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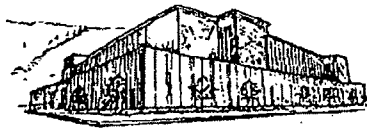
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INVESTIGATING AND RECONCEPTUALIZING RECREATION
SPECIALIZATION: FLOW AS A DEVELOPMENTAL INFLUENCE

by

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Presented in partial fulfillment of the requirements for the degree of

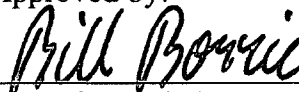
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College of Forestry and Conservation

The University of Montana

May 2005

Approved by:



Committee Chair



Dean, Graduate School

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Investigating and reconceptualizing recreation specialization: flow as a developmental influence

Committee Chair: William T. Borrie

B

Recreation Specialization has typically been employed by researchers as a measure of intensity of involvement in outdoor recreation activities. Several studies have shown links between level of specialization within an activity and many variables such as; use of information to make trip decisions, destination choices, motivations and expected rewards, attitudes toward resource management, preferences for physical and social settings attributes, place attachment, and other aspects of involvement. This has been useful for managers and researchers to understand the spectrum of behaviors and attitudes that are present in any given activity. Rather than measuring a person's current level of specialization for an activity, recent research has raised the question of what factors influence a person's progression through stages of specialization. In other words, why do some people progress farther along the spectrum and become highly specialized while others seemingly hover around lower levels of specialization in an activity? The purpose of this study was to explore how a psychological trait, the disposition to experience flow, influences a person's level of recreation specialization.

The participants of this study were students at The University of Montana. Confirmatory factor analysis, a special application of structural equation modeling, was used to test if the three dimensional model of specialization developed by Scott and Shaffer (2001) and Lee and Scott, (2004) was valid and reliable for a measure of specialization that included all outdoor recreation activities that a person participates in. Once an overall level of specialization for each person was established, a psychological trait, the disposition to experience flow, was examined for its influence on a person's level of specialization using both simple linear regression and structural equation modeling techniques.

Results showed that the general measure of specialization was valid and reliable and that a person's level on the dispositional flow scale had a positive linear relationship with their level of specialization for outdoor recreation activities. In other words, among those that participate in outdoor recreation activities, the higher a person's disposition to experience the flow state, the higher their level of specialization in outdoor recreation activities was likely to be. The implications are that a general measure of specialization is a useful tool when investigating the developmental process of specialization and that future research should focus on other factors that influence this progression.

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CHAPTER ONE: INTRODUCTION

Managing outdoor recreation on public wildlands is an increasingly difficult task. The provision of opportunities for public recreation is a part of all agencies' mandate. Outdoor recreation in general, is evolving, with recent data indicating increasing participation rates among the recreating public (Kelly & Warnick, 1999). As recreation increases on public lands, so too does the diversity of how people recreate. People will inevitably participate in different activities and in different ways. In order to manage and provide for this diversity, agency personnel and researchers need to continually strive for a greater understanding of all facets of visitor diversity and the implications associated with them.

Public lands can support an unlimited number of potential activities. Each one utilizes public lands differently. Rock climbers and horseback riders may be able to utilize the same geographic area but may be looking for very different setting attributes. Keeping track of this range of activities and the ways that they use public land is challenging for managers.

Even within one activity, there is a wide spectrum of participants. They will vary in their skill level, experience, centrality of the activity to their lifestyle, and level of enduring involvement in that activity. The phrase "recreation specialization" was coined by Hobson Bryan (1977) to describe the degree to which people continue to participate in an activity. Bryan's original goal was "to provide managers and researchers with a conceptual framework to characterize the diversity among participants of the same outdoor activity, rather than treating them as one homogenous group" (Bryan, 1977 p.187).

Given the wide array of characteristics, a manager should not make decisions based on the average visitor. The percentage of people that actually possess the characteristics represented by the average is very small. Therefore, decisions that are made based on the average visitor will not accommodate the needs and interests of the entire range of use. Decisions must be made taking into account visitor characteristics from across the spectrum. In this way, a greater diversity of visitor activities, preferences, motivations, and benefits can be catered for.

Recreation Specialization

Research into recreation specialization has been one way that managers and researchers have addressed the need to understand the diversity of recreation on public lands. Specialization, as the level of intensity of involvement in an activity, has served as a way to conceptualize and measure the nature of how people recreate. Several studies have shown links between level of specialization within an activity and many variables such as: use of information to make trip decisions; destination choices; motivations and expected rewards; attitudes toward resource management; preferences for physical and social settings attributes; place attachment; and others (Scott & Shaffer, 2001).

This has been helpful to managers in many ways. First, an understanding of the spectrum of use for each activity can inform decisions on minimizing impact on wildland resources. Given increasing or evolving participation rates, an in-depth understanding of the spectrum of use is crucial in preventing impacts from exceeding standards and in preventing the spread of impact to new areas. For example, people that occupy different specialization levels will prefer different setting attributes (e.g. Cole & Scott, 1999; Ewert & Hollenhorst, 1994). The level of specialization becomes a way to predict the

ideal conditions of participation for the entire spectrum of visitors. The question then becomes, what will people do if they can no longer find the ideal setting attributes for their activity and level of specialization? Commonly they will seek new locations to achieve those ideal setting attributes. If a highly specialized hiker holds a high level of solitude as a key attribute, they will seek out other places to hike if the ones they use commonly become unsatisfactorily crowded. This has the potential to cause unwanted or unregulated dispersion of visitors and their associated impact. Managers should be sensitive to this dispersion of impact because research has shown that the first several instances of impact produce far greater damage than successive instances, and once a certain level of impact has occurred, it may take a significant amount of time for the area to recover to its original state, if it returns to its original state at all (Cole, 2004). With an understanding of specialization, managers can monitor the spectrum of uses and preferences in an attempt to prevent unwanted dispersion of impact or to provide a more intentional alternative.

Secondly, an understanding of the various levels of specialization is helpful when designing effective public relations and education programs. This understanding will allow managers to more accurately target the user groups that they want to reach. For example, it has been shown that different levels of specialization within an activity will use information differently to make trip decisions (e.g. Cole & Scott, 1999; Ditton et al., 1992). Some groups may be more apt to read trailhead signs, or visit agency offices. More highly specialized people are likely to be active in clubs associated with their activity and could be reached through those avenues. To reach the appropriate group effectively and efficiently, an understanding of specialization is extremely useful.

After the initial conceptualization by Bryan, many researchers have described specialization primarily in terms of behavioral involvement in a specific activity, i.e. frequency of participation, amount of previous experience, monetary investment, type of equipment used, amount of equipment owned (e.g. Choi, Loomis, & Ditton, 1994; Donnelly, Vaske, & Graefe, 1986). For example, a highly specialized individual may participate in an activity several times a week, have a long history of experience, and have a large sum of money invested in a large amount of equipment specific to the activity. Some researchers have defined specialization by participants' psychological attitude toward an activity, i.e. measures of centrality to lifestyle (e.g. McIntyre, 1989; Shafer and Hammitt, 1995). For example a highly specialized person may view the activity as very integral to their lives. Most more recent research has defined specialization as both a set of behaviors and an array of attitudes (e.g. Bricker & Kerstetter, 2000; Kuentzel & Heberlein, 1992).

As a result, many indicators have also been used to measure recreation specialization. These include: number of years of involvement in the activity, experience use history (EUH), frequency of participation, centrality to life style, enduring involvement, commitment, economic investment, self assessed level of expertise, equipment choice, etc. Using some combination of behavioral and attitudinal indicators, many researchers have created an additive index of specialization specific to an activity (Bricker & Kersteter, 2000; Donnelly, Vaske, & Graefe, 1986). This overall index has been used to predict various facets of involvement such as destination choices, use of information, place attachment, and others (Scott & Shaffer, 2001).

A Reconceptualization of Specialization

Recent work has attempted to redefine the specialization construct (Scott & Shafer, 2001; Kuentzel, 2001). An accepted assumption before this point was that people became more specialized as they gained more experience, i.e. the level of specialization had a linear relationship with time. With this assumption, a common and much emphasized measure of specialization was the length of time of involvement in the activity. Scott & Shafer and Kuentzel suggested that this assumption was false. When considering a life course of involvement in an activity, they recognized that a person's level of specialization is likely to plateau and is also likely to eventually decline. Furthermore, Scott and Shafer (2001) proposed that not all people progress along the specialization spectrum equally. Some people progress more quickly, stop their progression at certain points, or even become less specialized as time goes on. For example, Donnelly et al. (1986) classified motorboat users into three categories according to specialization (day boaters, overnight cruisers, and racers). They found that racers were the most highly specialized in terms of the amount of equipment owned, the self-perceived level of skill, subscription to boating related magazines, and membership to boat clubs. By all accounts, the racer category was the most involved in the activity. However, racers did not show the greatest number of years experience. In fact, overnight cruisers on average had more years experience than racers. This demonstrates that the progression to a higher level of specialization is not necessarily dictated by number of years experience, as was previously thought by Bryan (1979). In Scott and Shafer's eyes, this example with motor boat use provides an interesting question. Why did some of the

boaters seem to gravitate towards overnight cruising rather than continuing on to the more specialized racing world? In other words, what factors facilitated their progression into that niche of the activity and not another?

Scott and Schaffer (2001) offered some possible explanations for a non linear relationship between specialization and time. For example, a person may have been highly specialized in an activity and later reduced their involvement due to an influence such as having a family. They may still participate in the activity but would be classified as less specialized. In this case, these people would report a high number of years experience with the activity but would score low on many of the other specialization measures (less centrality to life, less monetary and time commitment, etc.). Scott and Schaffer (2001) conceptualized that certain factors exist that facilitate or constrain a person's ability to progress along the specialization continuum. In the example above, having a family would be a factor that would constrain the individual's progression towards becoming more specialized. Beyond constraints, they theorized that psychological factors could also influence a person's progression. What traits, for instance, influence a person's level of specialization? Reinforcement theory, identification theory, and cognitive theory are all psychological constructs of leisure that are likely to act as underlying mechanisms that influence a persons progression (Scott & Shafer, 2001).

Kuentzel (2001) also saw problems with the linear relationship between specialization and time. He recognized that, even given enough time, people are not likely to progress to the same pinnacle of high specialization. Some may reach the most highly specialized realm, but most will stop their progression before becoming highly

specialized. The level of involvement necessary to be highly specialized would preclude many from ever reaching it. Only those that are truly dedicated and motivated will ever reach the most highly specialized realm. Most people's level of involvement in an activity will plateau well before becoming highly specialized in an activity. To address these concerns, Scott & Shafer and Kuentzel called for future research to focus on the developmental process of specialization and to identify how different factors influence a person's progression through levels of specialization.

Scott and Schafer (2001) proposed that a more valid measure of specialization would not include the element of length of time of involvement in the activity and should focus on specialization as a developmental process that differs from person to person. They suggested three dimensions of measurement: (1) a focusing of behavior, (2) the acquiring of skills and knowledge, and (3) the tendency to become committed to the activity such that it becomes a central life interest. Beyond obvious life constraints such as having children, it seems plausible that psychological traits also have an influence on how people progress along the specialization spectrum. That is, certain people may possess psychological traits that motivate them to move easily and quickly through levels of specialization or reach a higher pinnacle. Others may not progress quickly or may hover around lower levels of specialization. *The purpose of this study is to explore the possibility of how one psychological trait, the disposition to experience "flow", influences a person's level of recreation specialization.*

Kuentzel also called attention to the fact that each research attempt has measured specialization levels within a specific activity. He proposed that a person may not specialize in a single activity but may specialize more generally in outdoor recreation

encompassing a variety of activities (Kuentzel, 2001). This is an important implication when thinking about specialization as a developmental process that differs from person to person. Once we start thinking about the differences in how people progress through the specialization continuum or influences on that progression, we need to move away from measuring specialization for individual activities. Instead, a more global measure of specialization that takes into account participation in all outdoor recreation activities is necessary. This allows us to use both people that participate in a single activity and people that participate in multiple activities for analysis. For example, a hypothetical person participates in three outdoor recreation activities. They split their involvement in these activities fairly evenly. A measure of their level of specialization for any single activity would account for roughly one-third of their overall level of specialization for outdoor recreation as a whole. Let's say that another person participates in only one activity. For this person, a measure of specialization for this activity essentially represents how specialized they are in outdoor recreation as a whole. When both of these people are included in a study investigating the influence of factors on levels of specialization, comparisons of measures of specialization for any single activity would not be accurate. The person that participates in multiple activities would unfairly be underrepresented in level of specialization. In order to understand the influence of certain factors on specialization in a valid way, we need to measure specialization for outdoor recreation as a whole. *A secondary purpose of this study is to test the reliability and validity of a measure of specialization that takes into account all outdoor recreation activities that a person participates in.*

Flow

Flow was originally conceptualized by Csikszentmihalyi (1975) as "...holistic sensation(s) that people feel when they act with total involvement" (p. 36). Also referred to in physical activity as "being in the zone" or the "runner's high", it describes a psychological state that occurs when a participant perceives clear goals, immediate feedback, and a balance of challenge and skill. The state of being in flow is characterized by intense concentration and total absorption into the activity, a sense of control over self, a loss of self-consciousness, a merging of action and awareness, and the transformation of time (Csikszentmihalyi, 2000).

Achieving the state of flow has been described as one motivation for continued involvement in an activity, especially outdoor recreation activities. Based on reinforcement theory, a person's motivation for involvement in a given recreation activity is shaped by the rewards that he or she has gained over time. These rewards can be either extrinsic (e.g. praise or recognition coming from other people) or intrinsic (e.g. internal feelings of satisfaction). Iso-Ahola (1999) viewed intrinsic motivations as being the stronger of the two because they are less affected by outside influences and "therefore more directly related to 'good performance'" (p.50). Csikszentmihalyi (1990) viewed the flow state as a state of optimal experience and an intrinsic reward. Thus, the pursuit of opportunities for experiencing flow can motivate a person for continued and possibly more specialized involvement in an activity. The question remains as to whether everyone is motivated by flow and thus likely to advance in degrees of specialization.

A scale was developed by Jackson and Eklund (2002, 2004) to measure an individual's propensity to experience the flow state. They theorized that certain people have a greater ability or disposition to experience flow than others. This psychological

trait allows certain people to experience the flow state frequently and easily, while others may find the flow state more difficult to achieve. The Dispositional Flow Scale (DFS) has measured this trait of an individuals' ability to experience flow in activity. The DFS accomplishes this by measuring the frequency at which an individual experiences flow. The premise is that flow is an optimal state of experience but is elusive and difficult to achieve. Therefore, "... people who report more frequent occurrence of flow characteristics (must) possess a greater predisposition towards experiencing flow" (Jackson and Eklund, 2004).

This project theorizes that a person's propensity to experience flow is one of the factors, in this case a psychological trait, which influences a person's level of specialization. The DFS could explain why some people progress quickly to high levels of specialization and others progress slowly or remain at low levels of specialization.

CHAPTER TWO: LITERATURE REVIEW

To understand the purpose of this study it is necessary to first examine the origins of recreation specialization and the concepts on which it is based. We will then explore how the construct has been applied to range of activities and as a predictor of many variables of interest. An effort will be made to map out the evolving and somewhat nebulous ways that researchers have operationalized the construct. Most importantly, we will investigate the implications of recent scholarship that suggests that some of the most important assumptions about specialization may not be true. Lastly, the psychological trait, the disposition to experience flow, will be examined for its usefulness in understanding this new conceptualization of specialization.

Origins of the Concept of Recreation Specialization

Recreation specialization traces its roots back to Hobson Bryan, who in 1977 first conceptualized the idea. Bryan drew on the concepts of Shibutani (1955) who developed the idea of social worlds, referring to social groups that were identifiable by specialized communication channels. Also crucial were the ideas of Devall (1973), who expanded the notion of social worlds to incorporate *leisure* social worlds, referring to the social grouping of friends, activities, and behavior around a common leisure activity. Members that are active in the same recreation activity are likely to also belong to the leisure social world related to that activity (Devall, 1973).

Bryan (1977, 1979) advanced this idea by recognizing that not all people that participate in a recreation activity are members of its social world segment and that there

are a wide range of orientations and behaviors that accompany any recreation activity. Bryan (1977) stated, “In fact, a major weakness of past research efforts has been the assumption of sportsman group homogeneity, with variations among individual sportsman remaining largely unexplored” (p.175).

Bryan (1977) sought to explore this issue by examining the recreation activity of sport-fishing. “The object is the development of a conceptual framework, covering a broad spectrum of angler types, utilizing the variable ‘recreation specialization’” (Bryan, 1977, p. 175). Bryan then defined recreation specialization as “a continuum of behavior from the general to the particular, reflected by equipment and skills used in the sport and activity setting preferences” (1977, p.175). Based on the amount of participation and technique and setting preferences, Bryan (1977) classified fisherman into a typology of specialization. The types were: *occasional fisherman*- those that are new to the activity or those that fishing is not a major interest, *generalists*- those that participate regularly and use a variety of techniques, *technique specialists*- anglers that use a specific technique to the exclusion of others, and *technique setting specialists*- those that specialize in a single method and have distinct preferences for specific water types on which to fish. Overall, Bryan thought that anglers could “be arranged along a continuum of experience and commitment to the sport, from beginning recreationist to specialist, [with] distinctive preferences and behavior at each level” (1977, p.176).

At this point, it is important to note a key point of Bryan’s conceptualization of recreation specialization. Bryan (1977, 1979) used the term specialization to mean two things. One would be the range of orientations and behaviors displayed by individuals in an outdoor recreation activity. More importantly, he used specialization to mean a

process whereby individuals became increasingly committed and specialized in the recreation activity over time. Bryan's goal was to create a framework for understanding the typical stages of involvement that individuals were likely to progress through as their involvement in the activity continued. He believed that although the numbers of individuals at different levels of specialization are concentrated at the low end of the continuum, there was a tendency for anglers to progress to more specialized stages the longer they participated in the activity (Bryan, 1979).

This progression, Bryan believed, was accompanied by changes in motivations, preferences, and attitudes about management practices. He observed that as anglers became more specialized, they focused on catching fish under exacting circumstances rather than catching any fish. They also preferred to fish on spring fed streams rather than any water. Further, Bryan observed that anglers displaying higher specialization preferred preservation of the natural setting as opposed to ease of access and stocking (Bryan, 1977).

Activities

Subsequent research has focused in part on applying the concept of recreation specialization to a variety of activities. The following outdoor recreation activities have been examined: hiking and backpacking (Shafer & Hammit, 1995; Virden and Schreyer, 1998; Watson et al., 1994; Kyle et al., 2004), boating and sailing (Donnelly et al., 1986; Kuentzel & Heberlein, 1997), fishing (Choi et al., 1994; Ditton et al., 1992), rock climbing (Ewert & Hollenhorst, 1994), canoeing and whitewater activities (Bricker and Kerstetter, 2000; Kuentzel and McDonald, 1992; Wellman et al., 1982), wildlife watching (Lee & Scott, 2004; Martin, 1997; Scott and Thigpen, 2003), camping

(McFarlane, 2004; McIntyre & Pigram, 1992), mountain bike racing (Shafer et al., 2004), and hunting (Miller & Graefe, 2000). Recreation specialization has even been extended to a non-outdoor recreation activity, contract bridge (Scott & Godbey, 1994).

These efforts have demonstrated that the concept of specialization is indeed applicable to a wide variety of outdoor recreation activities. Common to the vast majority of these studies, however, is that they have focused on a single activity or measured one activity at a time. These approaches have served to further the understanding of the spectrum of participation in each activity but fail to make meaningful comparisons across activities. One exception is the work of Donnelly et al. (1986), who compared data from both motorboat and sailing disciplines of boating. This was an attempt to make comparisons of people who engage in different recreation activities. The obvious shortcoming of this effort however, is that the two activities under investigation are more similar than different and therefore not enough variation is present to conclude that the construct could be applied to any other activity. Another exception is the work of Schreyer and Beaulieu (1986), whose study evaluated data collected from two sources, visitors to wildland settings in the Intermountain West and members of the Utah Wilderness Association. No attempt was made to differentiate by activity. They found moderate success in the performance of their specialization measures in the prediction of attribute preferences, giving hope to the possibility that the specialization construct could be used to compare individuals that participate in different recreation activities in wildland settings. However, their methods relied heavily on the length of time that respondents had participated in wildland recreation which, as described below, may not be an accurate measure in capturing a true level of specialization.

Bryan (1979) believed that recreation specialization was likely to exist in all activities and that it should be possible to examine specialization both *within* and *between* activities. Williams and Huffman (1986) argued that traditional approaches to specialization too narrowly focus on a single activity. They conceptualized that people may specialize in outdoor recreation more generally (i.e. show interest in several activities at the same time). Kuentzel (2001) also acknowledged this possibility.

“Instead of progressing through stages of participation in well-established activities, leisure participants may instead be sampling from a growing variety of opportunities. Some participants may favor a diversity of experience across different activities, rather than a qualitatively better experience with repeated engagement in a single activity” (Kuentzel, 2001, p.353-354).

For these reasons, a specialization measure that focuses on a single activity may miss an overall specialization level *across* many outdoor recreation activities. A person may participate in several activities and if examined separately, they would not account for a total or overall level of specialization. Certainly, measuring specialization within an activity has proven useful to understand the full spectrum characteristics for that activity, but when examining the nature of specialization and how people move along the specialization spectrum, a more universal and complete measure of specialization is necessary.

Variables of Interest

Since its inception, specialization has been used as a tool for researchers to differentiate among recreationists in relation to many variables. Mostly, it has been used as an independent variable to predict such variables as: preferences for physical and social setting attributes (Schreyer & Beaulieu, 1986; Martin, 1997; Ewert & Hollenhorst, 1994;

McFarlane, 2004), behavioral loyalty among hikers (Kyle et al., 2004), place attachment (Bricker & Kerstetter, 2000; Kyle et al., 2003), attitudes towards resource management (McIntyre & Pigram, 1992; Kuentzel & McDonald, 1992; Anderson & Loomis, 2003), attitudes towards depreciative behavior (Wellman et al., 1982), perceptions about crowding (Kuentzel & McDonald, 1992), motivations for a recreation visit and expected rewards from that visit (Ditton et al., 1992), attitudes about wilderness conditions (Shafer & Hammit, 1995), and equipment preferences (Ewert & Hollenhorst, 1994). This wide range of variables demonstrates that recreation specialization is a useful tool in differentiating among recreationists.

Measurement of the Construct

The most evolution, and the most debate, in the development of recreation specialization has been the consideration of how it should be measured. In fact, there has been little agreement among researchers about how to best operationalize the construct. For example, many studies have measured specialization solely in terms of behavior, i.e. frequency of participation, amount of previous experience, monetary investment, type of equipment used, amount of equipment owned (e.g. Bryan, 1977; Ditton et al., 1992; Donnelly et al., 1986). In some cases, researchers have measured specialization solely in terms of attitudes, i.e. measures of centrality to lifestyle, level of enjoyment derived from the activity, amount of importance of the activity to the person's life, level of self expression through the activity (e.g. McIntyre, 1989; Shafer & Hammit, 1995). Many have used a combination of behavioral and attitudinal measures (e.g. Bricker & Kerstetter, 2000; McIntyre & Pigram, 1992; Kuentzel & Heberlein, 1997; Scott &

Schafer, 2001). Confusing this matter is the fact that researchers using the same measures have classified them as different things. For example, some researchers (Bryan, 1977) have considered skill level and knowledge of the individual to be a behavioral measure, while other researchers have classified it as a measure of attitudinal dimensions (McIntyre & Pigram, 1992).

Bryan himself was not clear in how the construct should be measured. In one place he describes that specialization should be viewed "... as a product of time, money, skill, and psychic commitment" (Bryan, 1979, p.60). However in a more recent reflection of the concept, Bryan says, "In retrospect, I would emphasize a behavioral operational definition of the specialization continuum, length and degree of involvement in an activity" (Bryan, 2000, p.19). Other researchers, as well, have leaned towards behavioral indicators, many focusing on the length and degree of previous involvement (Schreyer & Beaulieu, 1986; Ewert & Hollenhorst, 1994). In fact, the concept of *experience use history* (EUH) mirrors this aspect of the measurement of specialization. According to Schreyer et al. (1984), experience use history refers to "the amount and extent of participation by the individual in recreational pursuits" (p.34). Hammit et al. (1989) argued that "[EUH] has to be a phenomenon closely related to the specialization process" (p.212). Both Schreyer & Beaulieu (1986) and Ewert & Hollenhorst (1994) applied the principals of EUH as a measure of specialization.

McIntyre and Pigram's (1992) work brought emphasis to the non-behavioral aspects of the specialization construct. "Measurement of recreation specialization has been limited to the observation and recording of behaviors associated with activities and has ignored to a large extent, individual *affective attachment* to participation" (McIntyre

& Pigram, 1992, p.3). Part of Bryan's view of specialization is that it is partially made up of "psychic commitment" (Bryan, 1979, p.60). McIntyre and Pigram's (1992) idea of affective attachment expands on this aspect. Drawing on the work of Kapferer and Laurent (1985) in the area of product involvement, and on the work of Little (1976), McIntyre and Pigram's (1992) proposed that an *affective dimension* in specialization would consist of the level of enduring involvement that an individual would have in an activity. They defined enduring involvement as being comprised of four things: (1) importance of activity to the person's life, (2) enjoyment of the activity, (3) self expression through the activity, and (4) centrality of the activity to the person's lifestyle. Overall, McIntyre and Pigram (1992) attempted to define specialization as being comprised of three dimensions: a *behavioral* dimension made up of measures of prior experience and familiarity with the activity, an *affective* dimension made up of the level of enduring involvement described above, and a *cognitive* dimension made up of the knowledge and skills that a person has accumulated about the activity.

Bricker and Kerstetter (2000) combined many of the dimensions that other researchers had conceptualized. They defined five dimensions: level of experience, skill level and ability, centrality to lifestyle, enduring involvement, and equipment and economic investment. This measurement of specialization serves as the most comprehensive of studies that are based on the traditional assumptions of specialization. However, many of the traditional assumptions of specialization have fallen under question by more recent scholars (Scott & Shafer, 2001; Kuentzel, 2001).

Redefining the Construct

Although there has been little agreement over the optimal way to measure specialization, a few trends are recognizable. First, although there has been a heavy lean towards using behavioral measures, attitudinal measures have become more widespread. Second, there has also been a progression towards defining specialization as a multi-dimensional construct rather than based on any single variable. These efforts have served to make recreation specialization a more accurate and salient tool for research.

However, the popular assumptions that underlay much of the specialization literature have come under criticism in recent years. Through the work of Scott and Shafer (2001), Kuentzel (1992, 2001), and even Bryan (2000) himself, a new direction is forming within recreation specialization. This direction has focused on specialization primarily as a developmental process rather than just a variable to measure intensity of involvement.

As mentioned earlier, one assumption has been that the level of specialization an individual displays has a linear relationship with time, and that the longer a person participates in an activity the more highly specialized they will become (see Figure 1). This assumption is reflected in statements such as, “Persons participating in a given recreation activity are likely to become more specialized in that activity over time” (Ditton et al., 1992, p.3) or “it is likely that individuals develop into racers after participating in other boating activities for a period of time” (Donnelly et al., 1986, p.84). Although a linear relationship with time reflects a developmental process, i.e. people *develop into more advanced levels of specialization over time*, Scott and Schafer (2001) brought attention to the fact that no research had been undertaken to assess the “*extent to*

which recreationists progress to more advanced levels of involvement over time”

(p.321).

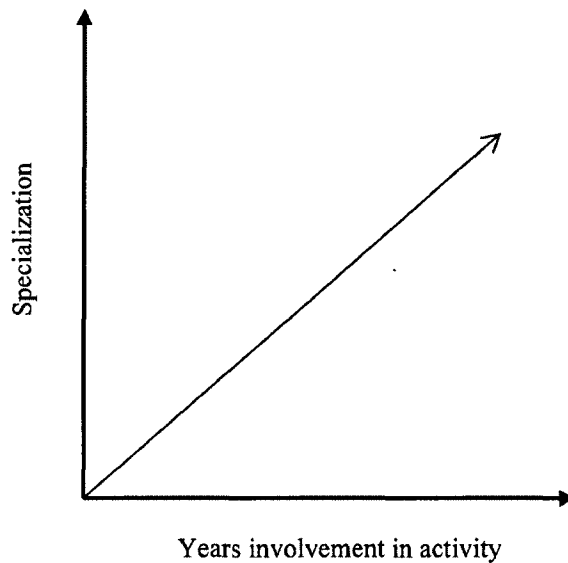


Figure 1. Linear Relationship Between Level of Specialization and Number of Years Involvement in an Activity.

Through a review of the literature they found many cases in which a progression over time did not occur (e.g. Kuentzel & Heberlein, 1998; Virden & Schreyer, 1988; Kuentzel & McDonald, 1992; Scott & Godbey, 1992). One example is the work done by Donnelly et al. (1986) whose findings suggest that individuals that participate in motorboat racing (considered to represent the high end of the specialization spectrum) averaged 5.7 less years experience than overnight cruisers. The work of Kuentzel and McDonald (1992) also found little support for a linear relationship with time. They split their sample into two groups: those with below average experience levels and those with above average experience levels. If the linear relationship between specialization and

time were true, we would expect the more experienced group to also show higher levels of commitment to the activity and centrality of the activity to the person's lifestyle. This in fact was not the case. Kuentzel and McDonald found no relationship between the level of previous experience and levels of commitment and centrality to lifestyle. This finding suggests that people do not continue to progress to a higher level of specialization as time goes on and thus reach a plateau in their level of specialization (Kuentzel & McDonald, 1992).

These findings raise some interesting concepts. It seems likely that the level of specialization does not have a linear relationship with time because of the possibility of reaching a plateau or even decreasing involvement in an activity over time. For example, a person may not continue to increase their level of specialization in an activity due to other time constraints such as a job. Short of giving up their job, they may reach a level of involvement that suits their other life interests and not progress further. Also it is unlikely that a person will continue to become more specialized in an activity until death. At some point, health or ability concerns may limit a person's ability to actively participate in an activity, thereby causing a decline in level of specialization (Figure 2).

In thinking of a developmental process, it also seems likely that individuals will develop at different rates along the specialization spectrum, or attain different levels of specialization in their leisure career. Some may progress quickly, attaining a high level of specialization with little experience. The author has observed many individuals that become immersed in an activity quickly and achieve high levels of skill and commitment in very little time. In order to receive intrinsic rewards for participation, these people need to participate frequently and at a high level. On the other hand, some people may

participate in an activity for a long period of time and never progress beyond introductory levels of specialization. These “generalists” as Bryan classified them, may not progress

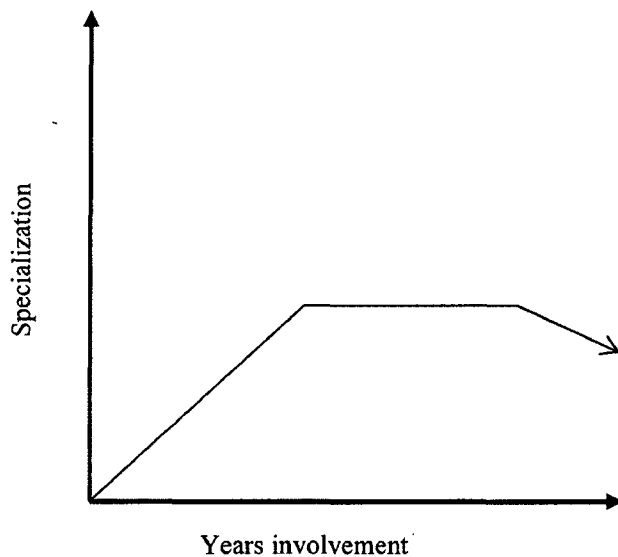


Figure 2. Non-Linear Relationship Between Level of Specialization and Number of Years Involvement in an Activity.

through the specialization spectrum due to many factors. A possibility is that constraints such as lack of easy access to the activity from their residence may keep them from progressing. Another possibility is that the level of reward that they receive from participation does not motivate them to continue to increase involvement. In other words, their enjoyment is less derived from specialist skills, challenges, and styles of participation. In order to further our understanding of the influence of the level of specialization on variables of interest, these issues warrant further investigation. For instance, what influences how people progress through the specialization spectrum? Are there common contingencies that facilitate or constrain a person’s ability to progress? Do certain people have traits that make them more or less likely to progress over time?

In order to answer the above questions, one must have an understanding of the underlying mechanisms that drive progression. Scott and Shafer (2001) summarized four such mechanisms of progression. The first three are housed within psychological models of leisure; reinforcement theory, identification theory, and cognitive theory. The fourth, career contingencies, deals with the various events or constraints that recreationists inevitably face during their leisure careers.

“According to [reinforcement theory], a person’s involvement in a given leisure activity is shaped by the rewards he or she has attained over time” (Scott & Shafer, 2001, p.334). Rewards can be classified as external (such as compliments from others) or as internal (such as happiness). Iso-Ahola (1999) viewed internal motives as being the stronger of the two. The progression along the specialization spectrum can be influenced by the nature of such rewards. For instance, “if rewards come too easily, they may cease to be satisfying which can lead to seeking out new rewards within the particular leisure [activity]” (Scott & Shafer, 2001, p. 334).

Closely related to reinforcement theory is identification theory which is the need for humans to find meaning or identity in life. Some individuals may find this meaning in leisure activities and their status in the associated leisure world. The degree to which an individual finds meaning in an activity is likely to influence their progression along the specialization spectrum (Scott & Shafer, 2001).

Cognitive theory deals with the way recreationists mentally organize and structure information. As people gain experience in an activity, “their cognitions become increasingly complex and they have more information they can use to evaluate

participation... [this] can actually lead to a change in the types of decisions and choices recreationists make” (Scott and Shafer, 2001, p.335).

The final mechanism conceptualized by Scott and Shafer (2001) is the idea of career contingencies. Contingencies are factors that facilitate or constrain a person’s movement along the specialization continuum. Scott and Shafer (2001) identified three possible categories of contingencies; “(1) support individuals receive from significant others and social world members, (2) the gender of the recreationists, and (3) available opportunities and personal resources” (p.335-336).

Kuentzel (2001) added an additional underlying mechanism of progression. He thought of progression as consisting of multiple trajectories from a single starting point. The idea here is that people, even if they have a similar starting point, will progress along their own path of specialization. Not all people are progressing towards the same pinnacle of high specialization. Some anglers, for instance may become very highly specialized at lake fishing for bass, while others may progress towards fly fishing on spring fed streams for native trout, while others may not progress at all (Kuentzel, 2001).

Both Kuentzel (2001) and Scott & Shafer (2001) identified that future research should focus on (1) identifying factors that influence how people progress through stages of specialization and (2) understanding how those factors influence progression.

A New Measurement Construct

With the re-conceptualization of specialization to be primarily a developmental process, Scott and Shafer (2001) believed that the measurement of specialization should also acknowledge and reflect a developmental process and should not include the length

of time of involvement in the activity. Based on the three dimensional model developed by McIntyre and Pigram (1992) and Little (1976) described above, Scott and Shafer (2001) proposed that specialization could be understood, independent of length of experience, by (1) a focusing of behavior, (2) the acquiring of skills and knowledge, and (3) tendency to become committed to the activity such that it becomes a central life interest. These dimensions differ slightly from those of McIntyre and Pigram (1992) as they “place a greater emphasis on an orientation to skill development, rather than on simply advanced knowledge, and commitment processes, rather than enduring involvement” (Scott & Shafer, 2001, p.326).

The focusing of behavior in this case refers to the tendency for individuals to intensely participate in outdoor recreation activities at the expense of other kinds of activities. Highly specialized people focus their behavior in such a way that they do not have the time and resources to participate in competing activities. The dimension of acquiring skills and knowledge should be characterized not only as the accumulation of skills and knowledge but also as the desire to develop skills and knowledge. The dimension of commitment in this case encompasses the types of behavioral and personal commitments that recreationists develop in the activity. Personal commitment consists of defining oneself in terms of the activity and an inner conviction that the activity is worth doing for its own sake. Behavioral commitment, on the other hand, is the expectations and costs that make stopping participation in the activity difficult (Scott & Shafer, 2001). Scott and Shafer believed that these three dimensions are interrelated and mutually reinforcing.

Lee and Scott (2004) tested this three dimensional model on a sample from the American Birding Association. Using confirmatory factor analysis in structure equation modeling, they found good fit a three dimensional model to their data. They also found that all dimensions loaded well into a single overall factor, specialization. These results indicate that the three dimensional model conceptualized by Scott and Shaffer (2001) and operationalized by Lee and Scott (2004) is valid and reliable. The present study's specialization measures were based on this three dimensional model and followed closely the question items employed by Lee and Scott (2004).

In attempt to answer the call by Kuentzel (2001) and by Scott & Shafer (2001) for future research to investigate the factors that influence people's progression through stages of specialization, this study proposes that a psychological trait, the disposition to experience flow, acts as one such factor.

Flow

The concept of flow was originally developed by Csikszentmihalyi (1975) who investigated the experiences of diverse groups (dancing, surgery, chess, and rock climbing) during performance of their chosen activity. Csikszentmihalyi (1975) found a high level of consistency in responses of what was felt during the activity when everything came together and people had special absorbing experiences. The name flow was given to this special psychological state that brings the participant much enjoyment. Csikszentmihalyi (1975) described flow as a "holistic sensation(s) that people feel when they act with total involvement" (p.36). Jackson and Eklund (2004) describe flow as:

“Flow occurs when one is totally involved in the task at hand. When in flow, the performer feels strong and positive; not worried about self or of failure. Flow can be defined as a experience that stands out as being better than average in some way, where the individual is totally absorbed in what he or she is doing, and where the experience is very rewarding in and of itself” (p.3).

Csikszentmihalyi (1990) also thought of flow as representing optimal experience and used the two terms interchangeably.

Central to the concept of flow is the balance of challenge and skill. The optimal conditions for flow occur when a participant experiences a balance of challenge and skill that exceeds the levels that are typical for their daily experiences and where there is an investment of psychic energy into the task (Csikszentmihalyi, 1990). This idea is represented by the four channel flow model that distinguishes between flow and other psychological states such as anxiety, boredom, and apathy based on the balance or imbalance of a person’s level of challenge or skill (see Figure 3).

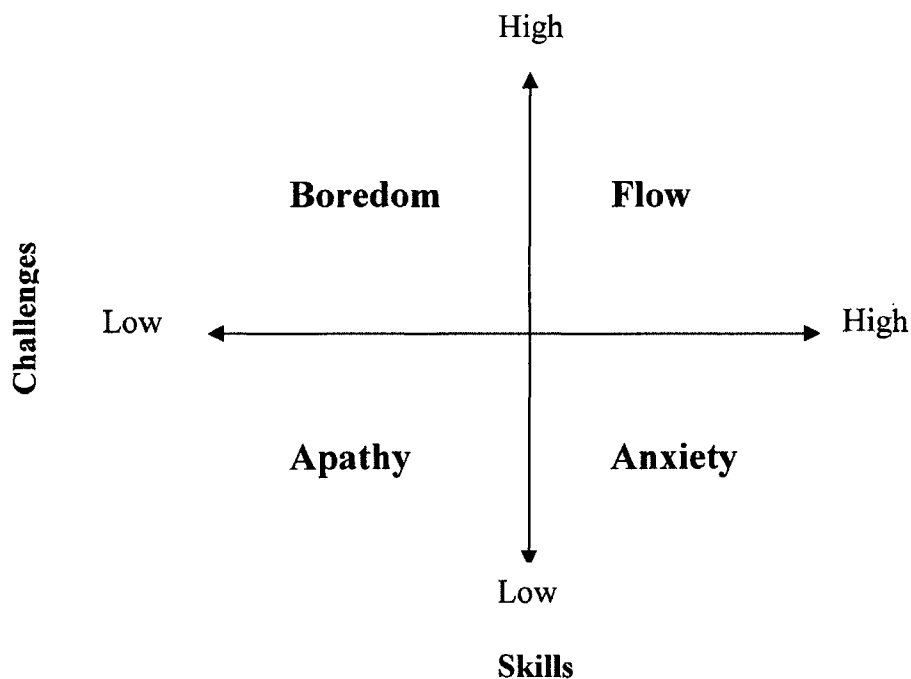


Figure 3. Four Channel Flow Model (adapted from Csikszentmihalyi & Csikszentmihalyi, 1988)

Ongoing research however has identified that other dimensions, beyond the challenge/skill balance, characterize the flow state. Csikszentmihalyi (1990) identified nine dimensional conceptualizations of flow. They are: (1) *Challenge/skill balance* Critical to the idea of the balance of challenge and skill above one's average is that it is based on the individual's perception of challenge and skill. "This perception makes our beliefs or confidence regarding what we are able to do in a situation more important than what our objective skill levels might be" (Jackson & Eklund, 2004, p.7). (2) *Action-awareness merging*, which is achieved when a participant is completely absorbed by what they are doing. This absorption leads to a sense of oneness that is characterized by a sense of effortlessness and spontaneity. (3) *Clear goals*, referring to the clarity of purpose that a participant will have during the flow state. This clarity of purpose keeps the participant fully connected to the task and responsive to appropriate cues. Closely related to clear goals is the dimension of (4) *unambiguous feedback*, which refers to process of knowing how the performance of the activity is going in relation to these goals. When in flow, the participant will process this information effortlessly keeping them on the right track towards reaching their goals. (5) *Concentration on task*. When in flow, there are no extraneous thoughts and participants are not easily distracted. One is totally focused in the present on the activity at hand. (6) *Sense of control*. Frequently, participants will report a strong sense of being in control when in the flow state. "Failure thoughts are nowhere to be found during flow, enabling the individual to take on the challenge at hand" (Jackson & Eklund, 2004, p.10). (7) *Loss of self consciousness*. Participants that experience flow often report that they lose concern with what others think of them. (8) *Time transformation*. In flow state, participants report experiencing a slowing or

stopping of time. This is related to the intense involvement experienced during flow. Since awareness of everything else is absent in a flow state, participants are surprised when a significant amount of time has passed. The final dimension of flow is (9) *autotelic experience*. Composed of the Greek roots *auto* meaning self and *telos* meaning goal, autotelic experience refers to the intrinsically rewarding experience that flow brings to an individual (Jackson & Eklund, 2004).

Flow is theoretically assumed to occur when the nine dimensions listed above converge into one optimal experience. For most people, this is a rare occurrence and is an elusive phenomenon. Because of this elusiveness, flow is a difficult concept to study (Voelkl et al., 2003). Most researchers have tried to study an approximation of it by examining various characteristics of it as they occur during the course of daily life. Typically researchers have used the experience sampling method or ESM (research subjects wear beepers that randomly indicate when the subject should fill out a brief questionnaire asking them about their current state) to assess flow in daily life. The ESM has been used to assess flow experiences in daily life among students (Csikszentmihalyi & Larson, 1984), family members (Larson & Richards, 1994), adults with psychiatric diagnoses (Massimini et al., 1987), community dwelling older adults (Voelkl, 1990), and whitewater kayaking (Jones et al., 2000). The premise is that when all of the characteristics co-occur at high levels, flow is likely to be present (Voelkl et al., 2003).

Jackson and Marsh (1996) pointed out that while the ESM has been used to assess flow in daily activity, it did not work well to assess flow during physical activity where a disruption of performance would not be desired. Another criticism that they brought up is that the ESM focuses heavily on the challenge and skill balance and does not reflect all

nine dimensions of flow (partially because the questionnaire is kept brief and typically doesn't cover all nine dimensions). In answer to these shortcomings, Jackson and Marsh (1996) began development of the Flow State Scale (FSS) to assess flow experiences within a particular activity. Administered immediately post-event, this 36 item self-report instrument contains 4 items for each dimension. Confirmatory Factor Analyses provided a satisfactory fit of both a nine factor model and one higher order model with a global flow factor (Jackson & Marsh, 1996).

Jackson et al. (1998) also began development of the Dispositional Flow Scale (DFS) to measure the dispositional tendency to experience flow in activity. The DFS uses the frequency that a person experiences flow in order to assess the individual differences in the propensity to experience flow. Csikszentmihalyi suggested that there are individual differences in the ability to experience flow and that certain people may have psychological traits that allow them to more easily experience flow, regardless of the situation (Csikszentmihalyi & Csikszentmihalyi, (1988). The premise of this assessment is that “people who report a more frequent occurrence of flow characteristics possess a greater predisposition towards experiencing flow” (Jackson & Eklund, 2004, p.14). The DFS is also a 36 item self-report instrument, but since the DFS measures a trait and not a state, the DFS is not tied to a particular event. The respondent is asked to think about the frequency with which he or she generally experiences the flow items within a particular activity.

Development of both the FSS and the DFS began with a qualitative approach to explore the perceptions that elite performers held of flow and how they attained this state during their performances (Jackson, 1992, 1995, 1996). The FSS was initially published

in 1996 (Jackson & Marsh, 1996), while the DFS was initially published in 1998 (Jackson et al., 1998). Confirmatory factor analysis, an application of structural equation modeling, provided a satisfactory fit of the FSS and the DFS to both the nine factor model and a single higher order model (Jackson et al., 1998). In order to improve the measurement of some of the flow dimensions, secondary versions, FSS-2 and DFS-2, were developed. Modifications were made to a few items to address certain statistical issues with the original items (Jackson & Eklund, 2002). Throughout all studies conducted, the scales maintained an acceptable level of reliability and validity (Jackson & Eklund, 2004).

Developed within the field of sports psychology, the FFS and DFS studies used various physical activities for their samples. Many activities were in the realm of athletics. Running was the largest activity group comprising nearly 25% of the sample in the 2002 study. Other examples of athletic activities include triathlon, rugby, basketball, and soccer. Physical activities that would not be considered traditional athletic events were included in their sample as well. Dance was the second largest activity group in the 2002 study comprising 17% of their sample. Yoga comprised nearly 10% of their sample (Jackson & Eklund, 2002). Whitmore and Borrie (2005) applied the most recent version of the DFS to a sample of visitors to the Bob Marshall Wilderness Complex. The primary activities reported in that study were hiking, horseback riding and fishing. Results from that study demonstrated a satisfactory level of reliability and validity, and suggest that future application of the DFS to outdoor recreation activities is possible.

The Connection of Recreation Specialization to Flow

Havitz and Mannell (2005) explored the relationship between enduring involvement and flow. Enduring involvement has been included as one aspect of recreation specialization (e.g. Bricker & Kerstetter, 2000) and has been defined as the “unobservable state of motivation, arousal, or interest toward a recreational activity” (Rothschild, 1984, p. 216). Results from this study found no direct relationship between a person’s level of enduring involvement and the likelihood of that person to experience flow. The self described limitation of that result, however, was that the measurement of flow in the study did not capture all of the facets of the flow concept. Most notably, measures of challenge and skill were not included. Using the experience sampling method, they measured flow as a construct comprised of only four items; (1) the level of happiness derived from the activity, (2) the amount of focus on the activity at that point, (3) whether they were good-humored or irritable at the time, and (4) level of boredom. These measures of the flow construct cannot hope to capture a complicated and elusive state with any degree of validity and reliability.

The relationship between the disposition to experience flow and level of specialization is likely to be caused in two ways. The first would deal with the application of reinforcement theory. A person’s continued involvement in an activity somewhat depends on the rewards that they receive through the activity (Scott & Shaffer, 2001). Flow is an intrinsic reward and, “the experience itself is so enjoyable that people will do it even at great cost, for the sheer sake of doing it” (Csikszentmihalyi, 1990, p.4). People that experience flow typically want to experience it again and again (Csikszentmihalyi, 1990). An increase in a person’s disposition to experience flow leads to a higher

participation rate, which is an indicator of level of specialization. The second way is that flow is partially based on the balance of the challenge at hand with the person's current skill level. When this balance occurs at a place that is above the average for each, the optimal conditions for flow occur. Due to an increased participation rate for people who have a high disposition to experience flow, it is likely that their skill level will progress farther than a person who participate less frequently. The skill level of the individual is also an indicator of level of specialization.

CHAPTER THREE: METHODS

This section introduces the research question and related hypotheses for this study. It also describes the population that was sampled and the procedures that were followed for data collection. The development of the specialization items is reviewed here, along with inclusion of the measurement items of the dispositional flow scale. Finally, descriptions of the statistical procedures used for analysis (reliability analysis, regression analysis, and confirmatory factor analysis, an application of structural equation modeling) are included.

Research Question

How does the psychological trait, the disposition to experience flow, act as a factor that influences an individual's level of recreation specialization?

Hypotheses

1. When applied to a sample of outdoor recreation activities that take place in natural settings, the Dispositional Flow Scale will display a satisfactory level of reliability and validity.
2. A measure of recreation specialization that takes into account all outdoor recreation activities that a person participates in is valid and reliable.
3. The disposition to experience flow will influence a person's level of specialization.

Sample Population

The participants of this study were students at The University of Montana. With the abundance of public lands surrounding the university, it is likely that the vast majority of students have participated in at least some outdoor recreation on public wildlands. In fact, access to recreation opportunities is listed as a major reason for students to choose The University of Montana. Given the wide range of recreation opportunities nearby, it is also likely that students participate in a wide range of outdoor recreation activities. Indeed, within a short drive from Missoula, one can ski, hike, fish, hunt, mountain bike, rock climb, kayak, or ride horses just to name a few. With a high percentage of students participating in outdoor recreation activities, an array of level of specialization will be seen. That is, some students may only occasionally participate in an activity on public lands, while others may be highly involved in an activity. A similar variation is likely to occur for the disposition to experience flow. Some students are likely to experience flow often and easily, while others will not.

A variety of different classes around campus were chosen to participate in the study. These classes came from three departments: college of forestry, health and human performance, and psychology. Students were primarily undergraduates. The vast majority of subjects were likely to be between 18 and 22 years old. The total number of students sampled was 441. The questionnaire took approximately 15-20 minutes of class time to complete.

Participation in the study was completely voluntary. Students did not receive any penalty if they choose not to participate. Each questionnaire response remained anonymous. No personal information such as name, address, identification number,

telephone number was collected. Furthermore, no socio-demographic data was collected, in part to keep the questionnaire short and to partially to limit identifying characteristics. All responses collected were kept confidential for use by the authors of this study only. The authors of this study do not anticipate that there was any possibility of harm to the participants as a result of participating in this study. These aspects were read to potential study participants before completing the survey.

Measurement Items

The questionnaires employed in this study asked people to consider their participation in outdoor recreation activities that occur in natural settings. Instructions and examples were given as to what constitutes natural settings and what kinds of activities should be included as outdoor recreation activities. These examples were read aloud prior to handing out the questionnaire. An example of this script is included in Table 1.

Table 1. Script of examples of outdoor recreation activities in natural settings, read aloud to research participants before filling out questionnaire.

Definition of a natural setting: A place that lacks human development, and where people experience nature.

Examples of local natural settings:

- Pattee Canyon Recreation Area
- Blue Mountain
- Kim Williams Trail
- Rattlesnake Recreation Area
- Rock Creek
- Clark Fork River
- National Parks (such as Yellowstone or Glacier National Park)
- Wilderness areas (such as the Bob Marshall Wilderness Area)

Examples of outdoor recreation activities are:

- Hiking or trail running
- Backpacking
- Rock climbing outdoors
- Skiing or snowboarding, both at a resort or in the backcountry
- Kayaking, canoeing, or rafting on a river or lake
- Mountain biking
- Hunting or fishing
- Horseback riding or horse-packing

For this survey, outdoor recreation activities **do not** include:

- Soccer
 - Basketball
 - Football
 - Tennis
 - Golf
 - Other activities that take place outside but not on public wildlands
-

Two questionnaires were administered. Both questionnaires consisted of two elements: (1) recreation specialization items, and (2) the Dispositional Flow Scale. The first questionnaire, the **activity specific questionnaire**, measured specialization for a specific activity. Research subjects were asked to indicate the outdoor recreation activity they participate in the most. Specialization items on this questionnaire referred to this activity. The second questionnaire, the **general activity questionnaire**, measured a participant's level of specialization across all outdoor recreation activities. In answering the specialization items on this questionnaire, subjects were asked to take into account all outdoor recreation activities that they participate in. The remainder of the questionnaire appeared exactly the same for both versions. An equal number of questionnaires were administered. For each class, the first subject was randomly assigned a version of the questionnaire and then each subsequent subject was given alternating versions. Both forms of the questionnaire are included in Appendix 1.

Although the vast majority of previous studies have measured specialization in specific activities, in order to understand the influence that factors such as the disposition to experience flow have on level of specialization, it is necessary to measure specialization across activities. The reason is that a general activity measurement of specialization takes into account the possibility of being specialized in outdoor recreation in general, i.e. participating in multiple activities. A measure of level of specialization for any single activity for this kind of person would result in inaccurately low results. For example, a person participates regularly in three different outdoor recreation activities. They split their time between the three, participating roughly equally in each. A measure of the frequency of participation (an indicator of specialization) for any single activity

would yield about a third of their overall participation in outdoor recreation. A general activity measure of specialization provides a more accurate overall measure of specialization. This is important when testing the effects of factors, such as psychological traits, for their effect on an individual's level of specialization. In this study, the purpose of having both an activity specific measure of specialization and a general activity measurement is to confirm that the general activity measurement is valid and reliable.

The measurement items for specialization on both questionnaire versions consisted of three dimensions; (1) a focusing of behavior, (2) acquisition of skills and knowledge, and (3) commitment. This version of the construct of recreation specialization follows closely the re-conceptualization of specialization by Scott and Shafer (2001). In order to adhere as closely as possible to work that has previously been done, question items in this study were taken directly from Lee and Scott's (2004) study measuring birding specialization. In that study, the level of specialization for participants of the activity of birding was accessed using the previously mentioned three dimension construct. The authors developed question items that assessed each dimension and an overall flow construct with satisfactory reliability and validity (Lee & Scott, 2004).

Table 2 shows the question items that were employed by Lee and Scott's 2004 study on birdwatching.

Table 2. Dimensions and Question Items from Lee and Scott (2004).

Dimensions	Question Items
Behavior	1. How many trips have you taken that included bird watching as an activity in 2001? 2. How many days have you spent on birding trips in 2001?
Skill and knowledge	3. How many birds can you identify by sight without a field guide? 4. How many birds can you identify by sound? 5. Subjective level of skill (7 point scale from novice to expert)
Commitment (7 point scale from strongly disagree to strongly agree.)	6. Other leisure activities don't interest me as much as birding. 7. If I couldn't go birding, I'm not sure what I'd do. 8. If I stopped birding, I would probably lose touch with a lot of my friends. 9. I would rather go birding than do most anything else.

General Activity Questionnaire

To create the general activity questionnaire, a few modifications from Lee and Scott's question items were necessary. First, since the obvious focus of Lee and Scott's study was on birding and this version of the questionnaire focused on a variety of activities, we included a preliminary question to focus respondents' attention to the outdoor recreation activities that they participate in. This question asked respondents to list some of these activities. With their focus now on these activities, they were ready to answer the actual specialization items. To create the specialization items for the general activity questionnaire, each item from Table 2 was modified to exclude its original

reference to birdwatching and to include a reference to outdoor recreation activities as a whole. These modifications are listed in Table 3. The question items of the behavior and commitment dimensions remain as close to the original as possible. For the skill and knowledge dimension, questions 3 and 4 in Table 2 that address the subject's level of knowledge in birdwatching, were dropped because they are very specific to that activity. In their place, a single item was added to the general activity questionnaire to address level of knowledge in outdoor recreation activities (see Table 3).

Table 3. General Activity Questionnaire, Specialization Items.

Previous Question:	What are some of the outdoor recreation activities that you participate in?
Dimensions	Question Items
Behavior	<ol style="list-style-type: none"> 1. How many trips have you taken that included outdoor recreation activities in the last 12 months? 2. How many days have you spent on outdoor recreation activities in the last 12 months?
Skill and knowledge (7 point scale from novice to expert)	<ol style="list-style-type: none"> 3. How would you rate yourself in terms of knowledge of your outdoor recreation activities? 4. How would you rate your skill level in your outdoor recreation activities?
Commitment (7 point scale from strongly disagree to strongly agree.)	<ol style="list-style-type: none"> 6. Other leisure activities don't interest me as much as my outdoor recreation activities. 7. If I couldn't participate in outdoor recreation, I'm not sure what I'd do. 8. If I stopped participating in outdoor recreation, I would probably lose touch with a lot of my friends. 9. I would rather participate in outdoor recreation than do most anything else.

Activity Specific Questionnaire

The activity specific questionnaire assessed respondents' level of specialization for a single activity. To focus the respondent on a single activity, a preliminary question asked them to list the outdoor recreation activity that they participate in the most. With this activity in mind, respondents were then asked the specialization items listed in Table 4. The wording of the question items remained as close as possible to the general activity questionnaire.

Table 4. Activity Specific Questionnaire, Specialization Items

Previous question: What outdoor recreation activity do you participate in the most?	
Dimensions	Question Items
Behavior	<ol style="list-style-type: none"> 1. How many trips have you taken that included your activity in the last 12 months? 2. How many days have you spent on your activity in last 12 months?
Skill and knowledge (7 point scale from novice to expert)	<ol style="list-style-type: none"> 3. How would you rate yourself in terms of knowledge of your activity? 4. How would you rate your skill level in your activity?
Commitment (7 point scale from strongly disagree to strongly agree.)	<ol style="list-style-type: none"> 6. Other leisure activities do not interest me as much as my activity. 7. If I couldn't participate in my activity, I'm not sure what I'd do. 8. If I stopped participating in my activity, I would probably lose touch with a lot of my friends. 9. I would rather participate in my activity than do most anything else.

Dispositional Flow Scale

The second part of both questionnaires consisted of the Dispositional Flow Scale-2 (DFS-2) developed by Jackson and Eklund (1998, 2004). The question items are listed in Table 5. The DFS-2 consists of 36 items (4 for each for the nine dimensions of flow). Possible responses are a 1-5 Likert scale ranging from never to always. The nature of the DFS-2 requires participants to think of a single activity while answering the questions. To help respondents focus on a single activity, they were asked to write the outdoor recreation activity that they participate in the most at the beginning of the section. The DFS-2 question items were identical to those used Jackson and Eklund, in their (2004) Flow Scale Manual.

Table 5. Dispositional Flow Scale Question Items

Rating scale: (1 never, 2 rarely, 3 sometimes, 4 frequently, 5 always)

Questions by dimension:

Challenge/skill balance

I am challenged, but I believe my skills will allow me to meet the challenge.
 My abilities match the high challenge of the situation.
 I feel I am competent enough to meet the high demands of the situation.
 The challenge and my skills are at an equally high level.

Merging action and awareness

I make the correct movements without thinking about trying to do so.
 Things just seem to happen automatically.
 I perform automatically, without thinking too much.
 I do things spontaneously and automatically without having to think.

Clear goals

I know clearly what I want to do.
 I have a strong sense of what I want to do.
 I know what I want to achieve.
 My goals are clearly defined.

Unambiguous Feedback

It is really clear to me how my performance is going.
 I am aware of how well I am performing.
 I have a good idea while I am performing about how well I am doing.
 I can tell by the way I am performing how well I am doing.

Concentration on task at hand

My attention is focused entirely on what I am doing.
 It is no effort to keep my mind on what is happening.
 I have total concentration.
 I am completely focused on the task at hand.

Sense of control

I have a sense of control over what I am doing.
 I feel like I can control what I am doing.
 I have a feeling of total control.
 I feel in total control of my body.

Loss of self consciousness

I am not concerned with what others may be thinking of me.
 I am not concerned with how others may be evaluating me.
 I am not concerned with how I am presenting myself.
 I am not worried about what others may be thinking of me.

Transformation of time

Time seems to alter (either slows down or speeds up).
 The way time passes seems to be different from normal.
 It feels like time goes by quickly.
 I lose my normal awareness of time.

Autotelic experience

I really enjoy the experience.
 I love the feeling of the performance and want to capture it again.
 The experience leaves me feeling great.
 The experience is extremely rewarding.

Note. The DFS question items did not appear in this order on the questionnaire. Refer to Appendix 1 for the actual question ordering.

Statistical Procedure for Model Fit

Confirmatory factor analysis, a special application of structural equation modeling, was used to assess much of the data in this study. Within confirmatory factor analysis, researchers can specify which observed variables are affected by specific common factors prior to investigation (based on a-priori theory). The advantage of this procedure is that it can deal with latent variables. A latent variable is a variable that is not directly measurable. For example, specialization is a complicated construct that cannot hope to be measured directly by any one variable. It is in fact a single construct, but is made up of many observable variables. In structural equation modeling, not only can observed variables be explained by latent variables but latent variables can also be used to explain other latent variables. Confirmatory factor analysis is very helpful in assessing the reliability and validity of multidimensional constructs such as specialization or flow.

Hybrid models can also be employed that test the influence of one construct (observed and latent variables combined) on another construct. Relationships between dimensions of different constructs are also easily able to be assessed. These models are helpful in understanding the relationship between two complicated constructs such as specialization and flow.

The software package EQS version 6.1 was used for SEM analysis. This software package was used because at the time of the study, it was the best available for dealing with categorical variables and non-normal data. In all cases, the maximum likelihood method of estimation with robust correction was employed, and a correlation matrix of indicators was used for model identification. Maximum likelihood methods assume normally distributed and continuous data, and violations to these assumptions lead to an

increase in type one error (Kline, 1998). This study employs many Likert type scale items which are not continuous and rarely accurately approximate a normal distribution. In previous studies (e.g. Jackson & Eklund, 2002, 2004; Lee & Scott, 2004), these categorical variables were treated as continuous variables and fit indices were reported using the standard maximum likelihood method of estimation. Due to the violation of assumptions of maximum likelihood, it is likely that many of the results reported suffered from type 1 error. Version 6.1 of EQS offers a new way to deal with these violations through a “robust” option within the maximum likelihood method. This option employs the Sattora-Bentler scaled chi-square statistic which is robust to violations of normality (Bentler, 2004). All SEM results in this study are reported as the maximum likelihood results with the robust correction.

Several goodness of fit indices are produced by all SEM software packages. Following the previous work by Jackson and Eklund (2002, 2004), Lee and Scott (2004) and the recommendations by Hu and Bentler (1998), four goodness of fit indices were employed in this study. These were: chi-square, Bentler’s comparative fit index (CFI), the Bentler-Bonnett non-normed fit index (NNFI), and the root mean-square error of the approximation (RMSEA). The chi-square shows the most basic index and should be non-significant to support the best model fit. Chi-square should not be considered the absolute standard fit index due to its sensitivity to sample size. Rather, the ratio of X^2/df is a better measure of fit between models. Good fit is considered to occur when X^2/df ratio values are less than 3 for sample sizes of 200 or more (Kline, 1998). CFI indicates the portion in the improvement of the overall fit of the researcher’s model to a null model. NNFI is an index that adjusts the overall portion of explained variance for model complexity.

RMSEA indicates a summary of the difference between the observed and model implied covariance. CFI, NNFI, and RMSEA have values ranging from 0 to 1.0. CFI and NNFI values of at least .9 indicate acceptable fit, while values of at least .96 indicate good fit. RMSEA values of less than .05 are also considered good fit (Hu & Bentler, 1998; Kline, 1998).

Reliability and regression analyses were run with the Statistical Package for Social Sciences (SPSS) version 10.0. Cronbach's alpha was used to assess the internal consistency reliability of the question items for each dimension. Alphas above .60 indicate sufficient reliability (Churchill, 1979). A simple linear regression was run with the overall DFS score as the independent variable and the overall specialization score as the dependent variable.

CHAPTER FOUR: ANALYSIS AND RESULTS

Once all the data was collected, several procedures were employed. In order to assess the influence of the dispositional flow scale on level of specialization (hypothesis 3), several preliminary steps were necessary. The first step was to assess the differences in the two questionnaire versions. The next step was to assess the reliability and validity of the flow scale for this population (hypothesis 1). Another preliminary step was to establish the reliability and validity of the general activity measure of specialization (hypothesis 2). Once these preliminary steps were completed, the relationship between the dispositional flow scale and the general activity measure of specialization was determined.

Overall a total of 441 questionnaires were completed, 112 from Psychology, 174 from the Health and Human Performance department, and 155 from the College of Forestry and Conservation. The means and standard deviations of each question item are included in Appendix 2. Both questionnaires asked respondents to indicate how many outdoor recreation activities that they participate in. The responses ranged from 0 to 20 with a mean of 5.0 and standard deviation of 2.7.

The general activity questionnaire asked respondents to list some of the outdoor recreation activities that they participate in. Hiking and backpacking, by far, were the most listed activities. Among the other activities listed, rough groupings were apparent. Each had fairly equal numbers. These were; (1) water sports such as kayaking, rafting, and canoeing, (2) snow sports such as skiing and snowboarding, (3) hunting and fishing, and (4) mountain biking. Other activities that showed large numbers were; trail running, horseback riding, rock climbing/mountaineering, and frisbee golf.

The activity specific questionnaire asked respondents to indicate the outdoor recreation activity that they participate in the most. Hiking, again, was the most listed activity. Trail running was also a frequent response. The four categories of activities listed above were also apparent in the responses to this question.

Difference in Versions of Questionnaire

One of the first assessments of the data was the similarities and differences between the general activity and the activity specific versions of the questionnaire. First, independent item t-tests were employed to assess if the item means were different for each questionnaire version. All specialization items were significant at the .01 level, indicating that there was a difference in item means for the two versions. No flow scale items were significant at the .05 level, indicating that the item means for the flow questions were not different between the versions. Item means for the specialization items in the two versions of the questionnaire are shown in Table 6. It would seem obvious that the number of days and trips would be less for the activity specific version. When limited to a single activity we would expect people to report a smaller number than when considering outdoor recreation as a whole. The reasons for differences in the other items are less obvious but results indicate that the different versions of the specialization items tap into different measures of specialization.

Second, Kolmogorov-Smirnov Z tests were employed to see if items from the two versions came from the same distribution. Rather than just testing the differences in means, this test is sensitive to any type of difference in distributions including shape and location. Again, all specialization items were significant at the .05 level, indicating that

the two versions of specialization measures had different distributions. No flow scale items were significant at the .05 level indicating that the flow scales in the two versions did not have different distributions.

In summary, both the means and variances of the specialization items were different for the two versions. These results are signs that the different specialization scales did measure different constructs. This result was expected, as the question items were different for each version. Also, both the means and variances for the flow scale items were not different, lending suggestion that the version of the questionnaire made no difference in responses to the flow scale. Again, this result is expected since the flow scale appeared exactly the same between the two versions of the questionnaire.

Table 6. Specialization Item Means for Each Version of Questionnaire

Item	Version of questionnaire	
	General	Activity specific
Number of days	75.5*	58.7
Number of trips	15.7*	10.4
Other leisure activities do not interest me as much as (activity).	3.9*	3.2
I would rather participate in (activity) than do most anything else.	4.8*	3.8
If I couldn't participate in (activity), I'm not sure what I'd do.	4.1*	3.0
If I stopped participating in (activity), I would probably lose touch with a lot of my friends.	3.3*	2.3
Subjective knowledge level in (activity)	4.6	5.1*
Subjective skill level in (activity)	4.5	5.0*

Note. The word "activity" has been included here in place of the words "outdoor recreation activities" in the general activity version and in place of the words "your activity" in the activity specific version.

*p<.01

Hypothesis 1:

The purpose of this hypothesis was to determine if the Dispositional Flow Scale was valid and reliable when applied to this population. Although the version of DFS used in this study was developed to be applicable to all activities, little testing had been done on its reliability and validity for a sample of outdoor recreation activities. Whitmore and Borrie (2005) applied the DFS to sample of 297 visitors to the Bob Marshall Wilderness Complex and found satisfactory fit of the DFS model to the primary reported activities of hiking, horseback riding, and fishing. This result lent support to the application of the DFS to a broad range of outdoor recreation activities, but the variety of activities sampled in the Bob Marshall Wilderness was fairly limited. The present study was the first time that the DFS was administered to a sample comprised of a wide variety of outdoor recreation activities.

Since none of the flow questions showed significant differences between versions of the questionnaire, all cases were included in the analysis (N=441). Recall that flow is theorized to consist of nine dimensions. The first step in establishing the reliability of the DFS was to assess the composite reliability or coefficient alphas for each dimension indicating the consistency of the indicators in measuring their respective latent variable (dimension). Shown in Table 7, the coefficient alphas for each dimension ranged between .78 and .90 with a mean alpha of .85. Alphas above .60 indicate sufficient internal consistency reliability (Churchill, 1979), thus these nine dimensions are found to have very good reliability.

Table 7. Coefficient Alphas for the Dispositional Flow Scale Dimensions

Dimension	Coefficient alpha
Challenge – Skill Balance	.78
Merging of Action and Awareness	.84
Clear Goals	.81
Unambiguous Feedback	.86
Concentration on the Task at Hand	.85
Sense of Control	.86
Loss of Self Consciousness	.90
Transformation of Time	.88
Autotelic Experience	.84

Note. n = 441, each factor was comprised of four question items.

The validity of the DFS in this study was assessed by two models in confirmatory factor analysis. The first model, the first order factor model (Figure 4), tests that the question items load satisfactorily into their intended dimensions and that the dimensions are independent and homogeneous. The second model, the higher order factor model (Figure 5), tests that the dimensions contribute to a higher order factor, flow. In both models, rectangular boxes represent observed variables. Labels inside the boxes, such as “DFS 1”, indicate the item number. Ovals represent latent variables or factors. Labels inside the ovals, such as “F1”, identify the factors.

In the case of the first order factor model, straight arrows point from the latent variables to the observed variables. The direction of the arrows means that the observed variables can be explained by the latent variables. The values for each straight arrow can be interpreted as a factor loading, or the variance in the factor explained by the observed variable. These values are listed in Table 8. The variance that is not explained by that

relationship (error) is represented by the letter “E”, and appear on the right most column of the model. Curved, double ended arrows represent correlations. In this case, all possible combinations of correlations between the factors are represented.

In the higher order factor model, the symbols are the same. Notice the addition of the second, higher order factor, flow. Straight arrows from flow to each on the nine first order factors indicate that each of the nine factors can be explained by a single overriding factor, flow. These values of these arrows can be interpreted as a structure loading, or the variance in the overall factor explained by the first order factors. The values are listed in Table 11. The error or disturbance in these relationships are represented by the letter “D”.

Label Key:

F1= Balance

F2= Merging

F3= Goals

F4= Feedback

F5= Concentration

F6= Control

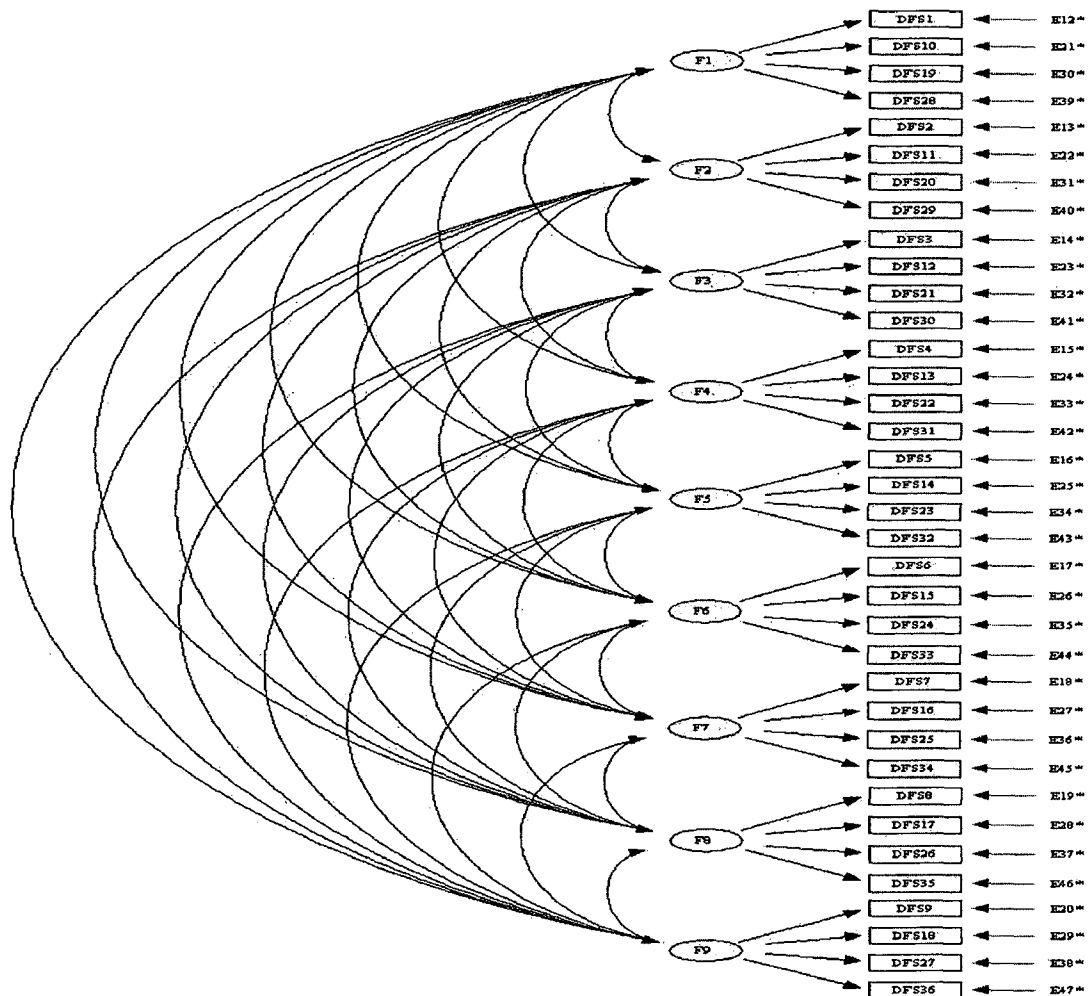
F7= Consciousness

F8= Time

F9= Autotelic

DFS 1-36 = Question item numbers

E = Error terms for each item

**Symbol Key:**

Rectangles = observed variables

Ovals = latent variables (factors)

Curved arrows = correlations between factors

Straight arrows from ovals to rectangles = factor loadings

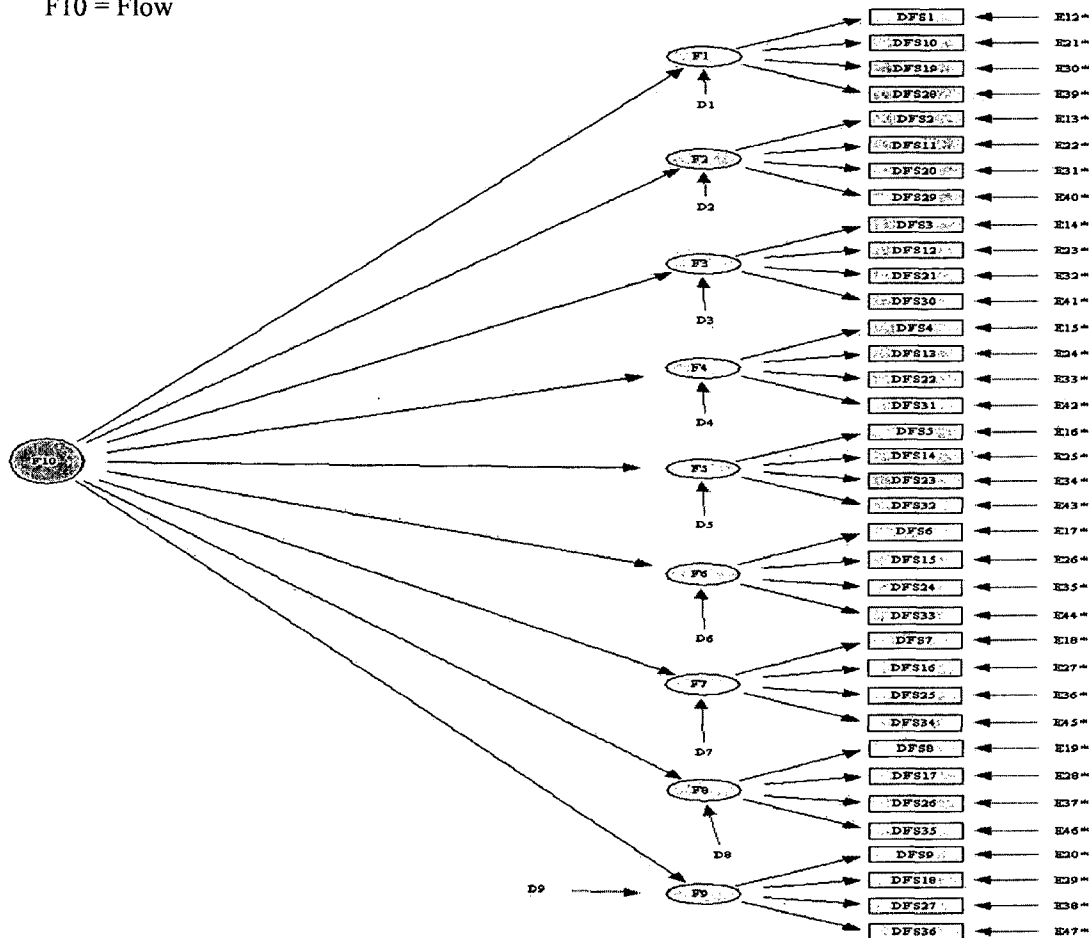
Straight arrows from error terms to observed variables = amount of variance in the question item not explained by the factor.

Figure 4. First Order Factor Model, Dispositional Flow Scale.

Label Key:

- F1= Balance
- F2= Merging
- F3= Goals
- F4= Feedback
- F5= Concentration
- F6= Control
- F7= Consciousness
- F8= Time
- F9= Autotelic
- F10 = Flow

- DFS 1-36 = Question item numbers
- E = Error terms for each item
- D= Disturbance or Error terms for each factor



Symbol Key:

- Rectangles = observed variables
- Ovals = latent variables (factors)
- Curved arrows = correlations between factors
- Straight arrows from ovals to rectangles = factor loadings
- Straight arrows from error terms to observed variables = amount of variance in the question item not explained by the factor.
- Straight arrows from disturbance terms to factors = amount of variance in the factor not explained by the overall factor - flow

Figure 5. Higher Order Factor Model, Dispositional Flow Scale

With regard to the first order factor model, evidence suggests that all items load well on the factors they are intended to define. Factor loadings are represented on the model as the straight arrows from the latent variables to the observed variables. Loadings were between .65 and .90 with a mean factor loading of .77 (see Table 8). The independence of the nine dimensions was evaluated via examination of the correlations among the dimensions (curved double ended arrows). These intercorrelations ranged from .16 to .77 with a mean of .49 (see Table 9). The magnitude of these relationships indicates that most factors share a common variance. This should be expected given that all factors were developed to measure aspects of a more global flow experience. Overall, the common variance between subscales tends to be less than 50% so it seems reasonable to believe that the flow subscales tap into reasonably unique aspects of the flow experience. Overall, the goodness of fit indices (Table 10) point to good fit of the first order model to the data (ratio of chi-square to *df* of 1.5, CFI of .966, NNFI of .961, and RMSEA of .03). This reinforces that each item does load well into its intended factor and that the factors measure relatively independent aspects of flow.

The higher order factor model tests that the dimensions of flow contribute to a more global construct, flow. The goodness of fit indices (Table 10) point to a good fit between the higher order factor model and the data (ratio of chi-square to *df* of 1.6, CFI of .954, NNFI of .950, and RMSEA of .04). This suggests that an overall flow construct does exist and that each flow dimension contributes to it. The structural loadings of each dimension to the higher flow factor ranged between .37 and .89 with a mean of .70 (Table 11). These values represent the strength of the contribution of each dimension to the overall flow construct.

Taken together, these results indicate that the DFS is valid and reliable for this sample population. The fit indices for both models demonstrate good fit, indicating that the scale is a valid way of measuring the flow construct. The scale elicited internally consistent responses and hence has desirable reliability properties. All indications are that the DFS is a valid and reliable tool ready to help explain other variables.

Table 8. Factor Loadings for the Dispositional Flow Scale.

Item	Factor	Factor loading
01	F1 – Balance	.66
10	F1 – Balance	.77
19	F1 – Balance	.77
28	F1 – Balance	.75
02	F2 – Merging	.67
11	F2 – Merging	.74
20	F2 – Merging	.85
29	F2 – Merging	.78
03	F3 – Goals	.68
12	F3 – Goals	.78
21	F3 – Goals	.71
30	F3 – Goals	.69
04	F4 – Feedback	.74
13	F4 – Feedback	.74
22	F4 – Feedback	.84
31	F4 – Feedback	.81
05	F5 – Concentration	.74
14	F5 – Concentration	.65
23	F5 – Concentration	.83
32	F5 – Concentration	.86
06	F6 – Control	.74
15	F6 – Control	.80
24	F6 – Control	.78
33	F6 – Control	.77
07	F7 – Consciousness	.81
16	F7 – Consciousness	.84
25	F7 – Consciousness	.81
34	F7 – Consciousness	.90
08	F8 – Time	.82
17	F8 – Time	.85
26	F8 – Time	.68
35	F8 – Time	.86
09	F9 – Autotelic	.69
18	F9 – Autotelic	.66
27	F9 – Autotelic	.82
36	F9 – Autotelic	.85

Note. Factor loadings were calculated using EQS version 6.1. These values are represented in the first order factor model (Figure 4) by straight arrows from the factors to each observed variable.

Table 9. Correlations Among Factors, Dispositional Flow Scale.

Factor	F1	F2	F3	F4	F5	F6	F7	F8	F9
F1	1.000								
F2	.771	1.000							
F3	.725	.660	1.000						
F4	.748	.616	.766	1.000					
F5	.600	.413	.698	.592	1.000				
F6	.699	.642	.692	.661	.597	1.000			
F7	.341	.344	.404	.225	.324	.410	1.000		
F8	.349	.389	.222	.283	.272	.160	.213	1.000	
F9	.562	.434	.548	.445	.494	.433	.298	.482	1.000

Note. Correlations were calculated using EQS version 6.1. These values are represented in the first order factor model (Figure 4) by the curved arrows between factors.

Table 10. Goodness of Fit Indices for the Dispositional Flow Scale

Model	n	X^2	<i>df</i>	X^2/df	CFI	NNFI	RMSEA
First order factor model	441	808.6	549	1.5	.966	.961	.03
Higher order factor model	441	940.1	575	1.6	.954	.950	.04

Note. Results were calculated using EQS version 6.1, maximum likelihood method with robust corrections. The chi-square reported is the Sattora – Bentler scaled chi-square statistic.

Table 11. Structural Loadings for the Dispositional Flow Scale

1 st Order Factor	Higher Order Factor	Loading
F1- Balance	F10 – Flow	.89
F2- Merging	F10 – Flow	.77
F3- Goals	F10 – Flow	.88
F4- Feedback	F10 – Flow	.82
F5- Concentration	F10 – Flow	.71
F6- Control	F10 – Flow	.80
F7- Consciousness	F10 – Flow	.42
F8- Time	F10 – Flow	.37
F9- Autotelic	F10 – Flow	.61

Note. Structure loadings were calculated using EQS version 6.1. These values are represented in the higher order factor model (Figure 5) by the straight arrows from the overall flow factor to each of the first order factors.

Hypothesis 2:

The goal of this hypothesis was to establish that a measure of specialization which takes into account all outdoor recreation activities that a person participates in was valid and reliable. To accomplish this task, two versions of the questionnaire were employed. The activity specific questionnaire measured a respondent's level of specialization for the outdoor recreation activity that they participated in the most. The general activity questionnaire measured a respondent's level of specialization for all outdoor recreation activities that they participate in. The purpose of administering the activity specific questionnaire was to establish that the overall specialization scale used was valid and reliable for the population sampled and to compare the activity specific version to the general activity version. Past research that used this scale measured specialization for a single activity. We wanted to eliminate the possibility that differences in population or

item wording unfairly contributed to validity and reliability of the general activity questionnaire.

Since all specialization item means were significantly different, it is reasonable to assume that the two versions of the questionnaire measure different constructs of specialization. Roughly equal numbers of the questionnaire versions were administered (223 activity specific, 218 general activity). The first step in establishing the reliability of both of the questionnaire versions was to assess the composite reliability or coefficient alphas for each dimension indicating the consistency of the indicators in measuring their respective latent variable (dimension). Shown in Table 12, the coefficient alphas for each of the dimensions of the activity specific questionnaire were .41, .88 and .72. The alphas for the general activity questionnaire were .61, .90, and .76. It is interesting to note the improvement of the behavior dimension for the general activity version. On average, respondents reported more number of days participation and number of trips on the general activity questionnaire, and the reliability coefficients indicate that the general activity questionnaire generated more internal consistency among answers to that dimension. Overall, the reliability coefficients for the general activity questionnaire suggest satisfactory reliability and an improvement over the activity specific questionnaire.

Table 12. Coefficient Alphas for Specialization Scales

Dimension	Version	
	Activity specific	General activity
Behavior	.41	.61
Skill and Knowledge	.88	.90
Commitment	.72	.76

Similar to the DFS, the validity of the specialization scales was assessed via two models, both a first order factor model (Figure 6) and a higher order factor model (Figure 7). In both models, the rectangular boxes represent the observed variables. Labels such as “Q3” represent the item number in the questionnaire. Ovals represent latent variables or factors. Labels such as “F1” represent the factor names. In the first order factor model, factor loadings for the activity specific questionnaire were between .44 and .91 with a mean of .66 (see Table 13). Factor Loadings for the general activity questionnaire were between .59 and .98 with a mean of .74. Again, notice the slight improvement of the factor loadings of the general activity version over the activity specific version, indicating that the items on the general activity version do a better job of explaining the factors they are meant to measure.

The independence of the three dimensions was also evaluated via examination of the correlations among the dimensions. These intercorrelations were .43, .62, and .41 for

the activity specific questionnaire and .59, .50, and .60 for the general activity questionnaire (see Table 14).

Overall, the fit indices for the first order factor model of the specialization scales showed good fit for both versions. The activity specific version had a chi-square to *df* ratio of 1.7, CFI of .960, NNFI of .919, and RMSEA of .06. The general activity version demonstrated better fit with a chi-square to *df* ratio of 1.04, CFI of .999, NNFI of .997, and RMSEA of .01 (see Table 15). These results indicate that for both versions, the dimensions used are valid measures of the specialization construct. It is interesting to note that the general activity version demonstrated a noticeable better fit of the model to the data. Hu and Bentler (1998) suggested that values of the NNFI and CFI that are over .98 indicate extremely good fit.

The higher order factor model was also tested for both versions of the questionnaire to assess the presence of a higher order factor of specialization and that each dimension contributes to the overall construct. The structural loadings for how each dimension loaded into the higher order specialization factor were .81, .53, and .77 for the activity specific questionnaire and .71, .84, and .72 for the general activity questionnaire (see Table 16). The fit indices for the higher order factor model of specialization showed only marginal fit for the activity specific version with a chi-square to *df* ratio of 2.3, CFI of .927, NNFI of .843, and RMSEA of .08 (see Table 15). Again, the indices for the general activity version were noticeably better than the activity specific version and point to extremely good fit of the model to the data with a chi-square to *df* ratio of 1.02, CFI of .999, NNFI of .999 and RMSEA of .01.

Taken all together, these results indicate that the activity specific measure of specialization was valid and reliable for this population. More importantly, the general activity measure of specialization was also valid and reliable and in many ways a better measure of the theorized specialization construct. This suggests the usefulness of the general activity version in assessing the influence of other factors on a person's overall level of specialization in outdoor recreation activities.

Label key:

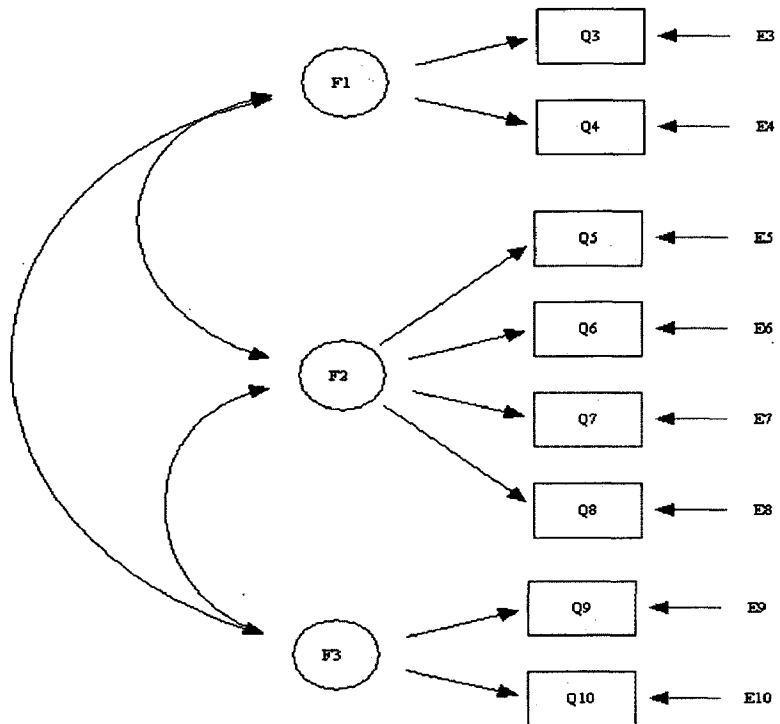
F1= Behavior

F2= Commitment

F3= Skill and Knowledge

Q3-10= Question item number

E = Error terms for each item

**Symbol Key:**

Rectangles = observed variables

Ovals = latent variables (factors)

Curved arrows = correlations between factors

Straight arrows from ovals to rectangles = factor loadings

Straight arrows from error terms to observed variables = amount of variance in the question item not explained by the factor.

Figure 6. First Order Factor Model for Specialization

Label key:

F1= Behavior

F2= Commitment

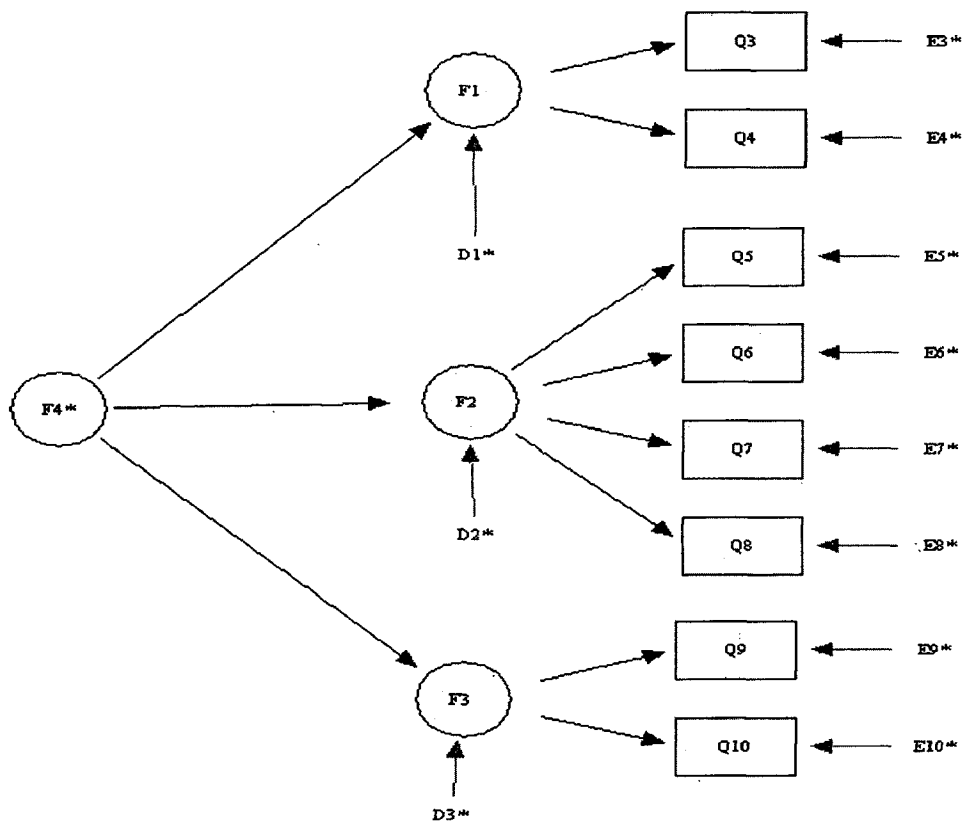
F3= Skill and Knowledge

F4= Specialization

Q3-10= Question item number

E = Error terms for each item

D = Disturbance (error) terms for each factor

**Symbol Key:**

Rectangles = observed variables

Ovals = latent variables (factors)

Curved arrows = correlations between factors

Straight arrows from ovals to rectangles = factor loadings

Straight arrows from error terms to observed variables = amount of variance in the question item not explained by the factor.

Straight arrows from disturbance terms to factors = amount of variance in the factor not explained by the overall factor – specialization

Figure 7. Higher Order Factor Model for Specialization

Table 13. Factor Loadings for the Specialization Scales.

Item	Factor	Version	
		Activity specific	General activity
03	F1 – Behavior	.51	.71
04	F1 – Behavior	.51	.59
05	F2 – Commitment	.72	.69
06	F2 – Commitment	.86	.85
07	F2 – Commitment	.47	.59
08	F2 – Commitment	.44	.64
09	F3 – Skill and Knowledge	.91	.98
10	F3 – Skill and Knowledge	.86	.88

Note. Factor loadings were calculated using EQS version 6.1. These values are represented in the first order factor model (Figure 6) by the straight arrows from factors to each observed variable.

Table 14. Correlations Among Factors, Specialization Scales.

	Version					
	Activity specific			General activity		
	F1	F2	F3	F1	F2	F3
F1	1.000			1.000		
F2	.429	1.000		.593	1.000	
F3	.620	.409	1.000	.505	.601	1.000

Note. Correlations were calculated using EQS version 6.1. These values are represented in the first order factor model (Figure 7) by the curved arrows between factors.

Table 15. Goodness of Fit Indices for the Specialization Scales.

First order factor model							
Version	n	X ²	df	X ² /df	CFI	NNFI	RMSEA
Activity specific	223	24.4	14	1.7	.960	.919	.06
General activity	218	14.6	14	1.04	.999	.997	.01

Higher order factor model							
Version	n	X ²	df	X ² /df	CFI	NNFI	RMSEA
Activity specific	223	30.3	13	2.3	.927	.843	.08
General activity	218	13.3	13	1.02	.999	.999	.01

Note. Results were calculated using EQS version 6.1, maximum likelihood method with robust corrections. The chi-square reported is the Sattora – Bentler scaled chi-square statistic.

Table 16. Structural Loadings for the Specialization Scales.

1 st Order Factor	Higher Order Factor	Version	
		Activity Specific	General activity
F1- Behavior	F4 – Specialization	.81	.71
F2- Commitment	F4 – Specialization	.53	.84
F3- Skill and Knowledge	F4 – Specialization	.77	.72

Note. Structure loadings were calculated using EQS version 6.1. These values are represented in the higher order factor model (Figure 7) by straight arrows from the overall factor – specialization to each first order factor.

Hypothesis 3:

Since the validity and reliability of both the dispositional flow scale and the general activity measure of specialization were previously established, an exploration of the relationship between these constructs was able to be conducted. This relationship was conducted in two ways. The first was via a simple linear regression using an overall DFS score as an independent variable to predict an overall specialization score. This process has its advantages in establishing a simple relationship between the two variables but has the disadvantage of removing some of the dimensionality of each construct. To address this issue, each overall score was calculated as a weighted sum of dimension averages. Dimension averages were weighted by their structure loading in the previous confirmatory factor analysis. Finally, structure equation modeling was also used to evaluate the relationship of the constructs with the dimensions in place, maintaining their full presence in the overall model.

In order to run a simple linear regression, a single overall score was derived for each respondent on both the DFS and the specialization scale. For the DFS, Jackson and Eklund (2004) addressed the options of creating (1) subscale scores based on the dimensions of flow or (2) using a single total scale score when applying the results of the DFS to other variables. On this subject they comment, "...the global approach has received satisfactory psychometric support overall, and there may be instances where a single, global assessment of flow is the information required by users of the scale" (p. 17-18). Given that the higher order factor model of the DFS showed good fit for the presence

of a single higher order factor, it seems plausible that a single overall score would represent the construct well. In the higher order factor model, each dimension had different influences on the overall factor. This suggests that to arrive at an accurate overall score, dimension scores should be weighted by their structure loadings from the model.

A single specialization score has most often used in past research when assessing the relationship of specialization with other variables (e.g. Wellman et al., 1982; Williams & Huffman, 1986; Virden & Schreyer, 1988; Donnelly et al., 1986; and Bricker & Kerstetter, 2000). Traditionally this has been done through an additive approach whereby each variable has an equal influence on the overall specialization score. Both this study and the Lee and Scott (2004) study showed support for a multidimensional approach to the construct. Fit indices in both studies also support an overall factor presence with each dimension contributing differently to the overall factor. Again, this suggests that an overall score for specialization is plausible and that it should be derived by weighting scores by dimension structure loadings.

Once weighted scores were derived for both scales, a check was done to see if the scores were normally distributed, an assumption of linear regression. The overall flow scores (Table 17) ranged from 15.3 to 31.6 with a mean of 24.8 and standard deviation of 2.9. The overall specialization scores ranged from 4.6 to 195.4 with a mean of 37.5 and a standard deviation of 24.8. An expected normality plot showed close adherence to the diagonal for the flow scores (Figure 8), but for the specialization scores, too many cases were above the diagonal at high and low values (Figure 9). This deviation from the expected normality plot suggests patterns of skewness and kurtosis. Kolmogorov –

Smirnov tests also confirmed that that the flow scores satisfactorily fit a normal distribution while the specialization scores did not (Table 18). Skewness and kurtosis statistics revealed that the specialization scores were both highly peaked and positively skewed. Data transformation literature suggests to correct for failure of normality and that data can be transformed based on the characteristics of the original data distribution. Because the original distribution was substantially positively skewed, a natural log transformation was performed (Tabachnick & Fidell, 1996). The transformed specialization scores were then verified for adherence to a normal distribution. Both the expected normality plot (Figure 10) and the Kolmogorov – Smirnov tests (Table 18) confirmed a close fit of the transformed data to a normal distribution.

The next step was to run a simple linear regression with the log transformed specialization score as the dependant variable and the flow score as the independent variable (since the DFS, as a trait, is thought to influence level of specialization). The initial regression indicated that several cases were outliers. Hair et al. (1998) recommends identifying outliers by examining the standardized residuals of each case. “With a fairly large sample size (50 or above), standardized residuals approximately follow the t distribution, such that residuals exceeding the threshold of 1.96 (the critical t value at the .05 confidence level) can be deemed statistically significant. Observations falling outside the threshold are statistically significant in their difference from 0 and can be considered outliers” (p223). Cases deemed as outliers using these criteria (7 in total) were deleted and the regression was re-assessed.

The results of the regression appear in Table 19. The Pearson correlation between the two variables was .345 with a highly significant p value of less than 0.0005,

indicating that there is a positive linear relationship between the variables. The R^2 value is .119 and can be interpreted as the proportion of the total variation in specialization accounted for by flow (flow explains 12% of the variability of specialization). The F statistic (26.981, $p < 0.0005$) also indicates that the independent variable helps explain the variation in the dependent variable (the slope of the regression is not 0). Taken together, these results suggest that flow has a moderate but detectable influence on specialization.

Table 17. Overall Respondent Scores for Specialization and Flow.

	Minimum	Maximum	Mean	Standard deviation
Flow	15.3	31.9	24.8	2.9
Specialization	4.6	195.4	37.5	24.8

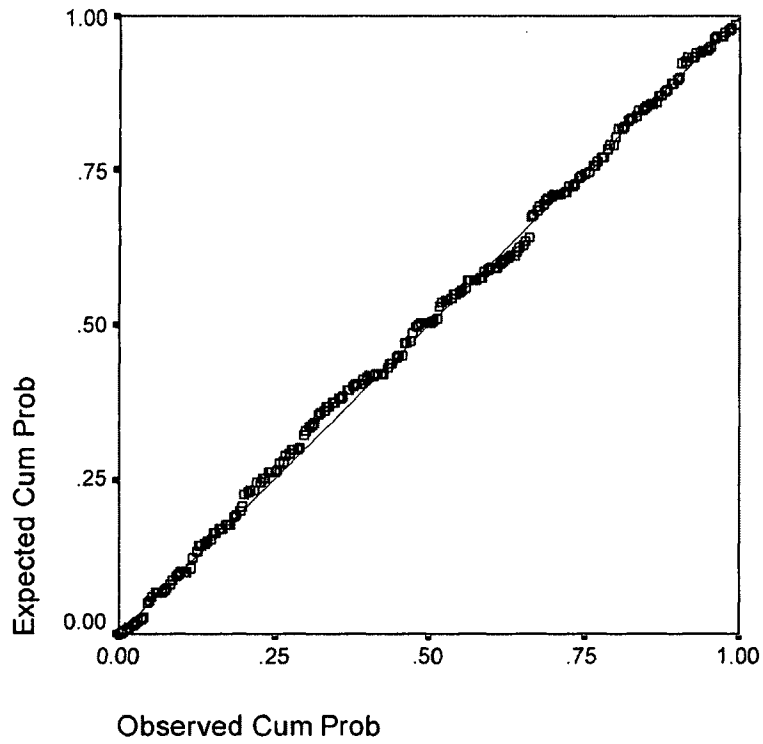


Figure 8. Expected Normality Plot for the Overall Flow Score.

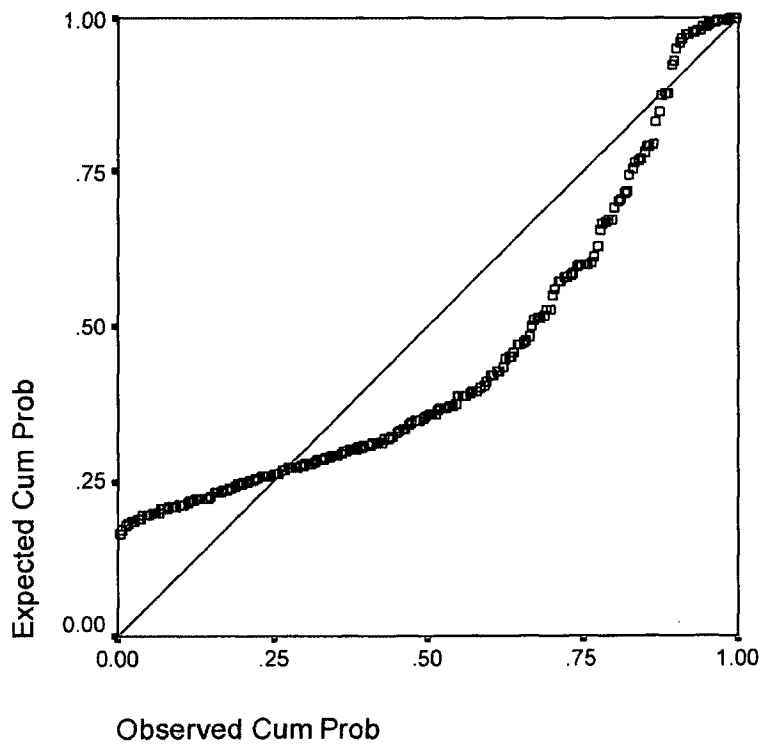


Figure 9. Expected Normality Plot for Overall Specialization Score

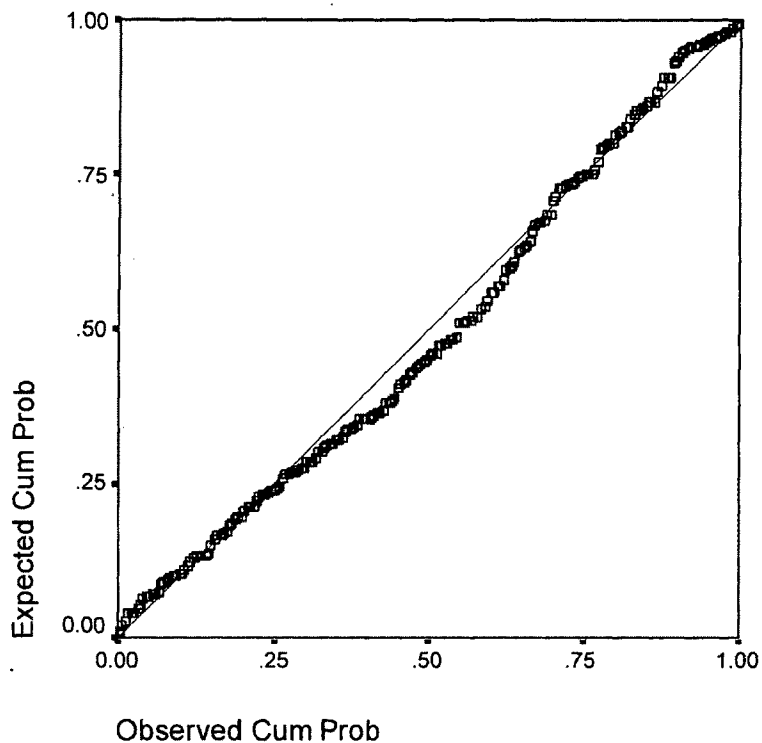


Figure 10. Expected Normality Plot for Log Transformed Specialization Score

Table 18. Kolmogorov – Smirnov Tests for Normality

Scale	Significance Value
Overall flow score	.926 ^a
Overall specialization score	.000
Log transformed overall specialization score	.385 ^a

Note. Significance values less than .05 indicate poor adherence to the normal distribution.

^a distributions approximate the normal distribution

Table 19. Regression of Flow on Specialization

R	.345				
R ²	.119				
Adjusted R ²	.114				
Standard error of the estimate	.699				
<i>Analysis of Variance</i>					
	Sum of Squares	df	Mean Square	F Ratio	sig.
Regression	13.172	1	13.172	26.981	.000
Residual	97.635	200	.488		
Total	110.807	201			
<i>Coefficients</i>					
	Coefficient	Standard Error of Coefficient	Standardized Regression Coefficient	Patial <i>t</i> value	sig.
Constant	1.101	.419		2.630	.009
Flow score	.087	.017	.345	5.194	.000

The relationship of flow and specialization was also evaluated in structural equation modeling. To create the model that would test this relationship, the higher order factor models of both constructs were combined (see Figure 9). A path was added between the overall specialization score and the overall flow score to test the influence of the entire flow construct on specialization. The fit indices (Table 20), suggest good fit of this model to the data with a chi-square to df ratio of 1.3, CFI of .940, NNFI of .935, and RMSEA of .04. This indicates that this overall model combining specialization and flow did fit the data well.

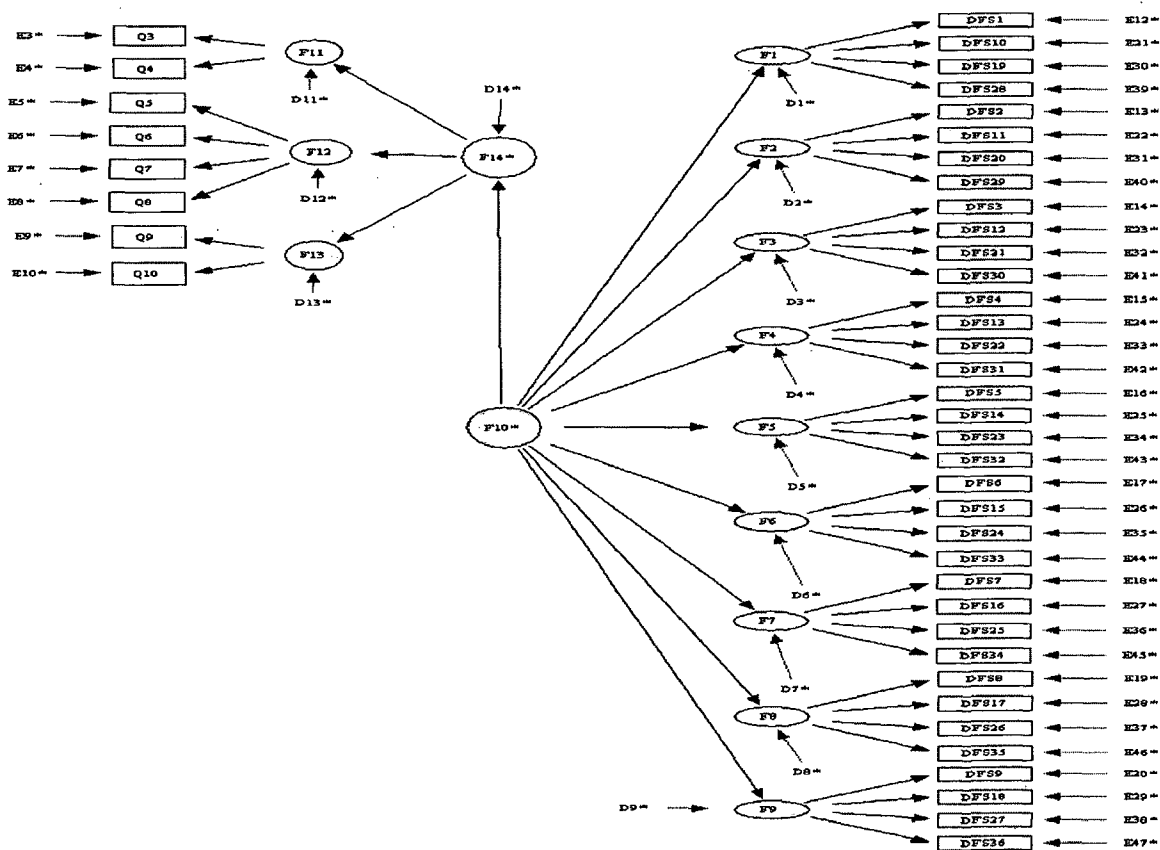
The standardized path coefficient between the entire flow model and the entire specialization model (arrow between the higher order flow factor and the higher order specialization factor) was .64. This value can be interpreted as the variance in specialization explained by flow. The meaning of this value is essentially the same as Pearson's correlation coefficient assessed in the regression model in this study. When we square the value of this path coefficient we get .41, and can say that 41% of the variance in specialization is explained by flow. With respect to the magnitude of standardized path coefficients in structural equation modeling, Cohen (1988) suggests that for the social sciences, absolute values less than .10 may indicate a "small" effect; values around .30 a "medium" effect; and "large" effects may be suggested by coefficients with absolute values of .50 or more. Hence, the value of .64 indicates that flow has a "large" effect on specialization.

It is interesting to observe the relative improvement in percent variance of specialization explained by flow from the structural equation model compared to the simple linear regression assessment (.41 vs .12). Although both results support a linear relationship between the constructs, an explanation of difference in values is warranted. In order to run a simple linear regression, a subjective method of combining the observed variables into an overall score for each construct was used. This method was based on an 'a priori' theory to account for the differing contribution of the observed variables to the overall score. The advantage of structural equation modeling is that the inclusion of the observed variables, the first order latent variables, and the single higher order latent variable in the model ensures an objective method of assessing more accurately the differing contributions of the variables. Essentially, the structural equation modeling

method is much more complex and yields a more accurate value for the overall relationship between the constructs. Hence, an improvement in the strength of the relationship between flow and specialization from structural equation modeling is expected in this case.

Label Key:

- | | |
|-------------------|----------------------------------------------|
| F1= Balance | F11= Behavior |
| F2= Merging | F12= Commitment |
| F3= Goals | F13= Skill and Knowledge |
| F4= Feedback | F14= Specialization |
| F5= Concentration | |
| F6= Control | Q 3-10= Specialization question item numbers |
| F7= Consciousness | DFS 1-36 = DFS question item numbers |
| F8= Time | E = Error terms for each item |
| F9= Autotelic | D= Disturbance or Error terms for |
| F10 = Flow | each factor |



Symbol Key:

- Rectangles = observed variables
- Ovals = latent variables (factors)
- Curved arrows = correlations between factors
- Straight arrows from ovals to rectangles = factor loadings
- Straight arrows from error terms to observed variables = amount of variance in the question item not explained by the factor.
- Straight arrows from disturbance terms to factors = amount of variance in the factor not explained by the overall factor – specialization
- Straight arrow connecting overall flow and specialization factors = the amount of variance in specialization explained by flow

Figure 11. Relationship Between Flow and Specialization Models

Table 20. Goodness of Fit Indices for the Combination Model of Flow and Specialization.

Model	n	X^2	<i>df</i>	X^2/df	CFI	NNFI	RMSEA
Combo flow-specialization	248	1157.8	875	1.3	.940	.935	.04

Note. Results were calculated using EQS version 6.1, maximum likelihood method with robust corrections. The chi-square reported is the Sattora – Bentler scaled chi-square statistic.

CHAPTER FIVE: DISCUSSION

Summary of Results

The central purpose of this study was to examine the influence of a psychological trait, the disposition to experience flow, on a person's level of recreation specialization. To that end, the data provided evidence of a positive linear relationship between the two constructs. In fact, structural equation modeling suggests that flow accounted for 41% of the variation in specialization in this sample. This is an important contribution in light of recent criticism and proposed reconceptualization of the recreation specialization construct. Previously, it was assumed that the level of specialization had a linear relationship with time. The longer that a person participated in an activity the more specialized it was assumed they would become. This essentially meant that all people were progressing equally along the specialization spectrum and that given enough time, all people would achieve the highest levels of specialization. As a result, past measures of specialization relied heavily on the length of time that a person had participated in the activity (i.e. EUH). Several researchers (Scott & Schaffer, 2001; Kuentzel & McDonald, 1992; Kuentzel, 2001) challenged this assumption. They identified that a person's progression through levels of specialization is influenced by many factors and that people stop their progression at different points in time or even become less specialized over time. Scott and Shaffer (2001) proposed that a more accurate measure of specialization would not include the length of time of involvement in the activity. More importantly

they called for future research to examine the factors that influence a person's progression through the specialization spectrum. For instance, why do certain people progress to the highest levels of specialization while others do not? Results from this study suggest that the propensity to experience flow is a factor that helps answer this question. The greater a person's disposition to experience flow, the higher their level of specialization is likely to be.

The linear relationship between the disposition to experience flow and level of specialization is likely to be caused in two ways. The first deals with reinforcement theory. A person's continued involvement in an activity somewhat depends on the rewards that they receive through the activity (Scott & Shaffer, 2001). Flow is an intrinsic reward and, "the experience itself is so enjoyable that people will do it even at great cost, for the sheer sake of doing it" (Csikszentmihalyi, 1990, p.4). An increase in a person's disposition to experience flow leads to a higher participation rate, which is an indicator of level of specialization. The second way is that flow is partially based on the balance of the challenge at hand with the person's current skill level. When this balance occurs at a place that is above the average for each, the optimal conditions for flow occur. Due to an increased participation rate for people who have a high disposition to experience flow, it is likely that their skill level will progress farther than a person who participate less frequently. The skill level of the individual is also an indicator of level of specialization.

Another important contribution of this study is the way that specialization was measured. Past research has focused on a person's level of specialization for a single activity. This has done well to understand the range of participants for any particular activity, but when investigating the influence of factors on a person's progression along

the specialization spectrum a broader measure of specialization is necessary. Kuentzel (2001) identified the possibility that a person could be highly specialized in outdoor recreation as a whole (i.e. participate in many activities), rather than in just one activity. The author of this study knows several people that almost exclusively participate in a single activity. For these people a measure of their level of specialization for that activity would be an accurate assessment of their overall specialization in outdoor recreation. In contrast, the author also knows several people that participate in many outdoor recreation activities. For these people, a measure of their level of specialization in a single activity would inaccurately under-represent their total level of specialization in outdoor recreation. This is an important implication when assessing influence of various factors on a person's level of specialization. In order to analyze these relationships validly, we need an accurate measure of specialization, one that is not underrepresented by only measuring a single activity.

To help assess if people participate in multiple activities, this study asked respondents to indicate the number of outdoor recreation activities that they participate in. The responses ranged from 0 to 20 with a mean of 5.0 and a standard deviation of 2.7. Only 6 of the 441 sampled reported participating one outdoor recreation activity. These results may reflect the wide variety of possible activities in Montana and the seasonal nature of outdoor recreation in this area (i.e. many people ski in the winter and hike in the summer), but suggest that people who participate in outdoor recreation tend to participate in more than one activity.

This study measured a person's level of specialization for both a single activity (the one that they participate in the most) and for all outdoor recreation activities as a

whole. Results indicate that not only was the general activity measure of specialization a valid and reliable tool, but that it was a *more valid and reliable measure than the activity specific version*. This suggests that if researchers want to determine the effects of certain factors on a person's progression through the specialization spectrum, a measure of specialization that takes into account participation in all outdoor recreation activities would provide more accurate results.

The measure of specialization utilized in this study was based on Scott and Shaffer's (2001) conceptualization that the specialization construct should be represented by three dimensions; (1) a focusing of behavior, (2) the acquiring of skill and knowledge, and (3) the development of commitment to the activity. The question items were adapted from Lee and Scott's 2004 application of these dimensions to a sample of members of the American Birding Association. This study confirms that this conceptualization of specialization was valid and reliable for an additional population. Furthermore, this conceptualization maintains or even improves its validity and reliability when expanded to include a more general measure specialization for all outdoor recreation activities.

A validation of the Dispositional Flow Scale was also achieved by this study. Similar to Whitmore and Borrie's (2005) study, confirmatory factor analysis revealed satisfactory factor loadings of items into the nine theorized dimensions and the presence of an overall flow construct for a sample of outdoor recreation activities. This lends evidence that the DFS is a valid and reliable tool for a diverse range of activities.

In previous studies that the DFS was employed (e.g. Jackson & Marsh, 1996; Marsh and Jackson, 1999; Jackson & Eklund, 2002) the transformation of time dimension and the loss of self consciousness dimension did not load strongly into the overall flow

construct (.30 and .43 respectively, Jackson & Eklund, 2002). In a description of the DFS, Jackson and Eklund (2004) suggested possible explanations for each dimension. Their populations contained high numbers of timed athletic events, in which part of the essence of the activity was an awareness of time (i.e. the clock in a running event). They theorized that in these events, athletes could have an increased sense of the actual time passing while in the flow state. They theorized that this was a possible reason for the low contribution of the time dimension to the overall flow factor. For the loss of self consciousness dimension, they theorized that high numbers of competitive events that are judged on the quality of performance lent to the poor contribution of this dimension to the overall flow factor. For example, a figure skater would be highly conscious of the presentation of her body during competition. The skater may actually experience an *increase* in the ability to perceive her own presentation of her body during flow state which would contradict a *loss* of self consciousness as an indicator of flow.

Both the time transformation and loss of self consciousness dimensions in this study also did not contribute as much as the other dimensions to the overall flow factor (.37 and .42, see Table 11). Since the sample population did not contain competitive athletic events, it seems likely that the explanations given by Jackson and Eklund (2004) do not account for the low contribution of these dimensions. Future development of the scale should focus on the operationalization of these dimensions and their performance in the overall model.

Due to the low contribution of the time dimension, Jackson and Eklund (2004) recommend leaving this dimension out of an overall flow score. In this study the structure loading was better than that reported in Jackson and Eklund's 2002 study (.37 vs. .30)

and removal of the dimension from the analyses did not noticeably change the results. For these reasons, the time transformation dimension remained in all models and analyses employed by this study.

Implications for Future Research

Although this study supports many of the arguments for a reconceptualization of specialization, it raises more questions than answers. One area of future inquiry would be to explore the relationships between the constructs evaluated in this study for other populations. For instance, would the same relationship be present in a population that does not have the same high level of access to a wide variety of outdoor recreation activities? Only 6 out of 441 sampled in this study reported not participating in any outdoor recreation activities and the vast majority reported participating in several activities. This result is likely at the University of Montana, given the abundance of outdoor recreation activities close to campus and the seasonality of recreation habits in the northern Rockies. Perhaps other locations lend themselves better to participation in a single outdoor recreation activity or in no activities at all. Future research will be needed to confirm that the psychological trait, the disposition to experience flow, does indeed lend to the prediction of a person's level of specialization.

Given the application of a psychological trait as a factor that influences a person's level of specialization in this study, an obvious area of future research is the influence of other psychological traits. One possibility is the influence of the concept of sensation seeking, described by Zuckerman (1979) as, "the need for varied, novel, and complex sensations and experiences, and the willingness to take physical risks for the sake of such experiences" (p.10). One application of sensation seeking has been to predict risk

behavior (Arnett, 1994), but it seems possible that sensation seeking could predict an individual's level of specialization as well.

Other factors that influence a person's level of specialization should also be explored. Constraints could certainly influence specialization heavily. Things like access to recreation activities, family and job commitments, and lifestyle changes all could have a profound impact on the developmental process of specialization.

This study focused on the overall relationship between the DFS and specialization, but an avenue of future research could be to assess the influence that the DFS has on the *speed* of a person's progression along the spectrum of specialization. It is likely, especially at the beginning stages of involvement, that a person's DFS score would show a positive linear relationship with the rate of change in specialization. A related avenue of inquiry could be to determine if a person's DFS score influences how highly specialized a person becomes before eventually decreasing involvement in the activity. Throughout a "career" of involvement in outdoor recreation, each person is likely to achieve a different pinnacle of specialization. The disposition to experience flow could have an influence on the height of that pinnacle.

The development of statistical techniques has made the evaluation of the relationship between dimensions of different constructs easier. For both of the constructs used in this study, literature suggests that the dimensional approach be used. Kuentzel and McDonald (1992) recommended using dimension scores rather than a single additive score when investigating the relationship of specialization to other variables. Lee and Scott (2004) found that a dimensional approach rather than a single additive approach showed better model fit for the specialization construct. Jackson and Eklund (2004) also

recommend using dimensional scores when comparing the DFS to other variables. This study addressed the dimensionality of each construct by achieving overall scale scores by weighting each dimensional score by its contribution to the overall factor. Some exploration was conducted on the relationship between each construct's dimensions, but no clear relationships were established. Future inquiry could strengthen the results presented in this study by systematically testing the relationships between the dimensions of each construct or the relationships between the dimensions of one construct and the overall factor of the other. The advancements in structural equation modeling make these explorations easily available.

One final area of suggested research is to apply the DFS to other areas of recreation and leisure research. In both Whitmore and Borrie's 2005 study and this study, the DFS has proven a useful tool. One particularly interesting application of the DFS would be to assess its influence on behavioral outcomes. Does a person's disposition to experience flow affect the way in which they recreate? The relationships between specialization and behavioral outcomes, and subsequently flow and specialization suggest that this is the case, but to date, a direct relationship has not been explored.

Conclusion

Overall this study has served to deepen the understanding of recreation specialization. The recent reconceptualization of specialization as primarily a developmental process has bread new life into understanding the role of specialization in a person's life course of recreation. People ultimately take different paths along their journey of involvement in recreation. In addition to its usefulness as a way for managers to understand the range of recreationists for any particular activity, specialization is also a

way to characterize people's involvement in recreation activities over the course of their lives. Understanding how or to what level people are involved in recreation activities throughout their lives is useful if patterns are detectable. The disposition to experience flow may help explain how many or what types of activities a person is likely to engage in. It may also help explain patterns over time such as how highly specialized a person becomes in an activity or the possible progression from one activity to the next. These patterns become salient when predicting how people will recreate in the future.

Once researchers and managers have an understanding of patterns of involvement as influenced by various factors, an understanding of the future needs of recreationists is possible. Staying ahead of the curve in recreation trends gives managers a head start in dealing with increasing or changing visitation rates and associated impacts. Appropriate education campaigns, mitigation of impacts, or facility modifications can be informed by knowledge of the likely future needs of the recreating public.

REFERENCES

Appendix 1: Questionnaire Versions

Activity specific questionnaire:

In this study, you are asked to think about your participation in **Outdoor Recreation Activities in Natural Settings**.

Natural Settings = A place that lacks human development, and where people experience nature.

Examples include:

- Pattee Canyon Recreation Area
- Blue Mountain
- Kim Williams Trail
- Rattlesnake Recreation Area
- Rock Creek
- Clark Fork River
- National Parks
- Wilderness Areas (i.e. Bob Marshall)

Outdoor Recreation Activities

Examples include (but are not limited to):

- Hiking or trail running
- Backpacking
- Rock climbing outdoors
- Skiing or snowboarding, both at a resort or in the backcountry
- Kayaking, canoeing, or rafting on a river or lake
- Mountain biking
- Hunting or fishing
- Horseback riding or horse-packing

For this survey, outdoor recreation activities **do not** include:

- Soccer
- Basketball
- Football
- Tennis
- Golf
- Other activities that take place outside but not in natural settings

1. What outdoor recreation activity do you participate in the **most**? _____

2. How many **different** outdoor recreation activities do you participate in? _____

3. How many days have you spent on **your activity** in the last 12 months? _____

4. How many trips have you taken that included **your activity** in the last 12 months? _____

Please rate how strongly you disagree or agree with the following statements by circling the appropriate number.

- 1= Strongly disagree
- 2= Disagree
- 3= Somewhat disagree
- 4= Neither agree or disagree
- 5= Somewhat agree
- 6= Agree
- 7= Strongly agree

- 5. Other leisure activities do not interest me as much as my activity.
- 6. I would rather participate in this my activity than do most anything else.
- 7. If I couldn't participate in my activity, I'm not sure what I'd do.
- 8. If I stopped participating in my activity, I would probably lose touch with a lot of my friends.
- 9. How would you rate yourself in terms of knowledge of your activity? (1= Poor, 7= Excellent)
- 10. How would you rate your skill level in **your activity**? (1= Novice, 7= Expert)

These questions relate to the thoughts and feelings you may experience while participating in **your activity**. You may experience these thoughts and feelings some of the time, all of the time, or none of the time. Think about how often you experience each characteristic during your activity and check the box that best matches your experience. There are no right or wrong answers.

Rewrite the name of your activity: _____

(Rating scale, 1= Never, 2= Rarely, 3= Sometimes, 4= Frequently, 5=Always)

- 1. I am challenged, but I believe my skills will allow me to meet the challenge.
- 2. I make the correct movements without thinking about trying to do so.

3. I know clearly what I want to do.
4. It is really clear to me how my performance is going.
5. My attention is focused entirely on what I am doing.
6. I have a sense of control over what I am doing.
7. I am not concerned with what others may be thinking of me.
8. Time seems to alter (either slows down or speeds up).
9. I really enjoy the experience.
10. My abilities match the high challenge of the situation.
11. Things just seem to happen automatically.
12. I have a strong sense of what I want to do.
13. I am aware of how well I am performing.
14. It is no effort to keep my mind on what is happening.
15. I feel like I can control what I am doing.
16. I am not concerned with how others may be evaluating me.
17. The way time passes seems to be different from normal.
18. I love the feeling of the performance and want to capture it again.
19. I feel I am competent enough to meet the high demands of the situation.
20. I perform automatically, without thinking too much.
21. I know what I want to achieve.
22. I have a good idea while I am performing about how well I am doing.
23. I have total concentration.
24. I have a feeling of total control.
25. I am not concerned with how I am presenting myself.
26. It feels like time goes by quickly.
27. The experience leaves me feeling great.
28. The challenge and my skills are at an equally high level.
29. I do things spontaneously and automatically without having to think.
30. My goals are clearly defined.
31. I can tell by the way I am performing how well I am doing.
32. I am completely focused on the task at hand.
33. I feel in total control of my body.
34. I am not worried about what others may be thinking of me.
35. I lose my normal awareness of time.
36. The experience is extremely rewarding.

General Activity Questionnaire

In this study, you are asked to think about your participation in **Outdoor Recreation Activities in Natural Settings**.

Natural Settings = A place that lacks human development, and where people experience nature.

Examples include:

- Pattee Canyon Recreation Area
- Blue Mountain
- Kim Williams Trail
- Rattlesnake Recreation Area
- Rock Creek
- Clark Fork River
- National Parks
- Wilderness Areas (i.e. Bob Marshall)

Outdoor Recreation Activities

Examples include (but are not limited to):

- Hiking or trail running
- Backpacking
- Rock climbing outdoors
- Skiing or snowboarding, both at a resort or in the backcountry
- Kayaking, canoeing, or rafting on a river or lake
- Mountain biking
- Hunting or fishing
- Horseback riding or horse-packing

For this survey, outdoor recreation activities **do not** include:

- Soccer
- Basketball
- Football
- Tennis
- Golf
- Other activities that take place outside but not in natural settings

1. What are some of the outdoor recreation activities that you participate in? _____

2. How many **different** outdoor recreation activities do you participate in? _____
3. How many days have you spent on outdoor recreation in the last 12 months? _____

4. How many trips have you taken that included outdoor recreation activities in the last 12 months? _____

Please rate how strongly you disagree or agree with the following statements by circling the appropriate number.

- 1= Strongly disagree
- 2= Disagree
- 3= Somewhat disagree
- 4= Neither agree or disagree
- 5= Somewhat agree
- 6= Agree
- 7= Strongly agree

- 5. Other leisure activities do not interest me as much as my outdoor recreation activities.
- 6. I would rather participate in outdoor recreation than do most anything else.
- 7. If I couldn't participate in outdoor recreation, I'm not sure what I'd do.
- 8. If I stopped participating in outdoor recreation, I would probably lose touch with a lot of my friends.
- 9. How would you rate yourself in terms of knowledge of your outdoor recreation activities? (1= Poor, 7= Excellent)
- 10. How would you rate your skill level in your outdoor recreation activities? (1= Novice, 7= Expert)

Choose the outdoor recreation activity that you ***participate in the most*** and write it in the space below (e.g. hiking, rock climbing, kayaking, fishing, etc.).

These questions relate to the thoughts and feelings you may experience while participating in your activity. You may experience these thoughts and feelings some of the time, all of the time, or none of the time. Think about how often you experience each characteristic during your activity and check the box that best matches your experience. There are no right or wrong answers.

When participating in _____

(Rating scale, 1= Never, 2= Rarely, 3= Sometimes, 4= Frequently, 5=Always)

- 1. I am challenged, but I believe my skills will allow me to meet the challenge.
- 2. I make the correct movements without thinking about trying to do so.
- 3. I know clearly what I want to do.
- 4. It is really clear to me how my performance is going.
- 5. My attention is focused entirely on what I am doing.

6. I have a sense of control over what I am doing.
7. I am not concerned with what others may be thinking of me.
8. Time seems to alter (either slows down or speeds up).
9. I really enjoy the experience.
10. My abilities match the high challenge of the situation.
11. Things just seem to happen automatically.
12. I have a strong sense of what I want to do.
13. I am aware of how well I am performing.
14. It is no effort to keep my mind on what is happening.
15. I feel like I can control what I am doing.
16. I am not concerned with how others may be evaluating me.
17. The way time passes seems to be different from normal.
18. I love the feeling of the performance and want to capture it again.
19. I feel I am competent enough to meet the high demands of the situation.
20. I perform automatically, without thinking too much.
21. I know what I want to achieve.
22. I have a good idea while I am performing about how well I am doing.
23. I have total concentration.
24. I have a feeling of total control.
25. I am not concerned with how I am presenting myself.
26. It feels like time goes by quickly.
27. The experience leaves me feeling great.
28. The challenge and my skills are at an equally high level.
29. I do things spontaneously and automatically without having to think.
30. My goals are clearly defined.
31. I can tell by the way I am performing how well I am doing.
32. I am completely focused on the task at hand.
33. I feel in total control of my body.
34. I am not worried about what others may be thinking of me.
35. I lose my normal awareness of time.
36. The experience is extremely rewarding.

Appendix 2: Means and Standard Deviations for Each Item

Question item	Activity specific		General activity	
	Mean	S.D.	Mean	S.D.
Specialization scale				
2. How many different outdoor recreation activities do you participate in?	4.67	2.18	5.56	3.03
3. Number of days?	58.7	72.6	75.46	82.17
4. Number of trips?	10.42	18.94	15.71	21.67
5. Other leisure activities do not interest me as much as (activity).	3.21	1.67	3.89	1.69
6. I would rather participate in (activity) than do most anything else.	3.81	1.73	4.76	1.54
7. If I couldn't participate in (activity), I'm not sure what I'd do.	2.99	1.82	4.06	1.96
8. If I stopped participating in (activity), I would loose touch with friends.	2.27	1.49	3.25	1.83
9. Subjective knowledge level in (activity)	5.12	1.16	4.63	1.33
10. Subjective skill level in (activity)	4.53	1.18	5.04	1.25
Dispositional Flow Scale				
1. I am challenged, but I believe my skills will allow me to meet the challenge.	3.69	.82	3.77	.84
2. I make the correct movements without thinking about trying to do so.	3.92	.72	3.96	.66
3. I know clearly what I want to do.	3.94	.70	4.07	.72
4. It is really clear to me how my performance is going.	3.96	.76	4.07	.75
5. My attention is focused entirely on what I am doing.	3.56	.88	3.66	.78
6. I have a sense of control over what I am doing.	3.99	.76	4.07	.75
7. I am not concerned with what others may be thinking of me.	3.83	1.04	3.94	.91
8. Time seems to alter (either slows down or speeds up).	3.94	.78	3.96	.95
9. I really enjoy the experience.	4.54	.61	4.59	.61
10. My abilities match the high challenge of the situation.	3.79	.78	3.82	.78

11. Things just seem to happen automatically.	3.75	.76	3.76	.74
12. I have a strong sense of what I want to do.	3.96	.68	4.04	.74
13. I am aware of how well I am performing.	3.89	.72	3.93	.84
14. It is no effort to keep my mind on what is happening.	3.77	.81	3.81	.77
15. I feel like I can control what I am doing.	4.05	.72	4.06	.63
16. I am not concerned with how others may be evaluating me.	3.80	.97	3.88	.89
17. The way time passes seems to be different from normal.	3.93	.83	3.95	.93
18. I love the feeling of the performance and want to capture it again.	4.36	.69	4.40	.76
19. I feel I am competent enough to meet the high demands of the situation.	4.03	.70	4.04	.76
20. I perform automatically, without thinking too much.	3.85	.76	3.92	.69
21. I know what I want to achieve.				
22. I have a good idea while I am performing about how well I am doing.	3.95	.73	4.00	.71
23. I have total concentration.	3.56	.78	3.52	.82
24. I have a feeling of total control.	3.78	.75	3.66	.89
25. I am not concerned with how I am presenting myself.	3.76	.94	3.91	.91
26. It feels like time goes by quickly.	3.75	.85	3.79	.97
27. The experience leaves me feeling great.	4.38	.65	3.79	.97
28. The challenge and my skills are at an equally high level.	3.71	.75	3.81	.80
29. I do things spontaneously and automatically without having to think.	3.73	.79	3.84	.75
30. My goals are clearly defined.	3.73	.82	3.81	.89
31. I can tell by the way I am performing how well I am doing.	3.84	.70	3.94	.82
32. I am completely focused on the task at hand.	3.62	.79	3.65	.79
33. I feel in total control of my body.	3.87	.75	3.97	.78
34. I am not worried about what others may be thinking of me.	3.88	.93	3.98	.87
35. I lose my normal awareness of time.	3.83	.80	3.86	.92
36. The experience is extremely rewarding.	4.46	.66	4.51	.67

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