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**CONFLICT, SPECIALIZATION, AND PLACE ATTACHMENT
AMONG NORTH AMERICAN ROCK CLIMBERS**

A Thesis in
Recreation, Park, and Tourism Management

by
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Abstract

Conflict in outdoor recreation is a topic that has been widely studied for over 50 years. Although conflict is widely researched, its relationship to other dominant constructs within outdoor recreation remains limited. This study utilized novel methods to examine the relationships between conflict and two other dominant constructs within outdoor recreation research, place attachment and specialization. The sample consisted of North American rock climbers. The study was performed by sending a survey to the membership of the American Alpine Club. This analysis explored long-theorized relationships proposed by Jacob and Schreyer (1980) and Ditton, Loomis, and Choi (1992). Place attachment was hypothesized to predict conflict. Specialization was hypothesized to predict place attachment and overall conflict. Additionally, the relationship between the frequency of viewing conflict behaviors and rating them as problematic was explored. Conflict behaviors were factored into three distinct factors using exploratory factor analysis: conflicts of ethics, crowding, and rude interactions. All place attachment and conflict items were phrased in terms of a participant's self-defined "primary outdoor climbing area." This novel approach was used to allow for comparisons on a national scale, as opposed to a specific location. Structural equation modeling was performed to test four hypothesized structural models. A general conflict model was tested. This was followed by an independent model for each conflict factor. All models displayed acceptable to good fit and the strength of relationships varied. Frequency of viewing behaviors was consistently the strongest predictor of rating behaviors as problematic. Place attachment demonstrated no relationship with conflict in any of the models. Many hypothesized relationships were found to be insignificant. The theoretical and methodological reasons for this are discussed.

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Chapter 1.

Introduction

The use and competition for resources creates conflict among people. In outdoor recreation, conflict can lower the quality of an experience. When you consider that quality is a driving goal in recreation management, conflict must be understood. Conflict has been defined as “goal interference attributed to another’s behavior” (Jacob & Schreyer, 1980). A significant amount of literature has been published about conflict and its relationship with other variables; however, there still remain important relationships to be tested. It has been suggested that conflict may increase due to an individual’s level of specialization or resource dependence (Jacob & Schreyer, 1980; Vaske, Carothers, Donnelly & Baird, 2000; Vaske, Dyar, & Timmons, 2004). There has been limited study of the relationships between specialization, resource dependence, and conflict. This lack of understanding requires further examination.

Conflict has been a major research interest within the field of outdoor recreation for over 50 years. Jacob and Schreyer (1980) originally theorized conflict as a result of four factors including: activity style, resource specificity, mode of experience, and tolerance for lifestyle diversity. Vaske, Donnelly, Wittmann, and Laidlaw (1995) took the framework further, to include social values conflict, a conflict that occurs where physical interaction may or may not occur. Much of the literature has been concerned with interactions between different user groups, known as intergroup conflict. Some examples include, hunters and non-hunters (Vaske et al., 1995), skiers and snowboarders (Vaske et al., 2000, Graefe & Thapa, 2004), motorized and non-motorized users (Jackson, Haider, & Elliot, 2003), and hikers and mountain bikers (Carothers, Vaske & Donnelly, 2001). Conflict within the same activity, or intragroup conflict, has received significantly less attention in recreation literature and is limited to a handful of

published papers (Vaske et al., 2000; Vaske et al., 2004; Graefe & Thapa, 2004). Conflict is said to be influenced by activity style, or as it is more commonly known in the literature, specialization (Jacob and Shreyer, 1980).

Specialization was originally defined as, “a continuum of behavior from the general to the particular, reflected by equipment and skills used in the sport” (Bryan, 1977). This definition has evolved into a tripartite framework, which represents a progression of behavior, skill, and commitment (Scott & Shafer, 2001). Specialization should be viewed as a multi-dimensional profile of characteristics and not reduced down into a single specialization index (Lee & Scott, 2004). Understanding the relationship between specialization and conflict may help inform managers’ expectations of conflict levels among different types of users. The relationship between specialization and conflict has received limited study throughout the literature, although specialization has been studied within many recreational activities. One study which looked at this relationship was performed by Vaske et al. (2004). Vaske et al. (2004) examined the relationship between specialization and conflict in the context of skiers and snowboarders. The specialization measure used was a single four-point skill level self-assessment from beginner to expert. Skiers and snowboarders of higher skill were found to have experienced more conflict than their less skilled counterparts. Thapa and Graefe (2003), however, conducted a similar study and found the opposite. Thapa and Graefe (2003) found that low skill skiers and snowboarders experienced more conflict than those of high skill. Although Thapa and Graefe (2003) found a negative relationship between specialization and conflict, the present study hypothesized a positive relationship in line with Jacob and Schreyer’s (1980) theory and the relationship demonstrated by Vaske et al. (2004). Overall, the relationship between specialization and conflict within activity groups requires further examination.

Conflict is not only expected to have a positive relationship with activity style, but also with place attachment (Jacob and Schreyer, 1980). In particular, conflict is expected to have a positive relationship with place dependence. Place attachment is the concept of valuing a recreation setting in a way that encompasses both functional and emotional or symbolic meanings (Williams & Roggenbuck, 1989). Place attachment has historically been divided into two dominant dimensions in the recreation literature: place dependence, and place identity (Manning, 2011). Place dependence is the functional association to a location or group of locations (Stokols & Shumaker, 1981). Place identity refers to the emotional and symbolic meanings that individuals attach to a place because of what the setting symbolizes or stands for (Proshanky, 1978). It has been theorized that conflict will increase with higher levels of resource specificity (Jacob & Schreyer, 1980), and that an increase in specialization will result in an increased dependence on a specific resource (Ditton, Loomis, & Choi, 1992).

The relationship between specialization and place attachment has been explored in the literature previously and positive relationships have been found. As the level of specialization increases, so does the overall level of place attachment (Bricker & Kerstetter, 2001; Nelb, 2007; Oh, Lyu & Hammitt, 2012). While Jacob and Schreyer (1980) theorized about the relationship between resource specificity and conflict, there has been little published empirical literature on the relationship. Two studies found a positive, but weak, relationship between place attachment measures and conflict, where conflict increased with the level of place attachment (Gibbons & Ruddell, 1995; Vaske, Carothers, Donnelly, & Baird, 2000). Although each of these studies found a relationship, further research was recommended in both cases. Given the mixed evidence in the literature, as well as the weak relationships which have been demonstrated, it is important to assess how specialization and place attachment relate to conflict.

The sport of rock climbing provided a unique lens for this study. Rock climbing is a popular and growing sport, with over 4 million annual participants in the United States of America (Outdoor Foundation, 2015). Traditional climbing was the seventh top outdoor activity for growth in 2014 with over 16% growth from 2012 to 2014 (Outdoor Foundation, 2015). Rock climbing is a highly specialized activity, with distinctive styles and detailed scales of difficulty not found in many other sports. The various styles of climbing (top-roping, sport climbing, bouldering, aid climbing, and traditional climbing) carry their own grading scales and are separated by the methods that one uses to complete a climb. Rock climbing is different from many other outdoor recreation activities because of its highly specific resource requirements. While one can go running almost anywhere, a rock climber requires a cliff, and as a rock climber becomes more specialized in a specific style, this dependence may increase (Nelb, 2007).

The specific place of interest in this study was a climber's primary outdoor climbing area. The term primary outdoor climbing area was used to describe the area most frequently visited to achieve the style of climbing a climber prefers. For example, a sport climber from Moab, UT may have a different primary outdoor climbing area than a traditional climber from the same location because not all cliffs offer the same opportunities. All participants were first asked to identify their own primary outdoor climbing area, and the following questions were put in the context of this location. This unique and novel method allowed the researcher to assess place based phenomena at a national level. To the researcher's knowledge, this method has not been used within the recreation literature and allows recreation researchers to understand how users interact with their primary recreation sites, without having to ground their study in one physical location.

Intragroup conflict is an issue that required further study. If conflict is related to

specialization and place attachment, managers can understand what problems may be occurring at their recreation resource. If a cliff offers the only opportunity for a given style of climbing in a geographic area, there is likely to be high place dependence (Stokols & Shumaker, 1981). If this cliff also offers opportunities for highly specialized climbers, then according to theory, conflict may increase even further (Jacob & Schreyer, 1980). The frequency of viewing conflict behaviors was treated as a predictor of overall conflict in this study. This approach was used to understand the nature of interpersonal versus social values conflict among North American rock climbers. If climbers need to experience behaviors frequently in order to view them as a problem, then we can infer that intragroup conflict among rock climbers is largely interpersonal. It is expected that the relationship between frequency of viewing conflict behaviors and rating them as problematic will be strong and positive. This is due to previous research and theory development by Vaske et al. (1995) and Vaske, Needham, and Cline (2007), where an underlying definition of social values conflict is that it occurs between groups. As this study assessed intragroup conflict, social values conflict was expected to be low. In addition to assessing whether the conflict between rock climbers is interpersonal or of social values, understanding how these relationships may vary across different types of conflict behaviors will be of use to managers.

Much of the previous research has treated conflict as a single unidimensional variable. This study sought to understand if conflict behaviors could be factored into distinct and logical groupings. This analysis explored whether or not the relationships between variables held for all types of recreation conflict, as well as whether or not they would markedly change in their strength. The relationships were expected to be constant in strength and significant across all types of conflict behaviors. This hypothesis was the result of theory developed by Jacob and

Schreyer (1980), which does not describe the relationships between resource specificity, activity style, and conflict changing depending on the type of goal interference behavior.

Knowing how these constructs relate could help managers predict issues in their area and also inform management decisions. If management knows that there is higher level of conflict among climbers with high place attachment and specialization, they could try to open up access to more cliffs for whatever style of climbing is lacking in their area. This could diffuse functional place dependence and provide more options for highly specialized climbers. Due to the fact that many climbing cliffs are not heavily used by other recreation users, climbing presents a well suited perspective to examine conflict within a recreation activity group. While it is certainly possible, and even likely, that climbers experience conflict with other recreation users, the focus of this study was the conflict between climbers.

Purpose Statement

The purpose of this study was to investigate the relationships between specialization, place attachment, and intragroup conflict. This was performed through the lens of rock climbers' place attachment to their primary outdoor climbing area. A primary outdoor climbing area was defined as the most frequently visited location used to achieve the type of rock climbing a climber prefers. The dependent variable was the level of intragroup conflict at their primary climbing area. The independent variable was the level of specialization, viewed as a profile of behavior, skill, and commitment in line with the framework put forth by Scott and Shafer (2001). A mediating variable was place attachment. An additional independent/mediating variable was the frequency of experiencing conflict behaviors. Additionally, this study sought to see how these relationships vary between different types of conflict behaviors.

Hypotheses

The hypothesized relationships are stated below.

H1: As the overall level of rock climbing specialization increases, the level of place attachment to a climber's primary climbing area will also increase.

H2: As place attachment to a primary climbing area increases, intragroup conflict between rock climbers will increase.

H3: As rock climbing specialization increases, intragroup conflict between rock climbers will increase.

H4: The relationship between rock climbing specialization and intragroup conflict at a climber's primary climbing area will be mediated by place attachment to a climber's primary climbing area.

H5: The strongest predictor of conflict will be the frequency of experiencing conflict behaviors.

H6: Frequency of experiencing conflict behaviors will be predicted by the frequency with which an individual goes rock climbing.

H7: These relationships will remain the same for all types of conflict behaviors.

Operational Definitions

Free Climbing: Rock climbing with using only your hands, feet and body for upward progress (Kirby, 2015).

Aid Climbing: Rock climbing using the assistance of objects such as pitons placed in the rock. Graded on the A-scale. The A-scale rates a climb based on the quality of gear placement and danger of taking a fall. Ranges from A0 to A5 (Alpinist, 2015).

Top-roping: A novice style of climbing where the rope is placed through an anchor at the top of a cliff before you start climbing, either by hiking around to the top, or having someone else lead the climb (Kirby, 2015).

Bouldering: the act of free climbing (using hands and feet) over crash pads without ropes, boulders are generally less than 20 feet tall, but many taller boulders are climbed (Kirby, 2015).

V-Scale: The scale by which bouldering difficulty is graded. The scale is an open-ended numerical grading scale with V0 being the easiest and V16 the most difficult.

Sport climbing: the act of free climbing on the face off a cliff clipping pre-installed bolts for protection; bolts are generally spaced within ten feet of each other. Sport climbing difficulty is rated on the Yosemite Decimal Scale.

Yosemite Decimal Scale (YDS): The grading scale used for traditional and sport climbing. Rock climbing difficulty can range from range from 5.1-5.15c.

Traditional climbing: the act of free climbing on a cliff and placing your own removable gear in cracks for protection (Draper, Jones, Fryer, Hodgson, & Blackwell, 2008). Traditional climbing difficulty is rated on the YDS as well as the National Climbing Classification Scale (NCCS).

National Climbing Classification Scale (Commitment Grade): a routes commitment and time investment for an “average” climbing team. Ranges from Grade I: half a day or less to Grade VII: Remote walls climbed in alpine style taking more than three days (Alpinist, 2015).

Chapter 2.

Literature Review

The purpose of this literature review is to outline the literature relevant to the study, the historical context of the research, and the theoretical frameworks to be used. The review will begin with satisfaction as a goal of outdoor recreation and conflict as a barrier; this will be followed by detailed sections describing previous conflict, specialization, and place attachment research. The review will culminate with a review of the small amount of literature which has worked to tie these concepts together.

Satisfaction as a Goal of Recreation Management

Quality of recreational experiences has long been held as a goal of outdoor recreation management (Manning, 2011). Models proposed to understand the quality of recreation experiences determine overall satisfaction from a variety of situational variables and subjective evaluations (Whisman & Hollenhorst, 1998). It has been suggested that subjective evaluations have a more direct impact on overall satisfaction than situational variables (Graefe & Fedler, 1986). Situational variables inform our evaluations of the experience, but the effect of these variables is seen as indirect to our overall satisfaction (Graefe & Fedler, 1986). It has been demonstrated that people respond to dissatisfaction through various coping strategies, such as rationalization, product shift and displacement (Manning & Valliere, 2001). Situations of dissatisfaction that people respond to with coping strategies can be those that involve conflict with other users (Manning & Valliere, 2001). Jacob and Schreyer (1980) viewed conflict as a “special class of user dissatisfaction, where the cause of one’s dissatisfaction is identified as another group or individual’s behavior” (p. 369). While coping may be an acceptable response

to dissatisfaction, it is important that managers know what is causing user dissatisfaction so that appropriate management plans may be implemented.

Conflict in Outdoor Recreation

Conflict has been studied in recreation for over fifty years (Vaske, Donnelly, Wittmann, & Laidlaw, 1995). Throughout this period there have emerged two dominant theoretical models (Manning, 2011). These models have been described as the interpersonal or goal interference model, proposed by Jacob and Schreyer (1980), and the social values model, put forth by Vaske et al. (1995). Both of these models have been empirically tested utilizing a variety of methods and the models are not mutually exclusive. Jacob and Schreyer (1980) defined conflict as, “Goal interference attributed to another’s behavior.” Vaske et al. (1995) goes further, describing a conflict in values where one experiences conflict due to differing social norms, where actual interaction may or may not be present.

In terms of interpersonal conflict Jacob and Schreyer (1980) suggested four main factors that contribute to recreation conflict. These include activity style, resource specificity, mode of experience, and tolerance for lifestyle diversity. Activity style is defined as the personal meanings attached to the set of behaviors constituting a recreation activity. Resource specificity is described as the importance individuals attach to the use of a particular recreation resource. Mode of experience refers to the way in which a user experiences an environment, which can range from focused to unfocused. The last factor described by Jacob and Schreyer (1980) is tolerance for lifestyle diversity. This factor is strongly related to social values conflict and represents a person’s unwillingness to engage in recreation where other lifestyle groups challenge their basic values (Jacob & Schreyer, 1980).

Conflict may also arise as a difference in social values. Differentiating between

interpersonal and social values conflict is important because the solutions to conflict will likely differ (Vaske et al., 1995). If there is a conflict of social values, it is unlikely that zoning and separation will solve user problems; in these cases, education is likely to be more effective (Vaske et al., 1995). Vaske et al. (1995) proposed a model to determine which type of conflict is occurring based on perceived problems and frequency of occurrence. Individuals are asked to rate various conflict behaviors on a 1 to 5 Likert scale from “never” to “always” based on the frequency of observing the behaviors. They are then asked to rate each behavior in terms of how big of a problem the behavior is. This scale is also rated from 1 to 5, ranging from “no problem at all” to “extreme problem”. If a participant sees a behavior but does not view it as a problem, there is no conflict. If they see a behavior and feel that it is a problem, there is an interpersonal conflict. When a behavior is not seen but viewed as a problem, this is when social values conflict occurs.

Vaske et al. (1995) used this model to study hunters and non-hunters at Mt. Evans in Colorado. They found that due to Mt. Evans’ natural visual barriers and regulations, which limit hunting near roads, interpersonal conflict was minimal. The conflict that did exist on Mt. Evans was one of social values. Social values conflict frequency was found to be constant across all visitation frequencies and it was recommended that researchers differentiate between interpersonal and social value conflict in future investigations (Vaske et al., 1995).

Measurement of conflict and the differentiation between interpersonal and social values conflict using the methods proposed by Vaske et al. (1995) has received further examination. Carothers, Vaske, and Donnelly (2001) used this measurement method to determine the level and type of conflict between hikers and mountain bikers. It was found that conflict was higher in relation to mountain biking than hiking. Although social values conflict did exist, all groups

reported a higher level of interpersonal conflict (Carothers et al., 2001).

The method of differentiating between interpersonal and social values conflict was expanded in a study by Vaske, Needham, and Cline (2007). Vaske et al. (2007) pointed out that it is possible for someone to feel a social values conflict towards an individual or group, and also have an interpersonal conflict. Likewise, just because a user has an interpersonal conflict, does not mean they have a social values conflict. Assessing an individual's social values conflict when interpersonal conflict was present was performed by measuring agreement with statements such as, "just knowing that skiers are in the area bothers me" (Vaske et al., 2007, p. 187).

Interpersonal conflict has been examined in many studies throughout the literature; however, there is a lack of consistency in the methods used and a common measure has not been adopted (Graefe & Thapa, 2004). Conflict has historically been framed as being asymmetrical in nature, often between non-mechanized and mechanized groups (Manning, 2011). Mechanized groups rarely have conflicts with non-mechanized, but non-mechanized users often express conflict with mechanized users (Manning, 2011). Jackson and Wong (1982) found this to be true between snowmobilers and cross-country skiers. Carothers, Vaske, and Donnelly (2001) also found asymmetrical conflict between hikers and mountain bikers in Colorado. Jackson, Haider, and Elliot (2003) focused on asymmetrical conflict solutions between motorized and non-motorized winter users in Alaska. It was found that inter-group conflict can be reduced by separating users by location and time of use. Overall satisfaction of both groups remained high during restricted weekends and went up considerably for non-motorized users. Using modified Recreation Experience Preference scales from Manfredo, Driver, and Tarrant (1996), it was determined that motorized and non-motorized users have different motivations, on a consistent basis. Motorized users preferred challenge and adventure, while non-motorized users preferred

solitude, wildlife viewing, and peace/tranquility (Jackson et al., 2003). Although asymmetrical conflict is noted in many cases, it is not universal and should not be assumed (Graefe & Thapa, 2004).

Few studies have taken a comprehensive look at recreation conflict through the lens of the model outlined by Jacob and Schreyer (1980). One study performed by Vaske, Carothers, Donnelly, and Baird (2000) attempted to assess all four factors of conflict outlined by Jacob and Schreyer (1980). Surveys were performed on skiers and snowboarders in Colorado, and in-group and out-group conflict was assessed. Conflict was measured by listing observed unacceptable behaviors and having respondents rate them based on a 1 to 5 Likert scale, with 1 being never observed, and 5 being almost always observed. Individual scales were created for each of the four factors outlined in Jacob and Schreyer's framework. Activity style was measured by number of days per year participating, amount of equipment owned, money invested, and years participating. Resource specificity was measured by rating statements about the resort from strongly disagree to strongly agree on a 5 point Likert scale. Lifestyle tolerance was measured by asking agreement about similarities between skiers and snowboarders, and mode of experience was measured by asking participants how much of their attention was focused on their sport. A new conflict variable that was measured in this study was perceived safety related problems.

Vaske et al.'s (2000) study had a comprehensive and complex set of results. Notable among them were the findings that conflict was not asymmetrical and occurred within and between groups. Overall conflict was found to be higher between the two groups. The only determinant of recreation conflict that influenced in-group and out-group conflict among skiers and snowboarders was activity style. It was suggested that Jacob and Schreyer's determinants may be more appropriate for measuring conflict between groups, not within groups (Vaske et al.,

2000).

Additional findings from Vaske et al. (2000) which are relevant to this study regard resource specificity. Resource specificity was measured using statements frequently used in place attachment research. It was found that snowboarders rated the statements higher than skiers. Snowboarders were found to have a positive relationship between resource specificity and out-group conflict with skiers. This was presented in juxtaposition to a similar study performed by Williams, Dossa and Fulton (1994), where it was found that skiers and snowboarders reported similarly in terms of resource specificity in British Columbia. Williams et al. (1994) hypothesized that this similarity would continue across other areas. Vaske et al. (2000) suggested the disparity in Colorado may have been attributed to the long held closure of ski resorts to snowboarders and recent lifting of bans near the time of study, resulting in more importance being placed on the resource by snowboarders (Vaske et al., 2000). Vaske et al. (2000) recommended further research on the relationship between place identity, dependence and conflict.

A similar study, performed by Thapa and Graefe (2004), also looked at skier and snowboarder conflict. Conflict was measured based on impact of other users (skiers and snowboarders), the seriousness of various problem behaviors, and tolerance of others. Problem behaviors were asked in terms of the local ski hill and rated on a 7-point Likert scale from “not a problem, to “very serious problem”. It was found in this study that groups tend to identify with their own recreation group and experience conflict when engaging with a different group of users. Similar to much of the literature, but unlike Vaske et al. (2000), conflict between groups was found to be asymmetrical. It was found that overall conflict was low.

Conflict has historically been studied primarily as a between-user-group phenomenon,

although it has been shown that conflict can be just as likely to result from within an individual's own user group (Vaske et al., 2004). One factor that has been shown to have a relationship to intragroup recreation conflict is specialization, although the exact nature of that relationship remains uncertain (Graefe & Thapa, 2004). Specialization has long been studied within the field of outdoor recreation and Jacob and Schreyer (1980) included specialization within their framework under the term "activity style". Specialization is a term originally coined and conceptualized by Bryan (1977) in terms of trout anglers of the northwestern United States. He sought to bring forth a conceptual framework that could inform future study in human dimensions of fish and wildlife (Bryan, 1977).

Specialization

According to Bryan (1977), specialization is, "a continuum of behavior from the general to the particular, reflected by equipment and skills used in the sport, and activity setting preferences" (p. 175). Specialization among anglers was conceptualized as a spectrum with four dominating attitudinal categories: occasional fishermen, generalists, technique specialists, and technique-setting specialists. These categories showed variation in their equipment preference, orientation to fish, resource orientation, management philosophy, social context, and vacation patterns. Bryan (1977) suggested that specialization is related to "leisure social worlds", which are reference groups one uses for standards of leisure behavior as well as influences of central life interest and other areas of activity.

Recreation specialization has been perceived as a progression from novice to expert; inherent in this comparison is the placement of one style of activity at a higher, or more authentic, status (Scott & Shafter, 2001). The models designed to explain recreation specialization have evolved over time. McIntyre and Pigram (1992) put forth a circular and

mutually reinforcing model comprised of a behavioral component, an affective component, and a cognitive component. This altered Bryan's (1977) conceptualizing by adding an affective component to the model. Each of these components is determined by its own individual measures, which are theorized to increase as the other two categories increase; thus each component is mutually reinforcing. This model has been challenged for representing a tautology, in that it solves itself (Ditton et al., 1992). Scott and Shafer (2001) adapted this model by proposing that specialization progression can be understood in terms of, "a focusing of behavior, the acquiring of skills and knowledge, and a tendency to become committed to the activity such that it becomes a central life interest" (p. 376). Scott and Shafer (2001) further stated that they do not believe that the progression of behavior, skill and commitment occurs in a "lock-step fashion" (p.338). Specialization is seen as a multi-dimensional construct in which different dimensions will change over time (Scott & Shafer, 2001).

Many specialization studies before 1992 focused on a specialization index, which was an aggregation of scores for the various components put forth by Bryan (1977). These included prior experience, skill level, and equipment owned (McIntyre & Pigram, 1992). By performing cluster analysis on prior participation and affective attachment variables collected from vehicle based campers, McIntyre and Pigram (1992) demonstrated the effectiveness and importance of measuring commitment, or enduring involvement and the creation of a specialization profile, as opposed to a singular index. They stressed the importance of measuring the affective attachment to recreation activities, as well as the prior participation history (McIntyre & Pigram, 1992).

The construct McIntyre and Pigram (1992) developed, which they termed "recreation involvement" included attraction, self-expression and centrality, as well as two separate participation history indicators including number of years involved in the activity, and number of

visits to the recreation site. McIntyre and Pigram (1992) suggested that specialization needs to be studied not as a rigid hierarchy of specialization, but from a framework that “conceptually and methodologically recognizes the multidimensionality of the concept and the importance of the affective attachment that individuals develop for the focus of specialization” (McIntyre & Pigram, 1992, p. 14).

The model proposed by Scott and Shafer (2001), which is viewed as a progression of behavior, skill, and commitment, was tested on a sample of birders by Lee and Scott (2004). Lee and Scott (2004) examined the reliability of the model, and whether or not reducing specialization to a single index, as previously done, was appropriate. It was determined that among a sample of avid birders, specialization of behavior, skill, and commitment did not always occur in a mutually reinforcing fashion (Lee & Scott, 2004). It was recommended that researchers and managers collect information on all three dimensions of specialization to not undermine their ability to properly understand their users. Lee and Scott (2004) further suggested that the creation of a single recreation specialization index would be “unwise” (p. 258).

A model developed to explain the degree and range of specialization across recreation subgroups was presented by Donnelly, Vaske, and Graefe (1986) in the context of boating specialization. Boaters were divided into sailboaters and motorboaters with each group having a progression ranging from dayboaters, to cruisers, to racers. Donnelly et al. (1986) defined the degree of specialization as a characteristic of a single individual which places an activity along a continuum. Range was used to describe the length of the specialization continuum from the lowest to highest categories. It was theorized that sailboaters on the whole would have a higher degree of specialization, while the range of specialization would not differ between the two

(Donnelly et al., 1986). In this study, sailboaters, overall, were more specialized than motorboaters. The degree of specialization followed as predicted for sailboaters, with racers being of the highest degree. This did not hold true for motor racers as they were of the same degree of specialization as motorized dayboaters (Donnelly et al., 1986).

While specialization has been theorized as a progression and research has used this as an underlying assumption, specialization as a progression has been criticized (Scott & Shafer, 2001). It has been noted that many individuals do not continually progress to a higher echelon of specialization, and regression has been noted (Kuentzel & Heberlein, 2006). While specialization has been seen as a progression over time, little research has been performed on a sample over a significant period (Kuentzel & Heberlein, 2006). Kuentzel and Heberlein (2006) sought to determine progression of specialization among Wisconsin boaters over 22 years. This was performed by surveying the same boaters in 1975, 1985 and 1997. Seven measures of specialization were used, “boat ownership, frequency of boating on other great lakes, frequency of boating on oceans, participation in sailing regattas or boat races, self-perceived boating skill, self-rated measure of changing interest, and whether or not respondents had stopped boating” (Kuentzel & Heberlein, 2006, p. 503). Boat ownership, perceived as a significant barrier to entry was seen as a key indicator of boating experience and commitment.

Findings by Kuentzel and Heberlein (2006) suggest that, “specialization progression is more the exception rather than the rule among boaters at the Apostle Islands” (p. 508). It was found that the majority of the people in the panel did not progress over time and may have had no interest in doing so. Rather, more individuals maintained involvement at a casual level than those at the upper levels of progression. It has been suggested that specialization likely varies by activity and group, so it is possible that some activities have a high likelihood of specialized

progression. These activities could be things like rock climbing, kayaking, or snowboarding (Keuntzel & Heberlein, 2006). Further research performed by Scott and Lee (2010) showed that among birders, the specialization progression hypothesis did not apply to the majority of participants. It was suggested that participation among many birders is marked by declines in participation. In terms of progression it is likely that newcomers experience a burst of progress followed by a plateau in specialization marked by declines (Scott & Lee, 2010).

An alternative approach to better understand the shortcoming of the specialization progression hypothesis was presented recently in terms of identity theory (Jun, Kyle, Graefe, & Manning, 2015). Identity theory is based in the idea that how we identify ourselves has a strong influence on the activities we choose to pursue and develop. Jun et al. (2015) state, “Successful affirmation of identity related to leisure generates positive emotions to the extent to which the identity is important to the individual” (p. 430). It was shown that among hikers on the Appalachian Trail, as people identified more as a “hiker”, their likelihood of describing the activity as central to their lives increased. In addition, the more that hiking allowed individuals an opportunity for identity confirmation, the more likely they were to hike and develop their skills. Identity theory may explain why users fail to progress to higher levels of specialization. If higher levels of specialization do not afford them the identity affirmation they desire, they may remain at a lower level on the specialization continuum (Jun et al., 2015).

Measurement of recreation specialization has varied in its operationalization (Scott, Ditton, Stoll, & Eubanks, 2005). While measurements have varied, many have been multi-dimensional, involving measures of behavior, skill, and commitment. Managers desired a simpler approach to classify birders along a specialization continuum (Scott et al., 2005). Scott et al. (2005) tested the effectiveness of utilizing a self-classification measure among birders.

Birders were asked to place themselves in three separate categories, casual birder, active birder, or committed birder. This was then compared with more traditional multi-element measures of specialization. The multi-element measures were in line with the framework proposed by Scott and Shafer (2001); they reflected a participant's behavior, skill, and commitment to birding. Overall the self-classification measure performed, "as well, if not better, than two other multi-item approaches" (p. 71). One explanation for this adequate reflection could be the long descriptions provided to describe each of the self-classification categories; these descriptions were in depth and addressed multiple elements of specialization within themselves (Scott et al., 2005).

The specialization literature has explored relationships between specialization and a host of other variables. Thapa, Graefe, and Meyer (2006) researched specialization in SCUBA diving and its relationship to environmental behaviors. Overall it was shown that higher levels of specialization were positively related to positive environmental behaviors (Thapa et al., 2006). Mowen, Graefe, and Virden (1998) found that those with high activity involvement and high place attachment rated locations better and had higher overall satisfaction. Wöran and Arnberger (2012) utilized Scott and Shafer's (2001) model of specialization to determine that recreation specialization predicts *flow*. *Flow* is described as "a psychological state in which the person feels simultaneously cognitively efficient, motivated and happy" (Moneta and Csikszentmihalyi, 1996 p. 277). The more specialized an individual is in hiking mountains, the more likely they are to experience flow (Wöran & Arnberger, 2012).

Vaske, Dyar, and Timmons (2004) used data from 1993 to examine the relationship between specialization and conflict through the lens of skiers and snowboarders. It was hypothesized that: 1. Skiers and snowboarders would report more out-group conflict than in-

group, and 2. As perceived skill level increased, in-group conflict and out-group conflict would both increase. A single, four-point skill level measure was used, with participants rating themselves from beginner to expert. To measure conflict, participants rated unacceptable behaviors in terms of how often they were observed from never (1) to almost always (5) (Vaske et al., 2004). Both hypotheses were supported with out-group conflict remaining higher, and overall conflict increasing with perceived skill level.

Thapa and Graefe (2003) conducted a similar analysis to Vaske et al. (2004). The relationship between conflict and skill was examined among skiers and snowboarders. Using data collected from a rural “ski town” in north-central Colorado in 1996, skiers and snowboarders were divided into self-reported “high” and “low” skill categories. Skill categories were then analyzed through one-way ANOVA by the level of perceived conflict and tolerance of other user-groups (e.g. skiers’ tolerance of snowboarders). Contrary to the findings reported by Vaske et al. (2004), Thapa and Graefe (2003) found that low skill skiers and snowboarders experience more conflict and are less tolerant than their high skill counterparts.

Specialization in rock climbing has been studied previously. Ewert and Hollenhorst (1994) studied rock climbing specialization by an individual’s experience use history, skill level, locus of control, and involvement. Specialization was contrasted against setting attributes including naturalness, social orientation, equipment, and risk. Results suggested that among rock climbers, setting preferences are concerned more with the characteristics and qualities of the route than the naturalness of the area. As rock climbing involvement increases, it was shown that dependence on remote areas decreases (Ewert & Hollenhorst, 1994). Further study by Merrill and Graefe (1998), also found route quality to be of higher importance than the overall quality of the recreation setting. While preference for remote and natural locations decreased, it

was suggested that, “as individual characteristics become more specialized, setting preferences also become more specialized” (Merrill & Graefe, 1998, p. 188).

Nelb and Schuster (2007) performed an in-depth study on rock climbing specialization at the Mohonk Preserve in New Paltz, NY. Specialization was measured through climbers’ behavior, skill, and commitment. The study sought to test whether or not rock climbing sub-activities could be placed on a specialization continuum. It was hypothesized that, “the variance of specialization components will not be significantly different across activity styles” (Nelb & Shuster, 2007, p. 205). Respondents were asked to describe their own style of climbing; top-roping, sport climbing, traditional climbing, or bouldering. The hypothesis was not supported, suggesting that climbing sub-activities can be placed on a specialization continuum. The climbing continuum places top-roping (least specialized) and traditional climbing (most specialized) at opposite ends of the spectrum, with sport climbing and bouldering in between.

The factor loading analysis performed by Nelb and Schuster (2007) suggested dimensions contrary to those suggested by Lee and Scott (2004). Lee and Scott (2004) used the three dimensional model of behavior, skill and knowledge, and commitment. Nelb and Schuster (2007) found that skill measures loaded with behavioral variables. Behavioral variables were also split from each other. Years of experience and years of experience on-site loaded together, but did not load with frequency of experience and frequency of experience on-site. Nelb and Schuster (2007) claim that this suggests two points, one being that behavioral variables cannot be asked in a single measure format; they state that we cannot assume a relationship between length of participation and frequency. The second point made is that site-specific experience is less important than experience in general. This is because site-specific indicators are not grouped together (Nelb & Shuster, 2007).

Place Attachment

Resource specificity has been categorized as one of the four determining factors of recreation conflict (Jacob & Schreyer, 1980). In the recreation literature, measurement of resource specificity is limited. A concept that has experienced more attention is place attachment. Place attachment is how an individual values a recreation setting through both functional and emotional, or symbolic, meanings (William & Roggenbuck, 1989). Place attachment has been historically divided into two dominant dimensions including: place identity and place dependence (Bricker & Kerstetter, 2000). Place dependence represents an individual's functional association to a location, or a group of locations (Stokols & Shumaker, 1981). It is important to note that it is not an inherently positive phenomenon (Jorgenson & Stedman, 2001). Place dependence describes an individual's ties to a resource and how that resource helps them achieve their goals. It can represent the best choice out of multiple bad locations for completing desired objectives (Jorgenson & Stedman, 2001). Moore and Graefe (1994) theorized place dependence as a function of a setting's ability to satisfy the requirements of a user's particular activity. Place identity has been defined as "those dimensions of the self that define the individual's personal identity in relation to the physical environment" (Proshansky, 1978, p. 155). It has been suggested that place identity forms more slowly over time and contains symbolic and emotional meanings associated to a place (Moore & Graefe, 1994).

The initial measurement of place attachment as a two dimensional construct was conducted by Williams and Roggenbuck (1989). Following this, a number of studies have emerged using the two dimensions and adding additional dimensions of their own. Additional dimensions measured have included social bonding (Kyle, Mowen, & Tarrant, 2004), lifestyle orientation (Bricker & Kerstetter, 2000), affective attachment (Kyle, Mowen, & Tarrant, 2004),

place familiarity, rootedness, and belonging (Hammit, Blacklund, & Bixler, 2006). Williams and Vaske (2003) examined the two dimensional model and sought to test the construct's validity. The analysis showed that participants separate place identity and place dependence into two distinct factors but also supported the interpretation that place identity and dependence can be combined into a single construct of place attachment. Williams and Vaske (2003) described a limitation in that while the two dimensional construct has validity, it remains unknown whether other distinct dimensions exist that have not previously been addressed. An additional finding of the analysis was that each construct could be adequately measured with good reliability using only four questionnaire measures. There was very little improvement in reliability by adding additional measures (Williams & Vaske, 2003).

In a similar study to Williams and Vaske (2003), Hammit, Blacklund, and Bixler (2006) examined a different model for place attachment. Hammit et al. (2006) used the term place bonding, although the functional definition remained the same as place attachment. A model was developed presenting three additional dimensions beyond identity and attachment. They are familiarity, rootedness and belonging. The model was tested on fishermen using a 26-measure scale. After dropping two of the items, resulting in a 24-measure scale, confirmatory factor analysis supported the model. It was suggested that while this conceptualization further complicated the construct of place attachment, there was evidence to support a five dimensional model and further research should be performed to determine the comparative validity of the two models (Hammit et al., 2006).

Hammit, Kyle and Oh (2009) performed comparative analysis of two conceptualizations of place attachment/bonding. Three models were tested using confirmatory factor analysis: a full model testing all five dimensions comprised of 24 measures, a 15-measure parsimonious model

testing all five dimensions but with only three items each, and a 12-measure partial model containing only identity and dependence. Each model was run against the variable of experience use history for groups of both campers and anglers. The differences between the models was surprisingly small. Hammitt et al., (2009) had difficulty recommending any model as better than the others. The difference in predictive power between the full model and the partial model at its greatest was 7% between campers and only 4% for anglers. Because it only used three more questions, added three additional dimensions and contained slightly higher predictive power, the authors preferred the parsimonious model over the partial model containing only identity and dependence (Hammitt et al., 2009).

Kyle, Graefe, Manning, and Bacon (2004) tested activity involvement, an affective factor of specialization, as a predictor of place attachment and evaluations of setting density. This was tested on a sample of hikers on the Appalachian Trail. Place attachment was measured using 12 items rated on a five-point scale from strongly disagree to strongly agree, four items of place dependence, four of place identity, and an additional four for social bonding. Users who reported higher place identity were more likely to report negative perceptions of crowding, contrary to the authors' expectations, while users who reported higher place dependence reported more favorable perceptions of crowding. This suggests that place dependent hikers do not view the presence of others to be detrimental to their experience. The results also indicated that activity involvement was a stronger predictor of place identity than of place dependence. The reason for the low overall predictive value of activity involvement on place dependence may be the result of a high level of substitution near the Appalachian Trail; the region has a large amount of trails to choose from, which may result in low overall place dependence. Kyle et al. (2003) theorized that another reason for the weak relationship may be a result of the place dependence statements

being hiking specific, when a user's primary activity may not be hiking. It has been recommended that further studies probe for a primary activity and ask questions related to the stated activity (Kyle et al., 2003).

The relationship between place attachment and specialization was examined by Bricker and Kerstetter (2000). They measured specialization as a multi-dimensional construct composed of skill level, ability, level of experience, centrality to lifestyle, enduring involvement, and equipment and economic investment. This was contrasted against an individual's place attachment. Place attachment was measured in three dimensions, place dependence, place identity, and lifestyle. It was found that high specialists were more likely to agree with place identity measures. The findings in regards to place dependence were counter-intuitive to theory (Bricker & Kerstetter, 2000). Although it was found that low skill level individuals had higher levels of place dependence, overall, respondents were relatively neutral about their dependence on the river. This disparity is possibly the result of the questions not adequately addressing the issues of functional dependence, or the possibility that boaters on the South Fork of the American River of all skill levels felt that they had a multitude of choices in northern California (Bricker & Kerstetter, 2000). Bricker and Kerstetter (2000) stated that further research should expand the functional nature of place attachment.

In 2014, Kyle, Jun, and Absher published a study proposing a new conceptualization of the place attachment model. Kyle et al. (2014) suggest that identity is a primary motivation of an individual's behavior. A new model was proposed with place identity as an antecedent variable to place dependence, affective attachment, and social bonding. This model was tested on members of the public within the wildland urban interface in southern California National Forests. The analysis provided support for the model. It was shown that in this instance, place

identity served as a predictor for place dependence, social bonding, and affective attachment (Kyle et al., 2014).

The relationship between specialization and place attachment was also explored by Oh, Lyu, and Hamitt (2012). Their study sought to examine the linkages between the three dimensions of specialization, behavior, skill, and commitment, and the two dimensions of place attachment, place identity and place dependence. Additionally, they sought to test for mediation between specialization and place attachment through consumptive orientation and experience preferences. Using structural equation modeling they found moderate evidence that specialization was associated with place attachment. When testing linkages between dimensions, an unexpected result was that the behavioral dimension of specialization did not have a significant association with either place identity or dependence. There was a direct relationship between the dimensions of skill and commitment and place identity and dependence. Consumptive orientation had no mediating effect. Skill and commitment, however demonstrated indirect influences on place attachment and dependence through experience preferences (Oh et al., 2012). The authors suggest that the dimensions of skill and commitment relate to a greater place identity. It was suggested that highly skilled, knowledgeable and committed anglers are more likely to develop a strong bond with a place (Oh et al., 2012).

Nelb (2007) examined the relationship between the two-dimensional place attachment model and the tripartite model of specialization proposed by Scott and Shafer (2001) within the context of rock climbers. It was found that among rock climbers in New York, there was a positive and significant relationship between both dimensions of place attachment and specialization. The relationship between overall specialization and place identity was stronger than that of place dependence. The specialization dimension of skill had a significant and

negative relationship to place dependence. This suggests that as a rock climber advances in skill, he or she is likely to have more choices of where to climb (Nelb, 2007).

Place attachment and its relationship to recreation conflict was examined by Gibbons and Ruddell (1995). Place attachment was measured only using place dependence and the Jacob and Schreyer (1980) model of goal-interference was tested explicitly. Two goal interference paths were tested between helicopter skiers and non-motorized backcountry skiers. The two goal interference paths examined were that of setting and activity. The setting based interference was based on interference with solitude and experiencing nature, and the activity based interference was based on making turns in fresh powder and experiencing excitement. Place dependence was found to be a significant predictor of activity and setting-based goal interference attributed to helicopter-skiers by non-motorized users. Conflict was found to be asymmetrical between helicopter skiers and non-motorized skiers. This presents a unique version of the traditional asymmetrical relationship observed between motorized and non-motorized users, as the primary activity is skiing, but goal-interference still exists because of the brief presence of the mechanized vehicle, the helicopter (Gibbons & Ruddell, 1995).

The Gap in the Literature

While there has been significant research on recreation specialization and conflict, there appears to be a gap in the literature concerning their relationship. This gap becomes especially apparent when considering in-group or intragroup conflict. Additionally, how this relationship is mediated by place attachment is yet to be known. While there is a significant body of literature on place attachment, the literature concerned with the relationship between place attachment, conflict, and specialization is limited. It is important for managers to understand how place attachment and specialization affects recreation conflict across a wide spectrum of users. The

knowledge of these relationships could increase overall recreation quality and satisfaction at highly specialized recreation resources. The use of rock climbing as a context for this study brought a unique activity with high levels of specialization. The recreation behavior of rock climbers has had limited study compared with many other outdoor recreation activities and understanding relationships within the sport will help those who are required to manage it.

This study expands on research performed by Nelb (2007), which explored the relationship between place attachment and specialization in rock climbers. Although relationships were found between the two constructs, the study had its limitations. The sample of traditional style climbers was much larger than that of any other style. This was likely due to the location where sampling took place, the Shawagunks, New York, which is a destination dominated by traditional climbing. Additionally, the reported statistics were simple bivariate correlations which did not provide much depth or understanding in terms of the overall relationships. Nelb and Schuster (2007) found positive relationships between place attachment and specialization, providing rationale for this study, which sought to examine place attachment's mediating effects between specialization and conflict.

This study, which measured specialization using the multi-element framework proposed by Scott and Shafer (2001) relates specialization to place attachment and conflict in a level of depth not yet available in the literature. Importantly, the researcher sought to understand the interactions between these constructs, not just between conflict as whole, but also between different types of conflict behaviors. Conflict is a clear barrier to satisfaction in recreation and understanding how an individual's specialization and place attachment is related to this barrier helps us better understand recreation users and how they interact with the places where they recreate.

Chapter 3.

Methods

Study Setting and Sample

The study setting was based around a participant's self-stated primary outdoor climbing area. The survey was sent to all members on the email list of the American Alpine Club (AAC). The AAC is a national non-profit organization which provides members with resources on climbing locations, rescue insurance, lodging at climbing destinations, and community events through local chapters. The AAC is based in the United States and currently reports a membership of 16,051 (AAC Annual Report, 2016). This organization was selected due to the desire for a sample which was representative of multiple locations, and multiple styles of climbing.

Data Collection

The survey was administered online using the Qualtrics Survey Platform. The survey was sent out as an anonymous link on July 5th, 2016. An invitation to participate in the survey was included as a part of a regularly occurring informational email from the AAC. The survey was only sent out one time, with no reminders. This decision was made by the AAC and their marketing team, due to their hesitance to send multiple emails to their membership. The survey was open for 30 days.

Variable Measurement

The full survey for this study is included in Appendix A. Although this survey was conducted online, a paper version was constructed for the purpose of this thesis. Place attachment was measured in terms of a participant's self-identified primary outdoor climbing

area using four traditional measures of place dependence and identity. This two-dimensional method was selected due to the low reported differences between it and scales comprised of additional dimensions (Hammitt et al., 2009). Participants were presented with a list of statements and asked to rate them on a 1 to 5 scale from “Strongly Disagree” to “Strongly Agree”. Only four items per dimension were used because of the lack of increased reliability when adding additional measures (Williams & Vaske, 2003).

These measures have been adapted from Williams and Roggenbuck’s (1989) original measures that have been used widely throughout the literature. Place dependence measures have been altered to include the statement “within a reasonable distance to where I live”. The purpose of this alteration was to increase the clarity, and hopefully, strength of the measures. Traditionally place dependence measures have not carried a statement regarding scale. Thus measures such as, “This place is the best place for climbing”, may become confusing to the respondent. It is unclear if we are asking if it is the best place that they could go to, or the best place in the world. The addition of this scale statement sought to increase the functional strength of the place dependence measures by adding clarity to the construct. An additional fifth place dependence item was created by the researcher, “I depend on my primary outdoor climbing area to do the type of climbing I like to do within a reasonable distance to where I live.” This was added as a check against the traditional four measures, and in the interest of asking about place dependence directly.

A primary outdoor climbing area was defined for participants as, “the area most frequently visited to achieve the type of rock climbing they prefer.” This definition was constructed by the author based on personal experience in the sport and consultation with the American Alpine Club. The choice of using a general, self-identified place as the focus for place

attachment was made due to the difficulties of sampling a wide variety of climbers at one specific location. By utilizing this approach, we sought to capture climbers of varying styles and skill levels while still learning about overall place attachment among climbers. Additionally participants were asked to write in what place they were referring to when answering questions about their primary climbing area.

Specialization was measured as a multi-dimensional construct composed of self-reported behavior, skill, and commitment. Self-reported behavior was measured in terms of frequency and history of participation. Skill was measured by a climber's self-expressed skill level within the sport. Each participant was asked the hardest grade he or she had climbed in each style without falling in the past six months, as well as a self-identified skill level ranging from novice to expert. Commitment was measured using the modified involvement scale from Kyle, Absher, Norman, Hammitt, and Jodice (2007). This scale was selected due to its ability to capture varying dimensions of involvement. The dimensions contained are attachment, centrality, social bonding, identity affirmation, and identity expression. Participants were presented with three items for each sub-domain and asked to rate them on a 1 to 5 scale from "Strongly Disagree" to "Strongly Agree". This provided a well-developed commitment profile that allows for interesting analysis. This scale contains measures similar to previous studies regarding centrality to life as well as measures less commonly seen in the literature regarding specialization.

All specialization questions were asked in a way that developed a specialization profile for climbing as a whole, as well as for each individual style. Participants were first asked if they identify with one style of climbing over the others. This question was included after consultation with the Education Manager of the American Alpine Club. Allowing climbers to state if they identify with one style over the others helps us understand how climbers really feel the sport

should be categorized. If they identified with one style more than the others, they were asked to state their primary style. If they did not identify with one style, they were asked to explain how they would describe themselves as a climber (Appendix B). The benefit to asking specialization in terms of rock climbing in general as well as within styles is the ability to explore the theorized relationships within each style of climbing. This increased the survey length with respondents completing two batteries of the modified involvement scale, but helps answer questions related to the specialization continuum among rock climbers.

Conflict was measured using the method provided by Vaske, Needham and Cline (2007). Participants were presented a list of possibly inappropriate behaviors related to climbing. This list of thirteen behaviors was developed by the researcher through consultation with the AAC Education Manager. The behaviors were designed to encompass a wide variety of possibly negative behaviors that climbers may experience at their primary outdoor climbing areas. Participants were asked to rate how often they have seen each behavior at their primary outdoor climbing area on a 1 to 5 scale from “Never” to “Always”. Following this, they were asked to rate how much of a problem each behavior is at that area on a 1 to 5 scale from “Not a Problem” to “Extreme Problem”. This method allowed us to understand how much conflict climbers experience and perceive. Unlike Vaske et al. (2007), this study treated the frequency of experiencing a conflict behavior as a predictor of rating the same behavior as a problem.

Data Analysis

Data was analyzed using SPSS 23.0 and Amos SPSS 23.0. Descriptive data was analyzed using SPSS. Missing data was analyzed using the missing data tool in SPSS and missing values were imputed using maximum likelihood regression single imputation in Amos. Model testing was performed using maximum likelihood structural equation modeling through

Amos. The full model was tested in a two-step fashion. First a measurement model was tested using confirmatory factor analysis. Following model trimming and re-specification, the structural model was tested. After testing the full theoretical model (Figure 1.), exploratory factor analysis was used to determine the grouping of conflict behaviors. Three distinct factors emerged: ethical conflict, crowding conflict, and rude interactions conflict. These factors were then analyzed independently as the ultimate dependent variable in the model. Each of these three models was analyzed in the same two-step fashion as the full model.

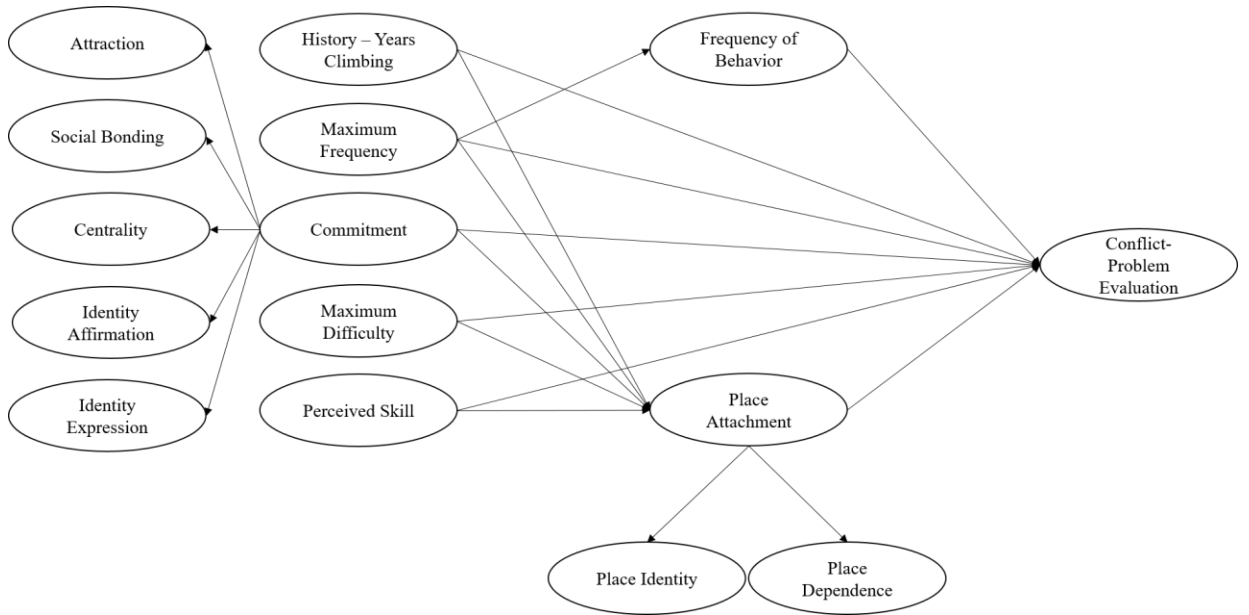


Figure 1. Full theoretical model

Chapter 4.

Results

Survey Response

The survey was sent out on the evening of July 5th, 2016. There was a misunderstanding between the researcher and the individuals in charge of sending emails to the members of the AAC. The researcher had discussed the plan to send out the survey in a customized email, and was under the impression that it would be the featured item in the email. The survey invitation and link were not the first item in the email, but were placed below an article about climbing safety. It is likely this contributed to an overall low response rate. The AAC marketing team told the researcher that they would schedule the emails so that they receive maximum engagement, however this email did not go out until 7:15pm EST. The reason for this timing is unclear. It is possible this prevented people from seeing the survey on their work email, and they ignored it the next day, thus contributing to a low response rate.

The initial plan between the researcher and the representative from the AAC was to gauge the first administration and then determine whether or not a reminder would be necessary. The researcher was under the impression that if the survey response was poor, at least one reminder would be sent out. Unfortunately, after the response was poor, the AAC was unwilling to send a follow up email to their entire membership. This situation resulted in the survey being administered as a one-time email.

The survey was sent to the entire membership listserv of the AAC and 28,137 emails were delivered. While this is a very large number, the quality of the email list is suspect. According to the AAC Annual report (2015), the AAC only has 16,051 members. After following up with contacts at the AAC, the researcher discovered that the email list contained

inactive members, as well as donors and contacts which may not be members. 8,125 (28.9%) emails were opened and 2,261 (8.0%) individuals clicked on something within the email.

According to MailChimp.com (2016), the average open rate for a non-profit email is 25.06% and the average click rate is 2.8%. In this regard, the email performed better than average. Although there was an above average click rate within the email, the majority of those clicks appear to have gone to the article placed above the survey, with only 564 individuals scrolling down and participating in the survey. Additionally, a number of individuals did not completely finish the survey. 391 of the 564 participants finished the survey, yielding a completion rate of 69.3%.

Calculating an overall response rate is difficult in this situation due to the method of administration. Calculating response rate based on an inflated email list with inactive members is unlikely to provide us with a useful response rate. If we use the amount of opened emails, 8,125 and the number of people who participated in the survey, we arrive at a response rate of 6.9%. Calculating response rate based off on the number of opened emails appears to be the most appropriate and realistic way to calculate response rate in this situation. There is no way for the researcher to know how many of the email addresses on the list are regularly used. Additionally, with the list having 12,000 more email addresses than the reported active membership, calculating response rate based off of the 28,137 seemed inappropriate.

Sample Characteristics

The sample was relatively homogenous. It was dominated by white males between the ages of 26-45 (Table 1.). The income of climbers varied within the sample; the median income was \$50,000 to \$74,999. The best represented region was the Northeast at 18.1% and the least represented was the Southeast at 6.0%.

Table 1. Sample Characteristics

Question	Percent	Frequency
What is your Sex? (n=385)		
Male	75.3	290
Female	24.7	95
What is your race? (n=381)		
White	90.6	345
Black	0	0
American Indian or Alaska Native	.8	3
Asian	4.5	17
Native Hawaiian or Pacific Islander	.3	1
Other	3.9	15
In what year were you born? (n=382)		
Before 1950	6.3	24
1951-1970	23.6	90
1971-1990	56.8	217
After 1990	13.4	51
What is your average yearly income? (n=375)		
Under \$24,999	8.5	48
\$25,000-\$49,999	14.0	79
\$50,000-\$74,999	13.3	75
\$75,000-\$99,999	11.2	63
\$100,000-\$124,999	7.4	42
\$125,000-\$149,999	3.9	22
\$150,000-\$174,999	2.3	13
\$175,000-\$199,999	1.4	8
Over \$200,000	4.4	25

Table 1. Cont.

Questions	Percent	Frequency
Which region of the American Alpine Club do you reside in? (n=385)		
Northeast	18.4	104
Western	14.4	81
Northwest	9.6	54
Southeast	6.0	34
Rockies	11.3	64
Central	6.4	36
Do not know	2.1	12

Respondents generally identified with one style of rock climbing more than the others (Table 2.). The majority of the sample selected traditional climbing as the style that best described them as a climber. Sport climbing was the next largest grouping, with top roping and bouldering following. Only one respondent identified aid climbing as the category which best described themselves.

Table 2. Sample Characteristics – Rock Climbing

Question	Percent	Frequency
Do you identify with one of these styles of rock climbing more than the others? (n=562)		
Yes	89.5	505
No	10.1	57
Please indicate which category best describes you as a climber. (n=500)		
Top Roping	7.8	44
Bouldering	5.3	30
Sport Climbing	17.7	100
Traditional Climbing	57.6	325
Aid Climbing	0.2	1

Handling of Missing Data

The handling of missing data is important when performing any statistical analysis, but especially so when performing structural equation modeling. Amos graphics, the SEM software used for this analysis, will not provide important information, such as modification indices, if there is any missing data present. Missing data for this analysis was handled in two steps. The first step was a deletion of every case in which participants did not complete the survey. Qualtrics provides a variable along with its output which indicates whether or not a participant finished the survey. “Finished” in this instance means that an individual clicked “Submit Survey” on the last page of the survey (Qualtrics.com, 2016). This resulted in 391 mostly completed surveys, for a completion rate of 69.3%. In the remaining data there is less than 3% missing data. Since this number is below 5% the dataset was appropriate for imputation (Kline, 2011).

Participants were not forced to complete any question throughout the survey. This meant that a large number of participants skipped questions periodically throughout the survey. While list-wise deletion, deletion of every case with at least one missing variable, could be performed, this method can introduce unnecessary bias and does not represent the state of the art (Shafer & Graham, 2002). A preferred method which has been shown to introduce the least bias is maximum likelihood (ML) imputation (Garson, 2015). ML uses an iterative process to draw inferences about missing values from a likelihood function (Shafer & Graham, 2002). This process was performed using the regression imputation option within the data imputation package provided by AMOS.

The decision was made to produce a single imputation dataset, as opposed multiple imputation. This decision was made in the interest of preserving the simplicity of analysis. An

ML imputation method which generates a single complete dataset allows us to preserve responses, generate important modification indices, and reduce the bias introduced by more traditional imputation or deletion methods. For the remainder of the analysis, including the descriptive information provided, numbers have been derived from the imputed dataset of 391 surveys. The imputation method used generated decimal values for responses that could only have been reported in whole integers; where this is the case, the imputed values were rounded to the nearest whole integer. This rounding added a small amount of additional error, however, the researcher felt that imputing values for participants which weren't an option presented to them was inappropriate. For the few variables where imputation was not performed, but descriptive data is provided, an alternative n is listed.

Specialization

As stated previously, specialization was measured as a profile comprised of behavior, skill and commitment. Each dimension was measured in terms of general rock climbing, as well as each individual's primary style. For the purposes of model testing, only general rock climbing specialization is being considered.

Commitment

Commitment was measured using the modified involvement scale (Kyle et al., 2007). All five dimensions are profiled in Table 7. All dimensions averaged towards the positive end of the spectrum. Attraction was rated the most favorably at 4.76, and also displays the highest internal consistency at .876. All sub-dimensions displayed acceptable reliability, except for identity affirmation which performed under the minimum threshold of .65 suggested by Vaske (2008). Identity affirmation also generated the lowest mean out of all the other sub-dimensions. This lack

of reliability within the identity affirmation sub-dimension will be further addressed during the confirmatory factor analysis portion of this thesis.

Table 3. Modified Involvement Scale Means and Reliabilities

Item	Mean	SD	Corrected Item Total Correlation	Alpha if Item Deleted	Cronbach's Alpha
<i>Attraction</i>	4.76				.876
Climbing is one of the most enjoyable things I do	4.76	.550	.725	.858	
Climbing is very important to me	4.78	.516	.784	.809	
Climbing is one of the most satisfying things I do	4.72	.579	.782	.808	
<i>Centrality</i>	4.13				.803
I find a lot of my life is organized around climbing	4.20	.924	.722	.663	
Climbing occupies a central role in my life	4.17	.947	.757	.622	
To change my preference from climbing to another recreation activity would require major rethinking	4.02	1.09	.503	.900	
<i>Social Bonding</i>	4.10				.754
I enjoy discussing climbing with my friends	4.41	.749	.493	.773	
Most of my friends are in some way connected with climbing	3.69	1.11	.643	.438	
Participation in climbing provides me with an opportunity to be with my friends	4.20	.911	.664	.450	
<i>Identity Affirmation</i>	4.06				.624
When I participate in climbing, I can really be myself	4.17	.906	.570	.335	
I identify with the people and image associated with climbing	3.92	.964	.458	.488	
When I'm climbing, I don't have to be concerned with the way I look	4.08	1.01	.295	.721	
<i>Identity Expression</i>	3.42				.797
You can tell a lot about a person by seeing them climb	3.25	1.12	.610	.759	
Participating in climbing says a lot about who I am	3.67	1.07	.678	.682	
When I participate in climbing, others see me the way I want them to see me	3.32	1.00	.638	.728	

*Items rate from 1- "Strongly Disagree" to 5- "Strongly Agree"

Behavior

Behavior for this analysis is composed of both frequency of participation within climbing, as well as history within the sport. On average, participants had been climbing for 14.7 years (Table 8). Participants were asked how frequently they had been climbing within the last sixth months for each of the five styles. Sport climbing and traditional climbing were the most frequent styles, with aid climbing being the least. A single frequency variable was calculated for the purposes of the SEM analysis. The variable was created by selecting the highest frequency reported out of all five styles. This variable was created before ML imputation. The reason for this decision was that it seemed likely to the researcher that individuals may have skipped answering for styles in which they did not participate. The researcher wanted to create the maximum frequency variable with as much original data as possible. After calculating the maximum frequency variable, data was imputed using only this variable and not the individual frequency by style items.

Table 4. Years Climbing

How many years have you been climbing?		Mean: 14.7 years SD:11.94
Years	Percent	Frequency
Under 10 years	44.5	174
11-20 years	37.1	145
21-30 years	7.7	30
31-40 years	5.1	20
Over 41 years	5.6	22

Table 5. Climbing Frequency

How many times in the past six months did you go...*								
Style	Mean	SD	Percentage					
			Did Not Participate (1)	1-3 Times (2)	5-10 Times (3)	10-20 Times (4)	20-50 Times (5)	50 or more (6)
Top Roping (n=268)	2.25	1.26	33.6	32.3	18.5	9.1	3.8	2.7
Bouldering (n=271)	2.32	1.42	34.8	25.8	15.6	7.2	6.4	3.8
Sport Climbing (n=375)	3.01	1.40	15.7	23.7	26.7	16.3	13.3	4.3
Traditional Climbing (n=375)	3.10	1.37	13.6	23.5	23.7	22.7	12.0	4.5
Aid Climbing (n=357)	1.23	.557	74.4	14.6	1.3	.8	0	.3
Highest Frequency Listed (n=391)	3.93	1.21	1.3	10.7	27.1	25.8	24.8	10.2

*Data not imputed for each style, only imputed for Highest Frequency

Skill

Skill was measured in two methods for this analysis, perceived skill level and actual reported difficulty levels of completed climbs. No individuals within the sample considered themselves novices (Table 10). Most participants considered themselves intermediate to advanced climbers. Actual level of climbing was asked for each of the 5 styles (Table 11). Three of the styles have the same grading scale, while bouldering and aid climbing each have their own scale. The average hardest grade climbed was in top-roping.

As with frequency of participation, the researcher desired to create a single skill item out of the five styles. This variable was created by standardizing all five variables into z-scores. This was done to standardize the different scales, as well as put every style in the terms of the average. This is important because even the styles with the same grading scale, top-roping, sport, and traditional, are at different levels of difficulty. Understanding each participant's skill in terms of the average skill listed help us better stand a climber's relative skill. The highest z-score each participant received among the five styles was selected and put into a maximum difficulty variable, representing the highest each participant was in regards to the average for their best reported style. Descriptive data are not provided for this item as they would be difficult to interpret. This variable is useful for model testing, but difficult to interpret as a descriptive statistic.

Table 6. Climbing Skill – Self Rating

	Percentage	Frequency
How would you describe yourself as a climber?		Mean: 3.55 SD: .776
Novice	0	0
Beginner	5.9	23
Intermediate	45.0	176
Advanced	37.3	146
Expert	11.8	46

Table 7. Climbing Skill – Hardest Grade Climbed

What is the hardest grade you have successfully climbed in the past sixth months of the following styles?			
	Percentage	Frequency	Average Grade*
Top Roping (n=362)			5.11a/5.11b
5.1-5.9	7.7	28	
5.10a-5.10d	22.9	83	
5.11a-5.11d	33.7	122	
5.12a-5.12d	16.8	61	
5.13+	2.2	8	
Not applicable	16.6	60	
Sport Climbing (n=366)			5.10d
5.1-5.9	15.3	56	
5.10a-5.10d	3.4	125	
5.11a-5.11d	24.6	90	
5.12a-5.12d	11.2	41	
5.13+	1.6	6	
Not applicable	13.1	48	
Traditional Climbing (n=374)			5.10a
5.1-5.9	45.6	172	
5.10a-5.10d	29.4	110	
5.11a-5.11d	9.1	34	
5.12a-5.12d	2.7	10	
5.13+	.5	2	
Not applicable	12.3	46	
Bouldering (n=354)			V4
V0-V1	5.1	18	
V2-V3	23.2	82	
V4-V5	23.2	82	
V6-V7	9.3	33	
V8-V11	5.4	19	
Not applicable	33.9	120	
Aid Climbing (n=338)			C1/A1-C2/A2
C0/A0	2.3	8	
C1/A1	7.7	26	
C2/A2	7.1	24	
C3/A3	2.7	9	
Not Applicable	80.2	271	

*Mean calculated for those who participated

Place Attachment

Place attachment was measured using modified items from Williams and Roggenbuck (1989). Both scales demonstrate good internal consistency with Cronbach's alphas being almost equal at .855 and .852. The mean for place identity is high at 4.42 out of 5. The mean for place dependence, while above neutral, is lower than identity at 3.57 out of 5.

Table 8. Place Attachment Means and Reliabilities

Item	Mean	SD	Corrected Item Total Correlation	Alpha if Item Deleted	Cronbach's Alpha
<i>Place Identity</i>	4.42				.855
My primary outdoor climbing area means a lot to me	4.63	.768	.753	.799	
I am very attached to my primary outdoor climbing area	4.37	.923	.823	.758	
I identify strongly with my primary outdoor climbing area	4.11	.99	.788	.775	
I feel NO commitment to my primary outdoor climbing area**	4.55	.846	.465	.903	
<i>Place Dependence</i>	3.57				.852
I enjoy climbing at my primary outdoor climbing area more than any other place within a reasonable distance to where I live	3.70	1.10	.663	.822	
My primary outdoor climbing area is the best place for the kind of climbing I like to do within a reasonable distance to where I live	3.90	1.10	.636	.828	
Climbing at my primary outdoor climbing area is more important than climbing at any other place within a reasonable distance to where I live	3.15	1.20	.713	.808	
There is no substitute for the type and quality of climbing at my primary outdoor climbing area within a reasonable distance to where I live	3.32	1.37	.688	.817	
I depend on my primary outdoor climbing area to do the type of climbing I like to do within a reasonable distance to where I live	3.77	1.17	.628	.830	

*Items rated from “Strongly Disagree” to “Strongly Agree”

**Item recoded

Conflict

Conflict was measured in terms of an individual's frequency of experiencing a list of behaviors at their primary outdoor climbing area, as well as whether or not they viewed these behaviors as a problem at the area. Both scales demonstrated good reliability with Cronbach's alphas above .85 (Table 13). All means for frequency and problem evaluation of the behavior are below 3. This indicates that on average, each behavior is being experienced at primary outdoor climbing areas less often than "Often" and rated as less than a "Moderate Problem". The most extreme problem behavior was, "Climbers creating environmental degradation of the area (i.e. erosion, litter)." The most frequently observed behavior was, "Climbers being inexperienced." The least frequent and least problematic behavior was, "New routes being put up where they do not belong."

Table 9. Conflict Descriptive Data and Reliabilities

Behavior	Frequency of Behavior* Cronbach's Alpha .852				Problem of Behavior** Cronbach's Alpha .897			
	Mean	SD	Corrected Item Total Correlation	Alpha if Item Deleted	Mean	SD	Corrected Item Total Correlation	Alpha if Item Deleted
Other climbers behaving in a discourteous manner	1.92	.651	.583	.838	1.70	.749	.656	.888
Other parties interfering with my goals for the day	2.01	.691	.455	.845	1.83	.756	.486	.894
Climbers allowing their dog off-leash at the base of the climbing area	2.46	1.14	.300	.866	1.77	.943	.436	.897
Climbers acting in a manner that is un-safe to themselves or others	2.07	.656	.628	.835	2.24	1.08	.726	.883
Climbers playing loud music	1.60	.600	.463	.845	1.69	.917	.606	.889
Other climbers hogging parts of the climbing area	2.01	.759	.587	.837	1.98	.832	.694	.886
Climbers creating environmental degradation of the area (i.e. erosion, litter)	2.00	.776	.578	.837	2.29	1.09	.658	.887
Climbers being inexperienced	2.57	.817	.603	.835	2.14	1.02	.627	.888
Climbers operating in a style that is not consistent with the ethic of the area	1.81	.688	.578	.838	1.81	.915	.701	.885
Climbers being loud and/or obnoxious	1.93	.733	.705	.829	1.91	.901	.729	.883
Inexperienced climbers getting in the way of more experienced climbers	1.85	.737	.531	.840	1.69	.806	.624	.889
New routes being put up where they do not belong	1.29	.532	.329	.851	1.42	.863	.461	.896
The numbers of climbers at the area forcing me to select a different route than I intended	2.43	.866	.485	.844	2.20	.899	.412	.898

*Rated from 1-“Never” to 5-“Always”

**Rated from 1-“Not at all a problem” to 5-“Extreme problem”

Model Testing

There are four structural models tested in this analysis. The first model sought to explain conflict using every variable theoretically included in the model (Figure 1.). Following this, conflict behaviors have been factored into three distinct factors, conflicts of ethics, conflicts of crowding, and conflicts of rude interactions. Each model will first be presented as a measurement model. Following this, a final structural model will be presented with significant paths removed. The method of estimation used for this analysis was maximum likelihood (ML) estimation of the variance-covariance matrix. This is the most common method used in SEM and has been shown to be robust to violations of the assumption of multivariate normality (McDonald & Ho, 2002). The analysis was performed using Amos SPSS 23.

Model trimming occurred in a systematic fashion removing one path or variable at a time. During model trimming, the change in chi-square threshold used for modification indices was set at 20. This threshold was set so as to prevent excessive modification of the model. Where modification indices recommended error correlation to make a change in chi-square over 20, the researcher removed the item which contributed the least to the latent variable it was meant to describe. When analyzing the structural models in this analysis, the researcher removed insignificant paths one at a time, starting with the highest p-value. This method was used so that the researcher could understand and see which effects were significant after other noise within the model had been removed.

Normality

Maximum likelihood structural equation modeling assumes multivariate normality. When this assumption is violated, models may show bias. Additionally, chi-square statistics are very sensitive to violations of this assumption (Kline, 2011). This dataset was examined for the

assumption of multivariate normality using Amos SPSS. Several of the variables in this dataset violate the assumption of univariate normality, resulting in a violation of multivariate normality. This violation for some variables is severe. Kline (2011) recommends utilizing transformations to try and resolve this issue. Due to the nature of this data, 1-5 Likert scales with integer values, transformations will not solve the problem of non-normality.

Mcdonald and Ho (2002) address this issue by stating, “ML estimation and its associated statistics seem fairly robust against violations of normality (p. 70)”. Additionally, asymptotically distribution free methods of SEM require extremely large sample sizes, larger than the sample size of this study. Due to this we must rely on the robustness of the ML method (Mcdonald & Ho, 2002).

Goodness of Fit Indices

For each model presented during the following analysis, the following fit indices and cut-offs were used.

- Chi-square Significance Test: Chi-square should be insignificant. However, as chi-square significance testing is highly sensitive to sample size, multivariate normality, and model complexity, models may still be accepted in the presence of other goodness of fit statistics. (Garson, 2015).
- Chi-square/Degrees of Freedom ratio: The chi-square/degrees of freedom ratio of 2 or less is considered good fit (Ullman & Bentler, 2003).
- Comparative Fit Index (CFI): $>.90$ = acceptable fit; $>.95$ = good fit (Garson, 2015).
- Tucker-Lewis index (TLI): $>.90$ = acceptable fit; $>.95$ = good fit (Garson, 2015).
- Root Mean Square Error of Approximation (RMSEA): $<.06$ = good fit, p-value must be insignificant (Hu & Bentler, 1999).

Full Theoretical Model

The full theoretical model is presented in Figure 1 (p. 36). This model includes every measured variable which, according to theory, should have a significant path in the model. For this model, commitment and place attachment are both treated as second order factors. The use of second order factors allows for the creation of unique dimensions within an overall construct while demonstrating that these distinct factors lead toward one dominant, or second order factor. Kyle et al. (2007) previously demonstrated the effectiveness of modeling commitment in this fashion, Kyle et al. (2007) also demonstrated how commitment could effectively be modeled as five separate dimensions; for this model the second order variant was used. Williams and Vaske (2003) describe place attachment as a general construct described by the two distinct dimensions of identity and dependence; for this model they are presented as such.

The use of correlated error is a controversial tool within structural equation modeling which should generally only be performed with strongly theoretical backing. The researcher should anticipate necessary error correlation a priori and plan accordingly (Kline, 2011). For this analysis the error between the frequency of observation and the problem evaluation of each behavior is allowed to correlate. This decision was made due to the use of the exact same behavior in each item. Due to this repetition, the researcher theorized that we should expect the errors to correlate. The behavioral dimension of specialization is presented as two distinct latent variables in the theoretical model. This is in line with the findings of Nelb and Schuster (2007), which demonstrated that history and frequency should not be expected to correlate or truly describe a single construct. The dimension of skill was also divided into two separate latent variables, perceived skill and maximum reported skill.

Full Model - Measurement Model Testing

The measurement model was analyzed through confirmatory factor analysis and can be seen in table 14. In addition to the behavioral dimension, skill was revised into two separate single item latent variables; perceived skill and maximum difficulty. This change was made after reviewing modification indices and comparing model fit when treating skill as a single dimension or as two separate latent variables. Four items were treated as single item independent latent variables. The error terms for these types of variables must be fixed in ML estimation. This analysis was run with the error terms for the four single item variables set at .1, .2, and .3. There was no observable change in model fit between the three error terms, the slight change in relationship strength was extremely minor for the four variables (ex. a difference between 1.00 and .999 in History). The remainder of the presented analysis was performed with the errors fixed at .1.

During the process of model trimming and modification, the two sub-dimensions of identity affirmation and identity expression were merged into one larger “Identity” sub-factor. This decision was made through the process of testing the model both ways and determining that, for this data, the two sub-factors appeared to be measuring the same thing. In addition to merging the two sub-factors, modification indices suggested the removal of one identity affirmation item, “When I’m climbing, I don’t have to be concerned with the way I look”. Multiple conflict behaviors were removed during model trimming (p. 56). When modification indices suggested that we allow the errors of two conflict behaviors to correlate, the weaker behavior was removed. When examining the modification indices provided, the conflict behaviors for which error correlation was suggested, appeared to represent redundancies when including all behaviors in the model. When a conflict behavior was removed, its matching

frequency behavior was also removed for the sake of face validity. One item in the social bonding sub-dimension, “I enjoy discussing climbing with my friends”, was removed due to its dissonance with the other two items.

Conflict items removed from the final model:

- Other parties interfering with my goals for the day
- Climbers playing loud music
- Inexperienced climbers getting in the way of more experienced climbers
- New routes being put up where they do not belong
- The number of climbers at the area forcing me to select a different route than I intended

The final CFA model represents an acceptable fit to the data (Table 14). The chi-square test is significant at $p < .001$; however as stated previously, the model may still be accepted if other goodness-of-fit indicators are acceptable. The CFI, and TLI are both above .9 which indicates an acceptable fit. The chi-square to degrees of freedom ratio is below 2, and the RMSEA is below .5.

Table 10. Confirmatory Factor Analysis Full Model

Item	Regression Weights ^{ab}	Standard Error	Standardized Regression Weights
<i>Perceived Skill</i>	1		0.911
<i>Maximum Difficulty</i>	1		0.941
<i>History – Years climbing</i>	1		1.000
<i>Maximum Frequency</i>	1		0.261
<i>Commitment</i>			
<i>Attraction</i>	1		0.703
Climbing is one of the most enjoyable things I do	0.864	0.050	0.771
Climbing is very important to me	0.939	0.046	0.894
Climbing is one of the most satisfying things I do	1		0.847
<i>Centrality</i>	1.658	0.197	0.967
I find a lot of my life is organized around climbing	1.384	0.121	0.889
Climbing occupies a central role in my life	1.456	0.126	0.913
To change my preference from climbing to another recreation activity would require major rethinking	1		0.543
<i>Social Bonding</i>	1.124	0.151	0.601
Most of my friends are in some way connected with climbing	1.543	0.154	0.901
Participation in climbing provides me with an opportunity to be with my friends	1		0.708
<i>Identity</i>	0.422	0.089	0.392
When I participate in climbing, I can really be myself	1.473	0.237	0.602
I identify with the people and image associated with climbing	1		0.367
You can tell a lot about a person by seeing them climb	1.969	0.309	0.649
Participating in climbing says a lot about who I am	2.318	0.347	0.803
When I participate in climbing, others see me the way I want them to see me	2.089	0.314	0.773
<i>Place Attachment</i>			
<i>Place Identity</i>	1		0.797
My primary outdoor climbing area means a lot to me	0.765	0.036	0.841
I am very attached to my primary outdoor climbing area	1.022	0.043	0.934
I identify strongly with my primary outdoor climbing area	1		0.856
I feel NO commitment to my primary outdoor climbing area	0.483	0.049	0.481

Model: χ^2 :1357.064 p=.000; DF: 783; χ^2 /df=1.73; CFI=.926; TLI=.919; RMSEA=.043

^a Items fixed at 1.00 due to constraints required by SPSS Amos, one path in each latent variable must be fixed at 1.00 as a reference item. Items fixed at random;

^b All regression weights significant at p<.005

Table 10. Cont.

Item	Regression Weights	Standard Error	Standardized Regression Weights
<i>Place Dependence</i>	0.634	0.150	0.540
I enjoy climbing at my primary outdoor climbing area more than any other place within a reasonable distance to where I live	1.059	0.084	0.755
My primary outdoor climbing area is the best place for the kind of climbing I like to do within a reasonable distance to where I live	0.959	0.082	0.69
Climbing at my primary outdoor climbing area is more important than climbing at any other place within a reasonable distance to where I live	1.223	0.093	0.8
There is no substitute for the type and quality of climbing at my primary outdoor climbing area within a reasonable distance to where I live	1.297	0.104	0.747
I depend on my primary outdoor climbing area to do the type of climbing I like to do within a reasonable distance to where I live	1		0.669
<i>Frequency of Behaviors (Frequency)</i>			
Other climbers behaving in a discourteous manner	1		0.629
Climbers allowing their dog off-leash at the base of the climbing area	0.788	0.152	0.284
Climbers acting in a manner that is un-safe to themselves or others	1.14	0.100	0.708
Other climbers hogging parts of the climbing area	0.996	0.105	0.541
Climbers creating environmental degradation of the area (i.e. erosion, litter)	1.241	0.115	0.649
Climbers being inexperienced	1.295	0.120	0.653
Climbers operating in a style that is not consistent with the ethic of the area	1.2	0.105	0.709
Climbers being loud and/or obnoxious	1.347	0.113	0.748
<i>Conflict – Problem Rating (Conflict)</i>			
Other climbers behaving in a discourteous manner	1		0.709
Climbers allowing their dog off-leash at the base of the climbing area	0.824	0.094	0.462
Climbers acting in a manner that is un-safe to themselves or others	1.636	0.110	0.802
Other climbers hogging parts of the climbing area	1.02	0.081	0.661
Climbers creating environmental degradation of the area (i.e. erosion, litter)	1.51	0.110	0.734
Climbers being inexperienced	1.285	0.103	0.666
Climbers operating in a style that is not consistent with the ethic of the area	1.259	0.092	0.735
Climbers being loud and/or obnoxious	1.299	0.091	0.766

Full Model – Structural Model

The full structural model demonstrates three significant pathways after insignificant paths were removed systematically. Place attachment is predicted by commitment, frequency of viewing behaviors is predicted by maximum frequency of climbing, and conflict is predicted by frequency. The effect sizes range from negligible to strong. Place attachment is moderately predicted by commitment, while frequency of observing behaviors strongly predicts conflict. The relationship between frequency of observing behaviors and maximum frequency of climbing, while significant, demonstrates a negligible level of effect. The model demonstrated acceptable fit; the chi-square test is significant at $p < .001$, but in light of the other goodness of fit measures, the model was accepted.

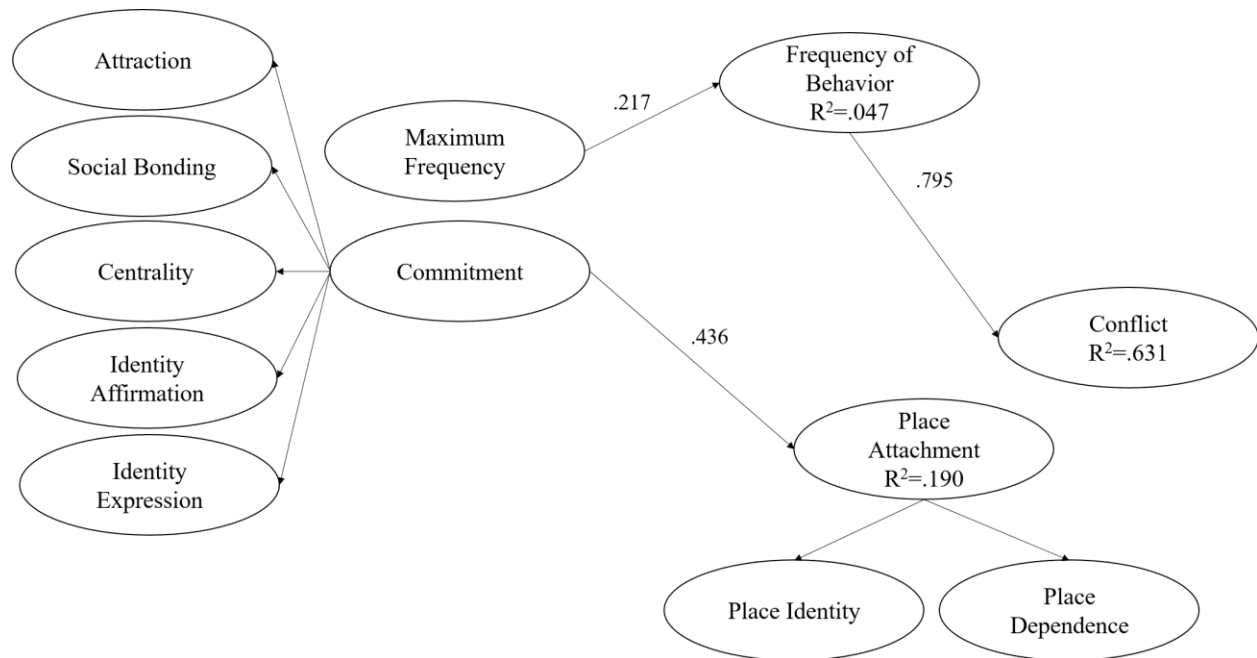


Figure 2. Full Structural Model

Model: χ^2 :1202.010 p =.000; DF: 685; χ^2 /df=1.755; CFI=.931; TLI=.925; RMSEA=.044

Table 11. Structural Analysis Full Model

Significant Paths	R ²	Regression Weights*	Standard Error	t-value	Standardized Regression Weights
Place Attachment	.190				
Commitment →		.844	.143	5.896***	.436
Frequency	.047				
Maximum Frequency →		.076	.020	3.813***	.217
Conflict	.631				
Frequency →		1.027	.095	10.797***	.795

Model: χ^2 :1202.010 p=.000; DF: 685; χ^2 /df=1.755; CFI=.931; TLI=.925; RMSEA=.044

*p<.05, **p<.005, ***p<.001

Exploratory Factor Analysis of Conflict

Following the analysis of the full model, the researcher sought to understand the relationships between constructs at a greater level of detail. An exploratory factor analysis (EFA) was performed on the conflict behaviors. There were no hypothesized subgroups within the behavior list, making an EFA the appropriate step before moving on to further SEM analysis. Principle components analysis using a varimax rotation was performed. Factor loadings below .35 were suppressed from the table (Table 16). Three distinct factors emerged through this process (Table 16.). The three factors that emerged grouped the behaviors in a logical fashion.

After reviewing the thematic grouping of the behaviors within each factor, the three conflict sub-domains were named ethical, crowding, and rude interactions. Five of the items demonstrated cross-loading above .35. These items were grouped into the factor with which they had the highest loading. Cronbach's alphas were calculated for each factor as an initial test of validity. All three factors demonstrated strong alphas above .8. Following this analysis, the decision was made to test three separate models with the three factors as the ultimate dependent variable.

The decision to not simply run one large model predicting all three independent factors of conflict at the same time was made due to the highly correlated nature of the factors. To truly understand the specific effects between constructs and subsets of behaviors, the appropriate method appeared to be three separate models. If the goal of the analysis was to include all conflict behaviors in the model simultaneously, it is clear to the researcher that the best way to do so would be to treat all conflict behaviors as a single unidimensional latent variable, as was done in the prior analysis. Additionally, in the interest of understanding the relationships not just between dominant constructs (e.g. commitment), but also their sub-factors (e.g. attraction), the

second order factors of place attachment and commitment were removed for the remainder of the analysis. The initial theoretical model utilized for all further testing is presented in Figure 3.

Table 12. Conflict Problem Level Exploratory Factor Analysis

Item*	Ethical Conflict	Crowding Conflict	Rudeness Conflict
Cronbach's Alpha	.842	.804	.801
Climbers operating in a style that is not consistent with the ethic of the area	.790		
New routes being put up where they do not belong	.765		
Climbers creating environmental degradation of the area (i.e. erosion, litter)	.709		
Climbers acting in a manner that is un-safe to themselves or others	.639		
Climbers being inexperienced	.586	.543	
Other parties interfering with my goals for the day		.829	
The numbers of climbers at the area forcing me to select a different route than I intended		.827	
Inexperienced climbers getting in the way of more experienced climbers	.402	.659	
Other climbers hogging parts of the climbing area		.577	.447
Climbers allowing their dog off-leash at the base of the climbing area			.768
Climbers playing loud music	.414		.733
Other climbers behaving in a discourteous manner			.685
Climbers being loud and/or obnoxious	.561		.604

*Values below .35 suppressed

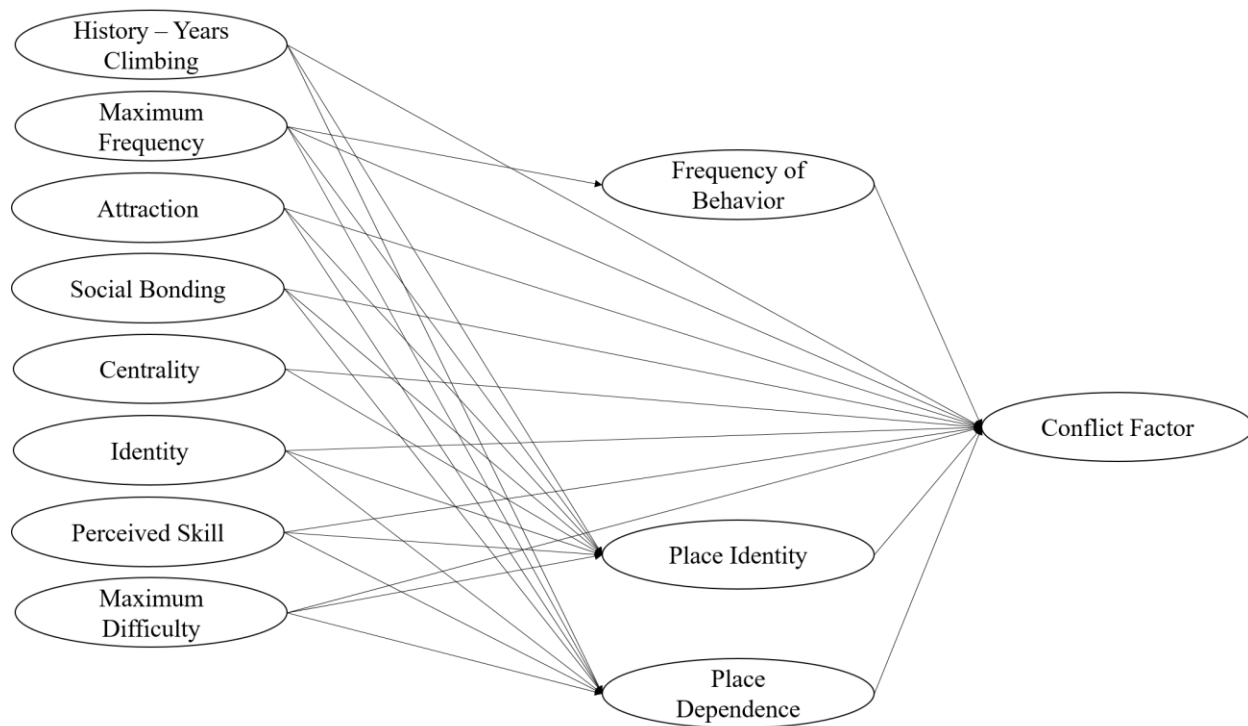


Figure 3. Theoretical model for factored conflict models.

Ethical Conflict – Measurement Model Testing

The measurement model for the ethical conflict model demonstrated acceptable to good fit based on the indicators used (Table 17). Although the chi-square statistic was significant at $p < .001$, the model was retained in light of the other indicators. During the process of model trimming one conflict behavior, “new routes being put up where they don’t belong”, was removed to due to its high level of similarity to the behavior, “climbers operating in a style that is not consistent with the ethic of the area.” Additionally, one identity expression item, “you can tell a lot about a person by seeing them climb”, was removed in the interest of improving model fit. This identity item was also removed for any subsequent analysis.

The behaviors included in the final measurement model were:

- Climbers operating in a style that is not consistent with the ethic of the area.
- Climbers creating environmental degradation of the area (i.e. erosion, litter).
- Climbers acting in a manner that is unsafe to themselves.
- Climbers being inexperienced.

Table 13. Confirmatory Factor Analysis Ethical Conflict Model

Item	Regression Weights ^{ab}	Standard Error	Standardized Regression Weights*
<i>Perceived Skill</i>	1		0.913
<i>Maximum Difficulty</i>	1		0.941
<i>History – Years climbing</i>	1		1.000
<i>Maximum Frequency</i>	1		0.261
<i>Attraction</i>			
Climbing is one of the most enjoyable things I do	0.861	0.050	0.769
Climbing is very important to me	0.942	0.045	0.897
Climbing is one of the most satisfying things I do	1		0.848
<i>Centrality</i>			
I find a lot of my life is organized around climbing	1.397	0.121	0.895
Climbing occupies a central role in my life	1.457	0.126	0.911
To change my preference from climbing to another recreation activity would require major rethinking	1		0.543
<i>Social Bonding</i>			
Most of my friends are in some way connected with climbing	1.483	0.132	0.884
Participation in climbing provides me with an opportunity to be with my friends	1		0.724
<i>Identity</i>			
When I participate in climbing, I can really be myself	1.657	0.259	0.687
I identify with the people and image associated with climbing	1		0.372
Participating in climbing says a lot about who I am	2.071	0.320	0.727
When I participate in climbing, others see me the way I want them to see me	2.061	0.315	0.774
<i>Place Identity</i>			
My primary outdoor climbing area means a lot to me	0.767	0.036	0.842
I am very attached to my primary outdoor climbing area	1.023	0.042	0.934
I identify strongly with my primary outdoor climbing area	1		0.855
I feel NO commitment to my primary outdoor climbing area	0.485	0.049	0.484

Model: χ^2 :724.241 p=.000; DF: 429 χ^2 /df=1.68; CFI=.950; TLI=.939; RMSEA=.042

^a Items fixed at 1.00 due to constraints required by SPSS Amos, one path in each latent variable must be fixed at 1.00 as a reference item. Items fixed at random;

^b All regression weights significant at p<.005

Table 13. Cont.

Items	Regression Weights	Standard Error	Standardized Regression Weights
<i>Place Dependence</i>			
I enjoy climbing at my primary outdoor climbing area more than any other place within a reasonable distance to where I live	1.062	0.084	0.758
My primary outdoor climbing area is the best place for the kind of climbing I like to do within a reasonable distance to where I live	0.960	0.082	0.690
Climbing at my primary outdoor climbing area is more important than climbing at any other place within a reasonable distance to where I live	1.226	0.093	0.802
There is no substitute for the type and quality of climbing at my primary outdoor climbing area within a reasonable distance to where I live	1.292	0.104	0.743
I depend on my primary outdoor climbing area to do the type of climbing I like to do within a reasonable distance to where I live	1		0.669
<i>Frequency</i>			
Climbers operating in a style that is not consistent with the ethic of the area	1		0.691
Climbers creating environmental degradation of the area (i.e. erosion, litter)	1.090	0.096	0.670
Climbers acting in a manner that is un-safe to themselves or others	1.023	0.085	0.745
Climbers being inexperienced	1.154	0.101	0.679
<i>Conflict</i>			
Climbers operating in a style that is not consistent with the ethic of the area	1		0.734
Climbers creating environmental degradation of the area (i.e. erosion, litter)	1.188	0.087	0.731
Climbers acting in a manner that is un-safe to themselves or others	1.351	0.090	0.836
Climbers being inexperienced	1.095	0.082	0.715

Ethical Conflict – Structural Model Testing

The ethical conflict structural model demonstrated seven significant paths and good model fit, except for the chi-square significance test (Figure 4.; Table 18). Due to the relative strength of the other indicators, the model was retained. Maximum frequency of going climbing weakly predicted frequency of observing behaviors. Place identity was weakly to moderately predicted by social bonding and attraction. Place dependence was weakly predicted by social bonding and attraction. Conflict was strongly predicted by perceived skill and frequency of viewing the behaviors. Frequency was, by far, the stronger of the two predictors of conflict.

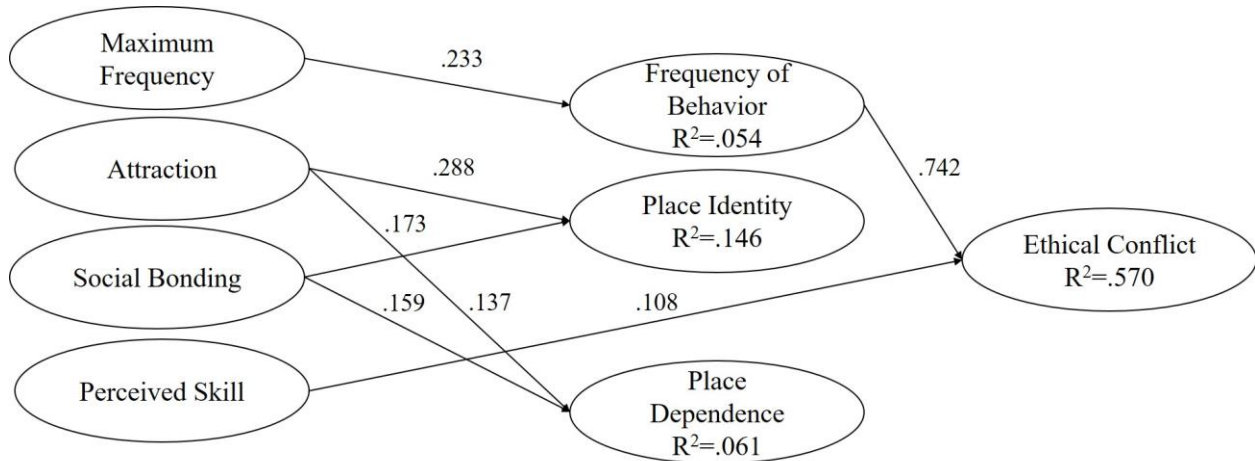


Figure 4. Ethical Conflict Structural Model.

Model: χ^2 :433.949 p=.000; DF: 237; χ^2 /df=1.83; CFI=.954; TLI=.946; RMSEA=.046

Table 14. Structural Analysis Ethical Conflict Model

Significant Paths	R2	Regression Weights	Standard Error	t-value	Standardized Regression Weights
Frequency	.054				
Maximum Frequency →		.095	.024	3.990***	.233
Place Identity	.146				
Social Bonding →		.232	.077	3.032**	.173
Attraction →		.485	.097	4.996***	.288
Place Dependence	.061				
Social Bonding →		.202	.078	2.558*	.159
Attraction →		.218	.098	2.223*	.137
Conflict	.570				
Perceived Skill →		.101	.042	2.402*	.108
Frequency →		1.029	.89	11.600***	.742

Model: $\chi^2:433.949$ $p=.000$; DF: 237; $\chi^2/df=1.83$; CFI=.954; TLI=.946; RMSEA=.046

* $p<.05$, ** $p<.005$, *** $p<.001$

Crowding Conflict – Measurement Model Testing

The crowding conflict measurement model demonstrated good fit (Table 19). During the process of model trimming one conflict behavior was removed as a result of suggested modification indices. The behavior, “the numbers of climbers at the area forcing me to select a different route than I intended”, appeared to be very similar to other items within the construct. As with the other models, the model was retained in light of the chi-square significance test due to other indicators.

The behaviors included in the final measurement model were:

- Other parties interfering with my goals for the day.
- Inexperienced climbers getting in the way of more experienced climbers.
- Other climbers hogging parts of the climbing area.

Table 15. Confirmatory Analysis Crowding Conflict Model

Item	Regression Weights ^{ab}	Standard Error	Standardized Regression Weights
<i>Perceived Skill</i>	1		0.913
<i>Maximum Difficulty</i>	1		0.941
<i>History – Years climbing</i>	1		1
<i>Maximum Frequency</i>	1		0.261
<i>Attraction</i>			
Climbing is one of the most enjoyable things I do	0.861	0.050	0.769
Climbing is very important to me	0.942	0.045	0.897
Climbing is one of the most satisfying things I do	1		0.848
<i>Centrality</i>			
I find a lot of my life is organized around climbing	1.393	0.121	0.895
Climbing occupies a central role in my life	1.453	0.125	0.910
To change my preference from climbing to another recreation activity would require major rethinking	1		0.544
<i>Social Bonding</i>			
Most of my friends are in some way connected with climbing	1.511	0.135	0.893
Participation in climbing provides me with an opportunity to be with my friends	1		0.717
<i>Identity</i>			
When I participate in climbing, I can really be myself	1.641	0.254	0.687
I identify with the people and image associated with climbing	1		0.376
Participating in climbing says a lot about who I am	2.070	0.316	0.734
When I participate in climbing, others see me the way I want them to see me	2.023	0.307	0.767
<i>Place Identity</i>			
My primary outdoor climbing area means a lot to me	0.767	0.036	0.842
I am very attached to my primary outdoor climbing area	1.023	0.042	0.934
I identify strongly with my primary outdoor climbing area	1		0.855
I feel NO commitment to my primary outdoor climbing area	0.486	0.049	0.484

Model: χ^2 :621.633 p=.000; DF: 369 χ^2 /df=1.69; CFI=.953; TLI=.940; RMSEA=.042

^a Items fixed at 1.00 due to constraints required by SPSS Amos, one path in each latent variable must be fixed at 1.00 as a reference item. Items fixed at random;

^b All regression weights significant at p<.005

Table 15. Cont.

Items	Regressions Weights	Standard Error	Standardized Regression Weights
<i>Place Dependence</i>			
I enjoy climbing at my primary outdoor climbing area more than any other place within a reasonable distance to where I live	1.058	0.084	0.756
My primary outdoor climbing area is the best place for the kind of climbing I like to do within a reasonable distance to where I live	0.959	0.082	0.691
Climbing at my primary outdoor climbing area is more important than climbing at any other place within a reasonable distance to where I live	1.223	0.093	0.801
There is no substitute for the type and quality of climbing at my primary outdoor climbing area within a reasonable distance to where I live	1.294	0.103	0.746
I depend on my primary outdoor climbing area to do the type of climbing I like to do within a reasonable distance to where I live	1		0.67
<i>Frequency</i>			
Other parties interfering with my goals for the day	0.767	0.098	0.557
Inexperienced climbers getting in the way of more experienced climbers	0.864	0.105	0.591
Other climbers hogging parts of the climbing area	1		0.665
<i>Conflict</i>			
Other parties interfering with my goals for the day	0.862	0.083	0.698
Inexperienced climbers getting in the way of more experienced climbers	0.907	0.087	0.69
Other climbers hogging parts of the climbing area	1		0.739

Crowding Conflict – Structural Model Testing

The crowding structural model demonstrates good fit (Table 20). All indicators are acceptable except for chi-square significance. Due to the strength of other indicators the model was retained. Six paths remained significant after the systematic removal of insignificant paths (Figure 5.). Place identity was weakly to moderately predicted by social bonding and attraction. Place dependence was weakly predicted by social bonding and attraction. Crowding conflict was strongly predicted by maximum difficulty climbed and frequency of viewing behaviors. Maximum difficulty demonstrated a negative, but weak predictive relationship, while frequency of viewing behaviors demonstrated a strong positive relationship.

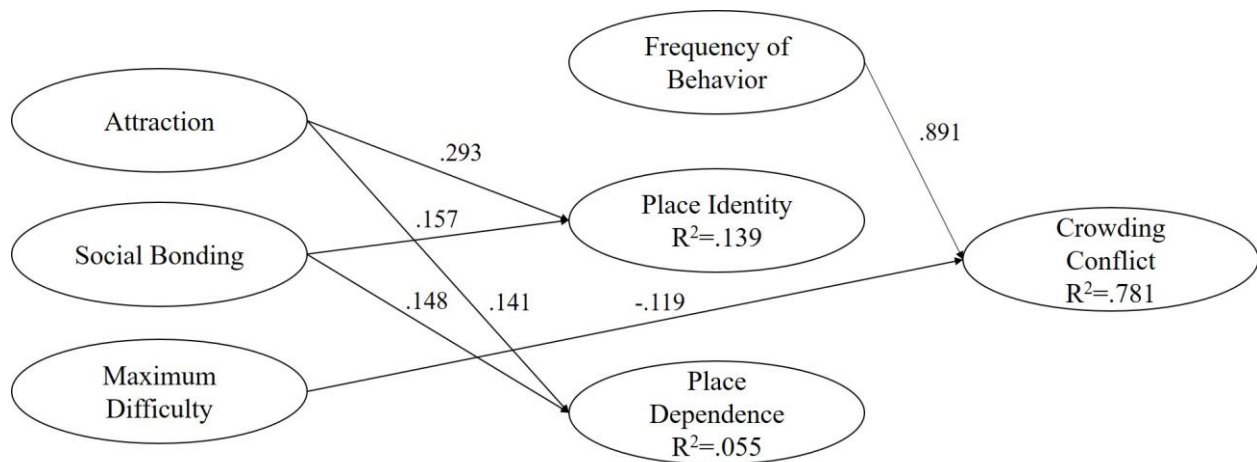


Figure 5. Crowding Conflict Structural Model

Model: $\chi^2:328.332$ $p=.000$; DF: 237; $\chi^2/df=1.88$; CFI=.958; TLI=.949; RMSEA=.047

Table 16. Structural Analysis Ethical Conflict Model

Significant Paths	R2	Regression Weights	Standard Error	t-value	Standardized Regression Weights
Place Identity	.139				
Social Bonding →		.220	.076	2.873**	.157
Attraction →		.494	.097	5.096***	.293
Place Dependence	.055				
Social Bonding →		.196	.079	2.497*	.148
Attraction →		.225	.098	2.297*	.141
Conflict	.781				
Maximum Difficulty →		-.083	.031	-2.673*	-.119
Frequency →		1.085	.095	11.463***	.891

Model: χ^2 :328.332 p=.000; DF: 237; χ^2 /df=1.88; CFI=.958; TLI=.949; RMSEA=.047

*p<.05, **p<.005, ***p<.001

Rude Interactions Conflict – Measurement Model Testing

The rudeness measurement model demonstrated good fit (Table 21.). During the process of model trimming the conflict behavior, “climbers allowing their dog off-leash at the base of the climbing area” was removed to improve model fit. As with the other models, the model was retained due to the strength of all indicators except for the chi-square significance test.

The behaviors included in the final measurement model were:

- Other climbers behaving in a discourteous manner.
- Climbers playing loud music.
- Climbers being loud and/or obnoxious.

Table 17. Confirmatory Factor Analysis Crowding Conflict Model

Item	Regression Weights ^{ab}	Standard Error	Standardized Regression Weights
<i>Perceived Skill</i>	1		0.913
<i>Maximum Difficulty</i>	1		0.941
<i>History – Years climbing</i>	1		1
<i>Maximum Frequency</i>	1		0.261
<i>Attraction</i>			
Climbing is one of the most enjoyable things I do	0.861	0.05	0.77
Climbing is very important to me	0.94	0.045	0.896
Climbing is one of the most satisfying things I do	1		0.848
<i>Centrality</i>			
I find a lot of my life is organized around climbing	1.39	0.121	0.893
Climbing occupies a central role in my life	1.454	0.125	0.912
To change my preference from climbing to another recreation activity would require major rethinking	1		0.545
<i>Social Bonding</i>			
Most of my friends are in some way connected with climbing	1.527	0.134	0.897
Participation in climbing provides me with an opportunity to be with my friends	1		0.713
<i>Identity</i>			
When I participate in climbing, I can really be myself	1.642	0.254	0.689
I identify with the people and image associated with climbing	1		0.376
Participating in climbing says a lot about who I am	2.047	0.312	0.727
When I participate in climbing, others see me the way I want them to see me	2.033	0.307	0.772
<i>Place Identity</i>			
My primary outdoor climbing area means a lot to me	0.767	0.036	0.842
I am very attached to my primary outdoor climbing area	1.023	0.042	0.934
I identify strongly with my primary outdoor climbing area	1		0.855
I feel NO commitment to my primary outdoor climbing area	0.485	0.049	0.484

Model: $\chi^2:617.045$ $p=.000$; DF: 369 $\chi^2/df=1.67$; CFI=.953; TLI=.941; RMSEA=.042

^a Items fixed at 1.00 due to constraints required by SPSS Amos, one path in each latent variable must be fixed at 1.00 as a reference item. Items fixed at random;

^b All regression weights significant at $p<.005$

Table 17. Cont.

Items	Regression Weights	Standard Error	Standardized Regression Weights
<i>Place Dependence</i>			
I enjoy climbing at my primary outdoor climbing area more than any other place within a reasonable distance to where I live	1.062	0.084	0.757
My primary outdoor climbing area is the best place for the kind of climbing I like to do within a reasonable distance to where I live	0.96	0.082	0.69
Climbing at my primary outdoor climbing area is more important than climbing at any other place within a reasonable distance to where I live	1.229	0.093	0.803
There is no substitute for the type and quality of climbing at my primary outdoor climbing area within a reasonable distance to where I live	1.294	0.104	0.744
I depend on my primary outdoor climbing area to do the type of climbing I like to do within a reasonable distance to where I live	1		0.669
<i>Frequency</i>			
Other climbers behaving in a discourteous manner	1		0.596
Climbers playing loud music	0.91	0.105	0.577
Climbers being loud and/or obnoxious	1.507	0.157	0.795
<i>Conflict</i>			
Other climbers behaving in a discourteous manner	1		0.703
Climbers playing loud music	1.343	0.1	0.768
Climbers being loud and/or obnoxious	1.495	0.11	0.872

Rude Interactions Conflict – Structural Model Testing

The rudeness conflict model demonstrates acceptable fit (Table 22.). The model was accepted in light of the chi-square significance test due to other indicators. Six significant paths remain after systematic deletion of insignificant paths. Frequency of observing problematic behaviors was weakly predicted by maximum frequency of climbing. Place identity was weakly to moderately predicted by social bonding and attraction. Place dependence was weakly predicted by attraction. Conflict was predicted solely by frequency of observing the behavior. Although the relationship was strong, it was weaker than the other two forms of conflict.

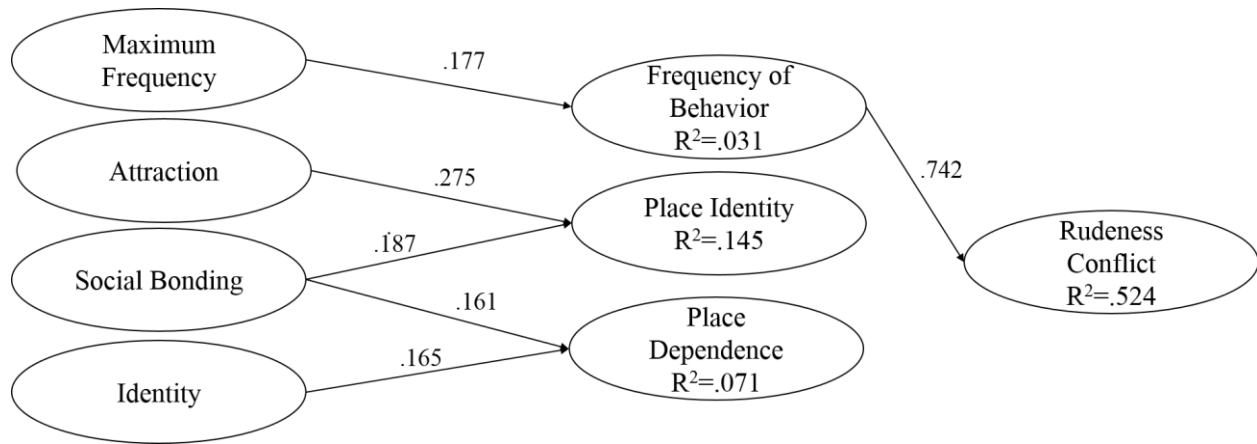


Figure 6. Rude Interactions Conflict Structural Model

Model: $\chi^2:513.227$ $p=.000$; DF: 261; $\chi^2/df=1.96$; CFI=.939; TLI=.930; RMSEA=.050

Table 18. Structural Analysis Rude Interactions Conflict Model

Significant Paths	R2	Regression Weights	Standard Error	t-value	Standardized Regression Weights
Frequency	.031				
Maximum Frequency →		.059	.020	2.899**	.177
Place Identity	.145				
Social Bonding →		.238	.076	3.137**	.187
Attraction →		.459	.097	4.747***	.275
Place Dependence	.071				
Social Bonding →		.194	.078	2.477*	.161
Identity →		.345	.147	2.350*	.165
Conflict	.524				
Frequency →		.974	.108	8.890***	.724

Model: $\chi^2:513.227$ $p=.000$; DF: 261; $\chi^2/df=1.96$; CFI=.939; TLI=.930; RMSEA=.050

* $p<.05$, ** $p<.005$, *** $p<.001$

Hypothesis Testing

The hypotheses examined in this thesis were tested in through four structural models. Hypotheses 1 through 6 represent expected paths of significance in the final models. Hypothesis 7 represents the expectation that paths would remain significant across all types of conflict behaviors. The remainder of this section will go through each hypothesis individually and determine whether or not the analysis supports the expected relationships.

H1: As the overall level of rock climbing specialization increases, the level of place attachment to a climber's primary climbing area will also increase.

Hypothesis 1 was partially supported. Of the three dimensions of specialization, the only one which predicts place attachment in the full model is commitment (Figure 2). Skill and behavior were not found to be significant predictors of place attachment for any of the models tested.

H2: As place attachment to a primary climbing area increases, intragroup conflict between rock climbers will increase.

Hypothesis 2 was unsupported by the data. There is not a significant relationship between place attachment and conflict for any of the models tested.

H3: As rock climbing specialization increases, intragroup conflict between rock climbers will increase.

Hypothesis 3 was partially supported by the data. In the full model, no element of specialization predicts conflict (Figure 2). However, in the crowding and ethical conflict models, the dimension of skill weakly predicts conflict (Figure 4; Figure 5). Level of perceived skill positively predicts ethical conflict which supports the hypothesis. However, maximum difficulty

climbed has a weak negative relationship with crowding conflict, which does not support the directionality proposed in hypothesis 3.

H4: The relationship between rock climbing specialization and intragroup conflict at a climber's primary climbing area will be mediated by place attachment to a climber's primary climbing area.

Hypothesis 4 was unsupported by the data. The requisite paths for mediation testing were not significant in any of the models tested. There is no presence of mediation.

H5: The strongest predictor of conflict will be the frequency of experiencing conflict behaviors.

Hypothesis 5 was supported by the data. Frequency of experiencing a behavior was the strongest predictor of whether or not a behavior was rated as a problem in all models tested.

H6: Frequency of experiencing conflict behaviors will be predicted by the frequency with which an individual goes rock climbing.

Hypotheses 6 was supported by the data. Maximum frequency of going climbing significantly predicted the frequency of experiencing a behavior in the full model (Figure 2). This relationship held in every model except for the crowding conflict model.

H7: These relationships will remain the same for all types of conflict behaviors.

Hypothesis 7 was not supported by the data. While frequency of observing a behavior predicted the problem evaluation of behaviors in every model, the other relationships were not constant. The relationship between skill and conflict varied between the three factored models, as did the relationship between maximum frequency of climbing and frequency of observing behaviors.

Additionally, the variance explained within the dependent variable varied between the models, with the crowding conflict model explaining 78% of the variance (Figure 5), and the rudeness conflict model only explaining 52% of the variance within the dependent conflict variable (Figure 6).

Chapter 5.

Discussion

This study explored the relationships between conflict, place attachment, and specialization of a sample of North American rock climbers. The section which follows discusses the results in detail. First the theoretical contributions and implications of this analysis will be discussed. Following that, the managerial and research implications will be presented. Finally, the limitations of the study will be highlighted.

Theoretical Contribution and Implications

This study sought to test three persistent theoretical relationships which are dominant within the field of outdoor recreation, the supposed positive and predictive relationships between specialization and place attachment, place attachment and conflict, and specialization and conflict. Additionally, this study examined the relationship between experiencing negative behaviors and evaluating them as a problem.

The significant and positive relationship between specialization and place attachment was in line with theory and previous research (Oh et al., 2012; Nelb, 2007; Ditton et al., 1992). The behavioral dimension of specialization did not predict place attachment. This result is the same as was found by Oh et al. (2012). Unlike the findings of Oh et al. (2012), skill did not demonstrate a significant relationship with either dimension of place attachment. The variance explained within the two sub-dimensions of place attachment in the factored conflict models was in-line with previous studies. Place dependence represented a weaker regression in all cases. The researcher had attempted to strengthen the place dependence items by adding a scaling item (i.e. “within a reasonable distance to where I live”) to each place dependence item. It does not appear that this scaling term helped in predicting place dependence.

When the commitment dimension of specialization was broken down in the three factored conflict models, we can see the nature of relationships between different aspects of conflict. Attraction and social bonding were the dominant predictors of place identity and dependence in both the ethical and crowding models. Identity significantly predicted place dependence only in the rudeness conflict model. It appears that climbers' attraction to their sport, as well the level of social bonding experienced, fostered a stronger level of place identity and dependence to their primary outdoor climbing area. Climbing's centrality to life was never a significant predictor of either place identity or dependence. This suggests that climbing's focus as a central life interest does not influence a climber's place attachment to his or her primary outdoor climbing area.

The relationship between conflict and place attachment did not present as expected. Jacob and Schreyer (1980) theorized that conflict should increase with a higher level of resource specificity. In this data, this is not the case. There was no discernable relationship between a climber's level of place attachment, identity or dependence, and the level of conflict he or she reported. This relationship is largely in line with previous findings, which have demonstrated a weak or insignificant relationship (Vaske et al., 2000; Gibbons & Ruddell, 1995). Vaske et al. (2000) tested the relationship between place dependence and conflict among skiers and snowboarders. Place dependence was only significant in one of four models, and was always a weak predictor. Gibbons and Ruddell (1995) explored the relationship between goal interference and place dependence among helicopter skiers and backcountry skiers. Place dependence was found to be weakly significant only in the case of conflict in which backcountry skiers attributed goal interference to helicopter skiers.

The dimensions of specialization and conflict did not demonstrate a consistent relationship in the models tested in this analysis. No specialization dimension significantly

predicted conflict in the full model. A dominant factor of conflict proposed by Jacob and Schreyer (1980) was that of activity style. As an individual participates more intensely in an activity, his or her level of conflict is expected to increase. This relationship has received some attention within the literature and the findings have not been consistent. Vaske et al. (2000) found activity style to be a significant predictor of conflict among skiers and snowboarders. Vaske et al. (2004) found that as skiers' or snowboarders' perceived level of skill increased, they would report more conflict. Thapa and Graefe (2003), however, found that as a skier's or snowboarder's perceived skill level increased, he or she was less likely to report conflict.

This study demonstrated non-existent to weak relationships between specialization and the different conflict behavior domains. Perceived skill positively predicted ethical conflicts, while maximum difficulty climbed negatively predicted crowding conflict. These relationships can be logically interpreted. It is likely that as climbers believe themselves to be more skilled in their sport, they are more likely to be aware of possible unethical climbing behaviors and report them as a problem. In terms of crowding conflict, it is possible that the more actual skill a climber develops compared to the average climber, the more accepting and understanding of crowding behaviors he or she becomes.

The lack of expected relationships in this study could be described in a number of ways; two main explanations will be presented here. The first possibility is that the theorized relationships proposed by Jacob and Schreyer (1980), and accepted in much of the literature, are more complex, and less linear than generally accepted. Further, the relationships between specialization, place attachment, and conflict may be more complicated than Jacob and Schreyer (1980) suggest. This study adds to a body of literature that has trouble demonstrating the expected predictors of conflict in the real world. While the narrative these predictors provide is

convenient for teaching and the framing of research, they may need revision. It does not appear that there is a consistent relationship between conflict and specialization, or activity style, within this study, or other studies. If we continue to expect users' levels of behavior, skill and commitment to have a direct impact on their level of perceived conflict, we need to demonstrate this relationship consistently and robustly.

The theory surrounding place dependence, or resource specificity, and conflict may be more complex than previously thought. The fact that there was no significant relationship between place attachment, dependence or identity, and conflict of any type, presents a stark contrast to the classic conflict theory in outdoor recreation. As is often the case in recreation research, place dependence did not behave as expected (Bricker & Kerstetter, 2000; Kyle et al., 2003; Nelb, 2007; Gibbon & Ruddell, 1995). It is possible that place dependence simply has no consistent relationship with a user's perceived level of conflict. There are many things which may influence a user's perception of problem behaviors. Whether or not they feel that they depend on the resource, although a reasonable conjecture, may not be a part of the equation when considering recreation conflict.

The complete lack of a relationship between two constructs which have been theorized to be highly related brings us to the second reasonable explanation for the lack of significance demonstrated in this study, the method of measurement. It is possible that the measures used to address place dependence, or resource specificity, in this study, as well as much of the literature, are flawed. The researcher sought to fix this perceived discrepancy by adding a scaling term; however, this change may not go far enough.

Stokols and Schumacker (1981) described place dependence as, "a two component process by which occupants assess the quality of the current place and the relative quality of

comparable places (p. 547).” The classically used measurement method may only be focusing on the first piece of this process. Items such as “My primary outdoor climbing area is the best place for the kind of climbing I like to do,” may lack the context required for a survey participant to make meaningful comparison between the current place, and comparable places. If researchers are to continue using these scales to measure place dependence, the use of a scaling term to put each statement into a locational context may help ground these items towards meaningful comparisons.

The method of measurement currently used to identify place dependence is one of attitudinal scales. It may be that researchers are not truly measuring the functional dependence on a location, or group of locations, as was described by Stokols and Shumaker (1981). While attitudinal measures centered around Likert scales are the classically used method for measuring place attachment, as well as many other constructs in our field, it may be time to try entirely different methods. The testing of a more objective approach to place dependence is needed. The creation of new scale items that use direct language to inquire about place dependence (e.g. “I depend on this resource”) may bring greater understanding to how a user feels about their functional dependence on a resource. Additionally, asking participants to describe how far they had to travel to get to the place in question, how often they recreate at that given place, how many reasonable substitutes are in the area, as well as how far away those substitutes are, may give researchers a more objective understanding of a user’s place dependence

As a final note on the measurement of place dependence, this study used place dependence as an analog for resource specificity. Future research may wish to measure resource specificity explicitly. Jacob and Schreyer (1980) highlighted three main domains of resource specificity: evaluations of resource quality, sense of possession, and status. The use of place

dependence as an analog for resource specificity may not adequately capture the latter two domains presented by Jacob and Schreyer (1980). It may be that possessiveness or sense of status would represent a stronger relationship with the eventual level of recreation conflict at a location.

Frequency of Viewing a Behavior

This study measured conflict using the same approach as Vaske et al. (1995); however, the method used to analyze the two scales was approached from a different direction. Unlike Vaske et al. (1995), social values conflict was not parceled out from interpersonal conflict. This allowed the researcher to instead explore the relationship between how frequently a user experiences a behavior, and how highly they rate it as a problem. This relationship was strong and highly predictive. As a user continued to experience a behavior, he or she was likely to rate it as more of a problem. This adds to the conflict literature by highlighting the importance of preventing conflict behaviors from occurring. If users see something at an area one time, they are unlikely to view it as a problem; however, if they see a possibly conflicting behavior every time they visit an area, they are far more likely to rate it as problematic. While this link between frequency of viewing a behavior and rating it as a problem may appear fairly obvious on its face, this study helps highlight how important this relationship is compared to the other variables examined.

Segmentation of Conflict Behaviors

Much of the previous literature has treated conflict behaviors as a singular construct (Vaske et al. 2000; Vaske et al., 1995; Carothers et al., 2001; Graefe and Thapa, 2004). Where conflict has been divided into separate groupings for analysis, it has often been for either social values or interpersonal conflict, or to differentiate to whom the conflict was attributed. This

study adds to the literature by demonstrating that there are different types of conflict behaviors that can be classified into factors with different predictive relationships and potential outcomes. Additionally it demonstrated that theoretical relationships will have varying levels of strength and may not necessarily hold for all types of behaviors.

Through exploratory factor analysis the researcher demonstrated that the conflict behaviors used in this study factored into three distinct dimensions. While frequency of viewing a behavior was always a strong and significant predictor of conflict, the relationship between skill changed between the factors; additionally, the strength of the relationships changed depending on which factor was the dependent variable. Frequency of viewing a behavior was strongest when predicting crowding behaviors. This highlights that, for our sample, climbers must have experienced crowding frequently to view it as a problem. Frequency of viewing a behavior demonstrates a weaker relationship in the cases of ethical and rudeness conflicts. One interpretation of this relationship is that climbers do not need to experience rude people, or violations of climbing ethics as often as crowding, to rate them as a problem.

An additional difference between the factored models is the relationship of how frequently you engage in climbing, and how frequently you observe behaviors. There was a weak positive relationship between the two in the cases of ethical and rudeness conflict, but not in the case of crowding. This suggests that as a climber climbs more frequently he or she either experiences more violations of ethics and rude interactions, or simply becomes more aware of them. In the case of crowding behaviors, it does not appear that simply going climbing more often will increase the chances of experiencing those behaviors. This may be because crowding situations are likely location specific and may not be present at many users' primary outdoor climbing areas.

Management Implications

While this study is theoretical in nature, there are a few notable implications for the management of climbing areas, the first of which is how strongly frequency of viewing a behavior predicts problem evaluation. If a manager wishes to decrease conflict between climbers at a given resource, the highest priority should be discouraging conflict behaviors. The method for this discouragement will likely look different depending on the specific type of conflict in question. Some conflicts will require direct management actions, while others will require an indirect approach (Manning, 2014). Direct management acts directly on the visitor behavior, while indirect management seeks to influence future decisions made by recreation users (Manning, 2014).

If the conflict is one of crowding, managers may wish to use direct management to put a restriction on the amount of visitors to their area. If the conflict is one of ethical behaviors, the managers may wish to alter behaviors indirectly by educating climbers on proper climbing ethics for the site in question. In the case of new routes going up where they do not belong, managers may wish to use direct management to place restrictions on new route development. In the case of rude interactions conflict, managers may need to use indirect methods to educate users on appropriate behavior as well as direct methods of enforcement to ensure compliance. It is likely that a mixture of both indirect and direct methods will be needed to prevent conflict behaviors, but understanding the behaviors which are occurring appears to be key. A final important note on conflict is that place identity and dependence have no relationship with perceived conflict among climbers. It does not appear to matter how much a climber values a resource; if they don't frequently experience a behavior, they will not view that behavior as a conflict.

An additional implication for management is rock climbers' commitment to their sport

and its predictive nature towards place attachment. If climbers are more committed to their sport, they are more likely to value a resource. Management of climbing areas should allow opportunities for highly committed climbers to climb at their area if they want to foster attachment to the resource. This may mean opening up new routes and areas to allow for continued use by highly committed climbers over time.

Research Implications and Recommendations

Future Analysis with the Dataset

There remain a number of possible avenues of analysis within this dataset. Three possible opportunities will be discussed here. The first obvious step for further analysis is to compare climbing sub-types. The survey instrument was designed to not only measure rock climbing specialization overall, but also rock climbing sub-type. Although the group sizes vary, comparing level of conflict and the strength of relationships between each sub-group may help better understand the differences, or similarities, between the various styles of climbing.

The second opportunity within the dataset is the measurement of sub-world affiliation. Each climber who identified more strongly with one style than another answered the modified involvement scale questionnaire for general rock climbing, and their primary style. Comparing the differences between the two can help researchers understand recreation sub-world affiliation among rock climbers. Calculating the difference between the two scales will generate a new metric which represents the degree to which individuals affiliate themselves with their sub-world, versus their main recreation social world. This metric may be used as a different way of looking at specialization; additionally, understanding how sub-world affiliation influences other constructs measured in this study will help researchers understand the value and implications of well-defined recreation sub-worlds.

The third immediate direction for future analysis is that of regional comparisons. The American Alpine Club is divided into 6 regions. Each of these regions has varying levels of access to climbing resources. Comparing levels of conflict, place attachment, and specialization by region may help researchers understand the varying landscape of climbing in the United States. It may be that the relationships between constructs change depending on a rock climber's location. A climber in the Rocky Mountain or West Coast Regions of the AAC is likely to have a greater pool of climbing areas to choose from when compared to a climber living in the Central Region of the United States.

Recommendations for Future Research

Further research on the relationships between specialization, place attachment, and conflict appears warranted. Three recommendations for further research will be highlighted here. The first recommendation for further research is that researchers make attempts to innovate and change the accepted method of measuring place dependence. As stated previously, it seems unlikely that the items historically used are adequately capturing the construct we wish to describe. If researchers are to use the Williams and Roggenbuck (1989) scales, the addition of a scaling term to put the items in context seems prudent. A recommended first step the author proposes is to pursue a more objective measure of place dependence. Generating a numerical score for place dependence based on a user's frequency of participation at the area, its distance from acceptable substitutes, and the number of acceptable substitutes within a similar distance, represents a possible first step in re-evaluating how we measure place dependence.

A second recommendation for further research is the continued differentiation of various types of conflict behaviors. Due to conflict's context, activity, and resource based differences, the creation of a general "conflict behavior scale" would seem inappropriate. However, the

generation of a unique scale of behaviors for each study, which seeks to address multiple dimensions of recreation conflict, will help researchers and managers understand the differences between different types of conflict behaviors. The traditional method of treating all conflict behaviors as unidimensional does not allow researchers and managers to understand the differences between the wide varieties of behaviors that can interfere with a user's goals while recreating.

Further research should seek to explore what makes users more likely to experience, or notice, the various conflict behaviors when they are recreating. As frequency of experiencing a behavior is the strongest predictor of rating it as a problem, understanding what drives frequency of observing behaviors may be of use. While some behaviors may not be useful to understand in this context (e.g. experiencing rude individuals sometimes just happens), understanding what drives a user's awareness of more subjective or amorphous behaviors may help researchers understand conflict on a higher level. For example, if a climber is not aware that certain behaviors are "not in line with the ethics of the area" then he or she is unlikely to be able to report if they happen frequently. Comparing survey results along with participant observation and qualitative interviews may help to provide a more holistic picture of recreation conflict.

Limitations

A few key limitations of this study need to be addressed. The first of these is the method of survey administration and resultant representation and generalizability. Due to the one-time nature of the survey invitation and the low percentage of individuals who chose to participate, we cannot assume that results are generalizable to the climbing population at large. Additionally, to be an individual invited to participate in the survey, a climber must be specialized enough to be on the American Alpine Club e-mail list. Due to this, it is likely that true beginners and novices

were not adequately represented. An additional limitation is the cross-sectional nature of the study. Although we can test relationships, we cannot truly speak to the causal nature of the relationships. A final limitation of this study is that of the data distribution; a number of variables violated the assumption of normality. While maximum-likelihood estimation is robust to violations of this assumption, results must be interpreted with caution.

Conclusion

This study tested the relationships between three dominant constructs throughout the recreation literature. Many of the theorized paths were insignificant. As this lack of a relationship has been found in a variety of other studies over the past 30 years, something we as researchers are doing requires revision. This may include the revision of the underlying theorized predictors of recreation conflict, or a radical change in how we measure these variables. This study contributes to a growing body of literature that does not display the relationships we expect to find as recreation researchers. Additionally, this study adds to the literature by demonstrating that conflict need not be treated as a unidimensional construct; there are a wide variety of behaviors that can interfere with a user's experience and create recreation conflict. Understanding the dimensions of conflict within each research context and how they relate to various constructs within the field of outdoor recreation will help researchers and managers alike.

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Appendix A.

Survey Instrument with Descriptive Data

1. Do you identify with one of these styles of rock climbing more than the others?

Top Roping: Free climbing with the rope above you attached to an anchor at the top of a climb.

Bouldering: Free climbing on boulders without a rope.

Sport climbing: Free climbing while clipping bolts for protection

Traditional climbing: Free climbing while placing your own gear for protection. Commitment grade of IV or less.

Big wall/Aid climbing: Multi-pitch climbs with a commitment grade of V or higher.

89.9% Yes 10.1% No

2. (If No) Please Explain.

See Appendix A

3. (If Yes) Please indicate which category best describes you as a climber

	Percent	Frequency
Top Roping: Free climbing with the rope above you attached to an anchor at the top of a climb.	8.8	44
Bouldering: Free climbing on boulders without a rope.	6.0	30
Sport climbing: Free climbing while clipping bolts for protection	20.0	100
Traditional climbing: Free climbing while placing your own gear for protection. Commitment grade of IV or less.	65.0	325
Big wall/Aid climbing: Multi-pitch climbs with a commitment grade of V or higher.	.2	1

Throughout this survey you will be asked questions about your **primary outdoor climbing area**. For the purposes of this study a primary climbing area is defined as **the area most frequently used to accomplish the type of rock climbing you prefer**. We are aware that climbers visit many areas, for this study please state the area you climb at most often.

4. Please specify your primary outdoor climbing area. Please be as specific as possible, (i.e. Indian Creek, not Moab)

See Appendix A

5. Please express your level of agreement with the following statements in regards to your previously specified primary outdoor climbing area.

	Strongly Disagree (1)	Somewhat Disagree (2)	Neither Agree nor Disagree (3)	Somewhat Agree (4)	Strongly Agree (5)	
	Percentage					Mean
My Primary outdoor climbing area means a lot to me.	2.0	1.1	3.8	19.9	73.2	4.61
I am very attached to my primary outdoor climbing area.	2.7	1.8	9.4	28.7	57.4	4.36
I identify strongly with my primary outdoor climbing area.	2.9	3.6	16.0	34.2	43.4	4.11
I feel NO commitment to my primary outdoor climbing area.	71.0	17.3	7.4	2.7	1.6	1.47
I enjoy climbing at my primary outdoor climbing area more than any other place within a reasonable distance to where I live.	3.8	12.8	22.9	34.1	26.5	3.67
My primary outdoor climbing area is the best place for the kind of climbing I like to do within a reasonable distance to where I live.	2.9	11.9	14.1	37.0	34.1	3.87

	Strongly Disagree (1)	Somewhat Disagree (2)	Neither Agree nor Disagree (3)	Somewhat Agree (4)	Strongly Agree (5)	
	Percentage					Mean
Climbing at my primary outdoor climbing area is more important than climbing at any other place within a reasonable distance to where I live.	10.3	19.7	29.6	24.9	15.5	3.15
There is no substitute for the type and quality of climbing at my primary outdoor climbing area within a reasonable distance to where I live.	12.4	21.1	16.0	25.4	25.2	3.30
I depend on my primary outdoor climbing area to do the type of climbing I like to do within a reasonable distance to where I live.	5.6	13.0	14.3	36.3	30.7	3.74

6. How often do you experience the following behaviors at your primary outdoor climbing area?

	Never (1)	Sometimes (2)	About Half the Time (3)	Most of the Time (4)	Always (5)	
	Percentage					Mean
Other climbers behaving in a discourteous manner.	20.2	71.9	4.7	2.2	1.0	1.92
Other parties interfering with my goals for the day.	19.3	65.1	12.4	2.7	.5	2.00
Climbers allowing their dog off-leash at the base of the climbing area.	21.5	40.0	16.0	18.0	4.4	2.44
Climbers acting in a manner that is unsafe to themselves or others.	13.6	70.3	11.4	4.7	0	2.07
Climbers playing loud music.	44.9	50.6	4.0	.2	.2	1.60
Other climbers hogging areas of the crag.	22.2	59.5	13.8	3.7	.7	2.01
Climbers creating environmental degradation (i.e. erosion, litter).	23.8	57.9	13.1	4.7	.5	2.00
Climbers being inexperienced.	2.0	55.7	29.0	10.4	3.0	2.57
Climbers operating in a style that is not consistent with the ethics of the area.	31.8	57.0	8.8	2.3	.3	1.82
Climbers being loud and/or obnoxious.	24.7	61.1	10.5	3.0	.7	1.94

	Never (1)	Sometimes (2)	About Half the Time (3)	Most of the Time (4)	Always (5)	
	Percentage					Mean
Inexperienced climbers getting in the way of more experienced climbers.	30.3	57.7	8.7	2.2	1.0	1.86
New routes being put up where they do not belong.	74.1	23.4	1.7	.5	.2	1.29
The number of climbers at the crag forcing me to select a different route than intended.	8.4	53.7	26.0	9.7	2.2	2.44

7. How much of a problem are the following behaviors at your primary outdoor climbing area?

	Not a Problem (1)	Slight Problem (2)	Moderate Problem (3)	Serious Problem (4)	Extreme Problem (5)	
	Percentage					Mean
Other climbers behaving in a discourteous manner.	45.4	41.9	10.4	2.0	.3	1.70
Other parties interfering with my goals for the day.	36.8	44.7	16.8	1.8	0	1.84
Climbers allowing their dog off-leash at the base of the climbing area.	50.6	30.6	12.2	5.1	1.5	1.76
Climbers acting in a manner that is unsafe to themselves or others.	25.8	43.5	16.7	9.4	4.6	2.23
Climbers playing loud music.	54.1	29.7	10.9	3.6	1.8	1.69
Other climbers hogging areas of the crag.	30.9	45.1	19.7	3.8	.5	1.98
Climbers creating environmental degradation (i.e. erosion, litter).	26.3	29.8	16.6	13.5	3.8	2.29
Climbers being inexperienced.	31.1	38.8	18.6	8.7	2.8	2.13
Climbers being loud and/or obnoxious.	37.2	43.0	14.0	4.1	1.8	1.90
Climbers operating in a style that is not consistent with the ethics of the area.	45.5	36.1	12.2	4.1	2.0	1.81
Inexperienced climbers getting in the way of more experienced climbers.	48.6	37.3	10.5	2.8	.8	1.70

	Not a Problem (1)	Slight Problem (2)	Moderate Problem (3)	Serious Problem (4)	Extreme Problem (5)	
	Percentage					Mean
New routes being put up where they do not belong.	73.8	17.4	3.3	2.6	2.8	1.43
The number of climbers at the crag forcing me to select a different route than intended.	22.8	43.7	26.1	5.3	2.0	2.20

8. How many years have you been climbing? _____ See Appendix A

9. How many times in the past six months did you go...

	Did Not Participate	1-3 Times	5-10 Times	10-20 Times	20-50 Times	50 or More
Sport Climbing	16.2	23.3	26.4	16.2	13.4	4.5
Trad Climbing	13.6	23.5	23.2	23.0	12.0	4.7
Bouldering	37.7	27.3	16.8	7.5	6.7	4.0
Big Wall/Aid Climbing	81.6	15.9	1.4	.8	0	.3
Top-roping only	33.7	32.1	18.7	8.9	3.7	2.9

10. What is the hardest grade you have climbed (red-point) in the past six months of the following styles...

	Percentage	Frequency	Average Grade*
Top Roping (n=362)			5.11a/5.11b
5.1-5.9	7.7	28	
5.10a-5.10d	22.9	83	
5.11a-5.11d	33.7	122	
5.12a-5.12d	16.8	61	
5.13+	2.2	8	
Not applicable	16.6	60	
Sport Climbing (n=366)			5.10d
5.1-5.9	15.3	56	
5.10a-5.10d	3.4	125	
5.11a-5.11d	24.6	90	
5.12a-5.12d	11.2	41	
5.13+	1.6	6	
Not applicable	13.1	48	
Traditional Climbing (n=374)			5.10a
5.1-5.9	45.6	172	
5.10a-5.10d	29.4	110	
5.11a-5.11d	9.1	34	
5.12a-5.12d	2.7	10	
5.13+	.5	2	
Not applicable	12.3	46	
Bouldering (n=354)			V4
V0-V1	5.1	18	
V2-V3	23.2	82	
V4-V5	23.2	82	
V6-V7	9.3	33	
V8-V11	5.4	19	
Not applicable	33.9	120	
Aid Climbing (n=338)			C1/A1-C2/A2
C0/A0	2.3	8	
C1/A1	7.7	26	
C2/A2	7.1	24	
C3/A3	2.7	9	
Not Applicable	80.2	271	

	Percentage	Frequency	Average Grade*
Commitment Grade			III/IV
I	4.0	15	
II	9.1	34	
III	21.4	80	
IV	19.8	74	
V	8.6	32	
VI	2.1	8	
VII	.3	1	
Not Applicable	16.1	60	
Do not know	18.5	69	

*Mean calculated for those who participated

11. How would describe yourself as a climber?

Skill Level	Percentage	Frequency
Novice	0	0
Beginner	6.1	24
Intermediate	45.4	179
Advanced	36.5	144
Expert	11.9	47

12. Please express your level of agreement with the following statements about **rock climbing in general**.

	Strongly Disagree (1)	Somewhat Disagree (2)	Neither Agree nor Disagree (3)	Somewhat Agree (4)	Strongly Agree (5)	
	Percentage					Mean
Climbing is one of the most enjoyable things I do.	.8	0	1.5	17.9	79.8	4.76
Climbing is very important to me.	.3	.5	1.8	15.8	81.7	4.78
Climbing is one of the most satisfying things I do.	.5	.3	3.1	18.7	77.4	4.72
I find a lot of my life is organized around climbing.	1.0	5.9	11.5	35.3	46.3	4.20
Climbing occupies a central role in my life.	1.8	4.9	12.8	35.3	45.3	4.17
To change my preference from climbing to another recreation activity would require major rethinking.	2.8	9.9	12.2	32.7	42.3	4.02
I enjoy discussing climbing with my friends.	.3	1.8	9.5	33.3	55.2	4.41
Most of my friends are in some way connected with climbing.	3.6	13.5	18.9	36.7	27.3	3.71
Participation in climbing provides me with an opportunity to be with my friends.	1.5	5.4	8.4	39.9	44.8	4.21
When I participate in climbing, I can really be myself.	1.0	3.4	18.6	31.7	45.4	4.17

	Strongly Disagree (1)	Somewhat Disagree (2)	Neither Agree nor Disagree (3)	Somewhat Agree (4)	Strongly Agree (5)	
	Percentage					Mean
I identify with the people and image associated with climbing.	1.5	5.9	24.6	35.1	32.8	3.92
When I'm climbing, I don't have to be concerned with the way I look.	2.1	6.2	18.2	31.0	43.6	4.08
You can tell a lot about a person by seeing them climb.	7.7	16.9	31.3	30.0	14.1	3.26
Participating in climbing says a lot about who I am.	4.9	8.5	26.2	35.7	24.7	3.67
When I participate in climbing, other see me the way I want them to see me.	4.6	11.3	46.8	22.3	15.1	3.32

13. (If one was selected) Please express your level of agreement with the following statements about your **primary style of rock climbing**.*

	Strongly Disagree (1)	Somewhat Disagree (2)	Neither Agree nor Disagree (3)	Somewhat Agree (4)	Strongly Agree (5)	
	Percentage					Mean
My primary style of climbing is one of the most enjoyable things I do.	.6	.6	5.2	28.0	65.7	4.58
My primary style of climbing is very important to me.	.6	.9	6.6	28.6	63.3	4.53
My primary style of climbing is one of the most satisfying things I do.	.3	1.7	7.0	31.6	59.4	4.48
I find a lot of my life is organized around my primary style of climbing.	2.6	8.7	22.8	38.4	27.5	3.79
My primary style of climbing occupies a central role in my life.	2.6	9.2	21.4	39.6	27.2	3.79
To change my preference from My primary style of climbing to another recreation activity would require major rethinking.	4.4	15.2	20.7	32.7	27.1	3.63
I enjoy discussing my primary style of climbing with my friends.	.6	5.8	13.0	44.6	35.9	4.10
Most of my friends are in some way connected with my primary style of climbing.	7.8	19.9	28.3	30.3	13.6	3.22

	Strongly Disagree (1)	Somewhat Disagree (2)	Neither Agree nor Disagree (3)	Somewhat Agree (4)	Strongly Agree (5)	
	Percentage					Mean
Participation in my primary style of climbing provides me with an opportunity to be with my friends.	3.5	8.7	15.9	44.9	27.0	3.83
When I participate in my primary style of climbing, I can really be myself.	2.0	4.7	27.9	36.9	28.5	3.85
I identify with the people and image associated with my primary style of climbing.	3.5	9.2	24.3	41.3	21.7	3.68
When I'm performing my primary style of climbing, I don't have to be concerned with the way I look.	2.3	5.5	25.7	30.3	36.2	3.92
You can tell a lot about a person by seeing them participate in my primary style of climb.	6.4	14.8	32.2	28.1	18.6	3.38
Participating in my primary style of climbing says a lot about who I am.	4.1	11.3	31.0	35.4	18.3	3.52
When I participate in my primary style of climbing, other see me the way I want them to see me.	5.5	10.7	46.7	22.9	14.2	3.30

*The term "my primary style of climbing" was replaced with whichever style was selected at the beginning of the survey using piped text (e.g. Sport climbing occupies a central role in my life).

14. Which region of the American Alpine Club do you reside in?

Region	Percentage	Frequency
Northeast	27.0	104
Western	21.0	81
Rockies	16.6	64
Northwest	14.0	54
Central	9.4	36
Southeast	8.8	34
Do not know	3.1	12

15. What is your home zip code? _____ Not included in this document _____

16. What is your sex? 75.3% Male 24.7% Female

17. What is your race?

Race	Percentage	Frequency
White	90.6	345
American Indian or Alaska Native	.8	3
Asian	4.5	17
Native Hawaiian or Pacific Islander	.3	1
Black or African American	0	0
Other	3.9	15

18. What is your average yearly income?

Region	Percentage	Frequency
\$0-\$24,999	12.8	48
25,000 – \$49,999	21.1	79
\$50,000 – \$74,999	20.0	75
\$75,000 – \$99,999	16.8	63
\$100,000 – \$124,999	11.2	42
\$125,000 – \$149,999	5.9	22
\$150,000 – \$174,999	3.5	13
\$175,000 – \$199,999	2.1	8
\$200,000+	6.7	25

19. In what year were you born?

Years	Percentage	Frequency
Before 1950	6.3	21
1951-1970	23.6	90
1971-1990	56.8	217
After 1990	13.4	51

Appendix B

Open Ended Responses

Please explain how you would describe yourself as a climber.

- ...Been climbing for over 50 years. ...prefer the alpine. Enjoy dragging, sport, trad, and especially like ice climbing. I rarely do any aid, but I'm hoping to do a little aid this summer. At my age, I can't climb anything over about 5.9... except on a top rope.
- A rock climber – self explanatory
- All around climber, that enjoys all types of climbing
- All around, lifetime climber
- All around, sport, trad, big wall, alpine, gym, I am really not a boulderer
- All around. Climb sport and boulder in the fall, trad in spring/summer and ice in winter
- All kinds of climbing for a long time including mountains and ice and snow and indoor climbing gyms
- All types including indoor gyms, big mountains, ice, and snow
- All around climber. I am equally happy on boulders, sport, trad/alpine, and ice
- All-rounder. Rock (all disciplines), ice, mountaineering, alpine, etc.
- Although I tend toward multi pitch trad I have done all of the above plus snow, ice, and general mountaineering
- Experience and interest in all areas of rock climbing
- I am a climber
- I am a wanna-be alpinist, climbing at the gym, sport crag, multi-pitch, ice, or be it long hike, when I can, although that's not as often as I'd like, which makes me just a gear junkie with an interest in a variety of outdoor pursuits
- I began climbing about 10 months ago. I started with top roping at the gym and moved outside for the same. About 6 months ago, I met my current climbing partner who encouraged me to be a more well-rounded climber. I've since incorporated bouldering and sport climbing into my work outs and outdoor climbs. He leads trad a couple of grades harder than me. I often second/clean his routes and have taken it as an introduction to my education of trad
- I enjoy the experience of climbing which leads me to practice all aspects. This results in me focusing on various disciplines for each trip
- I enjoy the personal challenge combined with access to wonderful places
- I love to get outside and sport climb when I can, but more often than not I go to the climbing gym to boulder and occasionally
- I practice many disciplines – it's all good as long as you are outside
- I strive to be an all-around climber, splitting my time/effort between trad, bouldering, and sport
- I try to be an all-around climber, though most of my outdoor climbing is single pitch trad and sport. Though I hate to admit it, I'm primarily a gym climber
- I'd like to say that I'm an ALL-ROUNDER with a pretty balanced knowledge and abilities and time equally dedicated to the disciplines of traditional, sport, ice, rock, mountaineering, bouldering, and big wall climbing. If there is a weakness it is in the arenas of bouldering and big wall climbing.

I'm an all-rounder; I do everything from bouldering to big walls, alpinism, trad, sport, TR and solo (easy routes these days). Only thing I don't really do as much anymore is boulder since every fall is a ground fall and I don't bounce like I used to

I'm an intermediate climber that mainly boulders and sport climbs

I'm just a kid who likes to adventure and test my skills, and find that rock climbing satisfies this more than almost anything else. At the crag is a great place to forget about petty problems

I'm not super experienced and I've lost my head for leading after getting hurt but I love to be outside in beautiful places and enjoy a variety of moderate climbing

I've been making a gradual progression from gym boulding, top roping, sport climbing, and finally alpine trad

Intermediate climber with experience bouldering, sport and trad climbing

Intermediate level overall. I prefer top roping, sport, and trad climbing. Most of my climbing is soloing without a rope

More of an alpine-style mountaineer, trudging up/down mountain trails and/or snow slopes; using technical climbing skills as needed

Mostly sport, with some bouldering and trad

Old man trying to regain the skills of youth

Recreational trad, sport, and boulderer. Spent the majority of the last ten years climbing (multi month climbing trips each year in addition to local cragging) but the last year and a half I've been broadening my activities to include other things

Rock climbing is a great pleasure and at the same time a challenge to explore the choices among many different combinations of movements and strategies designed to be on (and not fall off) and 'travel' on rock terrain; steep rock formations are the best to climbing on from my own perspective. Being in the high mountains is also the best for me but rocky cliffs are also fun. It's a big world to explore and be in, the complexity of acting in it successfully always creates a feeling of deep appreciation and happiness, and I approach doing climbing with a serious caution that grows out my respect for the limitations I see in being human

Roped climbing, whether that be trad, sport, or alpine. Big mountains are beautiful

Sexy

Sport, trad, boulder just getting out on the rock and climbing fun routes/problems. Trying hard sport problems

Trad and top rope and alpine rock

Trad/alpine/ ice climber- does not have to below commitment level IV

Traditional old school. Free climbs, big walls, mountaineering and ice climbing

Try hard boulderer with a knack for sport climbing

Well-rounded gumby. Pretty solid 5.10+ sport climber. 5.8 trad climber. Top roper of anything and C1 aid. Slab lover who also appreciates a good crack and anything over 3 pitches

Please specify your primary outdoor climbing area. Please be as specific as possible, (i.e. Indian Creek, not Moab)

Acadia National Park
Adirondacks
Adirondacks: High Peaks, Champlain Valley
Alabama Hills, Lone Pine, CA
Big Cottonwood Canyon (2)
Birdsboro Quarry, PA (4)
Bishop
Bishop Bouldering
Bishop Peak (San Luis Obispo, CA)
Bishop, happy boulder
Black Canyon
Black Mountain, CA
Blue Cloud Helena, MT
Blue Mound State Park, MN
Boulder area
Boulder Canyon (2)
Boulder, Colorado
Buttermilks
California Sierras
Camden Hills, Maine
Camden, Maine
Can't name only 1
Carderrock
Cathedral Ledge, North Conway, NH (4)
Catskills
Central Cascades
Central Park, upstate NY
Central/South America
City of Rocks, ID (3)
Clear Creek, Golden, CO (4)
Cleveland national forest
Cochise Stronghold
Cochrane Lane, Welsford, New Brunswick, Canada
College Rock in Hopkinton Massachusetts
Cottonwood Canyons, Salt Lake City
Cragmont, Berkeley, CA
Crowder's Mountain NC
Deep Creek
Deer Leap
Delaware Water Gap (Trad)
Denvers Front Range
Desert towers
Devil's Lake, WI (6)

Devil's Tower
Diablo Canyon (Santa Fe, NM), Questa Dome (Questa, NM) Sandia Mountains (ABQ, NM),
English Valley/Dennie's (Del Norte, CO)
Dinner summit, lovers leap
Donation Rocks
Donner Pass (Truckee, CA)
Donner Pass, CA
Donner Summit, CA (3)
Eastern High Sierra
Eastern Sierras, California (2)
Eldorado Canyon, CO (8)
El Potrero Chico, Mexico
Enchanted Rock State Natural Area, TX (3)
Erock
Exit 38 off I90 in WA (2)
Farley Ledge, MA (4)
Flatirons, Boulder
Freyr
Gally
Golden Gate State Park
Golden, Colorado
Governor Dick Park, Mt Gretna PA
Grand Teton National Park
Granite Dells
Great Falls Park in VA
Gus Fruh, Barton Creek Greenbelt, Austin, Texas
High Peaks, Adirondacks, NY
High Sierra
Horse Flats
Horseshoe Canyon Ranch, AR (2)
Hueco Tanks
Icicle Canyon
Icicle Creek
Icicle Creek, Leavenworth WA
Index, WA (2)
Indian Creek
Indian Creek, Cascade Colorado, East Animas, Transfer Park (Lemon Reservoir), El Rito Crag
NM
Jack's canyon, AZ
Jackson Falls, IL
Jackson Hole
Jilotepec, State of Mexico, Mexico
Joshua Tree CA (4)
Joshua Tree, Tahquitz
Juneau, AK
Leavenworth, WA (3)

Leavenworth, Frenchman Coulee
Linville Gorge
Little Cottonwood Canyon, UT (5)
Little Stony Mountain, Shenandoah
Little/Big Cottonwood Canyon
Looking Glass Rock, NC (2)
Lover's Leap, CA (3)
Lover's Leap, South Lake Tahoe
Lumpy Ridge, Eldorado Canyon
Malibu canyon
Malibu Creek
Manchester Wall, Richmond
Maryland
Moores Wall
Moores Wall NC (bouldering)
Mount Washington Valley
Mt. Arapiles, Victoria, Australia
Mt. St. Helena
New Hampshire
New Jack City
New River
New River
New River Gorge, WV (6)
North and Central Cascades, Washington
North Bend, WA
North Carolina
North Cascades, WA (2)
North Conway, NH
Obed National Park (2)
Ogden, UT area climbing
Organ Mountains NM
Ouray
Ouray, Colorado
Owens River Gorge
Ozark NF in NW Arkansas
Ozone, near Portland OR
PA - Haycock
Pawtuckaway State Park, NH
Peter's Kill
Phantom Spires and Lover's Leap
Pilot Mountain (2)
Pinnacles
Pisgah Forest, NC
Post Falls Q'mielln
Prouder canyon
Queen Creek Arizona

Ramapo Powerlinez, Torne Valley NY
Red River Gorge (2)
Red Rock, NV (5)
Ricky mountain national park
Riemer's Ranch
Rock Canyon, UT
Rocks of Sharon
Rocks of Sharon, Spokane, WA
Rocks state park
Rocky Mountain alpine.
Rocky Mountain National Park
Ross Cliffs
Rumney
Safe Harbor
Safe Harbor PA, Red Rock Utah
Sandia Mountains
Santa Barbara
Santa Catalina mountains - Mt.Lemmon; tucson, AZ
Secret private cliffs
Sedona
Seneca rocks, WV (7)
Shaffers Rock
Shagg Crag, Maine
Shawngunks, NY (10)
Shelf Road, CO (3)
Ship Rock, NC
Sierra East Side
Sierra Nevada alpine
Sierra's and JT
Sierras Yosemite
Sinks Canyon, WY
Smith Rock, OR (4)
Smuggler's Notch
South Platte
Squamish, BC (3)
Steele, Alabama
Stone Fort / LRC in Chattanooga
Sugarloaf Mountain
Tahoe
Tahquitz Rock. Idyllwild CA (3)
Taylor's Falls, MN
Tennessee Wall
Tetons (2)
The Obed and Clear Creek
The Overlook, Flagstaff AZ
Tieton, WA

Toulmne Meadows
Tucson, Arizona - Santa Catalina Mountains
Tuolomne Meadows (3)
Turkey Rock, CO
Unnamed crag, Oregon
Val David Qc
Vedauwoo, WY (2)
Wasatch/ cottonwoods
Washington Pass
West Rock Ridge CT
West Trappes, Gunks
Western Alps, northeast New England
Western Colorado / Eastern Utah
Western North Carolina
White Horse Ledge
White Rock, NM
Whitehorse/Cathedral No. Conway NH
Wild Iris
Willow River State Park, Wisconsin
Yosemite NP (5)
Yosemite Valley, Tuolumne, Indian creek (move between S.F. and Salt Lake regularly)
Yosemite Valley, Tuolumne Meadows, Bishop, Lover's Leap, Donner Summit