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THE INFLUENCE OF SPECIALIZATION AMONG ANGLERS AND HIKERS ON
INFORMATION NEEDS AND SITE ATTRIBUTE PREFERENCES DURING
SITE SELECTION

by

Steven W. Mackay

B. S., Humboldt State University, 1984

Presented in partial fulfillment of the requirements

for the degree of

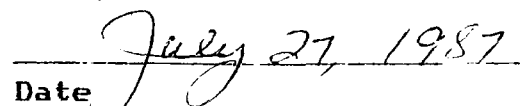
Master of Science

University of Montana, 1987

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Mackay, Steven W., M. S., July, 1987

Recreation Management

The Influence of Specialization Among Anglers
and Hikers On Information Needs and Site
Attribute Preferences During Site Selection (112 pp.)

Director: Stephen F. McCool



Any recreation site can be considered as a collection of elements known as attributes that give it value for the user. Studies of dispersed recreationists have shown decided linkages between site attributes, site choice behavior, and the satisfaction derived from recreation in certain settings. This study focused on the information needs (i.e., the amount and type of site attribute information) of a range of participants in fishing and hiking.

Because this study concerned participants and attributes in a conceptual rather than specific sense, sampling was restricted to customers at outdoor equipment stores that offered a range of technical sophistication in their merchandise. Responses were gathered via a return-mail questionnaire.

Analysis of the data showed that subjects could be reliably grouped into specialization categories on the basis of their preferences for setting types, management regimes, use of vacation time, experiences, techniques, and the influence of distance from home on participation. Variables such as length and frequency of participation, value of equipment, annual expenditures for recreation, subscription to activity-related magazines and club memberships were found to be either partially related or unrelated to specialization. The closest association observed was between perceived skill level and specialization. Subjects did not vary in the amount, but did in the type of information desired. All subjects were willing to try unfamiliar sites instead of imperfect familiar sites.

The finding that specialization is strongly correlated with perceived skill in an activity can serve to streamline future research methodology. The differing attribute preferences of the various participants in each activity (in both the informational and actual senses) can aid resource managers in providing information to the public while identifying acceptable substitute or future sites for each specialization group.

Acknowledgements

I have many people to thank for their support and assistance in this study, especially my committee members Dr. Stephen McCool, Dr. Sidney Frissell, and Robert Lucas, of the USDA-Forest Service Intermountain Forest and Range Experiment Station. Thanks are also due to my friends in the graduate program: Jim Traub, Steve Martin, Donna Loop, Liz Schultis, Bill Kaage, Georgina Gryc-Park, and Joe Ashor. The friendship and guidance of Dr. Stewart Allen of the University of Idaho were most welcome during the initial stages of my research.

I reserve special thanks for the person who has seen me through many days and nights of often frustrating work, who has always expressed enthusiasm and interest in me and my work, and who has on numerous occasions reviewed early drafts of this study for clarity: my ever patient and loving wife, Cara Lou.

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CHAPTER ONE

Introduction

Problem Definition

Natural resource recreation attracts and delights people in many ways: it provides opportunities to view and enjoy scenic beauty; it allows participants to experience solitude and in-group socialization; it provides challenges to participants' skill and judgment; and it provides spiritual and aesthetic rewards.

At recreation sites, activities become experiences. There, conditions present contribute in varying amounts to visitor satisfaction (Driver and Brown 1978, Clark and Stankey 1979). According to Restle (1961), each site can be thought of as a collection of characteristics known as "attributes." Each site is composed of attributes which give it some degree of recreational value or usefulness (Clark and Stankey 1979, 1986).

Studies of dispersed (i.e., not facility-dependent) recreationists over the past two decades have shown decided linkages among site attributes, recreation choice behavior, and the satisfaction derived from recreation experiences in certain settings. Dorfman (1979), McCool (1984) and Peterson (1974) have found that visitor satisfaction is

strongly correlated with the presence of preferred site characteristics and that dissatisfaction is similarly shaped by the presence of undesirable attributes. Recent work by McCool (1984), Watson and Roggenbuck (1985), and Mackay and McCool (1986) suggests that an understanding of which site characteristics are preferred by recreationists may make prediction of site choice possible.

Choice can be interpreted as a manifestation of preference for a specific set of characteristics (Hogarth, 1980; Kaplan and Kaplan 1982). Thus, an understanding of site selection behavior can aid natural resource planners in several ways. First, because nearly all forest resource management activities affect recreational use, an understanding of site choice behavior can improve the effectiveness of multiple-resource management (Clark 1987). Second, such an understanding can provide information about the site attributes that will be the best indicators of site quality when preparing impact acceptability guidelines (Lucas and Stankey 1985). Third, it would help identify the sites that are most likely to be preferred and used by various groups of visitors, thus providing greater clarity in delineating recreation opportunity class lands in order to better supply satisfactory recreation sites while reducing the potential for inter-group conflicts. Finally, it would identify the attributes and sites that are most likely to require management measures to mitigate unacceptable impacts.

Problem Statement

For more than twenty years, resource managers and social scientists have studied the preferences of various groups of dispersed recreationists in hopes of understanding which sites (that is, which collections of characteristics) are most desired. Groups studied have included dispersed campers, river floaters and canoe campers, hikers, fishermen and hunters.*

* Examples of such studies include the following:

Dispersed Campers: Burch (1966); Burch and Wenger (1967); Canon, Adler and Leonard (1979); Catton (1969); Clark, Koch, Hogans, Christiansen and Hendee (1984); Clark and Muth (1983); Dorfman (1979); Downing and Clark (1979); Haas, Allen and Manfredo (1979); Hancock (1973); Heberlein and Dunwiddie (1979); Hendee, Catton, Marlow and Brockman (1968); Hendee, Hogans and Koch (1976); Langenau, O'Quin and Duvendeck (1980); Lee (1977); Lucas (1980, 1985); McCool (1983a, 1984); Moeller, MacLachlan and Morrison (1974); Murray (1974); and Womble, Wolf and Field (1978).

River Floaters and Canoe Campers: Branch and Fay (1977); Bultena and Taves (1961); Cherem and Traweek (1977); Clark and Muth (1983); DeBettencourt and Peterson (1974); Driver and Bassett (1975); Frissell and Duncan (1965); Knopp, Ballman and Merriam (1979); Leatherberry (1979); Lentnek, Van Doren and Trail (1969); Lime (1972, 1979); Lucas (1963, 1970); Manning and Ciali (1981); Peterson (1974); Pfister (1977); Schreyer and Roggenbuck (1978); and Wellman, Roggenbuck and Smith (1982).

Hikers: Echelburger, Deiss and Morrison (1974); Haas, Allen and Manfredo (1979); Kaplan (1977); Lee (1977); Lucas (1971); McCay (1976); McCay and Moeller (1976); McCool and Petersen (1982); McCool (1983a); and Moeller, MacLachlan and Morrison (1974).

Fishermen: Bryan (1976, 1977); Branch and Fay (1977); Dowell and McCool (1984); Driver and Bassett (1975); Driver and Knopf (1976); Harris, Driver and Bergerson (1985); Heberlein and Dunwiddie (1979); Hendee, Clark and Dailey (1977); Lentnek, Van Doren and Trail (1969); Lucas (1965); and Moeller and Engelken (1972).

Hunters: Allen (1985); Basile and Lonner (1979); Dowell and McCool (1984); Langenau, O'Quin and Duvendeck (1980); and Stankey, Lucas and Ream (1973).

Unfortunately, these studies share a number of limitations. First, while there appears to be a consensus of opinion among researchers that recreationists are diverse in their motivations and preferences, few studies have examined the possible sources of this variability. Bryan (1976, 1977, 1979) and Williams (1985) have noted that variability occurs both within and across activity types. Second, in formulating models to explain choice behavior, most researchers have assumed that the decision-makers have universal knowledge about every aspect of the possible choices open to them. Additionally, Lucas (1981) has suggested that some such information may be erroneous. Such assumptions hamper the applicability of choice models to "real world" situations. Third, most studies of recreationists' preferences have been based on the degree to which respondents agreed with preferences for site attributes suggested by the researchers. Thus, there is the possibility that some site attributes of importance have been overlooked or overrepresented. Finally, little research has been conducted to explore the information needs of decision makers. Do all recreationists require the same amount and/or type of information when making decisions, or are there differences among individuals within and across activities? An understanding of recreationists' preferences and information needs could shed new light on our knowledge of choice behavior while suggesting the type and degree of effect that management (i.e., manipulation) of site attributes may have on recreationists.

Objectives

This study explores the information needs of recreationists by means of a series of experiments aimed at: 1) Determining whether participants in outdoor recreation differ in terms of their specializations within their chosen activities using their stated preferences for particular setting types, styles of management, certain equipment, proximity to home of recreation settings, activity outcomes, social settings, and use of vacation time. 2) Determining whether the indicators of specialization identified in past research--length of experience, frequency of experience, skill level, value of equipment, type of equipment, membership in activity-related organizations, subscriptions to activity-related magazines, and annual expenditures on the activity--are in fact associated with particular levels of specialization. 3) Examining the amount and type of information used in selecting a recreation setting. 4) Comparing abstract preferences for information with preferences for actual on-site conditions, and 5) Determining whether having information about a possible site will influence decision-making.

CHAPTER TWO

The Conceptual Basis for Specialization and Attribute-Based Recreation Site Choice

Recreation site choice behavior is composed of three inter-related components: the actual choice process (which can be generalized to other decision-making situations, such as product selection), factors influencing how the choice is determined (such as development of skill or specialization within an activity, motivations, preferences, and constraints), and the actual choice criteria themselves (or, in this case, site characteristics or attributes). This chapter presents a discussion of these components.

Attribute-Based Choice Behavior: A Review of Previous Research

It may at first seem specious to say that people cannot recreate everywhere at once, yet this is precisely why choice is such a universal function in human behavior: We cannot be everywhere at once; therefore, we must choose to be in some particular place at any given time. According to Hogarth (1980), people use choice to signify what they prefer (i.e., their desired combination of site attributes) and what they expect to gain by choosing one alternative over another. How recreationists select where they will be, assuming an absence of

external constraints on choice, has been the subject of considerable research over the past two decades. From this research have come the following models to describe or explain choice behavior.

The Linear Model

The linear model (Hogarth 1980), also known as the expectancy-valence model (Ajzen and Fishbein 1980), is perhaps the simplest of the explanations of how people choose a recreation site. It is assumed that the decision maker possesses perfect knowledge of the attributes of the various sites available. It is further assumed that the recreationist will seek to maximize the benefits to be gained by the process. Each attribute of each alternative site is then given some value for comparison with the others, and the alternative having the highest aggregate value is then selected. We can explain this process by the mathematical formula:

Maximize the function: $C = aX + bY + \dots + cZ$

Where C is the aggregate value of the site
 X, Y, ... Z are various site attributes
 a, b, ... c are the perceived values,
 positive or negative, of those attributes

It should come as no surprise to learn that the linear model is simply the economic profit function in a different guise: the aggregate value of the site is the revenue, and the various terms in the equation are the costs and returns incurred by the firm, or in this case, by the recreationist. This model has several strong points. By providing variable coefficients of value for each site attribute in the formula, it acknowledges that preferences for specific elements of

recreation sites are subject to change, whether from one person to another, or over time. Thus, the model allows for changes in recreationists' choices that follow as a result of such an analysis of alternatives. In addition, its mathematical simplicity facilitates quantitative studies.

Just as the model displays merits, it also has some serious drawbacks. First, in assuming that the decision-maker has perfect knowledge of the conditions present for each alternative, it sidesteps reality: rarely is a one-to-one comparison possible between alternative sites because information is frequently incomplete or inaccurate. Second, it assumes that each decision is made independently of prior experiences. Perhaps the chosen site produced an unsatisfactory experience on a past occasion. It hardly seems likely that it will again be selected as the optimum choice, even if it produces the highest value for the site choice function. Third, in its assumption that all individuals are rational optimizers, it fails to account for "satisficing" behavior (i.e., choosing an alternative that is "good enough" instead of continuing evaluation over a longer period in order to arrive at the "best" choice) (Kaplan and Kaplan 1982). Fourth, as pointed out by several researchers (McCool, Stankey, and Clark 1985; Harris, Driver, and Bergerson 1985; and Schreyer, Knopf, and Williams 1985), the relationship between the perceived outcomes of choices and the actual resulting experiences is considerably more complicated than can be explained by the linear model.

The Disjunctive Model

The disjunctive model (Hogarth 1980), also known as the compensatory model, is an outgrowth of the linear model and makes the same assumptions. An important difference, however, is that the disjunctive model assumes that a high value or larger amount of a particular attribute will compensate for a low value or deficiency in another. This unfortunately brings about what might be termed the "compensatory anomaly" which can be illustrated using the mathematical function of the linear model to compare two hypothetical sites:

$$C1 = aX \quad \text{and} \quad C2 = dX + eY + fZ$$

Given that: $C1 = C2$
 X, Y and Z are site attributes
 a, d, e and f are the amounts
 or quality of those
 attributes

It follows, according to the disjunctive model, that $C1$ and $C2$ may be equally desirable, despite the absence or low level of acceptability of attributes Y and Z at site $C1$. This anomaly--that an abundance or high value of a single element can offset the lack of all others--is the greatest weakness of the disjunctive model. A further weakness is found when one considers that the model expects the decision maker to be able to assign values to elements that cannot logically be compared, such as scenery and feelings of freedom. When these shortcomings are added to the fact that the disjunctive model has all of the drawbacks of the linear model, its inadequacy is demonstrated all the more. Its only strength lies in its recognition that sometimes people are willing to overlook the shortcomings of some alternatives if those attributes are of little importance. This variability in attribute importance, or

"salience" (McCool 1984), is discussed in a later section of this chapter.

The Conjunctive Model

In order to produce a more realistic choice model that lacks the inherent weakness of the disjunctive model, the conjunctive, or non-compensatory, choice model has been developed (Hogarth 1980). Here, unlike the disjunctive model, preferences are considered as undividable groups. That is, attributes X and Y and Z must all be present and in acceptable quantity or quality for a site to be considered as a legitimate choice alternative. Absence of, or unacceptable quantity or quality of, an important characteristic causes rejection of the site. Put in mathematical form again:

Maximize the function: $C = aX + bY + \dots + cZ$

Given that: $X, Y, \dots Z > 0$
 and $a, b, \dots c > t$, some threshold
 level of acceptability

To use an example, the conjunctive model states that an angler may select a fishing spot on the basis of the presence and degree of such things as numerous and/or large fish (of a particular species), ease of access, and likelihood of crowding, instead of some single attribute. Further, there must be an acceptable probability of each being present if a given site is to be selected. It is likely, then, that the conjunctive model reflects to a large degree the choice process made to fulfill the multiple desires and expectations of recreationists.

This model, while improving upon the linear and disjunctive models, nevertheless shares with them several drawbacks. First, it assumes

optimizing behavior (i.e., the achievement of maximum usefulness or value). Second, it assumes perfect knowledge of site characteristics on the part of the decision-maker. Third, it assumes that everyone has the capacity to evaluate a series of alternatives on the basis of multi-dimensional characteristics.

The Elimination-by-Aspects Model

The elimination-by-aspects model (Tversky 1972) represents a solution to the problem of multiplex evaluation that the conjunctive model proposes. As the name implies, this model suggests that once a group of desired attributes (or, in Tversky's nomenclature, aspects) is identified, sites are compared to one another one attribute at a time, and those alternatives which do not meet some level of acceptability are eliminated. The process is repeated for other attributes of the remaining sites until a single site--the site of choice--remains.

For example, suppose a hiker is choosing among three sites, A, B and C. Taking the first aspect that comes to mind, distance to the trailhead, the hiker rejects site A as being too far away. The next aspect, whether campfires are permitted, causes site B (where fires are not permitted) to be rejected, and leaves site C as the chosen site.

It is possible, however, to see two weaknesses inherent in this model. First, as Tversky has admitted, it is possible to eliminate an alternative on the basis of an attribute which is of little importance, thereby risking the selection of a site which is actually inferior to one that has been eliminated. In the example presented, suppose that the hiker really considered the presence of beautiful scenery most important. Site A, which was discarded for being too far away may have

offered more desirable scenery. Conversely, suppose the hiker preferred easy trails and few encounters with other hikers. Site C may have had trails that were more crowded or difficult than would have been desirable (or than the other two sites offered). Second, the elimination-by-aspects model shares with the others the assumption of perfect knowledge of all attributes of each alternative--an unrealistic generalization.

The Lexicographic Model

The lexicographic model (Coombs 1964, Watson and Roggenbuck 1985, and Williams 1985) avoids the initial weakness of the elimination-by-aspects model by ranking the important characteristics of the various alternatives in order of their importance to the decision-maker. Selection then proceeds as in the elimination-by-aspects model, using the most important attribute, then the second most important, and so on. There is thus an increasingly fine discrimination among alternatives at each level of evaluation, a tie to the idea of cognitive development that is discussed later.

As Figure 1 shows, the lexicographic model describes two simultaneous processes: first, the ranking of the relative importance of the various attributes of alternative sites in terms of the preferences of the decision-maker, and second, the elimination of those alternatives which fail to meet some minimum level of acceptability. In so doing, it not only accounts for the varying desires of the decision-makers, but also the degree to which alternative sites conform to those desires. Thus, it possesses the strengths of the preceding models in incorporating human values in decision-making. Further, it allows,

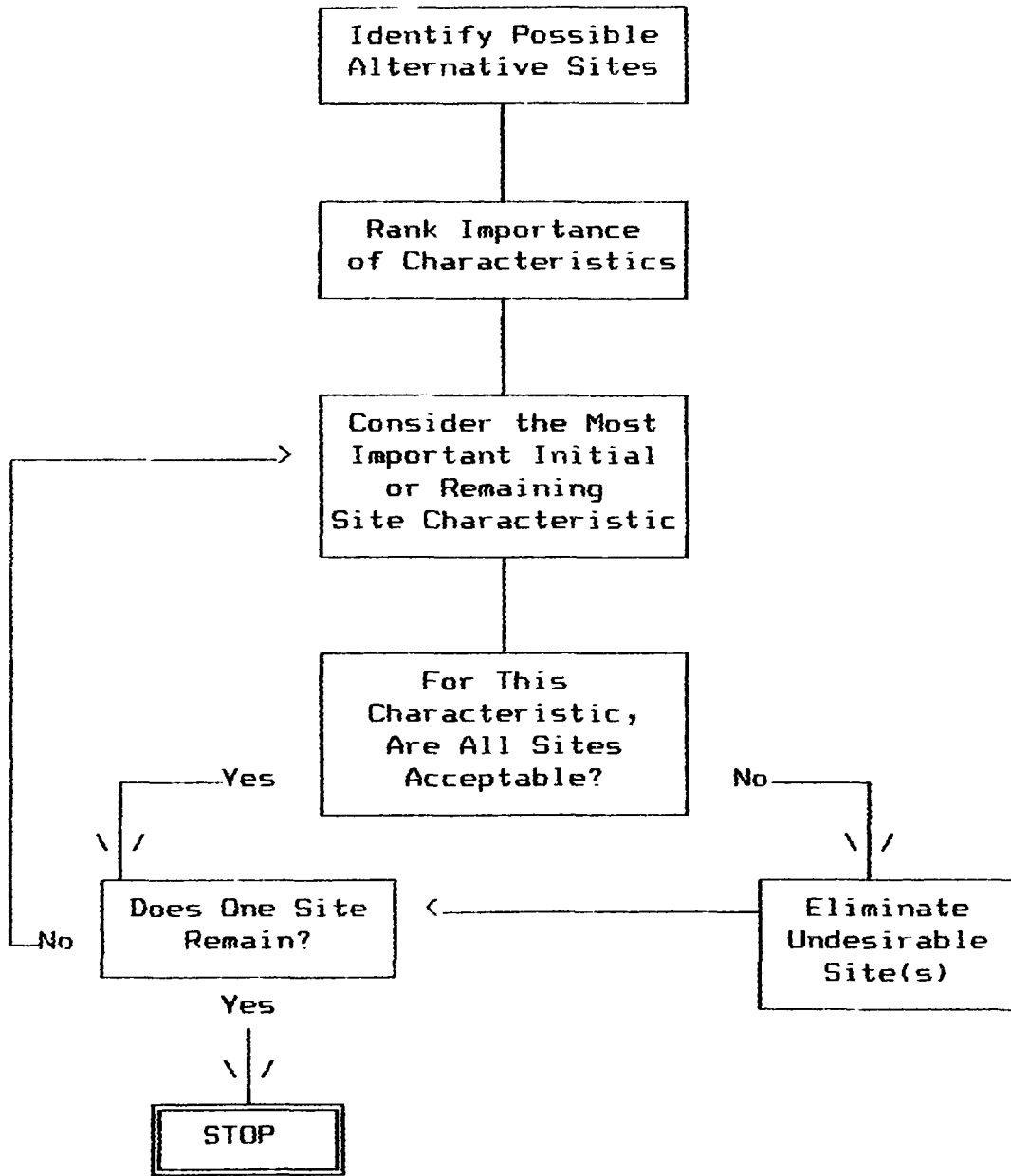


Figure 1. The Lexicographic Model of Site Choice

through its ranking of attribute preferences, for the changing valuation of attributes that emerges following changes in the participant's specialization, technical expertise, time available, and choice of companions. Its primary weakness lies in its dependence upon the

assumptions that decision-makers possess perfect knowledge of conditions at each alternative site and that the subjects are able to rationally rank a potentially large number of diverse and dissimilar attributes. While such shortcomings leave the lexicographic model in the theoretical realm, the model still represents the nearest approach to "reality" of any choice model to date.

The Concept of Recreation Specialization

In the previous section, several alternative theories about how a recreation site may be chosen were reviewed, but none of the models examined has addressed how the various alternative sites from which a choice is made are identified, nor why some characteristics are used in decision-making by some individuals while others are not. The following concepts have been proposed to explain these phenomena.

The Multiple-Attribute Salience Theory

Studies of visitors to Montana's Rattlesnake National Recreation Area and Wilderness (McCool and Petersen 1982) and Bob Marshall Wilderness Complex (McCool 1983a) revealed that some aspects of wilderness recreation settings contributed to the visitors' satisfaction, while others contributed to their dissatisfaction. Yet, visitors did not use the same elements in each case when determining how satisfying their outings were. This finding led to the development of the multiple-attribute salience theory (McCool 1984). Multiple-attribute salience theory has two basic premises: 1) Site attributes that lead to satisfaction and those that lead to dissatisfaction are evaluated separately by recreationists and are

non-compensatory (i.e., satisfaction is not a "net" effect). Therefore, a person can have a satisfactory recreation experience even though it contains unsatisfying elements. 2) The characteristics of recreation settings have differing degrees of salience, or importance, to the individual. Thus, potentially undesirable site characteristics may be tolerated or may go unnoticed because they are not relevant to the participant's recreational experience in that setting or are not used in decision making.

An alternate interpretation could be that in assessing the satisfaction derived from a recreational engagement, the participant seeks to avoid dissonance, the feeling that a bad choice was made (Hogarth 1980). To suppress that feeling, some dissatisfying elements may be deliberately ignored. The result, then, is that only those setting characteristics which are important to the individual's preferred experience are used in judging the potential for, or realization of, recreation satisfaction. In other words, each person judges sites and experiences only in terms of the elements he or she considers important. Thus, only salient site attributes, whether positive or negative, are likely to be used in the selection process models described previously. Although the concept of salience implicitly underlies many of these choice behavior models, salience is not so much a source of variability in recreation behavior or preference, as it is a demonstration of variability. Two constructs have been proposed to explain these differences among recreationists: cognitive development and recreation specialization.

Cognitive Development

People differ in terms of their interpretations of what constitutes "quality" in a recreation experience (Harry and others (1972), Hendee (1974), Knopf and others (1973) and Talhelm (1973)). While this phenomenon is demonstrated by the multiple-attribute salience theory, it is explained--at least in part--by the concept of cognitive development which is the product of work by Bryan (1977, 1979), Kelly (1974), Moore (1976), Wellman and others (1982), Williams (1985), and Williams and Huffman (1986).

According to the cognitive development model, preferences and behavior are the results of increased knowledge, skill, and awareness of setting characteristics developed over time. Bryan (1977, 1979) theorizes that as individuals increase their participation in an activity, either in intensity or time span, they become not only more aware of fine differences in settings, but more specialized in their preferences for particular attributes or combinations of attributes. These become manifested as subtle, progressive changes in patterns of behavior. According to Kelly (1974), increased participation in a recreation activity leads to changes in one's approaches to the activity. These are guided not only by changes in skill levels, but also by changes in the social sphere in which participation occurs. Moore (1976) feels that cognitive development occurs as a function of experience or familiarity with a setting or activity rather than as a function of age. Wellman and others (1982), however, argue that development depends not only upon an individual's experience, but upon his commitment to his chosen activity as well. Williams (1985) and

Williams and Huffman (1986) believe that as cognitive development occurs, certain attributes increase in importance to the recreationist, while there is an increase in preferences for specific activities, settings, and companions. Simultaneously, as cognitive development progresses, the recreationist realizes a greater capacity to perceive subtle differences within these three components of the recreation experience. They note, however, that development of specific preferences does not necessarily occur to the same degree in each domain. There is likely to be some variability in how those preferences are demonstrated, depending upon changes in motivation or outside conditions, such as may occur when recreating with a companion of lesser ability.

Cognitive development is thus a useful concept because it offers an explanation for the observed variability in recreation site preferences and behavior in recreation settings. In developing a model to explain choice behavior, cognitive development can be used to suggest how alternative sites are identified prior to comparison and which sites will be used as choice criteria.

Specialization Theory

While cognitive development offers a possible explanation of variability in recreation preferences and behaviors, it is a difficult variable to measure because many of the motivations and values involved are subconscious. In order to describe or categorize recreationists in terms of their cognitive development, Bryan (1976, 1977, 1979) has developed the conceptual framework of recreation specialization. According to Bryan (1977, p. 175), recreation specialization "refers to

a continuum of behavior from the general to the particular, reflected by equipment and skills used in the sport and activity setting preferences." Put in simpler terms, specialization refers to the behaviors, attitudes, and preferences of recreationists that evolve during the course of a lifetime participating in an activity. Most people have seen evidence of specialization in their own lives or those of relatives or acquaintances: the themes of vacations and leisure outings; the addition of activity-related terminology to daily conversation; even political leanings, choices of occupation or residence areas. While additional factors, such as personality, personal beliefs, and societal norms also influence recreation behavior, the complex, interactive cycle of experience/outcome/reward leads each recreationist to his or her "special" niche in the world of the activity. Specialization provides a convenient distillation of these that can be observed and, to some extent, be measured. Bryan (1977) has observed that specialization does in fact follow certain predictable patterns:

- 1) As specialization increases, there is a shift in resource orientation from consumption to preservation (For example, as specialization in fishing increases, the emphasis is shifted from killing fish to engaging in fishing whether any are caught or not. According to Bryan, a very specialized angler rarely if ever keeps the fish he catches.).

- 2) Increased specialization results in increased commitment to the activity in terms of time and money spent and distance traveled to preferred settings.

3) Increased specialization promotes increased identification with other specialists (via publications and club memberships).

4) Increased specialization produces greater dependence upon specific recreation settings (i.e., those deemed most likely to produce desired experiences).

Bryan (1977) has identified four categories of specialists based on the above criteria: the occasional recreationist, who seldom participates because the activity is not particularly important to him or who is a beginner (i.e., minimal cognitive development in the activity); the generalist, who participates regularly and uses a variety of techniques and equipment; the technique specialist, who participates often but prefers a single technique to all others; and the technique-setting specialist, who participates often, prefers a single technique and prefers a particular setting in which to participate. These specialization categories appear to be consistent following a study of anglers in the northern Rockies (Bryan 1977), and, indeed, they provide a means of explaining (at least in part) how people choose where they recreate.

It is important to note, however, that Bryan did not investigate associations between specialization and such variables as length of participation, frequency of participation, investment in equipment, annual expenditures on the activity, or self-assessment of proficiency. Many of these have been measured in prior recreation research and could strengthen inferences concerning recreation preferences of various groups. In addition, there is no empirical evidence to show that specialization is necessarily an evolutionary process independent of the

will of the individual. It is entirely possible--even probable--that specialization occurs only to the extent that its results continue to satisfy the participant. A child on her first fishing trip will not inevitably become a flyfisherman. Furthermore, not every participant enters a sport at an "unspecialized" level. Much depends upon personal preference, local patterns of participation, and innate skill. Thus, while specialization as a more conscious indication of cognitive development is a valuable concept that holds great promise in behavioral research and resource planning, it is in need of additional study to clarify its workings and influences on other behaviors, such as decision-making.

The Characteristics of Recreation Sites: A Review of Site Attribute Typologies

Previous sections of this chapter have shown how the site selection process may operate and how the process may be influenced by certain factors within the decision-maker. In this section, three different ways of considering the recreation site attributes themselves will be examined.

As stated in the introduction, site attributes are the characteristics of locales which influence the type and amount of use those areas receive. They also influence the degree of success or satisfaction experienced by the user, whether the site is used for commodity outputs such as timber or livestock forage, or for non-commodity uses such as recreation. Site attributes may be modified by managers to provide increased opportunities for desired recreation experiences or increased production of commodities.

Because the characteristics of sites are so important regardless of the type of use, recreation social scientists and resource planners have proposed various ways of looking at site attributes. The systems described in this section view attributes as site descriptors, as parameters of recreation type and style, and as influences on decision-making.

The Geographic Model

The geographic model (Stankey, unpublished) is based upon the concept of "place." To the geographer, "place" signifies not only the spatial arrangement or location of a site, but also the characteristics which contribute to the "feel" of the site--its perceived usefulness or desirability (i.e., its "value") to the beholder. Stankey has used the "place" concept to separate site attributes into three categories: 1) locational attributes, 2) areal attributes, and 3) site attributes. These represent a "focusing in" on a particular site by starting with the broadest overview of an area and then gradually narrowing the "field of view" until a particular site is reached.

Locational attributes concern distance, travel time, ease of access (in terms of time and effort), and difficulty of travel within the area of interest. These characteristics, then, deal with the "where" of the site: its geographic location, certainly, but also the kind of site it is--whether it lies in mountains, along a beach, in the desert, or so on. Locational attributes would therefore be important to the casual recreationist who may have only a few hours at his disposal. Sites that are too far distant or those that require a large investment in terms of his time or effort to reach them are less likely to be

considered useable. Distance or difficulty of access may become less important to the user who is willing to invest more in order to reach a specific desired site (a characteristic of specialization). Therefore, a visitor who desires a very circumscribed set of attributes may be more willing to travel greater distances to recreate in preferred settings. For example, many persons enjoy hiking in a wide variety of locales, yet some are willing to travel hundreds of miles in order to hike in the unique scenery of places such as Glacier National Park or the High Sierra.

Areal attributes are those which form the "packaging" of the site: its location relative to other attractions, its scenery, and the type and amount of modification observable from the site. These factors, while not intimately connected with the site, nevertheless may influence both use and satisfaction. For example, the view of clearcuts or the sounds of a highway may cause dissatisfaction for a visitor who came seeking a sense of naturalness.

Site attributes, according to Stankey, are those with which the visitor directly interacts. These may include weather, natural shelter, drinking water, privacy, campsite size and arrangement, the presence of large or numerous fish, and so on. It is this interaction which elevates the importance of site attributes in terms of visitor satisfaction. This is particularly true in the case of the visitor who spends considerable time in one place or who returns to the same place repeatedly. Indeed, as Lee (1972) points out, people interpret site characteristics in terms of the norms of their social reference groups.

Thus, a change in one or other of the characteristics of a recreation site can affect how the site is defined by its users.

While the geographic model may simulate to some extent the way in which potential visitors look at alternative recreation sites, it does not provide a means of categorizing attributes for inventory and comparison. According to McCool (1983b), it is necessary "to identify attributes that influence and define recreational opportunities as well as their supply, distribution and locational characteristics" (p.24). This function is met to some extent by the recreation opportunity spectrum concept.

The Recreation Opportunity Spectrum

To inventory the characteristics of existing or potential recreation areas, Driver and Brown (1978); Brown, Driver and McConnell (1978) and Clark and Stankey (1979) devised the recreation opportunity spectrum (ROS) concept. According to this concept, people seek a range of recreation opportunity settings ranging from pristine, untouched lands to highly developed recreation facilities. This range is defined in terms of the biophysical, social, and managerial components of the various sites.

Biophysical attributes are those which make up the natural state of the site: its weather, topography, soil, plant and animal life, water, and so forth. This category of attributes makes up the bulk of site attributes for dispersed recreation sites and is therefore highly important in defining the attraction some places have for visitors.

Social attributes are more difficult to identify and quantify than biophysical attributes, but they can have an equally strong influence on

choice. Examples include encounters with other recreationists; the presence of noise, of litter, of dissimilar other recreationists; and the likelihood of competition with other parties for such amenities as limited numbers of campsites.

Managerial attributes are those which result from the actions of resource managers. Campgrounds, forest roads, trails, signs, fences, and clearcuts are all examples of attributes in this category. An important aspect of managerial attributes is that actions directed at non-recreation resources may alter the character of recreation sites (Clark and Stankey 1986, Clark 1987 and Mackay 1987).

By combining ROS with the geographic model, it is possible to describe any recreation site in terms of its likely recreational utility or attractiveness. However, this combination is unable to account for how site attributes are used as a basis of site choice (Clark 1982). This additional dimension is found in the choice function model.

The Choice Function Model

The choice function model was developed by Krumpal and McLaughlin (1982), Clark and Stankey (1986) and Mackay and McCool (1986) to describe how attributes are interpreted for decision-making, rather than what the attributes are. Because site characteristics affect the recreational use of a given site, a means of identifying how this effect occurs is necessary in order to understand how the choice process works. The choice function model does this by considering attributes "enabling" if their presence is either necessary for a particular form of recreation or is an intrinsic attraction to the user, "impeding" if their presence prevents or discourages use, and as "enhancing" or

"detracting" if their presence contributes to greater satisfaction or dissatisfaction. These concepts can perhaps be most clearly explained by use of illustrations.

As seen in Figure 2, use of a site cannot occur if an attribute necessary for participation is absent. Clark (1987) refers to such attributes as "requirements." One cannot go canoeing in the desert, for example. A more common (and plausible) example is the recreationist who is unable to gain access to an otherwise suitable and desirable site.

		Enabling Attribute	
		Present	Absent
Can I Participate?	Yes	1 XX	3
	No	2 XX	4 XX

Figure 2. The Role of Enabling Attributes in Site Choice (Mackay and McCool 1986).

While access to recreation sites is not within the scope of this study, ease of access to a particular recreation site probably shapes its pattern of recreational use more than any other trait. However, the presence of an enabling attribute, as seen in the diagram is not in itself a guarantee that use will occur--merely that the potential user is now able to choose whether or not to participate. By way of illustration, a golf course adjacent to a hotel will not necessarily be used by every guest. There is thus the distinction to be made between a site's availability for an experience and its ultimate use.

Figure 3 shows the effect of impeding attributes. Impeding attributes are the conditions of the site that could be used to complete the sentence: "I would like to go hiking (or fishing, etc.) there, but _____." These attributes could include perceived hazards such as grizzly bears, feelings of excessive regimentation, or expectations of crowding. In any case, the presence of impeding attributes discourages or prevents use, while their absence or removal restores the choice of participation to the recreationist.

Can I Participate?		Impeding Attribute	
		Present	Absent
Yes	1	3	XX
No	2	XX	4
			XX

Figure 3. The Role of Impeding Attributes in Site Choice (Mackay and McCool 1986).

Assuming that enabling attributes are present on the site and impeding attributes are absent, the choice can be based on perceptions of the degree to which use of the site will please or displease the user. As Figure 4 illustrates, and as the multiple-attribute salience theory (McCool 1984) suggests, these attributes are separate from one another and are not additive. Thus, a campsite that has beautiful scenery, plenty of firewood, good drinking water--and noisy other campers--can provide both satisfaction and dissatisfaction, depending upon the importance attached to each characteristic by the user.

	Satisfaction	Dissatisfaction
Enhancing Attributes	1 Increased, if Present	3 No Effect, if Absent
Detracting Attributes	2 No Effect, if Absent	4 Increased, if Present

Figure 4. The Roles of Enhancing and Detracting Attributes in Satisfaction Gained from the Chosen Site (Mackay and McCool 1986).

As a process, the choice function model serves two purposes for the decision-maker: First, it defines sites on which a given type of recreation activity, fishing--for example--can occur. Such sites must have water (for fish habitat), fish, and a means of getting at them. If a site lacks any of these, or if it also has hazards such as grizzly bears, or restrictions such as private ownership and restricted access, it may not be considered a valid possible choice. It is unlikely that decision-makers consciously analyze the required criteria of recreation sites. Instead, such analysis is more likely to occur subliminally as alternatives are defined. Second, the process measures the relative attractiveness or desirability of each site in terms of the presence and quantity and/or quality of the site's enhancing or detracting attributes. It is in this second function that the significance of enhancing and detracting attributes is most apparent because they form the bases of conscious decision-making, regardless of the style of choice behavior used or whether they are subject to influences such as

cognitive development, specialization, and salience as described previously.

It is important to note that the roles of site attributes within this concept are not rigidly defined. This effect occurs in two ways. First, a particular enabling or impeding attribute may vary in the degree to which it permits/prevents a given activity. For example, few people would argue that it is possible to canoe on the waters of Lake Michigan near the Chicago waterfront, but it seems unlikely that many would equate that site with a lake in northern Minnesota's Boundary Waters Canoe Area, even though canoeing as a generic activity is possible on both sites. Intuitively, some quality scale is in effect. Second, as Lee (1972) observed, the same feature of a given site may be perceived differently by different visitors. For example, a sheer rock cliff may be just part of the scenery at a site if the user is there to camp or fish. However, to a rock climber, the same cliff is a necessary medium for pursuit of climbing. Thus, the same attribute may be an enhancing attribute or an enabling one as the type of activity/user changes.

By combining the choice function model with the geographic and recreation opportunity spectrum models, one gains an immensely more powerful means of defining recreation sites. It not only becomes possible to describe regional characteristics and qualities such as climate, access, and travel distance and difficulty, but also to identify those elements which are required by the various forms of recreation pursued in each locale and how these various combinations of

elements are likely to be used by visitors in choosing where they will recreate.

Such an understanding could suggest to resource managers that other forms of recreation may be possible in addition to current uses. Effects of other management actions on recreation could also be predicted with increased accuracy by knowing which enabling attributes would be eliminated, which impeding attributes might be introduced, which enhancing attributes could be introduced or improved, and which detracting attributes could be mitigated or worsened.

Research Needs and Hypotheses

While the preceding concepts and models offer plausible explanations of the recreation site selection process and its underlying influences, they still leave holes in the state of our knowledge of this phenomenon. This study seeks to fill a few of these "holes" as they relate to the recreation activities of fishing and hiking by testing a series of hypotheses suggested by the preceding discussion. For the sake of uniformity, these hypotheses are considered in their null form (i.e., that of no implied statistical difference). Bryan (1976, 1977, 1979) has suggested that specialization increases as a function of time spent engaged in an activity. Some association between length of participation and degree of specialization should be apparent if this is true.

H1: Length of participation does not vary across specialization groups.

Kelly (1974) and Bryan (1977) have proposed that cognitive development (or specialization) occurs with more frequent participation, suggesting that a person more committed to an activity will want to participate more often. If so, there should be a greater frequency of participation among more specialized anglers and hikers.

H2: Frequency of participation does not vary across specialization groups.

Kelly (1974), Bryan (1977, 1979), and Wellman and others (1982) have suggested that increased specialization is associated with increased proficiency in an activity. On this assumption, Graefe and others (1986) used recreationists' self-assessed skill level as a specialization variable. If this concept holds, then specialists should be more likely to rate themselves experts and non-specialists should be more likely to consider themselves novices.

H3: The distribution of self-assessed skill levels (i.e., novice, intermediate, expert) does not vary across specialization groups.

Bryan (1977) has suggested that increased specialization results in a stronger identification with the sport and with other specialists. Manifestations of these are subscriptions to activity-related publications and membership in activity-related organizations. Thus, a specialized angler is purportedly more likely to subscribe to a magazine such as *Outdoor Life* or *Salmon-Trout-Steelheader* and to belong to a fishing club, while a specialized hiker is more likely to subscribe to

magazines such as Outside, Backpacker, or Sierra and to belong to an organization such as the Sierra Club or Wilderness Society.

H4: The rate of subscription to activity-related periodicals does not vary across specialization groups.

H5: The rate of activity-related club membership does not vary across specialization groups.

Wellman and others (1982) have proposed that specialization is strongly associated with one's commitment to an activity. This commitment may be demonstrated by participation over a long period or with greater frequency (as previously described), or economically in the form of greater investment in equipment and/or greater annual expenditures in order to engage in their chosen pastime. If so, then the following two hypotheses should not be supported:

H6: The value of recreation equipment does not vary across specialization groups.

H7: Annual expenditures on recreation do not vary across specialization groups.

Bryan (1977) observed and proposed that members of different specialization groups tend to use different items of recreation equipment: unspecialized anglers, for example, tended to use inexpensive bait-casting or spin-casting gear, while specialists tended to use fly rods. He did not study the equipment use of hikers. If Bryan's proposition is true, then more specialized recreationists should be seen to own more specialized equipment: specialized anglers should own fly-fishing outfits, while specialized hikers should own such items as snowshoes that would connote greater commitment to their activities.

H8: There is no difference among specialization groups regarding ownership of specific items of fishing/hiking equipment.

A factor which may or may not be associated with one's degree of specialization is the amount of information required for decision-making. This relationship has received little attention in past research, yet it would appear that having adequate information about the attributes of the recreation sites available is a requirement for using any choice behavior model. If, as Bryan (1977, 1979) and Williams (1985) and Williams and Huffman (1986) have suggested, specialized anglers and hikers have more precisely defined site quality criteria, do they require more or less information than their less specialized counterparts?

H9: Members of all specialization groups tend to ask the same number of questions about potential recreation sites in order to make a choice (i.e., the amount of information needed does not differ).

Although it is unknown whether there is some association between recreation specialization and the amount of information necessary to make decisions, considerable evidence (Harry and others 1972; Hendee 1974; Hendee and others 1977; Knopf and others 1973; and Talhelm 1973) suggests that there are decided differences among recreationists in terms of their preferences for particular site characteristics. However, it is not understood how such preferences are associated with specialization, or whether such preferences carry over into preferences for information about specific attributes. Thus:

H10: There is no difference among specialization groups regarding how they rank the relative importance of the questions they ask when making a recreation site choice (i.e., the type of information needed does not differ).

Furthermore, the possibility of associations between specialization and site attribute preferences when some information is available has not been explored. Do abstract preferences carry over into actual settings? In addition, when a site offers a preferred element and an undesirable element, which takes precedence during site selection?

H11: When there is some knowledge of certain site characteristics in a paired-comparison decision situation, the choice of sites will be the same for all specialization groups.

Lastly, it is not known to what extent having any site attribute information affects site choice and whether such an effect is associated with recreation specialization. If, as Moore (1976) suggests, that cognitive development (or specialization) is related to familiarity with a recreation setting, then there should be a greater preference for familiar sites. Conversely, if specialists are choosier about recreation settings, as Williams (1985) and Williams and Huffman (1986) suggest, then a greater willingness to choose an unknown site over a familiar but less-than-ideal site should be observed.

H12: There is no difference among specialization groups regarding whether they are more likely to choose a site they have not previously visited over a familiar, but less-than-ideal site.

CHAPTER THREE

Methods

Sample Selection

Because the purpose of this study is a testing of certain hypotheses rather than measuring specific population parameters, a strictly random sample was not deemed necessary. Moreover, it was felt that contacting recreationists at specific recreation sites could produce misleading results because use of such sites would not only be a de facto demonstration of choice, but would also be a source of bias arising from the researcher's choice of the site for sample selection. The best solution appeared to be to sample the customers of fishing and hiking equipment stores that offered a range of technical sophistication in the merchandise they supplied. Sample sites included a specialty backpacking store, a general hunting/fishing/camping store, a fly fishing tackle shop, and an outdoor equipment "swap meet" conducted by the University of Montana Outdoor Center. Additional subjects were solicited from acquaintances who were known to be hikers or anglers. A final sample size of approximately 130 to 160 subjects was considered appropriate.

The Research Instrument

The research instrument itself evolved from two pretests that were conducted during the spring of 1986. These pretests had three goals: 1) To identify site characteristics which are valued by hikers (an open-ended study of preferences), 2) To identify the type and amount of information required to make a recreation site choice, and 3) To try out various formats of questions and variables. Questions which were either not answered or were answered in a manner contrary to directions were restructured or discarded. The result was the two questionnaires found in Appendix A and Appendix B. A brief discussion of the contents and form of the questionnaire is presented here.

The initial section of the questionnaire consisted of thirteen questions which could be used to segregate respondents into specialization groups within each activity. The first three questions explored length of experience and proficiency as specialization components as suggested by the work of Bryan (1979), Williams (1985) and Graefe and others (1986). Variables measured were: length of active participation, annual frequency of participation, and self-evaluation of skill level (i.e., novice, intermediate, expert). The second series of questions was designed to explore the association between recreation specialization and commitment to the chosen activity. Variables examined included ownership of various items of fishing/hiking equipment, subscription to activity-related publications, membership in activity-based organizations, estimated value of recreation equipment, and estimated annual expenditures on fishing or hiking. The remaining seven questions addressed the respondents' preferences for particular

recreation settings, management regimes, activity outcomes, social settings during participation, techniques, equipment, and the willingness to travel greater distances in order to recreate in preferred settings as suggested by Bryan (1979) and employed by Dowell and McCool (1984).

The middle section of the questionnaire was a series of paired-comparisons based on the results of the two pretests. In each case, respondents were asked to choose a site from a pair, each of which had a desirable and an undesirable attribute based on the pretest results. Responses to these fifteen questions could then be used to determine whether there is an interaction effect on attribute preferences if both desirable and undesirable attributes are present and whether choices differ according to which specialization group is making the choice. For example, is an angler willing to sacrifice solitude for the prospect of having more fish? Some such cognitive ranking must occur before any lexicographic process of choice-making can be initiated. Thus, inclusion of such rankings is important for the formulation of a more complete choice behavior model.

The third section was a list of twenty-four possible questions that each respondent might wish to ask in order to make a rational choice among alternative sites. Here again was an opportunity to verify the attribute ranking process by allowing each respondent to score some questions (attributes) as more important than others. This section also provided an opportunity to use the number of questions which were indicated as important to determine whether a more specialized

recreationist requires more, less, or about the same amount of information as a less specialized participant.

The final section examined each respondent's willingness to risk a bad decision on the basis of incomplete information. Given the choice between a familiar but less than ideal site and a site about which only the location is known, which would be chosen if one must commit his time and travel expense to one or the other, and which would be chosen if the commitment were minor?

CHAPTER FOUR

Results and Discussion

Survey Response

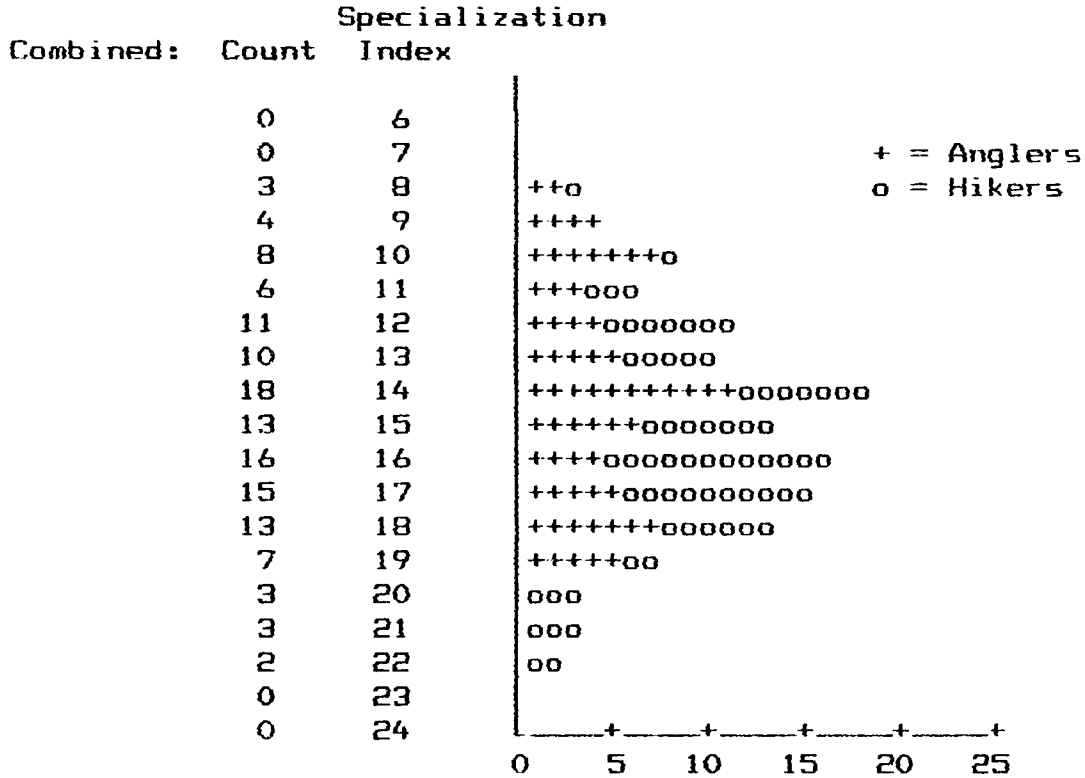
In order to minimize interviewer-subject interaction as a potential source of bias in this study, subjects were simply asked whether they would be willing to participate in a study of anglers or hikers for the University of Montana. Those willing to be subjects were given questionnaire packets containing a questionnaire, a cover letter, and a stamped return envelope. No provision was made for securing names and addresses of subjects, so followup mailings were not possible. In an analysis of 48 mail surveys, Dillman (1978) found an average response rate of 74%, and estimated that "without [3] followup mailings [of questionnaires and reminders to non-respondents], response rates would be less than half those normally obtained" (p.180). Nevertheless, of 200 survey questionnaires distributed, 144 were returned within the six weeks allotted for response: 68 for anglers and 76 for hikers, for a combined response rate of 72% (68% for anglers and 76% for hikers). Such a response rate is much higher than Dillman (1978) suggests should be expected under the circumstances. The range of responses in the questionnaires received and the generally good rate of return suggest that the probable significance of non-response bias is rather small.

Classification into Specialization Groups

Because specialization was a concept that underlay most of the comparisons conducted in this study, it was of crucial importance that categorization of respondents into appropriate specialization groups be highly reliable. The means of categorization was suggested by Bryan (1979) and Dowell and McCool (1984): Respondents were classified on the basis of their responses to questions concerning preferred recreation settings, preferred management regimes for recreation settings, preferred social contexts during recreation, preferred use of vacation time, preferred recreation outcomes, preferred equipment/techniques, and the influence of distance on their participation at desired sites.

Although Bryan (1979) and Dowell and McCool (1984) employed clusters of responses to each question, in this study each of these factors was addressed separately in seven questions, each having four possible answers. Responses to each question were then given values of 1, 2, 3, or 4, and an overall specialization index for each respondent was derived by adding together the values for the seven questions. After these indices were calculated, a histogram of frequencies for each specialization index value (See Table 1) suggested that the data were normally distributed. Each respondent was then assigned to one of three specialization groups of nearly equal size based on his or her specialization index: the lower third into the Unspecialized group, the middle third into the Generalized group, and the upper third into the Specialized group. Although Bryan (1977) categorized anglers into four groups, it was felt that an additional group would result in very small group memberships and partial loss of observable trends for each group.

Table 1. Frequency distribution of indices of specialization among anglers and hikers.



	Mean	Median	Std Dev	Min	Max
Anglers	14.048	14.000	3.285	8.000	20.000
Hikers	15.638	16.000	3.015	8.000	22.000
Combined	14.879	15.000	3.234	8.000	22.000

Note: Indices are based on summed scores for six variables (See Table 2).

To test the reliability of these specialization variables, Cronbach's coefficient alpha, a statistical procedure which measures internal consistency of grouping measures (Cronbach 1951), was employed. An initial analysis of reliability gave an alpha of .71130, the probability of correctly sorting cases on the basis of scores

derived from a series of nominal or ordinal-level variables. However, because some variables are associated to a lesser degree than others, reliability of grouping may be increased if such variables are ignored. The social context variable was found to result in a reduction in reliability, so it was deleted as a grouping variable. After its deletion, the alpha score increased to .74110. Table 2 shows the variables used for specialization groupings and the value of alpha if each were deleted. With the reliability of specialization groups satisfactorily established, group membership was used as a comparison variable for testing the hypotheses in this study.

Table 2. Cronbach's alpha-values for variables used in categorizing subjects according to their recreation specialization.

<u>Variable</u>	<u>Value of Alpha if Variable is Ignored</u>
Preferred recreation setting	0.70151
Preferred style of management	0.65805
Preferred use of vacation time	0.72866
Preferred recreation outcomes	0.71684
Preferred equipment/technique	0.67153
Influence of distance on site choice	0.73810

Cronbach's alpha for the combined effect of the six variables: 0.74110

Note: Best reliability of grouping occurs when deletion of any single variable would result in a reduced alpha for the combined effect of all remaining variables.

Other Variables Associated With Recreation Specialization

Hypothesis 1 states that specialized recreationists have participated in their chosen activities for a longer time than have less specialized individuals. If so, as Bryan (1977) and Graefe and others (1986) have suggested, then the mean number of years of participation should increase as specialization increases and there should be statistically discernable differences between any two pairs of groups. Table 3 shows the summary statistics for these comparisons for anglers and hikers. If Hypothesis 1 is supported, there should be no statistically discernable differences among specialization groups (at $\alpha=.05$). As Table 3 shows, the mean length of participation did not appear to increase with increased specialization. Generalist anglers tended to have fished longer, while non-specialists and specialists appeared to be about the same. Generalized hikers, on the other hand, had the shortest length of participation, although specialists did appear to have participated longer than non-specialists. Table 4 shows the results of one-way analyses of variance (ANOVAs) of length of participation by specialization groups for fishing and hiking. The ANOVA for anglers shows that the means of the three groups are not significantly different at $\alpha=.05$, nor were differences between pairs of groups. Thus, the hypothesis must be accepted for anglers. It appears that the generalized anglers never progressed from the stage of preferring to catch a limit of fish to that of fishing to demonstrate skill, as Bryan (1977) has suggested.

Table 3. Years of experience fishing or hiking by unspecialized, generalized, and specialized recreationists.

ANGLERS				
	Unspecialized (n=25)	Generalized (n=21)	Specialized (n=17)	All (n=63)
Mean	26.080	31.095	27.529	27.971
Median	25.000	30.000	25.000	25.000
Std Dev	12.359	14.131	12.928	13.321

HIKERS				
	Unspecialized (n=16)	Generalized (n=26)	Specialized (n=26)	All (n=68)
Mean	15.063	11.692	17.654	14.840
Median	14.000	10.000	19.000	14.000
Std Dev	7.716	6.098	8.940	8.373

Table 4. One-way analysis of variance of mean length of participation by specialization groups.

ANGLERS

Source	Degrees of Freedom	Sum of Squares	Mean Squares
Between Groups	2	295.8295	147.9147
Within Groups	60	10333.8848	172.2314
Total	62	10629.7143	
F-Ratio: .8588		F-Probability: .4288	

HIKERS

Source	Degrees of Freedom	Sum of Squares	Mean Squares
Between Groups	2	463.8747	231.9374
Within Groups	65	3820.3606	58.7748
Total	67	4284.2353	
F-Ratio: 3.9462		F-Probability: .0241	
Scheffe Test:		<u>15.063</u>	<u>11.692</u> <u>17.654</u>

Underlined values are not significantly different at $\alpha=.05$.

On the other hand, the results of the ANOVA for hikers does not support the hypothesis, and Scheffe's test indicates that specialists are significantly different from both non-specialists and generalists. Therefore, there does appear to be at least a partial, or weak, association between length of participation and specialization.

Hypothesis 2 states that specialized recreationists are no more likely than their less specialized counterparts to demonstrate greater commitment to their chosen sports by participating more frequently. An initial examination of the data showed that the distribution of frequency of participation was strongly skewed to the right. Some respondents reported averaging over 250 outings per year, which suggests that they either counted incidental activity rather than deliberate fishing or hiking trips, or that they may not have understood the question asked of them. Because it is highly unlikely that anyone goes hiking or fishing for pleasure five out of every seven days, such outliers were not considered during analysis of the data.

Among anglers, both unspecialized and generalized respondents went fishing about 25 times during the year, while specialists went fishing an average of only 21 times per year. Conversely, specialized hikers averaged nearly 22 outings per year, while unspecialized hikers averaged nearly 15 and generalists went hiking only 12 times annually. Table 5 summarizes these results. A one-way ANOVA of frequency of participation by specialization groups was conducted to determine whether the groups did in fact differ in terms of this variable. The results are shown in Table 6. As Table 6 shows, neither anglers nor hikers differed across specialization groups in the average annual number of fishing or hiking

Table 5. Frequency of participation in fishing or hiking by unspecialized, generalized, and specialized recreationists.

ANGLERS				
	Unspecialized (n=21)	Generalized (n=19)	Specialized (n=15)	All (n=55)
Mean	25.333	25.474	21.467	23.300
Median	24.000	25.000	20.000	20.000
Std Dev	13.410	15.291	12.983	13.738

HIKERS				
	Unspecialized (n=15)	Generalized (n=24)	Specialized (n=24)	All (n=63)
Mean	14.733	12.500	21.917	16.391
Median	10.000	9.500	20.000	12.000
Std Dev	16.276	10.677	15.019	13.840

Table 6. One-way analysis of variance of mean frequency of participation by specialization groups.

ANGLERS			
Source	Degrees of Freedom	Sum of Squares	Mean Squares
Between Groups	2	168.9722	84.4861
Within Groups	52	10165.1368	195.4834
Total	54	10334.1091	
F-Ratio: .4322		F-Probability: .6514	

HIKERS			
Source	Degrees of Freedom	Sum of Squares	Mean Squares
Between Groups	2	1134.0905	567.0452
Within Groups	60	11518.7667	191.9794
Total	62	12652.8571	
F-Ratio: 2.9537		F-Probability: .0598	

outings. Such findings contradict the proposed relationship described by Kelly (1974), Moore (1976), and Graefe and others (1986), and suggest that use of this variable as an indicator of specialization may prove misleading. The evidence here supports Hypothesis 2. It is possible that average length of each outing or number of days spent fishing or hiking annually may be more closely associated with recreation specialization.

Hypothesis 3 states that specialists, generalists, and non-specialists are equally likely to rate themselves as experts. Graefe

and others (1986) used recreationists' self-assessed skill level as a specialization variable in a study of hikers and were able to reliably group hikers by their "specialization." However, because the other variables used were length of experience and frequency of participation, skill level alone may have been the controlling variable. Because perceived skill level is an ordinal measure, ANOVA could not be used for analysis. Instead, a chi-square test of independence was employed to compare actual frequencies to estimated frequencies. The results of this test for anglers and hikers are summarized in Table 7. As can be seen, there appears to be a significant increase in perceived skill with increased specialization in both activities. Thus, Hypothesis 3 is not supported by the data in this study. This is a particularly useful finding in that it suggests that in future studies, specialization may be able to be estimated by asking a single question related to perceived skill level instead of a series of recreation outcome, orientation, or preference questions, thus streamlining research methodology and perhaps avoiding potentially confounding variables.

Bryan (1976, 1977) has suggested that more specialized recreationists are more likely to demonstrate their interests and loyalties to their avocations by maintaining affiliations with other specialists via subscriptions to magazines or membership in clubs devoted to their chosen activities or recreation resources. If so, then researchers would need only contact subscribers or club members when they wanted to sample specialized recreationists, or exclude them if a less specialized sample were desired.

Table 7. Associations between self-assessed skill level and recreation specialization among anglers and hikers.

ANGLERS				
Specialization Group	Self-Assessment Percentages			Row Total
	Novice	Intermediate	Expert	
Unspecialized (n=24)	12.5%	79.1%	8.3%	38.7%
Generalist (n=21)	4.7%	66.7%	28.6%	33.9%
Specialized (n=17)	0%	47.0%	53.0%	27.4%
Column Total	6.5%	66.1%	27.4%	100% (n=62)
Chi-square: 11.34043				
Degrees of Freedom: 4			Significance: 0.02300	
HIKERS				
Specialization Group	Self-Assessment Percentages			Row Total
	Novice	Intermediate	Expert	
Unspecialized (n=17)	23.5%	70.6%	5.9%	25.0%
Generalist (n=25)	4.0%	76.0%	20.0%	36.8%
Specialized (n=26)	0%	30.7%	69.2%	38.2%
Column Total	7.4%	57.4%	35.3%	100% (n=68)
Chi-square: 27.89027				
Degrees of Freedom: 4			Significance: 0.00000	

Hypotheses 4 and 5 state that specialists are no more likely to subscribe to activity-related magazines or to belong to activity-related organizations than less specialized participants are. As with hypothesis 3, the data are in nominal (i.e., count) form, so chi-square tests of independence were conducted. The results of the test of hypothesis 4 are summarized in Table 8. As shown in the table, somewhat fewer than half the anglers in any specialization group subscribed to activity-related magazines. Consequently, the three groups were not statistically discernable from one another with 95% confidence and the hypothesis must be accepted as it is applied to anglers. The rate of subscribers among hikers was even lower: only about one in five subscribed to a magazine related to hiking. Differences among the three groups were not statistically discernable and hypothesis 4 must be accepted as applied to hikers. Apparently, if increased specialization fosters an increase in identification with other specialists in the form of activity-related magazine subscriptions, as Bryan (1977) suggests, then either the specialization indices used here are invalid or subscription is only weakly associated with specialization. Motives for subscription may well vary from one individual to the next. While specialists could indeed subscribe for purposes of affiliation, other groups may subscribe in order to improve their skills or to learn of desirable places to visit. Perhaps a better means of exploring the specialization/subscription relationship (if one exists) would be to evaluate the specialization of subscribers rather than the subscription rates of specialization groups.

Table 8. Magazine subscription and recreation specialization of anglers and hikers.

ANGLERS			
Specialization Group	Subscription Percentages		Row Total
	Non-Subscriber	Subscriber	
Unspecialized (n=25)	60.0%	40.0%	39.7%
Generalist (n=21)	52.4%	47.6%	33.3%
Specialized (n=17)	58.8%	41.1%	27.0%
Column Total	57.1%	42.9%	100% (n=63)

Chi-square: 0.29739

Degrees of Freedom: 2

Significance: 0.8618

HIKERS			
Specialization Group	Subscription Percentages		Row Total
	Non-Subscriber	Subscriber	
Unspecialized (n=17)	88.2%	11.8%	24.6%
Generalist (n=26)	80.7%	19.3%	37.7%
Specialized (n=26)	73.1%	26.9%	37.7%
Column Total	79.7%	20.3%	100% (n=69)

Chi-square: 1.48932

Degrees of Freedom: 2

Significance: 0.4749

Table 9 shows the results of the test of hypothesis 5. As shown, the club membership rate for anglers was only about 15% for each group. A chi-square test of independence showed that the three groups of anglers did not differ significantly at $\alpha=.05$, and thus, the hypothesis that specialization is not associated with membership in activity-related clubs must be accepted as applied to anglers. Hikers tended even less to be members of activity-based clubs. Only about 6% of the sample were members and a chi-square test showed that the three specialization categories were not significantly different at $\alpha=.05$. Hypothesis 5 must therefore be accepted as applied to hikers. Here too, the question must be asked, are hikers really not "club persons," or is some other factor at work in this instance? It is possible that neither hikers nor anglers feel a need for off-site affiliation with others. Regardless of the reasons, it appears that use of club membership or speciality magazine subscription as specialization variables may produce misleading data.

Along with the notion of commitment proposed by Bryan (1977) and Wellman and others (1982) come the propositions that value of equipment for the chosen activity is linked to specialization, as are annual expenditures for participation and ownership of particular items of equipment. If commitment is in fact measurable economically, specialization information could be derived by simply asking participants how much their gear is worth and/or how much they spend annually on their chosen sports. Similarly, if ownership of particular pieces of sports equipment is a valid criterion of specialization, then

Table 9. Activity-related club membership and recreation specialization of anglers and hikers.

ANGLERS			
Specialization Group	Club Membership Percentages		Row Total
	Non-Member	Member	
Unspecialized (n=25)	92.0%	8.0%	39.7%
Generalist (n=21)	80.9%	19.1%	33.3%
Specialized (n=17)	76.5%	23.5%	27.0%
Column Total	84.1%	15.9%	100% (n=63)
Chi-square: 2.06523			
Degrees of Freedom: 2		Significance: 0.35610	

HIKERS			
Specialization Group	Club Membership Percentages		Row Total
	Non-Member	Member	
Unspecialized (n=17)	88.2%	11.8%	24.6%
Generalist (n=26)	100.0%	0%	37.7%
Specialized (n=26)	92.3%	7.7%	37.7%
Column Total	94.2%	5.8%	100% (n=69)
Chi-square: 2.87960			
Degrees of Freedom: 2		Significance: 0.23900	

researchers would only need to see what kind of equipment a subject was using in order to determine his or her degree of specialization.

Hypothesis 6 states that specialized recreationists invest the same amount in their equipment as less specialized individuals. Respondents to the survey listed an extremely wide range of values for this variable, from as little as \$25 to over \$25,000. An examination of the data showed that there was an extreme rightward skewness as a result of a handful of these very high values. (These were for anglers who owned their own motorboats and hikers who owned climbing equipment and included their value as part of the total value of sporting equipment.) In order to avoid misleading statistics, these outliers were not included in statistical tests. As shown in Table 10, the greatest average investment in equipment was among generalized anglers: a value of \$829.33. Generalists also displayed the highest median investment at \$000.00. Contrary to the pattern suggested by Bryan (1977), and Wellman and others (1982), specialists appeared to more closely resemble unspecialized anglers in terms of their equipment value. This curvilinear pattern of values may have been the result of a process of gradual accumulation of equipment and possibly "conspicuous consumption"--buying what one wishes he or she needed, rather than what is actually fitted for the style of participation practiced (Bryan 1977) during maturation as anglers, followed by a "paring down" to the items deemed essential among more specialized adherents. An additional explanation may be based on Bryan's (1977) proposal that generalists seek to catch as many fish as possible. It is reasonable to assume,

Table 10. Value of fishing or hiking equipment of unspecialized, generalized, and specialized recreationists.

ANGLERS				
	Unspecialized (n=20)	Generalized (n=15)	Specialized (n=14)	All (n=49)
Mean	823.00	829.33	825.00	809.44
Median	500.00	800.00	750.00	500.00
Std Dev	701.76	551.98	510.18	607.52

HIKERS				
	Unspecialized (n=17)	Generalized (n=24)	Specialized (n=18)	All (n=59)
Mean	587.06	675.00	1087.50	787.58
Median	500.00	600.00	1000.00	600.00
Std Dev	386.31	339.99	613.23	501.00

therefore, that they are likely to invest in whatever equipment they deem necessary to meet this goal.

Hikers, on the other hand, displayed an obvious increase in equipment value as specialization increased, with specialists reporting a mean value of \$1,087.50 and a median value of \$1,000. This value appeared markedly higher than those for non-specialists and generalists.

A oneway ANOVA was used to test for differences among the means of the groups in each activity. The results are summarized in Table 11. As can be seen, anglers did not differ significantly (at $\alpha=.05$) across specialization groups. In fact, a p-value so close to 1.000 would suggest that, statistically, the anglers are nearly completely homogeneous in terms of this variable. On the other hand, hikers--the

Table 11. One-way analysis of variance of mean estimated value of fishing/hiking equipment by specialization groups.

ANGLERS			
Source	Degrees of Freedom	Sum of Squares	Mean Squares
Between Groups	2	348.9116	174.4558
Within Groups	46	17006463.3333	369705.7246
Total	48	17006812.2449	
F-Ratio: .0005		F-Probability: .9995	

HIKERS			
Source	Degrees of Freedom	Sum of Squares	Mean Squares
Between Groups	2	2598269.3050	1299134.6520
Within Groups	56	11476565.4400	204938.6686
Total	56	14074834.7550	
F-Ratio: 6.3391		F-Probability: .0033	
Scheffe Test:		<u>587.059</u>	<u>675.000</u> <u>1087.50</u>

Underlined values are not significantly different at $\alpha = .05$.

specialists, at least--did differ significantly from one another. One reason for this observation may be that because the specialists expressed a preference for all-year participation, they would have required winter equipment in order to do so. We must therefore accept hypothesis 6 for anglers while rejecting it for hikers.

Hypothesis 7 states that more specialized persons annually spend no more than less specialized persons in pursuit of their preferred activities. Again, Bryan (1977) has suggested increased expenditures as indicative of greater commitment to the activity on the part of the participant. As observed for the equipment investment value variable, there were wide ranges in values of annual expenditures reported: some respondents stated that they spent nothing at all, while others estimated their expenditures at several thousand dollars. Because these very high values effected a pronounced skewness in the distribution of value, all expenditures above \$500 were excluded from calculations. Descriptive statistics are listed in Table 12.

Anglers once again appeared to follow the pattern suggested by the hypothesis. Specialists appear to have spent about the same amount as non-specialists, while generalists spent considerably more than either of the other groups. Hikers showed a considerably different picture: generalists spent the least, while specialists spent the most. Although there appeared to be some obvious differences in expenditures among the various specialization groups, it was necessary to perform a oneway ANOVA to determine whether the apparent differences were in fact significant. As summarized in Table 13, there was no statistically significant (at $\alpha=.05$) difference in annual expenditures among the

Table 12. Estimated average annual recreation-related expenditures of unspecialized, generalized, and specialized recreationists.

ANGLERS				
	Unspecialized (n=18)	Generalized (n=17)	Specialized (n=11)	All (n=46)
Mean	129.89	205.88	155.45	160.84
Median	100.00	100.00	150.00	100.00
Std Dev	96.12	189.00	138.23	142.61

HIKERS				
	Unspecialized (n=12)	Generalized (n=12)	Specialized (n=20)	All (n=44)
Mean	149.17	118.48	187.25	153.47
Median	100.00	100.00	125.00	100.00
Std Dev	165.84	91.84	166.52	141.56

specialization groups in the two activities. It is therefore necessary to accept the hypothesis of no association between specialization and annual expenditures on recreation.

Although the data suggest otherwise, it is possible that average annual expenditures may vary across specialization groups. These differences (if they do in fact exist) could have been accentuated if the form of the question in the survey questionnaire had been different. Respondents were only asked to indicate how much they spent on fishing/hiking in the previous year. A better question would have asked for an estimate of average annual expenditures, including travel, food

Table 13. One way analysis of variance of estimated annual recreation expenditures by specialization groups.

ANGLERS

Source	Degrees of Freedom	Sum of Squares	Mean Squares
Between Groups	2	51567.3824	25783.6912
Within Groups	43	919688.2698	21388.0993
Total	45	971255.6522	

F-Ratio: 1.2055 F Probability: .3095

HIKERS

Source	Degrees of Freedom	Sum of Squares	Mean Squares
Between Groups	2	50611.0260	25305.5130
Within Groups	52	1014987.1560	19518.9838
Total	54	1065598.1820	

F-Ratio: 1.2965 F-Probability: .2822

and lodging costs. In some cases, respondents indicated no expenditures (other than for fishing licenses). Such answers doubtless affected the usefulness and probable validity of the results of this test.

If the value of equipment or the amount of annual expenditures on one's recreation activity are not always associated with recreation specialization, perhaps ownership of specific items of equipment is. To test this idea, Bryan (1977) observed anglers to see what types of equipment they used, then he interviewed the subjects to identify their levels of specialization. In this study, such observation was not possible, so respondents were asked to indicate which fishing or hiking items they owned. Table 14 summarizes the patterns of ownership among anglers, while Table 15 does so for hikers. For each item, the null hypothesis is that there is no difference in ownership frequency among specialization groups (chi-square test of independence).

For anglers, equipment items were: baitcasting rig, spincasting rig, flycasting rig, waders, wet or dry flies, spinning lures, creel, and raft or boat. The different specialization groups were significantly different (chi-square probability value less than 0.05) for only a single item--spinning lures--although there were different ownership patterns that approached significance in two other items: baitcasting rig and creel. These suggest the validity of Bryan's (1977) proposition that specialists are more likely to favor a technique requiring expertise (i.e., fly fishing) and to have a greater orientation to the resource (i.e., an angler who releases fish caught has no need of a creel). An angler high in specialization is thus more likely (as seen here) to own a flycasting rig but not a baitcasting rig;

Table 14. Associations between recreation specialization and ownership of specific items of fishing equipment.

Equipment Item	Percentage Ownership by Specialization Group			Chi-Square	Group-Dependent Signif. Lambda
	Unspecialized (n=25)	Generalist (n=21)	Specialized (n=17)		
Bait casting rig	76%	81%	47%	0.0531	0.07895
Spin casting rig	96%	90%	82%	0.3350	0.05263
Fly casting rig	72%	81%	94%	0.2009	0.00000
Waders	64%	76%	88%	0.2041	0.00000
Wet or dry Flies	88%	81%	100%	0.1751	0.02632
Spinning Lures	100%	100%	76%	0.0031	0.10526
Creel	56%	76%	41%	0.0872	0.05263
Raft or Boat	68%	67%	82%	0.5037	0.00000

Note: All chi-square significance levels are based on 2 degrees of freedom. Lambda is a measure of the improvement in forecasting efficiency for a dependent variable when the distribution of the independent variable is known.

the specialist is also unlikely to own spinning lures because of preference for fly casting equipment/technique over spinning equipment/technique.

For hikers, the equipment items were: daypack, campstove, sleeping bag, mountain parka, hiking boots, backpack, tent, and snowshoes. Unlike anglers, the hikers differed with statistical significance only in terms of a single item of equipment: backpacks. Ownership percentage increased with specialization, reaching 100% among specialists. As shown in Table 15, other equipment ownership patterns were not markedly different. It is worth noting, however, that even though not statistically discernable, the ownership of snowshoes (a variable chosen to be an indicator of commitment to hiking by allowing participation to extend into the winter) did increase with specialization.

Although ownership of some items of equipment is thought to be associated with increased specialization, not all items are associated to the same degree. This may be due to several factors. First, as suggested previously, there is likely to be some upgrading of equipment over time as old items are replaced by more specialized substitutes. It is typical of human nature, however, to be loath to part with old equipment that is still serviceable and could be used by less experienced/specialized companions. Thus, it is not surprising to find some ownership of "unspecialized" gear by specialists. Second, many retail outlets provide rental equipment as a service to customers. Use of such equipment would permit a specialized recreationist of modest means to enjoy longer or more demanding outings without the requirement

of buying the necessary equipment. This may be the case with such items as snowshoes, which are costly and can only be used in winter. While such services are fairly common for hiking equipment, they are much

Table 15. Associations between recreation specialization and ownership of specific items of hiking equipment.

Equipment Item	Percentage Ownership by Specialization Group			Chi-Square	Group-Dependent Signif. Lambda
	Unspecialized (N=17)	Generalist (N=26)	Specialized (N=26)		
Daypack	94%	100%	100%	0.4732	0.06977
Campstove	82%	77%	92%	0.3096	0.09302
Sleeping bag	100%	100%	100%	-----	0.00000*
Mountain parka	65%	77%	85%	0.3186	0.04651
Hiking Boots	94%	92%	100%	0.3721	0.04651
Backpack	70%	88%	100%	0.0131	0.11628
Tent	82%	80%	92%	0.4544	0.06977
Snowshoes	18%	15%	53%	0.2135	0.11628

Note: All chi-square significance levels are based on 2 degrees of freedom. Lambda is a measure of the improvement in forecasting efficiency for a dependent variable when the distribution of the independent variable is known.

*Chi-square significance cannot be computed when perfect goodness-of-fit exists, as it does in this case.

less so for fishing gear. As a result, it is not surprising that there were more differences among the anglers than there were among hikers. Third, a list of eight items is rudimentary at best in terms of finding out who owns what. It is entirely possible that other items would have produced different results, either more or less associated with different degrees of specialization. On the basis of the data available here, we can reject hypothesis 8, that specialization groups do not differ in terms of ownership of specific items of equipment.

Specialization and Information Needs

We have seen in previous sections that recreation specialization is associated with certain continuous variables, and that recreationists do differ in terms of their preferences for certain activity settings, management styles, experiences, social settings, use of leisure time, willingness to travel, type of equipment used, and other measures. Do recreationists also differ in terms of the amount of information they require in order to rationally select previously untried recreation settings? What criteria do the different specialization groups use (i.e., do the groups differ as to the type of information needed) in comparing potential sites? Are members of different specialization groups equally willing to take a chance by choosing a completely unfamiliar and unknown site over a familiar, but imperfect site? These questions are explored in the following section.

The concepts of specialization and cognitive development suggest that maturation within a recreation activity leads to increased discriminatory ability on the part of the recreationist in identifying

the salient characteristics of recreation settings, and a preference for certain elements. If so, we may surmise that a more specialized person will want more information about site attributes in order to choose the more narrowly-defined site(s) that will meet his or her more exacting criteria. On the other hand, it is possible that a specialist may have a greater adaptive or intuitive ability, thus needing to ask fewer questions than an inexperienced person because of an increased ability to "read" information. Hypothesis 9 addresses both of these alternatives by testing the assumption that there is no difference among specialization groups in terms of the number of questions they require answers to when choosing a recreation site (that is, the amount of information each group requires is the same). To test this hypothesis, subjects were given a list of twenty-four possible questions, each concerning a particular aspect of a hypothetical recreation site. They were then asked to indicate which ones they would require answers to when selecting a recreation site. The number of questions marked by each subject was counted and summary statistics are presented in Table 16.

Although the numbers of questions asked ranged from 1 to 21, the mean number of questions asked by each group lay in the range from 8 to 9. Because the medians appeared to differ by a greater amount than the means, a oneway ANOVA (summarized in Table 17) was conducted to determine whether there were in fact discernable differences among the groups in the two activities. The ANOVA revealed no significant differences among groups--in fact, the F-probability suggests that the groups overlap substantially. Thus, we must accept the hypothesis that

all specialization groups will ask the same number of questions during site selection.

Although the data appear to contradict the suppositions of Bryan (1976, 1977) and Williams (1985), there are several possible explanations for this lack of difference among specialization groups. People may have needed answers to questions which were not provided as possible answers, or some may simply have been more "nosy" than others.

Table 16. Associations between recreation specialization and amount of information needed (i.e., number of questions asked) in site selection by anglers and hikers.

ANGLERS				
	Unspecialized (n=25)	Generalized (n=21)	Specialized (n=17)	All (n=63)
Mean	8.480	9.048	8.353	8.824
Median	7.000	9.000	8.000	8.500
Std Dev	3.970	3.008	2.029	3.438
HIKERS				
	Unspecialized (n=16)	Generalized (n=26)	Specialized (n=26)	All (n=69)
Mean	9.813	9.000	8.500	9.053
Median	11.000	9.000	8.000	9.000
Std Dev	4.119	2.771	2.943	3.153

Table 17. One-way analysis of variance of numbers of questions asked during site selection by fishing and hiking specialization groups.

ANGLERS			
Source	Degrees of Freedom	Sum of Squares	Mean Squares
Between Groups	2	5.5284	2.7642
Within Groups	60	625.0747	10.4179
Total	62	630.6032	
F-Ratio: .2653		F-Probability: .7678	

HIKERS			
Source	Degrees of Freedom	Sum of Squares	Mean Squares
Between Groups	2	17.0625	8.5313
Within Groups	65	662.9375	10.1990
Total	67	680.0000	
F-Ratio: .8365		F-Probability: .4378	

Another reason could lie in the type of information required. People may require the same amount of information, but about different aspects of sites. This possibility is explored in the following test.

If specialized hikers and anglers asked the same numbers of questions as unspecialized ones, do they ask the same questions? Are their preferences for specific site characteristics the same? Hypothesis 10 states that there is no difference among the groups concerning the type of information each deemed important. To test the hypothesis, subjects were asked to look back over the list of questions

described previously and to place an additional mark next to the five that they considered most important, and to underline the single most important question. Each question thus acquired an ordinal score of relative importance (i.e., 0 for unmarked questions, 1 for single marks, 2 for double marks, and 3 for underlines) for each respondent. For each specialization group, the overall importance of any single question was derived by adding the scores assigned by each group member. (If five or fewer were originally marked, each was counted as 2, except for the underlined question.) The scores (i.e., importance values) for each question were totaled, and the questions were ranked in order of their importance values. Table 18 summarizes the results for anglers and Table 19 the results for hikers.

As shown in Table 18, Spearman's correlation coefficient for comparisons of how the three groups ranked the twenty-four questions indicates a generally high level of correlation. All correlations were significant at $p < 0.001$, implying that if we assume a correlation, we will likely be wrong less than 0.1% of the time. However, such a statistic may be misleading in this case. Spearman's coefficient is based on the assumption of absolute rankings. That is, any item in the list must be either higher or lower than any other. Although a correction factor has been derived in order to deal with ties, the excessive number of ties resulting from the use of a constrained range of values (the importance scores used in this study, for example) causes the coefficient to gradually increase as the number of items in the list increases. In other words, the correlation is high because it is influenced by the many items of low importance to each specialization

Table 18. The relationship between recreation specialization among anglers and preferences for specific site attribute information.

Site Attribute Information	Information Rankings by Specialization Group		
	Unspecialized	Generalized	Specialized
Likely number of encounters	8	8.5	2.5
Fish species present	4	1	1
Type of Water	6	6.5	2.5
Other rec uses	11	10.5	9.5
Scenic quality	14.5	18.5	12.5
Regulations in effect	2	4	6
Numbers of fish present	5	6.5	11
Wild or stocked fish	21	12.5	4
Fish from shore or boat	7	2	9.5
Recommended tackle	16.5	14	20
Size of fish present	9.5	4	5
Entry fee required	9.5	12.5	14.5
Distance from home	3	10.5	8
Facilities present	20	22.5	23
Difficulty of access to water	14.5	8.5	14.5
Litter in or near water	12.5	15.5	12.5
Grizzly bears present	16.5	18.5	20
Water quality	1	4	7
Presence of outside noise	22	24	16
Frequency of car break-ins	19	15.5	20
Distance from parking to water	18	20	17.5
Presence of biting insects	23	21	23
Type of bait/lure to use	12.5	17	17.5
Guide services available	24	22.5	23

Spearman's correlation coefficient (corrected for tied ranks):

Between Unspecialized and Generalized Groups: 0.8316

Significance: $p < 0.001$

Between Generalized and Specialized Groups: 0.7169

Significance: $p < 0.001$

Between Unspecialized and Specialized Groups: 0.6914

Significance: $p < 0.001$

Note: Rankings are on a scale of 1 - 24. Importance scores were not used, owing to different group sizes.

group. Thus, if we were to compare only a few items, we would be more likely to see some definite differences between groups. For example, specialists ranked fish species, likely number of encounters with other anglers, water character, presence of wild fish and fish size as the most important elements of their preferred sites, while generalists preferred information about fish species, whether fishing was from shore or from a boat, regulations, fish size, and water quality, and non-specialists wanted to know about water quality, regulations, distance, fish species, and numbers of fish present. Apart from the top five attributes identified by each group, there were other differences worth pointing out. For example, the importance of fishing regulations declined in ranking from 2 to 4 to 6 as specialization increased, while the importance of wild fish rose from a ranking of 21 to 12.5 to 4. Clearly, there were differences between groups about which questions (representative of site attributes) were most important.

A similar pattern emerges among the preferences of hikers, as shown in Table 19. Once again, there was a significantly high correlation ($p=0.0017$ to $p < 0.001$) between pairs of groups, yet there were definite differences observed between groups. Specialists ranked type of terrain, likely number of encounters with other hikers, scenery, outside noise, and type of destination as their five most important considerations, while generalists preferred to know about the type of destination, scenery, type of terrain, likely number of encounters, presence of grizzly bears and availability of drinking water (these last two were tied), and non-specialists wanted information concerning scenery, presence of grizzly bears, type of terrain, trail difficulty,

Table 19. The relationship between recreation specialization among hikers and preferences for specific site attribute information.

Site Attribute Information	Information Rankings by Specialization Group		
	Unspecialized	Generalized	Specialized
Likely number of encounters	7	4	2
Trail difficulty	5	9	16.5
Type of trail destination	5	1	5
Grizzly bears present	2	5.5	8.5
Black bears present	20	24	24
Other forms of rec on site	8.5	10	8.5
Drinking water available	13	5.5	7
Entry permit required	15	11	6
Regular ranger patrols	24	23	22.5
Mosquitos present	11	19	20
Distance from home	5	7	10
Scenic quality	1	2	3
Presence of litter	15	13	11
Difficulty of trailhead access	15	15	21
Frequency of car break-ins	22.5	15	13
Area is designated wilderness	22.5	21	16.5
Campfires permitted	17.5	15	15
Wildflowers present	17.5	22	22.5
Type of terrain	3	3	1
Wildlife species present	11	19	19
Signs of other resource mgmt	20	17	13
Presence of outside noise	8.5	12	4
Trail distance to destination	11	8	13
Cross-country travel difficulty	20	19	18

Spearman's correlation coefficient (corrected for tied ranks):

Between Unspecialized and Generalized Groups: 0.8009

Significance: $p < 0.001$

Between Generalized and Specialized Groups: 0.8751

Significance: $p < 0.001$

Between Unspecialized and Specialized Groups: 0.5857

Significance: $p = 0.0017$

Note: Rankings are on a scale of 1 - 24. Importance scores were not used, owing to different group sizes.

type of destination, and distance to the area (the last three were tied). Just as marked differences in preferences among anglers were observed, so too were differences among hikers. The importance of the likely number of other hikers rose in ranking from 7 to 4 to 2 as specialization increased, while presence of mosquitos fell from 11 to 19 to 20, distance from home dropped from 5 to 7 to 10, and presence of outside noise went from 8.5 to 12 to 4.

The differences between groups in both activities suggest that there are indeed different sets of values at work which may well be linked to differences in specialization. In both activities, the more specialized people expressed a desire for sites free of human intrusion in the form of other recreationists, noise, or stocked fish, while non-specialists valued attributes which would be more likely to ensure a "successful" outing: lots of fish of preferred species, good water quality, scenery, nearness to home, and easy trails. These differences may exist in the abstract sense, but how do preferences of the various specialization groups compare when known site characteristics are paired?

Hypothesis 11 states that if information about two site elements is given simultaneously for two sites, that there will be no difference between groups in their choice of sites. To test the effect of partial

information on site preference, subjects were presented with a series of fifteen pairs of hypothetical recreation sites. The first site in each pair offered an attribute (identified through an open-ended pre-test) considered desirable paired with one generally considered undesirable. The second site offered the converse of the first site. For example, a pair might have been: Few people, far from home; many people, near home. Subjects were then asked to indicate which site from each pair they would choose. The percent of each group choosing each site was tallied, and a crosstabulation of choices by groups for each paired comparison was performed. The results are summarized in Tables 20 and 21.

As Table 20 shows, anglers differed in terms of what each specialization group was willing to "pay" in terms of less desirable site attributes in order to have a desired one. For example, in order to be assured of few encounters with other anglers, specialists were generally willing to accept difficult access, poor scenery, few fish, flies-only regulations, a long drive to the site, and even litter, but were unwilling to sacrifice desired fish species. Non-specialists, on the other hand, agreed with specialists in their willingness to accept difficult access, poor scenery, few fish and a long drive, but were unwilling to "pay" in terms of flies-only, litter, or undesirable fish in order to have few encounters. Disagreement among fishermen was greatest for the following pairs of characteristics: few anglers, flies-only; large fish, catch-and-release enforced; large fish, more than 6 hours away; many fish, poor scenery; near home, catch-and-release enforced; and near home, many anglers. In general, increasingly

Table 20. Anglers' preferences for fishing site attributes
(based on paired comparisons of sites where
conditions are known).

Site Attributes	Percentage Preferred by Group			Chi-Square	Choice-Dep.	Lambda
	Unspecialized	Generalized	Specialized			
Few anglers;difficult access	80%	95%	100%	0.0631	0.0000	
Few anglers;low scenic quality	72%	89%	88%	0.2397	0.0000	
Few anglers;few fish	54%	52%	75%	0.3157	0.0000	
Few anglers;flies only	37%	52%	94%	0.0012	0.2308	
Few anglers;litter present	14%	15%	54%	0.1912	0.0000	
Few anglers;warm-water species	33%	24%	18%	0.5104	0.0000	
Few anglers;over 3 hrs away	65%	86%	94%	0.0563	0.0000	
Large fish;catch/release	46%	81%	88%	0.0054	0.1053	
Large fish;over 6 hrs away	40%	71%	76%	0.0267	0.2000	
Large fish;no facilities	91%	95%	100%	0.4533	0.0000	
Large fish;entry fee required	35%	33%	35%	0.9918	0.0000	
Many fish;many anglers	46%	48%	25%	0.3157	0.0000	
Many fish;low scenic quality	65%	81%	41%	0.0393	0.1364	
High scenic qual.;many anglers	28%	10%	12%	0.2397	0.0000	
High scenic qual.;few fish	35%	19%	59%	0.0393	0.1364	
High scenic qual.;>6 hrs away	43%	38%	65%	0.2332	0.1724	
High scenic qual.;litter	4%	5%	0%	0.6725	0.0000	
No litter;low scenic quality	96%	95%	100%	0.6725	0.0000	
No litter;many anglers	86%	85%	65%	0.1912	0.0000	
Near home;small fish	60%	29%	23%	0.0267	0.2000	
Near home;low scenic quality	56%	62%	35%	0.2332	0.1724	
Near home;catch/release	36%	57%	88%	0.0049	0.2400	
Near home;many anglers	35%	14%	6%	0.0563	0.0000	
Facilities;small fish	9%	5%	0%	0.4533	0.0000	
Trout present;many anglers	67%	76%	82%	0.5104	0.0000	

specialized anglers appeared more willing to travel and to accept otherwise undesirable conditions in order to be assured of few encounters with other anglers, specialized technique and a resource of large, wild fish. In fact, response to potentially restrictive regulations, such as flies-only and catch-and-release produced improvements of over 23% in the ability to predict site preference once an angler's specialization level was known (λ values of 0.2308 and 0.2400 when site choice was the dependent variable).

As seen in Table 21, hikers also displayed differing preferences for sites when paired information was presented. Like anglers, hikers preferred to have few encounters with others, and they were willing to accept any conditions except poor scenic quality in order to be assured of solitude. When scenic beauty was at stake, it outranked everything from other hikers to grizzly bears in importance (although it gradually diminished in importance relative to encounters as specialization increased). Designated wilderness was not preferred if it was likely to be full of people, but specialists and generalists ranked it above difficult trails.

Chi-square tests of independence showed the following significant differences among preferences of the three hiking specialization groups: few hikers, hard trail; few hikers, entry permit required; high scenic quality, grizzly bears present; high scenic quality, more than three hours away; wilderness area, hard trail; and easy trail, no drinking water. While these differences in preference were observed, similarities between pairs of specialization groups were frequently fairly close, permitting improvement in predicting attribute preferences

Table 21. Hikers' preferences for hiking site attributes
(based on paired comparisons of sites where
conditions are known).

Site Attributes	Percentage Preferred by Group			Chi-Square	Choice-Dep.
	Unspecialized	Generalized	Specialized		
Few hikers;difficult trail	70%	100%	100%	0.0003	0.0000
Few hikers;no other recreation	70%	84%	88%	0.7587	0.0000
Few hikers;non-wilderness	81%	73%	88%	0.4024	0.0000
Few hikers;many mosquitos	40%	50%	65%	0.2588	0.0968
Few hikers;permit required	56%	77%	92%	0.0233	0.0000
Few hikers;no water	75%	76%	88%	0.4303	0.0000
Few hikers;low scenic quality	37%	38%	46%	0.8048	0.0000
Few hikers;no campfires	75%	85%	96%	0.1334	0.0000
High scenic qual;grizzly bears	50%	85%	88%	0.0082	0.0000
High scenic qual;> 3 hrs away	69%	92%	96%	0.0247	0.0000
High scenic qual;no water	75%	81%	88%	0.5200	0.0000
High scenic qual;many hikers	63%	62%	54%	0.8048	0.0000
High scenic qual;hard access	75%	92%	96%	0.0778	0.0000
Wilderness area;many hikers	19%	27%	12%	0.4024	0.0000
Wilderness area;hard trail	37%	81%	100%	0.0000	0.2667
Easy trail;no water	40%	11%	0%	0.0013	0.0000
Easy trail;hard access	37%	42%	35%	0.8477	0.0000
Easy trail;many hikers	29%	0%	0%	0.0003	0.0000
Abundant water;low scenic qual	25%	19%	11%	0.5200	0.0000
Abundant water;many hikers	25%	24%	11%	0.4303	0.0000
Abundant water;hard trail	60%	88%	100%	0.0013	0.0000

in only two cases: few hikers, many mosquitos ($\lambda = 0.0968$) and wilderness areas, hard trail ($\lambda = 0.2667$).

Here again, we have seen that even if different specialization groups require the same amounts of information about recreation site traits, they do differ in terms of the information and actual on-site conditions they prefer.

Suppose now that the recreationists, specialized and otherwise, are faced with the choice between a familiar site that does not quite match their preferred conditions and a completely unfamiliar site. Will familiarity prevail, or will recreationists risk making a bad decision by choosing the unfamiliar site? How will the choice be affected if the price of a bad choice includes lengthy travel time? Bryan (1977) and Williams (1985) maintain that a more specialized recreationist will have a fairly narrow range of acceptability in site characteristics because of the very precise identification of preferences. If this is so, then a specialist will be more likely to choose the unknown site and to reject the less-than-ideal known alternative. This is the subject of hypothesis 12.

As shown in Table 22, the majority of all recreationists chose the unfamiliar site over the familiar site when the stakes were high (i.e., a round trip of over six hours to the site). In fact, a chi-square test of independence showed no significant difference in the frequencies of the three groups' choices.

The choice of the unfamiliar site increased, especially among unspecialized recreationists, when the site was nearer to home, implying a lesser investment in time. As Table 23 shows, willingness to "take a

Table 22. The influence of recreation specialization among anglers and hikers on selection of recreation sites when one site is familiar, but less-than-ideal, the other is completely unfamiliar, and both are over three hours from home.

Specialization Group	Recreation Site Choice		Row Total
	Familiar Site	Unfamiliar Site	
Unspecialized (n=40)	15%	85%	31.3%
Generalist (n=46)	7%	93%	35.9%
Specialized (n=42)	10%	90%	32.8%
Column Total	10.2%	89.8%	100.0% (n=128)
Chi-square: 1.71284		Significance: 0.42470	
Degrees of Freedom: 2			

Table 23. The influence of recreation specialization among anglers and hikers on selection of recreation sites when one site is familiar, but less-than-ideal, the other is completely unfamiliar, and both are less than one hour from home.

Specialization Group	Recreation Site Choice		Row Total
	Familiar Site	Unfamiliar Site	
Unspecialized (n=40)	8%	92%	31.0%
Generalist (n=47)	4%	96%	36.4%
Specialized (n=42)	0%	100%	32.6%
Column Total	3.9%	96.1%	100.0% (n=129)
Chi-square: 3.12174		Significance: 0.21000	
Degrees of Freedom: 2			

chance" increased from 89.8% to 96.1% overall, and the choices of all respondents approached unanimity.

Such willingness on the part of nearly all respondents to risk a poor choice on the basis of the possibility of improvement over a previous choice is surprising, to say the least. The survey question instructed respondents to choose between a "less-than-ideal" site and one about which all that was known was how to get to it. Apparently, there are two potential forces at work in this instance: either there is a nearly universal drive to find the "perfect" recreation site, or the phrase "less-than-ideal" connotes complete undesirability, in which case the nearly unanimous response is all but inevitable.

In this section, data analysis has been utilized to test twelve hypotheses at the 95% level of confidence ($\alpha=.05$). The results are summarized below:

Hypothesis 1: Length of participation does not vary across specialization groups.

Supported: Partially

Hypothesis 2: Frequency of participation does not vary across specialization groups.

Supported: Yes

Hypothesis 3: The distribution of self-assessed skill levels (i.e., novice, intermediate, expert) does not vary across specialization groups.

Supported: No

Hypothesis 4: The rate of subscription to activity-related periodicals does not vary across specialization groups.

Supported: Yes

Hypothesis 5: The rate of activity-related club membership does not vary across specialization groups.

Supported: Yes

Hypothesis 6: The value of recreation equipment does not vary across specialization groups.

Supported: Partially

Hypothesis 7: Annual expenditures on recreation do not vary across specialization groups.

Supported: Yes

Hypothesis 8: There is no difference among specialization groups regarding ownership of specific items of fishing/hiking equipment.

Supported: No

Hypothesis 9: Members of all specialization groups tend to ask the same number of questions about potential recreation sites in order to make a choice (i.e., the amount of information needed does not differ).

Supported: Yes

Hypothesis 10: There is no difference among specialization groups regarding how they rank the relative importance of the questions they ask when making a recreation site choice (i.e., the type of information does not differ).

Supported: Partially

Hypothesis 11: When there is some knowledge of certain site characteristics in a paired-comparison decision situation, the choice of sites will be the same for all specialization groups.

Supported: No

Hypothesis 12: There is no difference among specialization groups regarding whether they are more likely to choose a site they have not previously visited over a familiar, but less-than-ideal site.

Supported: Yes

CHAPTER FIVE

Conclusions

Summary of Study

This study utilized a survey of anglers and hikers to explore characteristics of recreation specialization and the effects of specialization on information needs and site attribute preferences during site selection. Using a series of experiments, various possible parameters of specialization such as length and frequency of participation, investment in equipment, annual expenditures, ownership of specific items of equipment, and self-assessed skill level were tested in order: 1) To weigh their reliability as possible specialization variables, and 2) To determine whether a single aspect of specialization can replace the series of preference/orientation questions in future methodologies.

Once these concepts were tested, a series of tests was conducted to examine the effects, if any, that specialization had on the amount and type of information required for site selection. In addition, the effects on site selection as a result of familiarity and the perceived commitment to one's choice were observed.

It was hypothesized that recreation specialization would not be associated with longer history of participation, greater frequency of

participation, value of investment in equipment, annual recreation expenditures, ownership of certain items of equipment, subscription to activity-related publications, activity-related club membership, and self-assessed level of competence in the activity. It was further hypothesized that different specialization groups would not differ in terms of the amounts and types of information preferred when choosing a site, nor in their preferences for known site attributes. Lastly, it was hypothesized that all specialization groups would be willing to risk a bad decision rather than recreate at a familiar, but less-than-ideal site.

Findings and Implications

Using a series of tests, the study found that specialization can be reliably measured in terms of recreationists' preferences for setting types, management regimes, use of vacation time, recreation outcomes (or experiences), techniques, and the influence of distance from home on participation. Increased specialization was reflected in preferences for scenic, wilderness settings for hiking, or streams for fishing; for management designed to preserve the recreation resource rather than placing convenience and development first; for longer, wider-ranging vacations; for discovery of new areas or catching wild fish; for using specialized equipment under exacting conditions; and in an increased willingness to travel greater distances in order to reach preferred settings. Preferred social setting was not found to be a reliable indicator of specialization.

Increased specialization was not found to be strongly linked to greater length of participation among anglers, although it did appear to

be associated with specialization among hikers. It was not observed to be linked to greater frequency of participation, nor was it observed to be strongly associated with annual expenditures on participation. Value of recreation equipment was found to be related to hiking specialization, but not to fishing specialization. Ownership of specific items of recreation equipment was found to be of only limited use in distinguishing between specialization groups. Items representing greater commitment (such as backpacks and snowshoes) or preference for particular techniques (such as spinning lures versus flies) were most significantly related to specialization. Subscription to activity-related publications and membership in activity-related organizations were not found to be related to degree of specialization. The best single (i.e., unclustered) variable associated with specialization was the self-assessed skill level of the recreationist: specialists were much more likely to rate themselves experts, and non-specialists were more likely to consider themselves novices.

Thus, in terms of the conceptual framework for specialization proposed by Bryan (1976, 1977) and Wellman and others (1982), there appears to be support for the resource and technique orientation variables, but only partial support for the variables used to define commitment: length and rate of participation and economic involvement. We may surmise that these were either truly not relevant or that they were incorrectly measured or that the sample was too small to allow patterns to emerge.

The study found that the amount of information required for site selection does not vary across specialization groups, suggesting that

amount of information required is not influenced by the decision maker's degree of specialization. However, specialization **did** appear to affect the type of information required--that is, the preferences of recreationists for specific site characteristics do appear to be linked to specialization levels. More specialized recreationists preferred scenic, unaltered settings having a high likelihood of solitude for hiking or streams supporting populations of large, wild trout and having few other anglers for fishing. Less specialized individuals were more concerned with either ease of travel, scenery, and lack of grizzly bears when hiking, or good water quality, many fish, and nearness to home when fishing. These preferences appeared to be consistent, whether they related to hypothetical sites or to sites where some information concerning on-site conditions was available. Such findings not only lend credence to McCool's (1984) multiple-attribute salience theory, but also to the concepts proposed in the choice function site attribute typology (Mackay and McCool 1986), the concepts of cognitive development (Moore 1974, Williams 1985, and Williams and Huffman 1986), and the now generally accepted recreation opportunity spectrum concept (Brown and others 1978, Driver and Brown 1978 and Clark and Stankey 1979). Clearly, there are differences in preferences which are associated with the participant's degree of specialization, and which imply that a range of setting types is necessary if a range of specialization types is to be accommodated.

Of particular interest were the findings concerning the combined influences of familiarity and distance on site choice. While the distance element had already been identified as variable across

specialization groups, it was assumed that less specialized persons would be less willing to travel to visit an unknown site that might have proven to be less desirable than a more familiar but imperfect site. All groups displayed a high degree of willingness to take a chance. Such evidence suggests that despite specialization differences, recreationists are still willing to risk a bad decision while seeking the perfect experience. While it is probably premature to suggest that such motives underlie all choice behavior, the idea is nevertheless appealing.

The implications for recreation resource managers are numerous and important. First, people are not uniform in their preferences, expectations, or abilities. Thus, as suggested by Brown and others (1978), Driver and Brown (1978), and Clark and Stankey (1979), provision of a range of possible recreation settings should be the goal of managers. To do so, it will be necessary to determine a) the site attributes necessary for each possible activity (enabling attributes) and b) those that are likely to make the use of possible sites enjoyable. This suggests that an effective management tool would be a sort of activity/setting cross-reference in which the range of possible recreation settings is defined in terms of the activities they will support. It is entirely possible that public lands can support far greater recreational use and provide greater satisfaction to visitors than has previously been thought. Second, while the amount of information made available to the public concerning recreation opportunities does not appear to need to vary across visitor types, the content does. Therefore, for the previously mentioned activity/setting

tool to be effective, a fairly wide range of information must be available, from which the public can select the items it needs. Huffman and Williams (1986) discuss the use of in-office microcomputers as a means of providing such information. Ideally, visitors should be able to obtain information about possible recreation sites on the basis of any attributes they consider important (i.e., via a user-defined information "menu"). If adequate information is available (in a form that the public can utilize), necessary management action such as temporary site closures for rehabilitation or prescribed fire can be made more acceptable by demonstrating that interchangeable alternatives **as defined by the user** do in fact exist.

Further Research Needs

While this study did explore specialization and information effects on site choice behavior in some depth, additional research is needed. Such research needs to explore the characteristics and preferences of recreationists and the methodology of attribute preference research. This study, for example, concerned anglers and hikers. However, these groups represent only a fraction of the spectrum of outdoor recreationists. Skiers, hunters, mountain climbers, snowmobilers, runners, and river floaters are all in need of study. An understanding of their preferences--by specialization group--could provide valuable information for planners, such as: Which groups are likely to prefer a particular type of setting? Which sites are likely to afford acceptable substitutes in order to avert possible conflicts among different types of recreationists or between recreationists and non-recreation management actions? Which preferences are universal, and

which are sport-specific?

In addition, anglers and hikers need to be studied in greater depth concerning the following aspects of site characteristic preferences: Were the questions used to establish estimates of information needs the most important ones? Which others are important? How would these same questions be ranked if the conditions of decision-making were to change, such as if the decision-maker were taking a less-skilled companion along (Schreyer and Roggenbuck 1978 and Williams 1985), or if the same decision-maker were to reflect upon possible preferences ten or twenty years hence? Such knowledge would be a valuable addition to our understanding of human nature.

In terms of studying specialization, an obvious research need is the study of other possible parameters of specialization, such as average length of recreation outings, travel-cost of preferred site attributes (i.e., willingness to spend time or money to be assured of the preferred combination of setting characteristics) and possible associations with demographic variables such as age, income, or education.

Methodologically, this study was constrained by the format of the research instrument. It is possible that a different questionnaire design could produce somewhat different results. For example, there may have been other questions than those employed here which would have been more important, while some could have been deleted. In other words, a study of the salience of many additional attributes seems necessary. Furthermore, it is possible that specialization variables and attribute preferences differ geographically within a particular

activity. For example, does a hiker in Maine value the same setting elements as one in Colorado? Is an angler in Louisiana attracted by the same attributes as one in Washington?

Additionally, the ideal product of paired-comparison preference studies would be a table in which each site attribute is compared to every other attribute. Because such a table would doubtless require a multitude of comparisons, it would be necessary to employ an array of questionnaires with a series of population sub-samples or a series of followup questionnaires using the same subjects in order to produce the necessary data.

If we have gained some new insights into specialization and information needs and usages among recreationists, we have also delineated more clearly the distinction between what we know and what we don't know. Some of the findings presented here differ from those of previous research. While additional research is obviously in order if we are to accept or reject their validity, their primary value lies in their identification of new lines of inquiry in recreation social science.

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APPENDIX A. FISHING SPECIALIZATION QUESTIONNAIRE

MONTANA ANGLERS' SURVEY

Hello! We'd like to learn more about you as an outdoor recreation participant and about what you like--or don't like--in the places you go fishing.

1. How many years have you actively fished? _____
2. On a year-to-year basis, how often would you say you go fishing?
_____ times/year.
3. How would you rate yourself as an angler?
Check one: Novice _____ Intermediate _____ Expert _____
4. Please check which of these items you own:

Bait Casting Rig _____	Spin Casting Rig _____
Fly Casting Rig _____	Creel _____
Waders _____	Spinning Lures _____
Wet or Dry Flies _____	Rubber Raft or Boat _____
Fishing Magazine Subscription _____	
Fishing Club Membership _____	

5. What would you say your investment in fishing equipment is worth?
 _____ dollars.
6. What would you estimate you have spent on fishing during the past year (excluding licenses)?
 _____ dollars.
7. Indicate which description best suggests what you look for when deciding where to fish. (Please check only one):
- _____ Any water containing fish.
- _____ Lakes, larger free-stone streams or rivers.
- _____ Prefer streams to lakes or rivers.
- _____ Small, alpine lakes.
- _____ Spring creeks.
8. Which description best suggests the style of management you prefer for the area(s) you fish? (Please check only one):
- _____ Management emphasizes facilities and "easy" fishing. Frequent stocking of fish. No creel limits imposed.
- _____ Management to provide the greatest number of fish, including stocking to supplement natural fish populations. Facilities minimal or absent. Limits of ten fish.
- _____ Management is aimed more at producing trophy fish than numbers of fish. Limits of five or fewer fish. Facilities minimal or absent.
- _____ Management emphasizes natural setting and wild fish. No stocking. Catch-and-release only.
9. When fishing, what social setting do you prefer? (Please check only one):
- _____ Fishing with family.
- _____ Fishing with peers.
- _____ Fishing with fellow specialized anglers.
- _____ Fishing alone.

10. How do you spend your vacation time? (Please check only one):

- _____ Seldom take vacations.
- _____ Take short vacations within region.
- _____ Take extended fishing vacations.
- _____ Arrange work around fishing.

11. Which statement best describes your fishing orientation?
(Please check only one):

- _____ Catching a fish, any fish.
- _____ Catching a limit of fish.
- _____ Catching large fish.
- _____ Catching a fish under exacting conditions.

12. Which statement best describes your equipment/technique preference? (Please check only one):

- _____ Prefer any kind of tackle that will catch fish.
- _____ Prefer spinning or spincasting tackle.
- _____ Prefer fly tackle.
- _____ Prefer ultralight fly tackle.

13. How important is distance from home in determining where you fish? (Please check only one):

- _____ I prefer to fish near home.
- _____ I prefer to fish near home, but also fish farther away from time to time.
- _____ Distance from home is less important to me than other aspects of my fishing trip.
- _____ To fish the way I want I will go anywhere.

* * * * *

For each question in this section, choose **one** fishing site, based on the information given. Indicate your choice by marking the appropriate space. (Check only one choice for each question):

14. Many other fishermen, easy access _____
 OR
 Few other fishermen, difficult access _____.
15. High scenic quality, many other fishermen _____
 OR
 Low scenic quality, few other fishermen _____.
16. Many other fishermen, many fish _____.
 OR
 Few other fishermen, few fish _____.
17. Large fish, enforced catch-and-release _____
 OR
 Small fish, no creel limit _____.
18. High scenic quality, few fish _____
 OR
 Low scenic quality, many fish _____.
19. Trophy fish, six hours' drive from home _____
 OR
 Small fish, near to home _____.
20. Many other fishermen, any bait/lure permitted _____
 OR
 Few other fishermen, flies only permitted _____.
21. High scenic quality, six hours' drive from home _____
 OR
 Low scenic quality near to home _____.
22. High scenic quality, litter in or near water _____
 OR
 Low scenic quality, no litter _____.
23. Many other fishermen, no litter _____
 OR
 Few other fishermen, litter in or near water _____.
24. On site facilities, small fish _____
 OR
 No facilities, large fish _____.
25. Less than an hour from home, enforced catch-and-release _____
 OR
 More than three hours from home, no creel limit _____.

- _____ How hard (or easy) is it to get to the water?
- _____ Is there much litter?
- _____ Are there bears?
- _____ What is the water quality like?
- _____ Is there any outside noise, such as highway noise?
- _____ How often do unattended cars get broken into?
- _____ Do you have to walk far from the car to get to the fishing?
- _____ Are there biting insects?
- _____ What are other anglers using for bait?
- _____ Are guide services available?

Now look back over this list of questions. If you checked more than five questions, mark an "X" next to each of the **five** that are most important to you.

If you could ask only one question on which to base your decision, which would it be? Underline the **one** question that would be most important to you.

30. Suppose you had to choose one of two sites for a fishing trip. Both sites are three hours away from your home, but in opposite directions. You have fished at one of the sites before, but it was not what you would call an ideal site. The other site is one you have never visited; in fact, all you know about it is how to get to it. Which would you choose?

_____ The familiar site _____ The unknown site

Which would you choose if both sites were only an hour from home?

_____ The familiar site _____ The unknown site

* * * * *

THIS IS THE END OF THE SURVEY. THANK YOU VERY MUCH FOR
TAKING THE TIME TO PARTICIPATE.

* * * * *

School of Forestry
University of Montana
Missoula, Montana

APPENDIX B. HIKING SPECIALIZATION QUESTIONNAIRE

MONTANA HIKERS' SURVEY

Hello! We'd like to learn more about you as an outdoor recreation participant and about what you like--or don't like--in the places you hike.

1. How many years have you actively hiked? _____
2. On a year-to-year basis, how often would you say you go hiking?
_____ times/year.
3. How would you rate yourself as a hiker?
Check one: Novice _____ Intermediate _____ Expert _____
4. Please check which of these items you own:

Day Pack _____	Hiking Boots _____
Campstove _____	Backpack _____
Sleeping Bag _____	Backpack Tent _____
Mountain Parka _____	Snowshoes _____
Hiking Magazine Subscription _____	Hiking Club Membership _____
5. What would you say your investment in hiking equipment is worth?
_____ dollars.

6. What would you estimate you have spent on hiking during the past year?

_____ dollars.

7. Indicate which description best suggests what you look for when deciding where to hike. (Please check only one):

_____ Any open area with a trail.

_____ Scenic areas with easy trails.

_____ Scenic wilderness areas with some difficult trails.

_____ Remote, trailless wilderness areas.

8. Which description best suggests the type of management you prefer for the area(s) you hike in? (Please check only one):

_____ Area managed to promote easy access to all features. Naturalness is less important than visitor convenience. No restrictions on numbers of users.

_____ Area managed to provide some form of access to all features. Naturalness is as important as visitor convenience. No restrictions on numbers of users.

_____ Area managed to preserve naturalness. Access is less important than naturalness, and some features will have no access provided. There may be some restrictions on numbers of visitors.

_____ Area managed to preserve wildness, challenge. Access is de emphasized--most features will require cross-country travel. Visitor numbers will be restricted to minimize contacts with other parties.

9. When hiking, what social setting do you prefer? (Please check only one):

_____ Hiking with family.

_____ Hiking with peers.

_____ Hiking with fellow specialized hikers.

_____ Hiking alone.

10. How do you spend your vacation time? (Please check only one):

_____ Seldom take vacations.

_____ Take short vacations within region.

_____ Take extended hiking vacations.

_____ Arrange work around hiking.

11. Which statement best describes your hiking orientation?
(Please check only one):

_____ Like to visit a familiar area most of the time.

_____ Like to visit many different areas, some repeatedly.

_____ Like to visit many different areas, but prefer not to go to the same place twice.

_____ Like to discover new places, places nobody knows about.

12. Which statement best describes your equipment/technique preference? (Please check only one):

_____ Prefer day hikes in mild weather. Minimal equipment.

_____ Prefer overnight hikes, mostly in mild weather. Use some specialized equipment (ex.: lightweight pack, sleeping bag and tent).

_____ Prefer multi-day hikes over long distances, sometimes go overnight in wintertime. Use much specialized equipment.

_____ Prefer multi-day hikes over long distances under exacting conditions (ex.: extensive cross-country or winter travel). Use much highly specialized equipment.

13. How important is distance from home in determining where you hike? (Please check only one):

_____ I prefer to hike near home.

_____ I prefer to hike near home, but also hike farther away from time to time.

_____ Distance from home is less important to me than other aspects of my hiking trip.

_____ To hike the way I want I will go anywhere.

* * * * *

For each question in this section, choose **one** hiking site, based on the information given. Indicate your choice by marking the appropriate space. (Check only one choice for each question):

14. Few other hikers, difficult trail _____

OR

Many other hikers, easy trail _____.

15. High scenic quality, grizzly bears present _____

OR

Low scenic quality, no grizzly bears _____.

16. Many other hikers, opportunities for many other activities _____

OR

Few other hikers, no other activities possible _____.

17. Low scenic quality, less than an hour from home _____

OR

High scenic quality, more than three hours from home _____.

18. Wilderness area, many other hikers _____

OR

Non-Wilderness, few other hikers _____.

19. High scenic quality, no drinking water _____

OR

Low scenic quality, abundant drinking water _____.

20. Few other hikers, many mosquitos _____

OR

Many other hikers, no mosquitos _____.

21. Wilderness area, difficult trail _____

OR

Non-Wilderness, easy trail _____.

- 22. Few other hikers, entry permit required _____
 OR
 Many other hikers, no permit required _____.
- 23. Few other hikers, no drinking water _____
 OR
 Many other hikers, abundant drinking water _____.
- 24. High scenic quality, many other hikers _____
 OR
 Low scenic quality, few other hikers _____.
- 25. Difficult trail, abundant drinking water _____
 OR
 Easy trail, no drinking water _____.
- 26. Easy trail, difficult access by car _____
 OR
 Difficult trail, easy access by car _____.
- 27. High scenic quality, difficult access by car _____
 OR
 Low scenic quality, easy access by car _____.
- 28. Many other hikers, campfires permitted _____
 OR
 Few other hikers, no campfires permitted _____.

* * * * *

29. In deciding where to go hiking people need certain information in order to choose an enjoyable place. Listed below is a series of questions that hikers may ask to help make a decision. Indicate which ones you would need to have answers to in order to decide where you would go. REMEMBER: CHECK **ONLY** THOSE WHICH WOULD INFLUENCE YOUR DECISION--NOT JUST THOSE THAT WOULD BE NICE TO KNOW.

- _____ How many other parties am I likely to meet?
- _____ How difficult are the trails?
- _____ What kinds of places are reached by trail (ex.: lakes, meadows, old mines, etc.)?
- _____ Are there grizzly bears?
- _____ Are there black bears?
- _____ What kinds of other forms of recreation occur there (ex.: hunting, horseback riding)?
- _____ Is there good drinking water available?
- _____ Is an entry permit required?
- _____ Is the place patrolled by rangers on a regular basis?
- _____ Are there mosquitos?
- _____ How far from home is the area?
- _____ What's the scenery like?
- _____ Is there much litter?
- _____ How hard is it to drive to the trailhead?
- _____ How often do unattended cars get broken into?
- _____ Is it a designated Wilderness area?
- _____ Can you have a campfire?
- _____ Are there wildflowers?
- _____ What kind of terrain is it (ex.: mountains, desert, forest, canyon, etc.)?
- _____ What species of wildlife can be observed?
- _____ Can you see sights like clearcuts from the area?

- _____ Does the place get any outside noise, like highway noise?
- _____ How far do you have to go on a trail to get to someplace nice?
- _____ How hard is cross-country travel there?

* * * * *

Now look back over this list of questions. If you checked more than five questions, place an "X" next to the **five** that you feel are most important.

If you could ask only one on which to base your decision, which would it be? Underline the **one** question that would be most important to you.

30. Suppose you had to choose one of two areas for a hiking trip. Both places are three hours away from your home, but in opposite directions. You have hiked at one of the areas before, but it was not what you would call an ideal place. The other place is one you have never visited; in fact, all you know about it is how to get there. Which would you choose?

_____ The familiar site _____ The unknown site

Which would you choose if both sites were only an hour from home?

_____ The familiar site _____ The unknown site

THIS IS THE END OF THE SURVEY. THANK YOU VERY MUCH FOR TAKING THE TIME TO PARTICIPATE.

* * * * *

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