDES  
TOWARD MANAGEMENT AMONG ROCK CLIMBING SUB GROUPS:  
IMPLICATIONS FOR THE BENEFITS-BASED MANAGEMENT APPROACH**

by

Amy L. Ackerman  
B.S. August 2004, Old Dominion University

A Thesis Submitted to the Faculty of Old Dominion University in Partial Fulfillment of  
the Requirement for the Degree of

MASTER OF SCIENCE IN EDUCATION

PHYSICAL EDUCATION

OLD DOMINION UNIVERSITY  
December 2006

Approved by:

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Edwin Gómez (Director)

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Edward Hill (Member)

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David Swain (Member)

## **ABSTRACT**

### **DIFFERENCES IN MOTIVATION FOR PARTICIPATION AND ATTITUDES TOWARD MANAGEMENT AMONG ROCK CLIMBING SUBGROUPS: IMPLICATIONS FOR THE BENEFITS-BASED MANAGEMENT APPROACH**

**Amy L. Ackerman  
Old Dominion University, 2006  
Director: Dr. Edwin Gomez**

The purpose of this research was to develop a scale that would measure the motivation for participation of rock climbing sub groups, determine what differences exist among rock climbing subgroups and confirm the Rock Climbers' Attitudes toward Management Scale. Respondents were given an on-site questionnaire at three rock climbing areas in the United States. Respondents identified themselves according to their preferred type of climbing (e.g., traditional climbing, sport climbing, and hybrid climbing) and their preferred mode of climbing (e.g., lead climbing, top roping, and both equally). Exploratory factor analysis identified five factors for the Rock Climbing Motivation Scale: competition, control, escape, sensation seeking, and social. An analysis of variance confirmed there were no significant differences among types of climbers on the Rock Climbers' Motivation Scale or Rock Climbers' Attitudes toward Management Scale, contrary to previously reported findings. Mode of climbing was found to be a significant predictor of frequency of use, years of experience was found to be a significant predictor of frequency of use, and level of climbing ability was found to be a significant predictor of mode of climbing. The results of this study were then applied to the Benefits-Based Management Approach.

## ACKNOWLEDEMENTS

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**Differences in Motivation for Participation, and Attitudes toward Management among  
Rock Climbing Subgroups: Implications for the Benefits-Based Management Approach**

**Amy Ackerman**

**Old Dominion University**

## CHAPTER I

### INTRODUCTION

#### *Introduction*

Rock climbing is a sport that requires a participant to lift the body against gravity to climb on a rock face using the irregularities of the rock. On a highly rated climb, the rock face is “virtually perpendicular and the irregularities are very small” (Li, Margetts, & Fowler, 2001; Slinger & Rudestam, 1997, p. 359). Sports that involve a potential for injury, or even death, have become increasingly popular around the world. These so-called “extreme sports” are sports such as mountaineering, canyoning, bungee jumping, BASE jumping, parachuting, hang gliding, sky diving, and rock climbing (Palmer, 2002; Slinger & Rudestam, 1997). The essence of extreme sports is they take you higher, faster, and further and they often have elements of sensation seeking and risk (Koerner, 1997; Slinger & Rudestam, 1997).

Although some researchers have maintained that rock climbing involves both sensation seeking and risk taking as the key elements to one’s motivation for participation (Palmer, 2002), others have researched the possibility of characteristics that are unique to rock climbers, which set the rock climbing community apart from the other extreme sports (Kiewa, 2001; Slinger & Rudestam, 1997). Even though rock climbing has traditionally been thought of as an extreme sport, since the late 1970s, rock climbing has become more mainstreamed and therefore could be segmented into user types. In other words, all climbers are not homogenous, and should not be lumped into one category. This study proposes to look at differences between traditional and sport climbers as two varying segments within the rock climbing community. The purpose of

this study was to determine if there are differences in motivation between traditional rock climbers and sport rock climbers.

In the current study, a questionnaire was administered to the rock climbing community in order to examine benefits, preferences, and motivations of traditional and sport rock climbers. It was hypothesized that the motivations for participation differ between traditional and sport climbers. In particular, traditional climbers and sport climbers will differ on the components of (a) competition, (b) control, (c) escape, (d) self-efficacy, (e) sensation seeking, and (f) socialization – all dimensions of the aspect of motivation. A set of scales was developed to measure these dimensions and the scales were tested for validity and reliability.

Research has suggested it is advantageous for recreation and leisure professionals to have a better understanding of rock climbers' motivations and consumption behaviors so that they may better facilitate leisure benefits for this recreation group (Schuster, Hammitt & Thompson, 2001). Additionally, Feher, Meyers, and Skelley (1998) recommended that future research investigate possible psychological differences between various types of climbing, such as traditional and sport.

### *Statement of Problem*

The lack of empirical research on rock climbers represents a void in the recreation and leisure literature. Rock climbers are often cited in research of extreme sport athletes, and even then, rock climbers are treated as one homogeneous group. Few studies have acknowledged there are different segments of the rock climbing community or that perceptions, attitudes, and motivations differ among these segments (Schuster et al., 2001). Additionally, outside of the climbing community, there is a perception that rock climbing is reckless to the environment. Increasing the literature base for this user group

will alleviate some negative attitudes toward rock climbers and may provide valuable information for existing and future rock climbing regulations.

### *Statement of Purpose*

This research is an exploratory study of the motivations for participation and the attitudes toward management of rock climbers. The purpose of the study is to identify and empirically measure the motivations and attitudes toward management of the different user segments of rock climbing. By understanding these motivations, recreation providers can manage and predict the environmental, social, and political impacts of rock climbers.

### *Significance of Study*

The significance of this research to the field of recreation and leisure is that it serves as a case study and benchmark for future research on rock climbing. The research will contribute to the literature by (a) testing a new instrument to measure six subscales of rock climbing motivations that have been identified in the literature and to test the unidimensionality of the subscales; (b) re-testing and confirming the reliability of a previous scale on rock climber attitudes toward management practices; (c) assessing whether or not there are significant differences between traditional and sport rock climbers; and (d) offering suggestions, based on findings, for both theoretical and practical implications in the area of outdoor recreation management, with an emphasis on a Benefits-Based Management approach.

*Research Questions*

1. Is there a difference in motivation among traditional, sport, and hybrid rock climbers?

$$H_0: X_t = X_h = X_s$$

$$H_1: X_t \neq X_h \neq X_s$$

The dependent variable is motivation. The independent variable is the type of rock climber.

2. Is there a difference in motivation among rock climbers of different self-reported climbing abilities (beginner, moderate, advanced)?

$$H_0: X_b = X_m = X_h$$

$$H_1: X_b \neq X_m \neq X_h$$

The dependent variable is motivation. The independent variable is self-reported level of climbing ability.

3. Are attitudes toward management practices different among traditional, sport, and hybrid sport rock climbers?

$$H_0: X_t = X_h = X_s$$

$$H_1: X_t \neq X_h \neq X_s$$

The dependent variable is attitudes toward management practices. The independent variable is the type of rock climbing.

4. Explore the relationship (multiple  $r^2$ ) between (a) motivation and (b) attitudes toward management practices as predictors of frequency of use in rock climbing.

$$H_0: r^2 = 0$$

$$H_1: r^2 \neq 0$$

The dependent variable is frequency of use. The independent variables are the constructs for motivation and attitudes toward management practices.

### *Scope and Delimitations of the Study*

This study takes an exploratory look at motivations of rock climbers, because research in the area of rock climbing is limited. The scope of this study will be delimited to the variables of motivation related to the type of rock climber and attitudes toward management. It is further delimited by the fact that there may be regional differences among rock climbers. For example, west coast climbers may have different attitudes toward management or motivations for participation than their east coast counterparts. Additionally, there are other theories, such as sensation seeking (related to psychological and biogenetic theories) in rock climbing, that are not addressed in this study. The data collection method was another limitation. A convenience sampling approach was implemented, and as such, all possible rock climbers were not given the opportunity to participate in the study. However, all users who were rock-climbing on the days the questionnaires were administered were given the opportunity to participate in the study.

## CHAPTER II

### LITERATURE REVIEW

Rock climbing has been in practice since pre-historic times; however, it was not recognized as an international recreation activity until the 1970s (Feher et al., 1998; Li et al., 2001). Over the past 15 years, the number of rock climbers in the United States has increased four fold (Schuster et al., 2001). Currently, there are over 400,000 active climbers in the United States and that number is expected to continue to increase (Schuster et al., 2001). As the number of rock climbing participants grew, there was a need for natural resource managers to understand the attitudes, perceptions, motivations, and behaviors of rock climbers in order to implement appropriate management strategies. Congruent with the transition to a mainstream sport, rock-climbing users have become more segmented. In particular, two user segments are becoming more differentiated-- traditional rock climbers and sport rock climbers.

#### *Differences between Traditional and Sport Climbers*

Kiewa (2001) reported that rock climbers make a clear distinction between traditional and sport climbers. According to Schuster et al. (2001), traditional and sport climbers are differentiated by the type of gear used to protect themselves in the event of a fall. Traditional climbers follow the “pure” climbing ethic of using solely removable protective gear that is placed in weak areas of the rock face (e.g., cracks). Kiewa (2001) noted a violation of the traditional climbing ethic is “defined through such practices as placing bolts in the cliff for protection and chipping hand- and foot-holds in the rock” (p. 368). Siderelis and Attarian (2004) stated that traditional rock climbing involves protecting the rock features with equipment that the first climber in the group places as



they ascend the climb to safeguard themselves from falling, and then the equipment is removed by the second climber.

Sport climbing has been considered an offshoot of traditional climbing and many new participants engage exclusively in sport climbing (Schuster et al., 2001). Schuster et al. (2001) characterized sport climbing as using protective gear that is permanently fixed to the rock. The application of fixed bolts involves drilling a small hole and placing a steel expansion bolt in the rock face. Additionally, sport climbs tend to be shorter in length and technically more demanding than traditional climbs (Siderelis & Attarian, 2004).

For the purpose of this study, traditional climbing has been defined as any form of climbing which involves only removable hardware and sport climbing was defined as any form of climbing which includes bolts, fixed anchors, or other permanent modifications to the rock face.

Schuster et al. (2001) were the first to focus on, and identify, specific differences in attitudes between traditional and sport climbers and their perceptions toward natural resource management. A shortcoming in their study was that they did not consider motivations and benefits from the viewpoint of the users as an aspect or concern for management practice purposes. As such, this study seeks to fill a gap in the literature concerning this matter.

The purpose of this research was to create a scale that would measure motivations of rock climbers, to verify that various segments of the rock climbing community have different motivations for participation and to aid in the understanding of motivational differences that can affect rock-climbing management. Specifically, the following questions were addressed: (a) what are the motivation dimensions of rock climbers in the

United States? (addressed using exploratory factor analysis); and (b) along what dimensions do motivations differ between traditional and sport rock climbers?

Additionally, this study sought to replicate and confirm the attitudinal differences toward management by rock climbers found by Schuster et al. (2001). The objective of providing information concerning rock climbers' motivations is important for two reasons. First, there is currently no scale that has been developed to measure motivations of rock climbers. Second, this study seeks to verify the existing scale of attitudinal differences toward management among rock climbing subgroups developed by Schuster et al. (2001).

### *Understanding Rock Climbing Issues*

Since the early 1990s, there has been an increase in the amount of regulation and legislation involving rock climbing. Some rock climbing issues that were addressed in the literature include anchor bans, site closures, and biophysical impacts (Baker, 1999; Li et al., 2001; Nuzzo, 1995; Oosthoek, 2002). As an example, the issue of fixed anchors has been a subject of controversy since the early 1990s (Baker, 1999). The United States Forest Service (USFS) argued that fixed anchors are visually unappealing and may accelerate weathering of cliff faces; therefore, the USFS introduced the anchor ban. Adversary groups like the Access Fund, a 10,000-member climbing group, are opposed to the anchor ban because banning anchors will have a restrictive impact on climbing (Baker, 1999). Sam Davidson, senior policy analyst for the Access Fund said, "telling climbers they can climb but not use fixed anchors is like telling an equestrian you can go horseback riding but you can't use a horse" (Baker, 1999). Schuster et al.'s (2001) study also concurred that banning fixed anchors limits existing and potential rock climbing opportunities.

In August 1998, the USFS rescinded a decision that banned fixed anchors, including bolts, in congressionally designated climbing areas due to public response (Schuster et al., 2001). The USFS opted for a process called “negotiated rulemaking” that involves interested parties sitting down and coming to an agreement on bolt usage, which includes placement and number of bolts. Although negotiated rulemaking promotes a cooperative effort among land managers, public agencies, and the climbing community, there is still a need to understand rock climbing issues and attitudes toward management processes.

The environmental impacts of rock climbing have been studied in popular rock climbing areas like Joshua Tree National Park and Cliff Goldenrod (Baker, 1999; Nuzzo, 1995). In both studies, rock climbing was found to have a significant effect on the number of plant species. Currently, there is no research that determines if the environmental impacts caused by rock climbing are greater or lesser than the environmental impacts of other sanctioned wilderness activities such as backpacking, camping, or mountain biking. The response of rock climbers to restrictive legislation and other management actions suggests there is a gap in attitudes between rock climbers and managers on how well rock climbing areas are being managed.

#### *Understanding Rock Climbing Subgroups*

Currently, rock climbing is viewed as a legitimate or sanctioned use of wilderness areas (Schuster et al., 2001). National and state parks are allocating resources, both natural and managerial, to allow park users the opportunity to rock climb in designated areas. Rock-climbing participation has grown so widespread that management of the natural resources in which rock climbing takes place is a priority of many natural resource agencies. It is important to understand as much about rock climbers as possible

before implementing management approaches. Specifically, what subgroups exist in the rock climbing community, how do their attitudes, perceptions, motivations, and behavior differ and what impact do these differences have on the frequency of use of the natural resource?

Schuster et al.'s (2001) seminal study looked at attitudinal differences toward management among rock climbing segments. Managers should recognize the dynamic differences among types of rock climbers in order to better implement management strategies that maximize benefits for everyone. Schuster et al. (2001) reported that "assuming that commonalities exist when they do not, or ignoring commonalities, can result in distortions of one group's perceptions of the other and may lead to bias and error in subsequent management processes" (p. 403). Schuster et al.'s (2001) study measured the differences between traditional and sport rock climbers and focused on their perceptions of attitudes toward natural resource management. However, they did not consider motivations and benefits to the users as an aspect or concern for management practices.

The framework for this study models Schuster et al.'s (2001) research on rock climbing attitudes toward management of climbing and the use of bolts. The objectives of their study were to determine the attitudinal dimensions of rock climbers in the United States and the attitudinal differences between traditional and sport rock climbers. The purpose of their study was to verify that there were differences in attitudes toward management between traditional and sport climbers and to aid in the understanding of how attitudinal differences can affect rock climbing management.

Managers may easily disrupt the wilderness experience of one group, while trying to fulfill a positive experience for another group. As an example, by removing bolts that

may be aesthetically unpleasing to hikers, managers will be restricting rock climbing opportunities. On the other hand, by allowing rock climbers to climb without restriction may lead to congestion and noise in certain areas that may disrupt bird watching opportunities.

Answers to in-depth interviews with members from the U.S. rock climbing community were used to develop a questionnaire with 27 items that addressed climbers' attitudes toward management of rock climbing on a seven-point or five-point Likert scale. Their findings were as follows:

- The variance among climbing subgroups indicated that various climbing groups had significantly different attitudes toward management.
- When compared to sport climbers, traditional climbers had more reservations about bolt use, were more open to the need for management, were willing to exercise greater discretion concerning the use of bolts, and had a more negative attitude about the climbing communities' participation in the management process.
- All climbers surveyed had reservations about the management process.

Schuster et al. (2001) made significant contributions to the rock climbing literature. The current study sought to replicate and extend Schuster et al.'s seminal work by extending their framework to include motivational differences between rock climbers.

#### *Theoretical Approaches to Rock Climbing*

The researcher is unaware of any existing scales that measure motivational differences of rock climbers. In this study, six motivational constructs were developed using themes that were found in the outdoor recreation and extreme sport literature. The

six components are: (a) sensation seeking, (b) self-efficacy, (c) control, (d) escape, (e) social and (f) competition. Each will be discussed in turn.

*Sensation Seeking.* Sensation seeking was defined as the need for varied, novel, and complex sensations and experiences, and the willingness to take physical and social risks for the sake of such experiences (Fluker & Turner, 2000). Sensation seeking “implies the passive acceptance of sensations (e.g., a roller coaster ride), whilst relinquishing control to others” (Kiewa, 2001, para. 37). For instance, guided whitewater rafting participants relinquish control to the expert tour guide, trusting their safety to a complete stranger in their quest for the sensation (Fluker & Turner, 2000).

Risk is defined in the literature as the potential for losing something of value. A distinction is made between absolute and perceived risk. Absolute, or actual, risk is assessed as real risk, whereas perceived risk is contextualized as individual judgment (McIntyre & Roggenbuck, 1998). The topics of sensation seeking and risk are combined in one construct because sensation seeking is related to the level of perceived risk and/or absolute risk. That is, someone who has high levels of sensation seeking engages in activities where absolute and/or perceived risk is high. Kiewa (2001) reported results that were similar to Slanger and Rudestam (1997) whereby they did not consider climbers as sensation seekers. This is because sensation seeking implies the passive acceptance of sensation and climbers work to bring chaotic situations under control (p. 373). The assertion that climbers are not sensation seekers has not been statistically tested or proven in the literature. Therefore, sensation seeking is included as a theme in this study.

*Self-efficacy.* Slanger and Rudestam (1997) concluded that the factor most responsible for the disinhibitions associated with risk taking appeared to be perceptions of self-efficacy (p. 366). By definition, self-efficacy is the notion that “the kinds of

outcomes people anticipate depend on their judgments of how well they will be able to perform” (Slanger & Rudestam, 1997, p. 356; Bandura, 1997). People tend to undertake and perform with assurance in activities they judge themselves capable of handling. A person’s level of self-efficacy derives itself from four areas: (a) mastery experience, (b) vicarious experience, (c) verbal persuasion, and (d) physiological states (Bandura, 1997). The construct of self-efficacy in this study contains items that addressed each of these areas.

Jones, Bray, Mace, MacRae, and Stockbridge (2002) focused their research on self-efficacy and rock climbing and examined the impact of imagery script intervention on self-efficacy levels prior to rock climbing. The experimental group underwent imagery script intervention, where subjects imagined themselves performing the climb before they actually performed the climb. They found that the experimental group reported higher technical climbing self-efficacy than the control group. There was no significant difference in performance scores between experimental and control groups. According to Boschker, Bakker, and Michaels (2002), one explanation for similar performance scores between the experimental and control groups is that climbers indicated that “mistakes made during route finding are a major reason for falling during climbing” (p. 25). Rock climbers choose rock climbing routes based on level of difficulty of the route, type of equipment needed to complete the route, and type of movement needed to complete the “climbing choreography” (Boschker et al., 2002). It was reported that skilled climbers more accurately perceive the maximum distance of their reach than novice climbers. This indicates the importance of imagery scripts, or visual perception, in rock climbing. Even though the subjects in Jones et al.’s (2002) study participated in rock climbing, the focus of the study was imagery script intervention

and not self-efficacy in rock climbers. Therefore, the current study sought to fill a gap in the research regarding the relationship between self-efficacy and rock climbing.

There have been a couple of ways in which self-efficacy has been found to relate to other motivational components. The first relationship is self-efficacy and sensation seeking. Slanger and Rudestam (1997) noted a relationship between sensation seeking and self-efficacy in the context of extreme sports, and hypothesized a positive relationship between sensation seeking and self-efficacy. A second relationship was found between self-efficacy and control. In Kiewa's (2001) study it was found that climbers expressed personal satisfaction from the knowledge that they are good at performing under stress and "the sense of competence that arises through successful performance leads to feelings of exhilaration and control" (p. 371).

*Control.* Control is often defined as a sense of "power-over" and might refer to a number of factors including choice of activity, the environment, or one's feelings (Kiewa, 2001). Slanger and Rudestam (1997) were the first to identify control as a motive for rock climbing. They found that rock climbers strongly desire to meet and master challenges. A sense of mastery, or personal control, resulted from the ability to successfully meet the challenges set by physical surroundings through informed decision-making (Slanger & Rudestam, 1997). Slanger and Rudestam's (1997) study examined extreme risk takers, high-risk takers, and low risk takers in four different sports including rock climbing, kayaking, skiing, and piloting a small plane. Eighty-five percent of respondents in the extreme risk group identified a desire for mastery. However, rock climbers were not studied separately.

Kiewa's (2001) paper examined the relationship between control and rock climbing. Two forms of control were defined: (a) control over self which refers to



remaining “in control” throughout an activity, and (b) control over space (i.e., physical environment). Due to the nature of the protective gear used in each type of climbing, Kiewa noted that control can be used to make a distinction between traditional climbers and sport climbers. Traditional climbers “set themselves strict rules, that although appear arbitrary, allow them to engage with the environment over which they have little control” (Kiewa, 2001, p. 368). Therefore, traditional climbers exhibit more control over self than space. On the other hand, sport climbers exhibit more control over space than self, because they allow certain modification to the environment during the activity (Kiewa, 2001).

The participants in Kiewa’s study were restricted to those who practiced lead climbing and were members of the traditional climbing community. Eliminating sport climbers from the study allowed the researchers to measure one’s control over self rather than control over the environment. Each participant recorded reflections of significant interactions during all climbing experiences for six months in a personal diary. Due to the qualitative nature of the study, there was no scale measuring control as a motive for climbing. However, it was found that control forms an important component of a rock climber’s experiences.

Control was identified as a construct for this study because control has been determined as a motive for climbing for traditional climbers (Kiewa, 2001). However the relationship between control and sport climbing has not been tested. The researcher is unaware of any existing scales to measure control. Therefore, items for the control construct were developed from concepts found in Kiewa’s work.

*Escape.* Aesthetic considerations are recurring themes in outdoor recreation research. The feelings of escape and catharsis, or a purification that brings about spiritual

renewal or release from tension, are mentioned in the rock climbing literature as being benefits (Ewert, 1985; Kiewa, 2001; Slinger & Rudestam, 1997).

*Social.* In leisure research, social elements are very often noted as benefits of recreation pursuits (Burch, 1970; Edginton, Hudson, Dieser, & Edginton, 2004; Manning, 1999). Manning (1999) indicated that social groups are attracted to recreation activities based on motivations inherent within the group. Therefore, rock climbers should also be motivated by social benefits derived from rock climbing. Kiewa (2001) found there was a very important dynamic between climbing partners that needs to be studied in future research. For instance, female rock climbers noted their desire to climb with only female partners (Kiewa, 2001). Additionally, rock climbers tend to climb with those who have similar skill sets and climbing ethics. The preference for a partner and group dynamics were not incorporated into this study, however, the broader concept of social motivations was employed.

Schuster et al. (2001) reported that front country and back country settings lend themselves to different types of climbing. Sport climbing tends to occur in the front country areas where there are more opportunities for rock climbers to socialize with other climbers due to the numerous climbing opportunities in those areas. On the other hand, traditional climbers tend to climb in back country areas since those areas more easily lend themselves to traditional climbing. There are few opportunities in back country areas for traditional climbers to socialize with climbers outside of their climbing group.

*Competition.* The role competition plays in rock climbing has not been studied. However, Kiewa (2001) noted that Feher, Meyers, and Skelly's (1998) reporting of rock climbers as "competitors" was a mischaracterization of traditional rock climbers, as competition is typically anathema to traditional rock climbers. Sport climbers often, and

sometimes exclusively, participate in rock climbing competitions. The current study attempts to confirm the assumption that benefits derived from competition are not mutually exclusive to traditional rock climbers and sport rock climbers.

### *Understanding Management Issues*

All recreational activities that take place in or around a natural resource have an impact on the environment. Most studies that mention or include rock climbing also include one or more management issues that natural resource managers face concerning rock climbing (Nuzzo, 1995; Schuster et al., 2001; Siderelis & Attarian, 2004).

Environmental impacts of rock climbing include adverse effects to soil, damage to vegetation, harassment to wildlife, and the growing presence of litter and noise. More recently, bolting practices, damage to historic and cultural sites, and legal liability concerns (e.g., climbers lacking the appropriate technical skills and the compositions of groups) have gained the attention of natural resource managers. Many researchers have concluded that there is an urgent need for managing agencies to better integrate the growth of climbing with the requirements of preserving and administering public lands (Nuzzo, 1995; Schuster et al., 2001; Siderelis & Attarian, 2004). Specific examples of the need for more understanding of rock climbing from a management perspective are noted below.

*Management Case Study 1.* Siderelis and Attarian (2004) demonstrated the impact on climbing participation on natural resources by alternating the hypothetical closures of rock climbing areas at Crowder's Mountain State Park, one of the most popular rock climbing sites in North Carolina. Respondents were asked to indicate the number of trips they would take to Crowder's Mountain if a certain site were altered (i.e., fixed bolt ban) or closed. They found proposed closures of four climbing walls and the

restrictions of area access in order to reduce ecological damage negatively impacted participation, and they called for future research on how climbers would reallocate their climbs among remaining open areas. That is, would rock climbers reallocate their climbs to another site at Crowder's Mountain or would rock climbers use another park entirely?

*Management Case Study 2.* Nuzzo (1995) studied the effect of rock climbing on Cliff Goldenrod in Northwest Illinois. The researcher reported that "while no conclusion can be made about the different use intensities, it appears that climbing impact occurs with relatively few climbs" (p. 238). Although, these questions will not be addressed in the present study, they provide an important framework for understanding managerial issues.

#### *Benefits-Based Management Approach*

The objective of benefits-based management is to allow managers to more directly measure and facilitate benefits associated with recreation participation. Benefits associated with recreation are broadly defined and types of benefits include personal, social, economic, and environmental. Little empirical research exists regarding the relationship between rock climbing and benefits-based management. Using the benefits-based model, managers are able to design recreation opportunities, like rock climbing, to fulfill certain motivations and produce related benefits (Manning, 1999).

It is well known in the recreation and leisure industry that customers buy benefits or expectations of benefits, not amenities, products, and services. Natural resource managers who are responsible for rock climbing areas have implemented benefits-based management approaches, because they are in the business of identifying and creating benefit packages that can lead the customer to a satisfying leisure experience. The benefit-based management approach provides a framework and serves as an example for

natural resource managers to tie goals and objectives together in a meaningful way (Edginton et al., 2004). The current study will attempt to offer suggestions, based on findings, for both theoretical and practical implications in the area of outdoor recreation management, with an emphasis on a Benefits-Based approach.

## CHAPTER III

### METHODOLOGY

#### *Instrumentation*

The instrument in this study was a questionnaire (see Appendix A). The researcher seeks to contribute to the literature by (a) testing a new scale to measure six different aspects of motivation in rock climbing identified in the literature and to test the unidimensionality of the scale; (b) re-testing and confirming the reliability of a previous scale on rock climber attitudes toward management practices; (c) assessing whether or not there are significant differences between traditional and sport climbers; and (d) offering suggestions, based on findings, for both theoretical and practical implications in the area of outdoor recreation management, with an emphasis on the benefits-based management approach.

#### *Development of Rock Climbing Motivation Scale*

The purpose of this research was to create a scale that would measure motivations of rock climbers, to verify that various segments of the rock climbing community have different motivations for participation, and to aid in the understanding of motivational differences that can affect rock climbing management. The researcher is unaware of any existing scales that measure motivational differences of rock climbers. In this study, six motivational constructs were developed using themes that were found in the outdoor recreation and extreme sports literature (see Table 1). The six constructs are: (a) competition, (b) control, (c) escape, (d) self-efficacy, (e) sensation seeking, (f) social.

Table 1: *Motivation Items and Sources by Item*

<u>Construct</u>	<u>Item</u>	<u>Source</u>
COMP	To actively compete with others	Kiewa/Feher et al.
COMP	To be highly competitive	Kiewa/Feher et al.
COMP	To compete in rock climbing events	Kiewa/Feher et al.
COMP	To participate in Competition	Kiewa/Feher et al.
COMP	To seek out Competition	Kiewa/Feher et al.
CONT	To be in control of my climb	Kiewa
CONT	To be in control of myself	Kiewa
CONT	To be on established routes	Kiewa
CONT	To climb with removable hardware	Kiewa
CONT	To master a challenge	Kiewa
CONT	To study a route before climbing	Kiewa
ESCP	To be at peace	Kiewa/Slanger & Rudestam
ESCP	To be in a different state of mind	Kiewa/Slanger & Rudestam
ESCP	To be relaxed	Kiewa/Slanger & Rudestam
ESCP	To be with nature	Kiewa/Slanger & Rudestam
ESCP	To escape for a while	Kiewa/Slanger & Rudestam
SELF	To achieve a goal	Bandura/Slanger & Rudestam
SELF	To attempt climbs above my ability level	Bandura/Slanger & Rudestam
SELF	To be confident	Bandura/Slanger & Rudestam
SELF	To overcome a fear of failure	Bandura/Slanger & Rudestam
SEFLF	To try harder next time	Bandura/Slanger & Rudestam
SENS	To be safe	Kiewa/Slanger & Rudestam
SENS	To feel a rush of adrenaline	Kiewa/Slanger & Rudestam
SENS	To push the limits	Kiewa/Slanger & Rudestam.
SENS	To take physical risks	Kiewa/Slanger & Rudestam
SOCL	To be a part of a group	Schuster et al.
SOCL	To be alone	Schuster et al.
SOCL	To be with my friends	Schuster et al.
SOCL	To be with people I know	Schuster et al.
SOCL	To have a partner to motivate me	Schuster et al.
SOCL	To have fun	Schuster et al.
SOCL	To meet new people	Schuster et al.

Note:

COMP = Competition Motivation Component

CONT = Control Motivation Component

ESCP = Escape Motivation Component

SEFF = Self-Efficacy Motivation Component

SENS = Sensation Seeking Motivation Component

SOCL = Social Motivation Component

The Competition Component contained items that measured a respondent's motivation to strive for an objective or beat a rival in competition. Control is defined as a sense of power over, a sense of mastery, or personal control while rock climbing. The Escape Component measured a respondent's motivation for catharsis, or a purification that brings about spiritual renewal, and other aesthetic considerations that occur in the outdoors. Self-efficacy is the belief in one's capabilities to organize and execute a certain course of action or prospective situation. The Sensation Seeking Component measured one's willingness to take physical risks to achieve varied, novel, and complex sensations, such as an adrenaline rush. Rock climbers are motivated by social benefits such as being a part of a group and having fun.

#### *Development of Rock Climbers' Attitudes toward Management Scale*

An aim of this study is re-testing and confirming the reliability of Schuster's (2001) scale measuring rock climbers' attitudes toward management. The Attitudes toward Management Scale was used in its entirety for the current study (see Table 2).

#### *Development of the Questionnaire*

The research instrument used for this study was a questionnaire (see Appendix A). Two pages in length<sup>1</sup>, the questionnaire consisted of 54 Likert-scaled questions regarding motivation and rock climbing, and attitudes toward management practices. The Likert-scale questions used on the current survey have been created or adapted from the recreation and leisure literature.

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<sup>1</sup> Note: The original survey instrument was on one 8.5"x 14" (legal) sheet of paper, with print on front and back. The survey in Appendix A has the same content as the original, but the format was altered to be in line with thesis guidelines.



Table 2: *Rock Climbers' Attitudes toward Management Scale by Item*

<u>Segment</u>	<u>Item</u>
BOLT	Bolts should not be used at all
BOLT	Where, When and How a bolt is placed should be left to the individual placing the bolt
BOLT	There should be limits on the amount of bolting in an area
BOLT	The impact of bolts to the natural resource is minimal
BOLT	There should be official regulations concerning where, when, and how bolts should be used.
BOLT	Other recreation groups are not offended by groups
BOLT	Fixed anchors are not necessary in the sport of climbing
NEED	The use of bolts and fixed anchors needs to be regulated
NEED	Climbers need to be educated concerning their role in the management process
NEED	Most climbing areas need a management plan in order to provide sustained use
NEED	Managing climbing will be good for the sport in the long run
RESV	There is a conflict between land managers and the climbing community concerning the management of bolts
RESV	Land managers do not have adequate knowledge of climbing to properly manage it
RESV	Land managers are doing the best they can when trying to manage climbing
RESV	The government management process is a mystery
RESV	Climbing is micro-managed or over-managed by land managers
RESV	Climbing is not treated fairly in the management process when compared to other recreation activities
APPR	The use of bolts (on sport routes) and the use of fixed anchors (bolts, slings, pins, etc) are two separate issues
APPR	The use of bolts is appropriate in some areas and not others
APPR	Power drills should not be allowed in wilderness areas
PERC	Climbers practice of land stewardship is not adequate
PERC	Climbers have a negative attitude toward management
<b>Note:</b>	
BOLT = Bolt Placement and Use	
NEED = Need for Management	
RESV = Reservations about the Management Process	
APPR = Appropriateness of Bolts	
PERC = Climbers' Self-Perception	

The questions in Section One: Rock Climbing-General Motivations were acquired from multiple sources (see Table 1) and were adapted to reflect the context of rock climbers. Answers were given on a seven-point scale, ranging from 'Not At All Like You,' coded as "1" to 'A Lot Like Me,' coded as "7." The questions in Section Two: Rock Climbing and Management Practices came from Schuster, Thompson, and Hammitt's (2001) study on rock climbers' attitudes toward management of climbing and the use of bolts (see Table 2). Answers were given on a five-point Likert scale, ranging from 'Strongly Disagree,' coded as "1" to 'Strongly Agree,' coded as "5."

The last two sections of the questionnaire included three open-ended questions; three close-ended questions, as well as a section for background and demographic information. These questions were included to gain a sense of the typical rock climbers' usage patterns, level of climbing ability, and preferred climbing type (traditional, sport, or hybrid). Questions under the sections, 'Rock Climbing-General Motivations,' 'Rock Climbing and Management Practices,' and 'Rock Climbing Usage' (see Appendix A) were the questions of particular interest for the current study.

Below is a summary of Schuster's findings which this study will attempt to confirm:

- Traditional and sport rock climbers have significantly different attitudes toward management.
- When compared to sport climbers, traditional climbers had more reservations about bolt use, were more open to the need for management, were willing to exercise greater discretion concerning the use of bolts, and had a more negative attitude about the climbing communities' participation in the management process.
- All climbers surveyed had reservations about the management process.

### *Pilot Test*

After the research project was approved by the college level Human Subjects Research Committee at Old Dominion University, a pilot test of the questionnaire was conducted at The Rock Gym in Virginia Beach, Virginia, and with the Old Dominion University Rock Climbing Club in Norfolk, Virginia. Forty surveys were used as the pilot test to assess the face validity of the survey instrument, and also to make sure the questionnaire was worded appropriately and sequenced in a logical order. Feedback from the respondents was taken into consideration and slight modifications were made to the survey instrument after the initial pilot test. Therefore, the pilot surveys were excluded from analyses. Additionally, Dr. Rudy Schuster of Syracuse University was consulted to check validity of the survey instrument.

### *Data Collection*

Data for this study were collected at two indoor rock climbing centers and one outdoor rock climbing area in the United States (see Table 3). Questionnaires were also sent to an indoor facility in Utah, however, no questionnaires were returned during the amount of time allotted for data collection. Each participant in the study was given a brief description of the purpose of the study and had the opportunity to give verbal consent before the survey was administered. For purposes of confidentiality, all responses were kept anonymous and respondents were never asked to give their name or any other identifying information.

Table 3: *Sampling Locations of the Rock Climbing Questionnaire*

Site and State	Type of Facility	Number of Surveys Collected <sup>a</sup>
Rockreation, California	Indoor	14
Prime Climb, Connecticut	Indoor	6
New River Gorge, West Virginia	Outdoor	52

<sup>a</sup>Usable surveys collected at each location, n=75

### *Population and Sample Size*

The population for this study consisted of adult, outdoor rock climbers. A screening question was administered at the indoor sampling location to ensure only outdoor climbers were included in the analyses. Rock climbers at each location were surveyed on various occasions from the spring of 2006 through the fall of 2006. The respondents were surveyed on different days of the week/weekend and at different times of the day to seek as representative a sample as possible. All adult rock climbers were approached and asked to participate in the survey.

### *Research Protocol*

Through the use of a convenience sample approach, surveys were administered to rock climbers at indoor rock climbing facilities in Connecticut, Utah, and California and one outdoor rock climbing site in West Virginia. The surveys were completed on site. Because the focus of this study is placed on outdoor climbing, the researcher or her associates at each site screened out those who had no outdoor climbing experience via the first question of the self-administered questionnaire.

Surveys were sent out to indoor rock climbing facilities in the previously mentioned states and administered by managers on-site. Because personal information such as place of residence, address, social security number, or zip code was not collected,

respondent answers remained anonymous. And, because names were not collected and the data aggregated, confidentiality was maintained. Once surveys were administered and collected, they were sent to the Department of Exercise Science, Sport, Physical Education, and Recreation at Old Dominion University, where data were entered into SPSS and aggregated for analysis. The only identifier for the surveys themselves was the location from which the surveys were taken (i.e., Connecticut, West Virginia, California.), but no other information was obtained from the respondent for identification purposes.

### *Data Analyses*

Data for this study were analyzed and explored by using the Statistical Package for the Social Sciences (SPSS 14.0). The  $p$ -value of 0.05 was used to determine statistical significance among the variables. The following analyses were used to test the hypothesis and will be discussed in the next chapter: factor analyses, reliability analyses, analysis of variance, t-test, correlation, and regression.

## CHAPTER IV

### RESULTS AND DISCUSSION

The raw data gathered from the surveys were analyzed using the Statistical Package for the Social Sciences (SPSS 14.0). Basic descriptive statistics were run on the data set to get an overview of park users. For this study, competition (COMP), control (CONT), escape (ESCP), self-efficacy (SEFF), sensation seeking (SENS), and social (SOCL) served as the independent variables and CLIMBTYPE was the dependent variable.

#### *Descriptive Statistics*

A total of 72 surveys were collected from three rock climbing areas. Out of the 72 respondents surveyed, 62% were male and 38% were female. Respondents ranged in age from 18 to 67 years, with the average rock climber being age  $30.4 \pm 10.2$ . Rock climbing respondents were 86% White, 6% Multi-Ethnic/Mixed Race, 3% Latino/Hispanic, 1% Asian, and 4% other. Participants were well educated, with 25% having some college, 45% holding a Bachelor's degree, 4% have completed some graduate school, a Master's degree and/or a Ph.D. The highest percentage of rock climbers (54%) claimed a total household income of under \$24,000. Fifty-four percent of rock climbers were single, 40% married, 3% separated or divorced, and 5% were other.

Participants rock climbed anywhere from zero to 30 times per month, averaging  $8.11 \pm 8.0$  times per month. The average years of experience were  $5.8 \pm 5.2$ , with 30% having one year or less of rock climbing experience. Forty-one percent of respondents considered themselves "traditional" or "more traditional than sport" rock climbers, 36%

considered themselves “sport” or “more sport than traditional” rock climbers, and 23% considered themselves “hybrid” or “both traditional and sport equally” rock climbers.

#### *Factor and Reliability Analyses on Motivation Components*

Exploratory factor analyses using Varimax Rotation were conducted to determine if the variables within each component (i.e., escape, competition, control, self-efficacy, sensation-seeking, and social) were measuring the same phenomenon. Prior to statistical analysis, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was employed to evaluate the data. Sampling adequacy was confirmed using a KMO ( $>0.60$ ) and Bartlett’s Test of Sphericity ( $p < 0.05$ ) on each of the components.

According to Tabacknick and Fidell (1996), values of 0.60 for the KMO, and  $p < 0.05$  for Bartlett’s Test of Sphericity is required for factor analysis. Additionally, reliability analyses were performed on each component to determine the deletion of any items which would increase scale reliability. Due to the low  $n$  of 72, items with the reliability coefficients below 0.60 (i.e.,  $\alpha < 0.60$ ) were not retained. Guadagnoli and Velicer (1988) concluded that factors/components are well defined when they have factor loadings of 0.60 or higher. As such, the criteria used for retention of components and variables/items were a KMO ( $>0.60$ ), Bartlett’s Test of Sphericity (BTS) ( $p < 0.05$ ), factor loadings ( $>0.60$ ), and an overall component reliability ( $\alpha < 0.60$ ).

*ESCP*. The escape component was measured by five items labeled as follows (each escape item on the questionnaire began with ‘a reason for participating in rock climbing as compared to other sports is that it allows me’): *nature* (to be with nature), *statemind* (to be in a different state of mind), *escape* (to escape for a while), *relaxed* (to be relaxed), and *peace* (to be at peace) (see Table 4). The initial factor analysis for ESCP, with all five variables, yielded two components. Therefore, a reliability analysis

was performed on the full scale to ascertain whether any variables should be excluded from the scale. Two items, *nature* and *statemind*, were subsequently deleted from the escape component and reliability was re-evaluated. The final Escape Motivation Component used in the analysis was composed of three items, *escape*, *relaxed*, and *peace*, and had a Cronbach's alpha of 0.58. The KMO was 0.58 and BTS was significant ( $p=0.0001$ ). It should be noted that the KMO in this instance fell below the required 0.60 but was allowed due to the exploratory nature of this study. Cronbach's alpha would have increased to 0.60 with the exclusion of *escape*; however for statistical power *escape* was included in the final Escape Motivation Component.

*COMP.* Competition was initially measured using five variables. These five variables were labeled *partcomp* (to participate in competition), *highcomp* (to be highly competitive), *seekcomp* (to seek out competition), *actvcomp* (to actively compete with others), *events* (to compete in rock climbing events). The factor analysis determined that four of the variables, *partcomp*, *highcomp*, *seekcomp*, and *actvcomp*, loaded well together on the same dimension (see Table 4). With the exclusion of *events*, Cronbach's alpha for the Competition Motivation Component was 0.92, the KMO value was .82, and BTS was significant ( $p<.000$ ).



Table 4. *Items used for Motivation Component Construction (N = 72)*

<i>Items<sup>a</sup></i>		<u>M</u>	<u>SD</u>	<u><i>h<sup>b</sup></i></u>
<i>A reason for participating in rock climbing as compared to other sports is that it allows me:</i>				
Escape Motivation Component (ESCP, $\alpha = 0.58$ )				
<u>NATURE</u>	to be with nature	6.23	1.06	
<u>STATEMIND</u>	to be in a different state of mind	5.27	1.65	
ESCAPE	to escape for a while	5.68	1.27	0.64
RELAXED	to be relaxed	5.11	1.63	0.82
PEACE	to be at peace	5.40	1.59	0.74
Competition Motivation Component (COMP, $\alpha = 0.92$ )				
PARTCOMP	to participate in competition	2.52	1.75	0.90
HIGHCOMP	to be highly competitive	2.14	1.63	0.90
SEEKCOMP	to seek out competition	2.13	1.56	0.90
ACTVCOMP	to actively compete with others	1.93	1.23	0.89
<u>EVENTS</u>	to compete in rock climbing events	1.80	1.22	
Control Motivation Component (CONT, $\alpha = 0.76$ )				
MYSELF	to be in control of myself	4.73	1.89	0.67
MASTER	to master a challenge	5.57	1.48	0.73
ESTROUTES	to be on established routes	3.90	1.86	0.59
CONTCLMB	to be in control of my climb	4.90	1.74	0.85
STUDY	to study a route before climbing	4.09	1.76	0.75
<u>HARDWARE</u>	to climb with removable hardware	4.12	1.86	

Self-Efficacy Motivation Component<sup>c</sup> (SELF,  $\alpha = 0.58$ )

<u>ACHGOAL</u>	to achieve a goal	5.54	1.45
<u>TRYHARD</u>	to try harder next time	5.07	1.68
<u>FAILURE</u>	to overcome a fear of failure	3.73	1.98
<u>CONFIDENT</u>	to be confident	5.20	1.46

Sensation Seeking Motivation Component (SENS,  $\alpha = 0.70$ )

LIMITS	to push the limits	5.42	1.53	0.77
RUSH	to feel a rush of adrenaline	4.61	1.62	0.79
RISKS	to take physical risks	3.59	1.89	0.82
<u>SAFETY</u> <sup>d</sup>	to be safe	3.09	1.96	

Social Motivation Component (SOCL,  $\alpha = 0.74$ )

FRIENDS	to be with friends	5.81	1.23	0.84
FUN	to have fun	6.60	0.64	0.65
GROUP	to be part of a group	3.93	1.95	0.61
MEET	to meet new people	4.43	1.75	0.70
KNOWPPL	to be with people I know	4.86	1.52	0.69
<u>ALONE</u> <sup>d</sup>	to be alone	5.11	1.87	
PARTNER	to have a partner that motivates me	4.37	1.79	0.62

<sup>a</sup>-underlined items were not used in the scale construction

<sup>b</sup>-factor loadings only presented for those items included in the scale

<sup>c</sup>-sampling size not adequate (KMO = .57)

<sup>d</sup>-reverse coded

*CONT*. Six variables were used to measure the Control Motivation Component.

These variables were labeled *myself* (to be in control of myself), *master* (to master a challenge), *estroutes* (to be on established routes), *contclmb* (to be in control of my climb), *study* (to study a route before climbing), and *hardware* (to climb with removable hardware). The initial factor analysis for *CONT* with all six variables yielded two components, as such the component was not unidimensional (see Table 4). Therefore, a reliability analysis was performed on the full scale to ascertain whether any variables

should be excluded from the scale. One item, *hardware*, was subsequently excluded from the control component and reliability was re-evaluated. The final Control Motivation Component used in the analyses was composed of five items, *myself*, *master*, *estroutes*, *contclmb*, and *study*, and yielded a Cronbach's alpha of 0.76, a KMO of 0.74 and BTS was significant ( $p=0.0001$ ). It should be noted that the factor loading for *estroutes* (0.51) was below the required 0.60. Using reliability analysis it was determined that Cronbach's alpha would not have changed with excluding *estroutes*; therefore, this variable was included in the final component.

*SELF*. Four variables were used to assess the self-efficacy component. The variables were labeled *achgoal* (to achieve a goal), *tryhard* (to try harder next time), *failure* (to overcome a fear of failure), and *confident* (to be confident) (see Table 4). The initial factor analysis of all four variables yielded one component. Although, *achgoal*, *tryhard*, *failure*, and *confident* loaded on one component, *achgoal* had an unacceptable factor loading of 0.48. Another factor analysis was run using only *tryhard*, *failure*, and *confident* which also yielded one component. However, the KMO was 0.52, BTS was significant ( $p=0.0001$ ), and by using a reliability analysis of the same three factors it was determined that Chronbach's alpha was 0.58. Additionally, reliability analysis showed that by excluding *confident* Chronbach's alpha for the remaining two variables, *tryhard* and *failure*, would have been higher (0.62). Ultimately, it was concluded that the sampling size was not adequate to consider Self-Efficacy Motivation Component as a valid or reliable scale.

*SENS*. The sensation seeking component was measured using four variables. The variables were labeled *limits* (to push the limits), *rush* (to feel a rush of adrenaline), *risks* (to take physical risks), and *safety* (to be safe). *Safety* was reverse coded (see Table 4).

By using a factor analysis of all four variables it was determined that *safety* had a low factor loading (0.33) so it was excluded from the component. A factor and reliability analysis was run using the remaining variables. The final Sensation Seeking Motivation Component used in the analysis was composed of three items, *limits*, *rush*, and *risks*, and had a Cronbach's alpha of 0.70. The KMO was 0.67, and BTS was significant ( $p=0.0001$ ).

*SOCL*. The social component was measured using seven variables. The variables were labeled *friends* (to be with friends), *fun* (to have fun), *group* (to be part of a group), *meet* (to meet new people), *knowppl* (to be with people I know), *alone* (to be alone), and *partner* (to have a partner that motivates me). *Alone* was reverse coded (see Table 4). The initial factor analysis for SOCL with all seven variables yielded two components and thus lacked unidimensionality. Therefore, a reliability analysis was performed on the full scale to ascertain whether any variables should be excluded from the scale. *Alone* loaded high (0.93) on one component and was subsequently deleted from the social component and reliability was reevaluated. The final Social Motivation Component included six variables, *friends*, *fun*, *group*, *meet*, *knowppl*, and *partner*, and had a Chronbach's alpha of 0.74. The KMO was 0.76 and BTS was significant ( $p<.000$ ).

#### *Factor and Reliability Analyses on Attitudes toward Management Components*

Confirmatory factor analyses using Varimax Rotation were conducted to determine if the variables within each component (e.g., bolt placement and use, need for management, reservation about the management process, appropriateness of bolts, and climbers' self-perception) were measuring the same phenomenon. Sampling adequacy was confirmed using a KMO ( $>0.60$ ) and Bartlett's Test of Sphericity ( $p<.05$ ) on each of the components. Additionally, reliability analyses were performed on each component to

determine the deletion of any items which would increase scale reliability, as per the previous analysis.

The assumption is that factors identified by Schuster et al. (2001) will indeed hold in this study because they had a larger  $n$  and accessed 13 different survey collection sites. So this study is confirming whether these components are indeed components.

**BOLT.** The bolt placement and use component was measured by seven items labeled as follows: *nobolt* (bolts should not be used at all), *wwhbolt* (where, when, and how a bolt is placed should be left up to the individual placing the bolt), *limit* (there should be limits on the amount of bolting in an area), *impact* (the impact of bolts to the natural resource is minimal), *offreg* (there should be official regulation concerning where, when, and how bolts should be used), *offended* (other recreational groups are not offended by bolts), and *fxanchor* (fixed anchors are not necessary in the sport of climbing) (see Table 5). *Wwhbolt*, *limit*, *offended*, and *fxanchor* were reverse coded. The initial factor analysis for BOLT with all seven variables yielded three components and lacked unidimensionality. Therefore, a reliability analysis was performed on the full scale to ascertain whether any variables should be excluded from the scale. Two items, *no bolt* and *fxanchor*, were subsequently excluded from the BOLT component and reliability was reevaluated. However, factor analysis on the remaining five items yielded two components. By using a reliability analysis, it was determined that *offended* should also be excluded. The final Bolt Use and Placement Component used in the analysis was composed of four items, *offreg*, *wwhbolt*, *limit*, and *impact*, and had a Cronbach's alpha of 0.65. The KMO was 0.63 and BTS was significant ( $p=0.0001$ ).

**NEED.** The need for management component was measured by four items labeled as follows: *needreg* (the use of bolts and fixed anchors in wilderness needs to be

regulated), *educate* (climbers need to be educated concerning their role in the management process), *sustain* (most climbing areas need a management plan in order to provide sustained use), and *longrun* (managing climbing will be good for the sport in the long run) (see Table 5). By using a factor analysis, it was determined that three of the variables, *sustain*, *longrun*, and *educate*, loaded well together on the same dimension. With the exclusion of *needreg*, Cronbach's alpha for the Need for Management Component was 0.74, the KMO was 0.64, and BTS was significant ( $p=0.0001$ ). Additionally, reliability analysis showed that by excluding *educate* Chronbach's alpha for the remaining two variables, *sustain* and *longrun*, would have slightly increased to 0.75. However, since Chronbach's alpha with all three variables is above the acceptable level, *educate* was included in the scale.

Table 5. *Items used for Attitude toward Management Component Construction (N = 72)*

<i>Items</i> <sup>a</sup>		<u>M</u>	<u>SD</u>	<u><i>h</i></u> <sup>b</sup>
<b>Bolt Placement and Use Component (BOLT, <math>\alpha = 0.65</math>)</b>				
<u>NOBOLT</u>	bolts should not be used at all	2.01	0.94	
WWHBOLT <sup>d</sup>	where, when, and how a bolt is placed should be left up to the individual	3.40	1.21	0.71
LIMIT	there should be limits on the amount of bolting in an area	3.65	1.13	0.69
IMPACT <sup>d</sup>	the impact of bolts to the natural resource is minimal	2.79	1.07	0.58
OFFREG	there should be official regulation concerning where, when, and how bolts should be used	3.11	1.31	0.80
<u>OFFENDED</u> <sup>d</sup>	other recreational groups are not offended by bolts	3.05	1.16	
<u>FXANCHOR</u> <sup>d</sup>	fixed anchors are not necessary in the sport of climbing	4.01	1.03	

Need for Management Component (NEED,  $\alpha = 0.74$ )

<u>NEEDREG</u>	the use of bolts and fixed anchors in wilderness needs to be regulated	3.19	1.58	
EDUCATE	climbers need to be educated concerning their role in the management	4.13	1.01	0.74
SUSTAIN	most climbing areas need a management plan in order to provide sustained use	3.73	1.06	0.87
LONGRUN	managing climbing will be good for the sport in the long run	3.8	1.01	0.82

Reservations about the Management Process Component (RESV,  $\alpha = 0.75$ )

CONFLICT	there is a conflict between land managers and the climbing community	3.32	0.95	0.73
KNOWLDG	land managers do not have adequate knowledge of climbing to properly manage it	3.47	0.96	0.81
<u>BESTMNG<sup>d</sup></u>	land managers are doing the best they can when trying to manage climbing	3.11	0.86	
<u>PROCESS</u>	the government management process is a mystery	3.88	1.07	
MICRO	climbing is micro-managed or over-managed by land managers	3.11	0.81	0.69
FAIR	climbing is not treated fairly in the management process when compared to other recreational groups	3.25	0.91	0.79

Appropriateness of Bolts Component<sup>c</sup> (APPR,  $\alpha = 0.38$ )

<u>ISSUES</u>	the use of bolts (on sport routes) and the use of fixed anchors (bolts, springs, pins, etc.) are two separate issues	3.12	1.15	
<u>APPROP</u>	the use of bolts is appropriate in some areas and not others	3.72	1.06	
<u>DRILLS</u>	power drills should not be allowed in wilderness areas	3.23	1.25	

Climbers' Self-Perception Component<sup>c</sup> (PERC,  $\alpha = 0.65$ )

<u>STEWARD</u>	climbers' practice of land stewardship is not adequate	2.79	0.97
<u>ATTITUDE</u>	climbers have a negative attitude toward management	2.87	1.02

<sup>a</sup>-underlined items were not used in the scale construction

<sup>b</sup>-factor loadings only presented for those items included in the scale

<sup>c</sup>-sampling size not adequate (KMO =0 .50)

<sup>d</sup>-reverse coded

*RESV*. The Reservations About the Management Process Component was measured by six variables labeled as follows: *conflict* (there is a conflict between land managers and the climbing community concerning the management of bolts), *knowldg* (land managers do not have adequate knowledge of climbing to properly manage it), *bestmng* (land managers are doing the best they can when trying to manage climbing), *process* (the government management process is a mystery), *micro* (climbing is micro-managed or over-managed by land managers), and *fair* (climbing is not treated fairly in the management process when compared to other recreational groups) (see Table 5). *Bestmng* was reverse coded. The initial factor analysis for RESV with all six variables yielded three components and lacked unidimensionality. Therefore, a reliability analysis was performed on the full scale to ascertain whether any variables should be excluded from the scale. Two items, *process* and *bestmng*, were subsequently excluded from the RESV component and reliability was reevaluated. The final Reservations about Management Process Component used in the analysis was composed of four items, *conflict*, *knowldg*, *micro*, and *fair*, and had a Cronbach's alpha of 0.75. The KMO was 0.57 and BTS was significant ( $p=0.0001$ ). It should be noted that the KMO in this



instance fell below the required 0.60 but was allowed due to the exploratory nature of this study.

*APPR.* The appropriateness of bolts component was measured by three variables labeled as follows: *issues* [the use of bolts (on sport routes) and the use of fixed anchors (bolts, slings, pins, etc.) are two separate issues], *approp* (the use of bolts is appropriate in some areas and not others), and *drills* (power drills should not be allowed in wilderness areas) (see Table 5). By using a factor analysis, it was determined that two of the variables, *approp* and *issues*, loaded well together on the same dimension. When *drills* was included in the reliability analysis Chronbach's alpha was 0.38. With the exclusion of *drills*, Cronbach's alpha for the Appropriateness of Bolts Component was 0.48 and the KMO was 0.50 and was significant ( $p=0.0001$ ). Ultimately, it was concluded that the sampling size was not adequate to consider Appropriateness of Bolts Component as a valid or reliable scale.

*PERC.* The climbers' self-perception component was measured by two variables labeled as follows: *steward* (climbers' practice of land stewardship is not adequate) and *attitude* (climbers have a negative attitude toward management) (see Table 5). By using a factor analysis, it was determined that both variables loaded well together on the same dimension and Cronbach's alpha was 0.66. However, the KMO was 0.50 and BTS was significant ( $p=0.0001$ ). Ultimately, it was concluded that the sampling size was not adequate to consider Climbers' Self-Perception Component as a valid or reliable scale.

#### *ANOVA and T-test Analyses*

Due to the exploratory nature of this study, and because there is relatively little empirical research, there is relatively no current frame of reference for empirical findings. Analyses of variance (ANOVAs) and t-tests were run on the data to explore mean

differences among traditional, hybrid, and sport rock climbers in regards to each Motivation Component (i.e., ESCP, COMP, CONT, SENS, and SOCL) and each Attitudes toward Management Component (i.e., BOLT, NEED, and RESV).

*Type of climbing and motivation.* Analysis of variance was used to test the statistical significance of differences among traditional, sport, and hybrid climbers on (a) COMP, (b) CONT, (c) ESCP, (d) SENS, and (e) SOCL motivations (see Tables 6-10). There were no significant differences among any of the groups and their motivations for rock climbing.

Table 6. ANOVA of COMP by Type of Climber

Type of Climber	<u>N</u>	<u>M</u>	<u>SD</u>	Min.	Max.
Traditional	26	2.15	1.41	1.00	5.75
Hybrid	15	1.96	1.18	1.00	5.00
Sport	22	2.44	1.31	1.00	5.25
Total	63	2.21	1.31	1.00	5.75

	<u>Sum of Squares</u>	<u>df</u>	<u>M Sq.</u>	F	Sig.
Between Groups	2.16	2	1.08	0.614	0.545
Within Groups	105.85	60	1.76		
Total	108.02	62			

Table 7. ANOVA of CONT by Type of Climber

Type of Climber	<u>N</u>	<u>M</u>	<u>SD</u>	Min.	Max.
Traditional	26	4.66	1.29	1.60	6.60
Hybrid	15	4.32	1.47	1.40	6.60
Sport	23	4.98	1.04	2.60	6.20
Total	64	4.69	1.26	1.40	6.60

	<u>Sum of Squares</u>	<u>df</u>	<u>M Sq.</u>	F	Sig.
Between Groups	3.996	2	1.998	1.265	0.290
Within Groups	96.366	61	1.580		
Total	100.36	63			

Table 8. ANOVA of ESCP by Type of Climber

Type of Climber	<u>N</u>	<u>M</u>	<u>SD</u>	Min.	Max.
Traditional	26	5.30	1.10	2.67	7.00
Hybrid	14	5.47	1.18	3.33	7.00
Sport	22	5.56	0.97	3.33	7.00
Total	62	5.43	1.07	2.67	7.00

	<u>Sum of Squares</u>	<u>df</u>	<u>M Sq.</u>	F	<u>Sig.</u>
Between Groups	0.792	2	0.396	0.338	0.714
Within Groups	69.116	59	1.171		
Total	69.909	61			

Table 9. ANOVA of SENS by Type of Climber

Type of Climber	<u>N</u>	<u>M</u>	<u>SD</u>	Min.	Max.
Traditional	26	4.48	1.34	1.33	6.33
Hybrid	15	4.20	1.13	1.67	6.00
Sport	23	4.76	1.25	2.67	6.33
Total	64	4.52	1.26	1.33	6.33

	<u>Sum of Squares</u>	<u>df</u>	<u>M Sq.</u>	F	<u>Sig.</u>
Between Groups	2.980	2	1.490	0.929	0.401
Within Groups	97.881	61	1.605		
Total	100.861	63			

Table 10. ANOVA of SOCL by Type of Climber

Type of Climber	<u>N</u>	<u>M</u>	<u>SD</u>	Min.	Max.
Traditional	26	4.96	1.07	2.50	6.50
Hybrid	15	4.86	.94	3.17	6.83
Sport	23	5.06	1.07	2.67	6.67
Total	64	4.97	1.03	2.50	6.83

	<u>Sum of Squares</u>	<u>df</u>	<u>M Sq.</u>	F	Sig.
Between Groups	0.368	2	0.184	0.167	0.846
Within Groups	67.069	61	1.099		
Total	67.437	63			

*Level of climbing and motivation.* Level of climbing was segmented into beginner (5.5 and below), moderate (5.6–5.9), and advanced (5.10 and above) in accordance with previous literature (Feher et al., 1998). Analysis of variance was used to test the statistical significance of differences among climbers of self-reported ability levels on traditional climbs on each component of motivation: (a) escape, (b) competition, (c) control, (d) sensation seeking, and (e) social motivations. There were no significant differences among any of the groups and their motivation.

Analysis of variance was used to test the statistical significance of differences among climbers of self-reported ability levels on sport climbs on each motivation component (see Tables 11-15). There were no significant differences among any of the groups and their motivation.

Table 11. ANOVA of COMP by Level of Sport Climbing

Type of Climber	<u>N</u>	<u>M</u>	<u>SD</u>	Min.	Max.
Beginner	14	2.26	1.73	1.00	5.50
Moderate	27	2.17	1.12	1.00	5.25
Advanced	7	2.07	1.42	1.00	4.00
Total	48	2.18	1.34	1.00	5.50

	<u>Sum of Squares</u>	<u>df</u>	<u>M Sq.</u>	F	Sig.
Between Groups	0.188	2	0.094	0.050	0.951
Within Groups	84.374	45	1.875		
Total	84.563	47			

Table 12. ANOVA of CONT by Level of Sport Climbing

Type of Climber	<u>N</u>	<u>M</u>	<u>SD</u>	Min.	Max.
Beginner	14	4.67	1.05	2.60	6.20
Moderate	28	5.04	1.21	1.80	6.80
Advanced	7	4.23	1.46	1.60	6.00
Total	49	4.82	1.22	1.60	6.80

	<u>Sum of Squares</u>	<u>df</u>	<u>M Sq.</u>	F	Sig.
Between Groups	4.119	2	2.059	1.400	0.255
Within Groups	67.347	46	1.464		
Total	71.466	48			

Table 13. ANOVA of ESCP by Level of Sport Climbing

Type of Climber	<u>N</u>	<u>M</u>	<u>SD</u>	Min.	Max.
Beginner	14	5.21	.95	3.33	7.00
Moderate	27	5.83	.93	3.33	7.00
Advanced	6	5.22	1.04	4.00	6.67
Total	47	5.57	.98	3.33	7.00

	<u>Sum of Squares</u>	<u>df</u>	<u>M Sq.</u>	F	Sig.
Between Groups	4.450	2	2.229	2.450	0.097
Within Groups	39.920	44	0.907		
Total	44.300	46			

Table 14. ANOVA of SENS by Level of Sport Climbing

Type of Climber	<u>N</u>	<u>M</u>	<u>SD</u>	Min.	Max.
Beginner	14	4.30	1.36	2.33	6.67
Moderate	28	4.75	1.27	2.67	6.33
Advanced	7	4.23	1.83	1.67	6.33
Total	49	4.55	1.37	1.67	6.67

	<u>Sum of Squares</u>	<u>df</u>	<u>M Sq.</u>	F	Sig.
Between Groups	2.611	2	1.305	0.681	0.511
Within Groups	88.179	46	1.917		
Total	90.789	48			

Table 15. ANOVA of SOCL by Level of Sport Climbing

Type of Climber	<u>N</u>	<u>M</u>	<u>SD</u>	Min.	Max.
Beginner	14	5.18	1.08	3.17	6.83
Moderate	28	5.01	.93	2.67	6.67
Advanced	7	5.52	.92	3.50	6.00
Total	49	5.13	.97	2.67	6.83

	<u>Sum of Squares</u>	<u>df</u>	<u>M Sq.</u>	<u>F</u>	<u>Sig.</u>
Between Groups	1.481	2	0.741	0.774	0.467
Within Groups	44.004	46	0.957		
Total	45.485	48			

Analysis of variance was used to test the statistical significance of differences among climbers of self-reported ability levels on traditional climbs on each motivation component (see Tables 16-20). There were no significant differences among any of the groups and their motivations for rock climbing.



Table 16. ANOVA of COMP by Level of Traditional Climbing

Type of Climber	<u>N</u>	<u>M</u>	<u>SD</u>	Min.	Max.
Beginner	10	1.70	1.37	1.00	5.25
Moderate	25	2.31	1.27	1.00	5.25
Advanced	3	2.00	1.73	1.00	4.00
Total	38	2.12	1.32	1.00	5.25

	<u>Sum of Squares</u>	<u>df</u>	<u>M Sq.</u>	F	Sig.
Between Groups	2.709	2	1.354	0.761	0.475
Within Groups	62.260	35	1.779		
Total	64.969	37			

Table 17. ANOVA of CONT by Level of Traditional Climbing

Type of Climber	<u>N</u>	<u>M</u>	<u>SD</u>	Min.	Max.
Beginner	10	4.84	1.12	3.25	6.60
Moderate	25	4.90	1.46	1.60	6.80
Advanced	3	4.46	.41	4.00	4.80
Total	38	4.85	1.31	1.60	6.80

	<u>Sum of Squares</u>	<u>df</u>	<u>M Sq.</u>	F	Sig.
Between Groups	0.508	2	0.254	0.141	0.869
Within Groups	63.121	35	1.803		
Total	63.630	37			

Table 18. ANOVA of ESCP by Level of Traditional Climbing

Type of Climber	<u>N</u>	<u>M</u>	<u>SD</u>	Min.	Max.
Beginner	10	6.00	0.95	4.33	7.00
Moderate	24	5.70	1.03	3.33	7.00
Advanced	3	4.77	.19	4.37	5.00
Total	37	5.71	1.00	3.33	7.00

	<u>Sum of Squares</u>	<u>df</u>	<u>M Sq.</u>	F	Sig.
Between Groups	3.448	2	1.724	1.787	0.183
Within Groups	32.810	34	0.965		
Total	36.258	36			

Table 19. ANOVA of SENS by Level of Traditional Climbing

Type of Climber	<u>N</u>	<u>M</u>	<u>SD</u>	Min.	Max.
Beginner	10	3.90	1.27	2.33	5.67
Moderate	25	4.60	1.30	1.67	6.33
Advanced	3	4.55	2.26	2.00	6.33
Total	38	4.41	1.37	1.67	6.33

	<u>Sum of Squares</u>	<u>df</u>	<u>M Sq.</u>	F	Sig.
Between Groups	3.567	2	1.783	0.945	0.399
Within Groups	66.085	35	1.888		
Total	69.652	37			

Table 20. ANOVA of SOCL by Level of Traditional Climbing

Type of Climber	<u>N</u>	<u>M</u>	<u>SD</u>	Min.	Max.
Beginner	10	4.73	1.02	3.17	6.50
Moderate	25	5.24	.80	3.33	6.67
Advanced	3	5.16	1.44	3.50	6.00
Total	38	5.10	.91	3.17	6.67

	<u>Sum of Squares</u>	<u>df</u>	<u>M Sq.</u>	F	Sig.
Between Groups	1.872	2	0.936	1.121	0.337
Within Groups	29.232	35	0.835		
Total	31.104	37			

*Type of climbing and management.* It was concluded that *APPR* and *PERC* were not reliable or valid components in this study. Analysis of variance was used to test the statistical significance of differences among traditional, sport, and hybrid climbers on (a) bolt placement and use, (b) need for management, and (c) reservations about the management process. There were no significant differences among any of these groups on any of these components (see Tables 21-23).

Table 21. ANOVA of BOLT by Type of Climber.

Type of Climber	<u>N</u>	<u>M</u>	<u>SD</u>	Min.	Max.
Traditional	26	3.11	0.63	1.67	4.00
Hybrid	15	2.88	0.49	2.00	3.67
Sport	23	3.13	0.68	1.75	4.67
Total	64	3.06	0.62	1.67	4.67

	<u>Sum of Squares</u>	<u>df</u>	<u>M Sq.</u>	F	Sig.
Between Groups	0.659	2	0.330	0.850	0.432
Within Groups	23.649	61	0.388		
Total	24.308	63			

Table 22. ANOVA of NEED by Type of Climber

Type of Climber	<u>N</u>	<u>M</u>	<u>SD</u>	Min.	Max.
Traditional	26	4.03	0.76	2.67	5.00
Hybrid	15	4.02	0.68	3.00	5.00
Sport	23	3.84	0.69	2.33	5.00
Total	64	3.96	0.71	2.33	5.00

	<u>Sum of Squares</u>	<u>df</u>	<u>M Sq.</u>	F	Sig.
Between Groups	0.545	2	0.273	0.521	0.597
Within Groups	31.925	61	0.523		
Total	32.478	63			

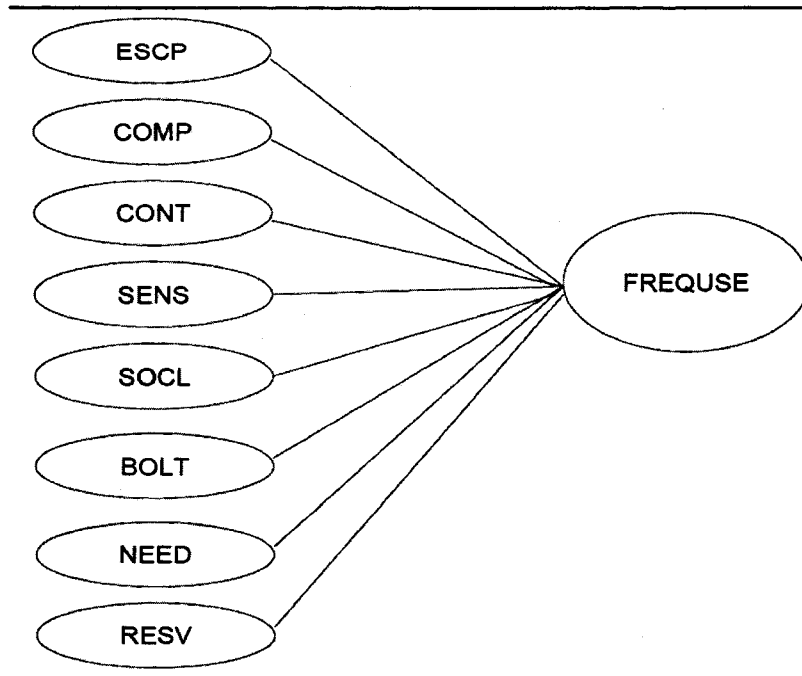
Table 23. ANOVA of RESV by Type of Climber

Type of Climber	<u>N</u>	<u>M</u>	<u>SD</u>	Min.	Max.
Traditional	26	3.25	0.64	2.00	4.25
Hybrid	15	3.33	0.67	2.50	4.50
Sport	21	3.51	0.65	2.50	5.00
Total	62	3.36	0.65	2.00	5.00

	Sum of Squares	<u>df</u>	<u>M Sq.</u>	F	<u>Sig.</u>
Between Groups	0.757	2	0.378	0.886	0.418
Within Groups	25.203	59	0.427		
Total	25.960	61			

### *Regression Analysis.*

Using the conceptual model in Figure 1 as the basis of the regression analysis, the variables ESCP, COMP, CONT, SENS, SOCL, BOLT, NEED, and RESV were entered as independent variables predicting frequency of use. With the inclusion of all the independent variables, it was found that SENS was the only significant predictor of frequency of use (see Table 24). Upon further analysis of the individual regression variables, the most problematic were COMP ( $p=0.915$ ), RESV ( $p=0.857$ ), and SOCL ( $p=0.605$ ).

Figure 1. *Conceptual Model of Factors Influencing Frequency of Use*Table 24. *Regression Analyses using Days Spent Climbing as Dependent Variable*

	Model X		Model Y		Model Z	
<i>Variables</i>	$\beta$	<i>p-value</i>	$\beta$	<i>p-value</i>	$\beta$	<i>p-value</i>
ESCP	0.254	0.173	0.227	0.202	0.233	0.182
COMP	0.018	0.915				
CONT	0.336	0.120	0.321	0.115	0.328	0.102
SENS	-0.455	0.022	-0.382	0.030	-0.374	0.029
SOCL	0.081	0.605	0.042	0.774		
BOLT	-0.181	0.282	-0.191	0.231	-0.190	0.227
NEED	-0.287	0.098	-0.289	0.076	-0.294	0.068
RESV	0.029	0.857				
R-Sq (adj)	30.8%		28.2%		28.1%	
F Test	2.06*		2.62**		3.20***	

\* alpha > 0.05 two-tail test; \*\* alpha = 0.03 two-tail test; \*\*\* alpha = 0.016 two-tail test

When these three variables were excluded (See Table 24), the null hypothesis was rejected ( $p=0.016$ ). The Sensation Seeking Component exerted the greatest significant influence on frequency of use ( $\beta=-0.374$ ).

#### *Additional Analyses*

This section provides some additional analyses that needed to be performed in order to better inform managers. These analyses were included separately in this section, because they did not relate directly to the original four hypotheses. Rather, they provided contextual and insightful information. Additionally, the analyses are in keeping with the exploratory nature of this study.

*Years of Experience and Days Spent Climbing.* A regression analysis was conducted to determine if years of rock climbing experience had an effect on the number of days spent climbing per month. The regression coefficient ( $r^2 = 0.10$ ) was found to be significant ( $p=0.028$ ). This work indicates that by knowing one's rock climbing experience we can predict usage per month 10% of the time. The correlation ( $r$ ) between these two variables was 0.32.

*Type of Climbing and Days Spent Climbing.* A one-way, between-subjects ANOVA was performed on the scores from the three levels of climbing types (traditional, hybrid, sport) with respect to the number of days spent climbing. The results were significant,  $F(2, 39) = 5.92, p = 0.006$ . A Tukey HSD test revealed that only the means for the traditional and sport climbers differed significantly ( $p < 0.05$ ). This manipulation accounted for 0.23 of the variance in scores (using  $\eta^2$ ).<sup>2</sup> Traditional, hybrid, and sport climbers spent an average of 4.4, 5.6, and 12.4 days climbing per month, respectively.

*Mode of Climbing and Days Spent Climbing.* A one-way, between-subjects ANOVA was performed on the scores from the three modes of climbing types: lead

climbing, top roping, and a combination of both lead climbing and top roping (both) on the number of days spent climbing per month. The results were significant,  $F(2, 41) = 30.64, p = 0.0001$ . A Tukey HSD test revealed that all the means for the lead and top roping climbers differed significantly ( $p < 0.05$ ). This manipulation accounted for 0.60 of the variance in scores (using  $\eta^2$ ).

*Mode of Rock Climbing and Level of Rock Climbing.* A regression analysis was conducted to explore the effect the level of *traditional* climbing ability (as measured by the Yosemite Decimal System) has on mode of rock climbing. The first regression analysis revealed an  $r^2$  of 0.52 at  $p = 0.0001$ . The beta weight for this regression was -0.72.

A one-way, between-subjects ANOVA was performed on the scores from the three modes of climbing types on the level of traditional climbing ability. The results were significant,  $F(2, 31) = 14.86, p = 0.0001$ . A Tukey HSD test revealed that the means for the beginner climbers were different from those of the moderate and advanced climbers, but moderate climbers were not different from advanced climbers. This manipulation accounted for 0.49 of the variance in scores (using  $\eta^2$ ). Climbers who were beginners, moderates, or advanced had an average score of 4.00, 2.36, and 1.66 (or mostly top rope, lead to both, and lead to mostly lead) respectively.<sup>2</sup> The three groups were significantly different from each other at the 95% confidence interval.

A regression analysis was conducted to explore the effect the level of *sport* climbing ability (as measured by the Yosemite Decimal System) has on mode of rock climbing. The first regression analysis revealed an  $r^2$  of 0.66 at  $p = 0.0001$ . The beta weight for this regression was -0.81.

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<sup>2</sup> Note that both traditional climbing ability and sport climbing ability were measured on the Yosemite Scale, where 5.4 was scored a "1" and 5.14 was scored an "11." If the respondent indicated N/A for either of the sport or traditional climbing abilities, then it would be score a "0."



A one-way, between-subjects ANOVA was performed on the scores from the three modes of climbing types on the level of traditional climbing ability. The results were significant,  $F(2, 42) = 12.56, p = 0.0001$ . A Tukey HSD test revealed that the means for the beginner climbers were different from those of the moderate and advanced climbers, but moderate climbers were not different from advanced climbers. This manipulation accounted for 0.37 of the variance in scores (using  $\eta^2$ ). Climbers who were beginners, moderates, or advanced had an average score of 4.16, 2.70, and 2.00 (or mostly top rope, mostly lead to both, and mostly lead) respectively. The three groups were significantly different from each other at the 95% confidence interval.

*Front Country and Back Country Rock Climbing.* Schuster, et al. (2001) gave one explanation as to the differences in responses between traditional and sport climbers on the Attitudes toward Management Scale by stating that “[socialization] and continued participation in climbing at front country sites may provide sport climbers with a frame of reference for responding to questions that is different from that of traditional climbers” (p. 410). Front country climbers are more likely to interact with other climbers, other user groups, and natural resource managers. Therefore, an exploration of differences was warranted between back and front country climbers and their relationship to the SOCL construct. A correlation analysis revealed no significant relationship between tendency towards front/back country and SOCL. Additionally, when the data were divided into front and back country climbers, the front country climbing group ( $M = 5.11, SD = .88$ ), produced no significant difference between the back country climbing group ( $M = 4.84, SD = 1.31$ ), with  $t(63) = +0.88, p > 0.05$ . This finding does not provide support for more or less socialization in the back or front country area.

General procedures and findings are summarized in the next and final chapter. Additionally, research hypotheses will be formally accepted or rejected, and recommendations for future studies will be discussed.

## CHAPTER V

### CONCLUSIONS

This chapter considers the extent to which hypotheses were rejected or failed to be rejected based on the data analysis. Following the examination of the hypotheses, I present an analysis of the conclusions that were reached about the issues related to motivations, attitudes towards management and an exploration of related issues (e.g., mode of climbing, front/back country, Benefits-Based management, etc.) and their implications for managers of outdoor climbing sites. The next section examines the hypotheses espoused in this study.

#### *Hypotheses Examined*

Research Hypothesis #1: Is there a difference in motivation among traditional (t), hybrid (h), and sport (s) rock climbers? There was no significant difference found between the motivation constructs among traditional (t), hybrid (h), and sport (s) rock climbers.

$H_0: X_t = X_h = X_s$                       **Fail to reject  $H_0$ .**

$H_1: X_t \neq X_h \neq X_s$

Research Hypothesis #2: Is there a difference in motivation among rock climbers of different self-reported climbing abilities [beginner (b), moderate (m), advanced (a)]? There was no significant difference found in the motivation among rock climbers of different self-reported climbing abilities.

$H_0: X_b = X_m = X_a$                       **Fail to reject  $H_0$ .**

$H_1: X_b \neq X_m \neq X_a$

Research Hypothesis #3: Are attitudes toward management practices different among traditional, hybrid, and sport rock climbers? There was no significant difference found in the attitudes toward management practices among traditional, hybrid, and sport rock climbers.

$H_0: X_t = X_h = X_s$                       **Fail to reject  $H_0$ .**

$H_1: X_t \neq X_h \neq X_s$

Research Hypothesis #4: A regression analysis (multiple  $r^2$ ) was used to determine the significance of (a) motivation, and (b) attitudes toward management practices as predictors of participation (frequency – times per month) in rock climbing.

$H_0: r^2 = 0$                                       **Reject  $H_0$ .**

$H_1: r^2 \neq 0$

#### *Conclusions about Motivations in Rock Climbing*

*Competition.* The role competition plays as a motivation for rock climbing has had little empirical study. However, Kiewa (2001) noted that Feher, Meyers, and Skelly's (1998) reporting of rock climbers as competitors was a mischaracterization of traditional rock climbers, as competition is typically anathema to rock climbers. Sport climbers often, and sometimes exclusively, participate in rock climbing competitions. It was hypothesized that sport climbers would have a higher mean than traditional climbers on the competition component because typically traditional climbers do not engage in competitive rock climbing events as rock climbing competitions utilize fixed anchors and bolts. However, the data analysis showed no significant difference between traditional and sport climbers with respect to competition. The overall mean for all climbers was 2.2, on a seven-point Likert scale, which indicated that rock climbers, in general, are not motivated by competition. Future studies should consider the differences between rock

climbers who climb exclusively indoors and exclusively outdoors on their motivation for competition.

*Control.* Kiewa's (2001) paper examined the relationship between control and rock climbing. Two forms of control were defined: (a) control over self which refers to remaining "in control" throughout an activity, and (b) control over space (physical environment). Due to the nature of the protective gear used in each type of climbing, Kiewa noted that control can be used to make a distinction between traditional climbers and sport climbers. It was hypothesized that sport climbers would have a higher mean than traditional climbers on the control component because sport climbers make more permanent modifications to the environment. There was no significant difference found between traditional and sport climbers on measures of control. The mean for all respondents was 4.7 on a seven-point Likert scale. The lack of significant difference may be attributed to limitations in the survey instrument. Future research should examine control over self and control over space elements separately to better understand the role control plays in rock climbing.

*Escape.* The current study attempted to explain the role escape plays in rock climbers' motivations for participation. It was hypothesized that traditional rock climbers would have a higher mean than sport climbers on the escape component because traditional climbing typically takes place in back country settings. Back country was considered to be an hour of hiking or greater, to reach the climbing site. The remoteness of back country areas may result in greater feelings of escape. Data analysis indicated no significant difference between traditional and sport climbing on elements of escape. The mean for all respondents was 5.4 on a seven-point Likert scale. Even though there was no significant difference between type of climbing and the escape motivation, there may

be a relationship between front country rock climbers and back country rock climbers on escape elements regardless of type of climbing, as discussed below.

*Sensation Seeking.* Sensation seeking was defined as the need for varied, novel, and complex sensations and experiences, and the willingness to take physical and social risks for the sake of such experiences (Fluker & Turner, 2000). Kiewa (2001) reported results that were similar to Slinger and Rudestam (1997), whereby climbers are not sensation seekers because sensation seeking implies the passive acceptance of sensation. The assertion that climbers are not sensation seekers has not been statistically tested or proven in the literature. Therefore, sensation seeking was included in this study. To be consistent with previous literature, it was hypothesized that there would be no significant difference between traditional and sport climbers. Data analysis concluded that there was no significant difference among the groups. The mean for all respondents on the sensation seeking component was 4.5 on a seven-point Likert scale.

*Social.* In leisure research, social elements are very often noted as benefits of recreation pursuits (Burch, 1970; Edginton et al., 2004; Manning, 1999). Therefore, rock climbers should also be motivated by social benefits derived from rock climbing. It was hypothesized that sport climbers would have a higher mean than traditional climbers on the social component because climbing at front country sites, where sport climbing most typically takes place, there is more opportunity for higher levels of social interaction (a) between climbing groups, (b) within climbing groups, (c) with non-climbers, and (d) with management (Schuster et al., 2001). Data analysis indicated no significant difference between traditional and sport climbers on the social component. The mean for all respondents was 5.0 on a seven-point Likert scale. Even though there was no significant difference between type of climbing and social motivation, there may be a relationship

between front country rock climbers and back country rock climbers on social elements regardless of type of climbing, as discussed below.

### *Conclusions about Level of Climbing and Motivation*

Rock climbing routes range in difficulty level from 5.0 to 5.14, on the Yosemite Decimal System, with the rating of the climb being determined subjectively, but affected by a combination of pitch and the accessibility and prominence of finger and toe holds (Slanger and Rudestam, 1997). Level of sport climbing was segmented into beginner (5.5 and below), moderate (5.6–5.9), and advanced (5.10 and above) (Feher et al., 1998). It should be noted that level of climbing ability was self-reported and therefore subjective in nature. Difficulty-rating systems in rock climbing vary from climbing area to climbing area, from climber to climber, and from climbing route to climbing route. Schuster et al. (2001) noted there may be “social desirability bias because climbers may consider it ethical protocol to understate their ability. Therefore, the ability levels may not be valid” (p. 406).

It was hypothesized that beginner climbers would have a higher mean than moderate and advanced climbers on Social and Sensation Seeking Components while moderate and advanced climbers would have higher means than beginner climbers on Escape, Competition, and Control Components. The above hypothesis was used when analyzing level of sport climbing and level of traditional climbing. Data analysis revealed there were no significant differences between groups on any of the motivation components for either level of sport climbing or level of traditional climbing. This finding suggests that a rock climber’s motivations may not change as their level of ability changes.

### *Conclusions about Attitudes toward Management*

*Bolt Placement and Use.* One of the major differences between traditional and sport climbing is bolt use (Schuster et al., 2001). The Bolt Placement and Use Component developed by Schuster et al. (2001) measures climbers' attitudes concerning how bolts should be used, necessity of bolts, regulatory limits on bolts, their impact on the resource, and impacts on other user groups. Schuster et al. concluded that none of the groups had strong reservations concerning the use of bolts, however traditional climbers had a significantly different mean. Therefore, it was hypothesized that traditional climbers would have more reservations concerning the use of bolts than sport or hybrid climbers. An ANOVA indicated no significant difference among any climbing subgroups. On a five-point scale the mean for traditional climbers was 3.1, the mean for hybrid climbers was 2.9, and the mean for sport climbers was 3.1. The difference in findings between the current study and previously reported findings may be attributed to regional variations of the samples or respondents' level of management exposure.

*Need for Management.* The Need for Management Component measured climbers' attitudes concerning the need for management of specific climbing activities, the need for general management plans for sustained use of resources, and climbers' level of knowledge of the management process. Consistent with Schuster, et al.'s findings, it was hypothesized that traditional climbers would have a higher mean than sport climbers. An ANOVA indicated no significant difference among any climbing subgroups. These findings indicate that none of the groups were more open to management of climbing than another group, and overall climbers agreed that there is a need for management (M=4.0).



*Reservations about the Management Process.* Reservations about the Management Process Component measured climbers' attitudes concerning the managers' role in the management process, managers' ability and efforts to manage climbing, and how climbing is treated in the management process in relation to other recreational activities. Consistent with Schuster et al.'s (2001) findings, it was hypothesized that there would be no significant difference between traditional and sport climbers. Data analysis confirmed that there was no significant difference. The grand mean for all three groups was 3.4 and indicated that the climbers surveyed were neutral in regards to reservations about the management process.

*Conclusions about Frequency of Use*

Most rock climbing literature is referenced as a sub-segment of extreme sport literature and rock climbers are often conceptualized and categorized as extreme sport athletes, such as whitewater rafters, skydivers, and BASE jumpers (Slanger & Rudestam, 1997; Schrader & Wann, 1999; Malkin & Rabinowitz, 1998). Since sensation seeking and extreme sport are synonymous in the literature, it can be assumed that frequency of use and sensation seeking would be a positive relationship. If rock climbers were extreme sport athletes, as the literature base suggests, then analysis would show that as sensation seeking increased, frequency of use would increase. However, the current study found that as a respondent's sensation seeking motivation increased, frequency of use decreased ( $r = -0.374$ ). One implication is that rock climbers have unique characteristics and should be segregated from the extreme sport literature in the future.

*Implications for the Benefits-Based Management Approach*

The Benefits-Based Management approach provides a framework and serves as an example for natural resource managers to tie goals and objectives together in a

meaningful way (Edginton et al., 2004). One of the goals of the current study was to offer suggestions, based on findings, for both theoretical and practical implications in the area of outdoor recreation management, with an emphasis on a Benefits-Based approach. This section of the discussion provides some additional analyses that needed to be performed in order to better inform practitioners/managers. These analyses were included separately from those presented in the previous chapter because they did not relate directly to the original four hypotheses, but rather provide contextual and insightful information for practitioners and academicians alike. Additionally, the analyses are in keeping with the exploratory nature of this study.

### *Discussion*

*Type of Climbing and Days Spent Climbing.* Without understanding the relationship between type of climbing and number of days spent climbing per month, a manager developing and implementing a rock climbing management plan may treat all rock climbing areas within a park in the same manner. This finding is consistent with Schuster, et al.'s (2001) assertion that many natural resources lend themselves to a specific type of climbing. For instance, a climbing site with no natural cracks in the rock face can only be climbed if bolted and sport climbed. With the knowledge that sport climbers on average spend nearly three times the number of days climbing per month than traditional climbers, natural resource managers can accurately predict the usage patterns for different rock climbing areas, better understand potential impacts to the natural resource, and manage accordingly.

*Mode of Climbing and Days Spent Climbing.* Although I have argued that the emphasis should be placed on the *type* of climber, the *mode* of climbing is important as well. The implication of this finding is that future research may need to address the issue

of mode of climbing as an impact/use issue, in addition to the type of climber. Lead climbers, top ropers, and both spent an average of 18.4, 3.0, and 9.4 days climbing per month, respectively.

Natural resource managers should consider the type of rock climbing area (i.e., sport or traditional) when implementing rock climbing management plans. Similarly, they should consider mode of climbing (i.e., lead climbing or top roping). Those who lead climb exclusively on average spend six times the number of days climbing per month as top ropers.

*Mode of Climbing and Level of Climbing.* The above findings suggest that as a rock climber's level of climbing ability increases, so does their mode of climbing. The implication of this finding is that mode of climbing is not categorical but is continuous and a hierarchy is implied. Natural resource managers can use this knowledge to facilitate the optimal level of flow for their rock climbing constituents. Managers should designate and develop rock climbing areas that allow rock climbers to change their mode of rock climbing as their level of rock climbing ability changes.

#### *Future Studies*

Little research has been conducted on rock climbers and their motivations to participate in rock climbing. Additionally, few studies looked at the differences among types of climbers. In this way, this study may serve as a seminal study for future research on this topic. Future research should not only expand on this study but should also look to other theoretical frameworks such as regional differences within the United States. The role gender plays in rock climbing should be incorporated into future research. For example, the preference for a same-sex climbing partner and group dynamics.

Slanger and Rudestam (1997) noted a relationship between sensation seeking and self-efficacy in the context of extreme sports, and hypothesized a positive relationship between sensation seeking and self-efficacy. This relationship was not tested in the current study, but is recommended for future research.

Individuals who rock climb may have different opinions about rock climbing than those who do not. Therefore, future research should examine the attitudes towards management of non-rock climbing users. Additionally, managers' attitudes toward rock climbing management should also be examined. It is important for more research to be conducted in this field as the popularity of rock climbing grows and gains increased acceptance globally.

#### *Summary and Contributions*

In the majority of my hypotheses, I was unable to reject the null. No differences were found between the motivation constructs and the three types of rock climbers. No differences were found between the motivation constructs and the three levels (climbing abilities) of users. With respect to perceptions of management practice, there were no differences found between the management practice constructs and the three types of rock climbers. Lastly, although all variables did not hold in the multiple regression analysis, those that did hold were found to be significant predictors of number of days spent climbing per month.

There are several contributions that this study makes to the recreation and leisure literature:

- Tested reliability and validity of new instrument that measures Rock Climbers' Motivations for Participation.

- Tested previous instrument that measures Rock Climbers' Attitudes toward Management.
- Explored relationships between traditional and sport rock climbers.
- Found evidence to support that other subgroups exist in the rock climbing community, such as lead climbers and top ropers, which warrant additional research.

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## APPENDIX A

**Date :** \_\_\_\_\_ **Survey Location#:** \_\_\_\_\_

**SELECTION CRITERIA: *Screening Questions***

**Do you rock climb outdoors?**  YES  NO (If No, terminate & Thank You!) – Count as indoor rock climber

**Do you tend to ...**  Lead climb exclusively  Mostly lead climb, some top rope

Do both lead and top rope  Mostly top rope, some lead climb  Top rope exclusively

**INSTRUCTIONS**

This survey is meant to capture the perceptions of benefits, motivations, and management practices from the rock climbing community. The purpose of this study is to determine what differences in motivation for participation exist among outdoor rock climbers. It is important that you answer the following questions as honestly as possible in order to accurately represent the rock climbing community. Your participation in this study is voluntary, and at any time you may choose not to participate. Your answers will remain confidential, and your identity anonymous. Please take your time answering the questions. The questionnaire should take approximately 5-7 minutes to complete.

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**SECTION I: ROCK CLIMBING – GENERAL MOTIVATIONS**

**Directions:** Please indicate the extent to which you feel the statement reflects your opinion on the following topics by placing a “√” or “X” in the box along the scale from 1-7, with 1 being not at all like you and 7 being a lot like you.

**1. A reason for participating in rock climbing as compared to other sports is that it allows me:**

	Not at all like me		←————→			A lot like Me	
	1	2	3	4	5	6	7
...To be with nature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To have a partner to motivate me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To be with my friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To have fun	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To achieve a goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To be in a different state of mind	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To participate in competition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To be in control of myself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To push the limits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To be part of a group	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To be highly competitive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To escape for a while	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To try harder next time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To feel a rush of adrenaline	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To master a challenge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To overcome a fear of failure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To seek out competition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To take physical risks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To meet new people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To be on established routes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To actively compete with others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To be with people I know	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To be relaxed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To be confident	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To be in control of my climb	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To be safe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To be at peace	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To study a route before climbing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To attempt climbs above ability level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To climb with removable hardware	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To be alone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...To compete in rock climbing events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## SECTION II: ROCK CLIMBING AND MANAGEMENT PRACTICES

**Directions:** Please indicate the extent to which you feel the statement reflects your opinion on the following topics by placing a "√" or "X" in the box along the scale from 1-5, with 1 being strongly disagree and 5 being strongly agree.

	← Strongly Disagree ————— Strongly Agree →				
	1	2	3	4	5
Bolts should not be used at all	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Where, when, and how a bolt is placed should be left to the individual placing the bolt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bolt impac to the natural resource is minimal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There should be limits on the amount of bolting in an area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other recreation groups aren't offended by bolts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There should be official regulations concerning where, when, and how bolts should be used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fixed anchors are not necessary in the sport of climbing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The use of bolts and fixed anchors need to be regulated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Climbers need to be educated concerning their role in the management process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most climbing areas need a management plan in order to provide sustained use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Managing climbing will be good for the sport in the long run	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The government management process is a mystery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There is a conflict between land managers and the climbing community concerning the management of bolts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Climbing is micro-managed or over managed by land managers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Land managers do not have adequate knowledge of climbing to properly manage it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Land managers are doing the best they can when trying to manage climbing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Climbing is not treated fairly in the management process when compared to other recreation activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Power drills shouldn't be allowed on in wilderness areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The use of bolts (on sport routes) and the use of fixed anchors (bolts, slings, pins, etc.) are two separate issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The use of bolts is appropriate in some areas and not others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Climbers practice of land stewardship is not adequate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Climbers have a negative attitude toward management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**SECTION III: ROCK CLIMBING USAGE**

How long have you been climbing?

\_\_\_\_\_ years

How many days a month do you go climbing?

\_\_\_\_\_ days

How many people are in your party today?

\_\_\_\_\_ people

How many people in your party are climbing

today? \_\_\_\_\_ people

What is your level of **lead climbing** ability on the Yosemite Decimal System (*choose one answer by placing a "√" or "X" in the box along the scale?*)

	N/A	5.4	5.5	5.6	5.7	5.8	5.9	5.10	5.11	5.12	5.13	5.14
<b>Sport</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Trad</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

What type of climber do you consider yourself to be?

- Traditional  
 More Traditional than Sport  
 Both Traditional & Sport Equally  
 More Sport than Traditional  
 Sport

Where do you tend to climb?

- Front Country (< 1 hour hiking) only  
 More Front Country than Back Country  
 Both front and Back Country Equally  
 More Back Country than Front Country  
 Back Country (> 1 hour hour) only

**SECTION IV: DEMOGRAPHICS**

*This information will be kept in the strictest confidence and used for statistical purposes only.*

Are you?  Male FemaleAre you?  Single Married Separated Divorced Widowed Other \_\_\_\_\_

What is your age? \_\_\_\_\_

Which statement best describes your total 2005 annual household income? (Check **only one**) under \$24,000 \$24,001 - \$35,000 \$35,001 - \$50,000 \$50,001 - \$75,000 \$75,001 - \$100,000 \$100,001 - \$125,000 \$125,001 - \$150,000 above \$150,001Please indicate the highest level of education you have obtained? (Check **only one**) less than High School Graduate Some College Some Graduate School High School Graduate College Degree Advanced Degree Technical SchoolWhich of the following best describes your race or ethnic origin (Check **only one**) Caucasian/White Black/African American Asian Native Hawaiian/Pacific Islander Hispanic/Latino American Indian/Alaskan Native Multi-ethnic/Mixed race Other \_\_\_\_\_

**That completes our survey. Thank you very much for your assistance!**

**IF YOU NEED MORE INFORMATION, PLEASE CONTACT:**

