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THE EFFECTS OF NORMATIVE AND INFORMATIONAL
SOCIAL INFLUENCE ON VISITOR BEHAVIOR
IN OCCUPIED GRIZZLY BEAR HABITAT

By

Amy M. Braithwaite

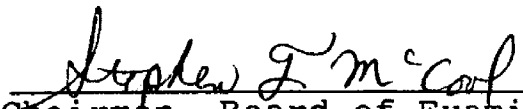
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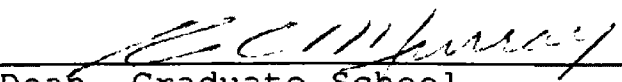
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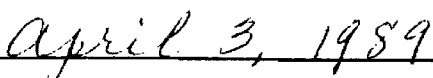
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The Effects of Normative and Informational Social Influence on Visitor Behavior in Occupied Grizzly Bear Habitat (139 pp.)

Director: Stephen F. McCool *SFM/97/11*

Rising concerns about confrontations between backcountry recreational visitors and bears have lead to bear management plans that rely heavily upon information programs to persuade such visitors to adopt appropriate behaviors. The effectiveness of such programs is sometimes questioned because confrontations continue, and the cause is often inappropriate behavior. Contemporary attitude theory suggests that social influences on behavior may affect the reception and adoption of information programs. Fishbein and Ajzen's (1975) theory of reasoned action served as the theoretical framework to investigate the importance of various social groups to backcountry visitors, both as sources of information and as influences on appropriate behavior in occupied grizzly bear habitat.

A return mail questionnaire was sent to a random sample of backcountry campers (n = 568) visiting Glacier National Park and Jewel Basin Hiking Area during the 1987 camping season. The survey instrument was designed to assess visitors' perceptions of social influences on backcountry behavior. To determine whether social influences affect various types of backpackers differently, perceptions of personal safety, grizzly bear presence and hazards, as well as group type and demographic information were collected.

Overall, study findings reveal that social normative pressures, as measured by the Fishbein and Ajzen (1975) behavioral model, provide very little insight into the prediction of backcountry camper behavior in occupied grizzly bear habitat. However, informational and social normative influences do affect certain types of backpackers in various ways. Groups composed of family members or family and friends were much more susceptible to social influence than individuals travelling alone or with some other group type. Additionally, individuals with no or very little prior backpacking experiences in occupied grizzly bear habitat had higher social influence scores than individuals who backpack often in grizzly bear country.

ACKNOWLEDGEMENTS

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CHAPTER 1

INTRODUCTION

As access into areas where bears are common, such as the interior of Alaska's Denali National Park, the mountains of the northern Rocky Mountains, the Great Smokey Mountains and the north woods of Michigan has become easier, backcountry managers have become increasingly concerned with bear-human confrontations. Though recreational use of backcountry areas may have decreased in the last few years (Roggenbuck and Lucas 1987, Lucas and McCool 1988), the rate of bear-human encounters has increased (Craighead 1982). The outcome of these conflicts may not only result in injury or death to visitors, but may often lead to increased human induced bear mortality.

Backcountry and wilderness managers have joint mandates to provide implicitly safe recreation opportunities to the public as well as to protect wildlife, especially the grizzly bear (Ursus arctos), which is currently classified as a threatened species in

the continental United States under the provisions of the Endangered Species Act. To reduce confrontations and allow for the coexistence of humans and bears, backcountry managers have recognized the necessity for effective bear management plans. A major component of the plans includes actions which are directed at managing the recreational use that occurs in occupied bear habitat. Often the actions include the temporary closure of trails and areas frequented by bears and rely upon providing information to backcountry visitors to persuade them to engage in recommended behaviors which should ultimately reduce potential conflicts. Information programs currently developed by state and federal agencies attempt to educate the user about proper camping, cooking and food storage techniques; bear avoidance strategies; bear behavior, signs, movement, and ecology; and the inherent risks associated with hiking in grizzly habitat.

Even with intense information programs recreationists often behave as if they do not realize they are in bear country, do not know the proper camping or travelling techniques for grizzly country, or do not

care about human safety or grizzly bear conservation (Weaver 1984). Thus it is understandable that researchers are reporting evidence that suggests that human-bear confrontations may be increasing (McArthur 1979). For example, Martinka (1982) reported that for 30 years the ratio of human-bear incidents to visitation remained steady, yet in the past few years this ratio has been increasing. Table 1 shows the number of human-bear incidents, park visitation rates, and confrontation ratios for the past 25 years.

Table 1. Human-bear incidents in Glacier National Park which resulted in injury or death for the past 25 years, park visitation rates, and confrontation ratio (GNP, 1988).

<u>Year</u>	<u>Incidents (5 year period)</u>	<u>Park Visitation (5 year Period)</u>	<u>Ratio[*]</u>
1961 - 1965	3	3,628,810	.83
1966 - 1970	4	4,006,500	1.00
1971 - 1975	6	5,049,149	1.20
1976 - 1980	9	11,160,685	.82
1981 - 1985	8	9,184,808	.89
1986 - 1988 ¹	6	5,039,928	1.20

*Incidents per million visitors

¹Three year time period

The increase in confrontations, as well as recommendations from bear researchers (for example, see Craighead 1982, Jonkel 1982, and Martinka 1982) for greater public awareness exhibit a need for a better understanding of human behavior in occupied grizzly bear backcountry areas. Since a major portion of bear management plans relies upon influencing human behavior, an understanding of how persuasive communication programs influence visitor behavior is essential.

LITERATURE REVIEW

A variety of communication devices (signs, pamphlets, personal contacts from rangers, slide tape programs, etc.) is available to backcountry visitors to inform them of appropriate behaviors and potential dangers. Very little research, however, has investigated the relationship of information programs to visitor knowledge levels and behaviors in grizzly bear backcountry areas. It is well known in social-psychological research that human responses to public information campaigns, use restrictions, brochures and other measures are influenced by visitor attitudes,

perceptions, value systems and knowledge. Understanding human behavior requires linking beliefs and attitudes with behavioral intentions (Fishbein and Ajzen 1975). A favorable attitude toward a given behavioral alternative, however, does not inevitably result in the selection of that alternative. Therefore, attitudes by themselves are not necessarily predictive of human behavior. The following discussion is intended to review the relevant literature on the effectiveness of information programs, visitor attitudes, social influence and human behavior in recreation settings to provide a conceptual framework for analyzing visitor behavior in occupied grizzly bear habitat.

Information as a Management Tool

The use of information has been an appealing non-regulatory approach to wilderness management that has permitted the manager to adopt less intrusive actions (Lucas 1981). Most managers agree that the public reacts more favorably to control by information rather than regulatory controls (Bury and Fish 1980).

Information as a management tool has been effective in modifying some types of visitor behavior, such as redistributing visitors, minimizing campsite impacts, and reducing recreation conflicts among visitor groups. Krumpe and Brown (1982) determined that 30% of backcountry visitors selected alternate routes when given a "trail selector" guide at ranger stations. Oliver et al. (1985) tested the effectiveness of information given to recreationists in a developed campground. Observed behavior indicated a 50 to 80 percent reduction in depreciative behavior, depending on the method of information dispersal. In an experiment with the Boy Scouts, Dowell and McCool (1986) determined the "Leave No Trace" education program effectively increased wilderness knowledge levels, skills and no impact behavioral intentions.

Several factors must be considered in determining the effectiveness of information programs. For example, information must be delivered at the appropriate stage in trip planning and execution to insure that recreationists will be effectively influenced (Brown and others 1987, Anderson and Manfredo 1986). Also, information must be

distributed in a variety of methods to reach a majority of the target audience (Schwabb 1982, Fazio and Gilbert 1981). The effectiveness of the communication process may be influenced by a recreationist's level of previous experience (Huffman and Williams 1986), degree of specialization (Williams and Huffman 1986, Mackay 1987), and previous existing beliefs (Fishbein and Ajzen 1975). Williams and Huffman determined that experienced visitors were less likely to use trail information, while highly specialized recreationists tended to seek out additional information.

Most of the past research has investigated the effectiveness of information programs on an individual level; however, the social group has been identified as the basic unit in which recreation behavior occurs (Cheek et al. 1976). The type of social group in which an individual participates may influence recreation behavior (Burch 1964). Lee (1977) states that we know very little about how social group dynamics may influence outdoor recreation behavior. Previous studies (Cockrell et al. 1984, Dorman and Fridgen 1982) have shown that individuals can influence other group members, but very

few have examined how this social influence affects behavior of the group as a whole.

Cockrell and others (1984) studied the amount of influence other individuals, both in the activity group or outside the group, had on commercial river trip customers. They investigated both the persons who verbally expressed expectations of others (definers) and those who served as examples (models). Models (guides, family members and others present on the trip) were significantly more influential than definers (managers, family, friends, and other recreationists not present on the trip). This suggests that recreation participants may be more effective in informing and influencing other participants rather than non-participants. Also, communication may be more effective if channelled through group leaders, outfitters or family and friends.

Unfortunately, Dorman and Fridgen (1982) found outdoor recreation vehicle regulation information that was transmitted through informal channels (family and friends) was often less accurate than information transferred through formal channels (brochures, managers). This suggests that agencies (formal channels)

may need to direct communications at those groups (informal channels) likely to transmit messages and information to others within their group or to other groups or individuals. The more credible the receiver of information (recreationist) views the sender (manager or significant others), the greater the chances of effectively influencing the receiver (Fazio and Gilbert 1981).

Some research has been done on the effectiveness of particular methods of information dispersal in relation to an increase in knowledge levels, but little work has looked at the relationship between information transfer and actual behavioral changes. Knowledge, attitudes, and behavioral intentions may change, but actual behavior may not be altered (Dowell and McCool 1986). Much of the research appears to deal with one or several components (effectiveness of programs, behavioral intentions) of information transfer, but very few studies have actually investigated the entire process.

Information, Attitudes and Knowledge Concerning Bears

Joep and Shelby (1984) in their study of interactions between hikers and grizzly bears stated visitor attitudes toward bears are difficult to change and may not be directly related to the behaviors which actually cause or avert confrontations. They stated attitudes can be affected by how a person perceives a risk, deals with danger and uncertainty and potential behavioral responses when a hazard is present. Often people may react to bear warnings with an "it can't happen to me" attitude. In a survey of visitors to Glacier National Park, Mihalić (1974) found that 65% had positive attitudes toward bears, in which respondents felt bears were an important component of the natural ecosystem. Twenty percent of the visitors had negative attitudes toward bears with the remainder (15%) having neutral attitudes. It was determined that reading outdoor literature, past experience, or knowledge about bears had little effect on these attitudes. When given a hypothetical bear encounter, most respondents chose the "correct" course of action. The behavioral intentions of the respondents, however, were unrelated to attitude

intensity.

For example, Chester's (1977) study of human-bear interactions in the forests of Yellowstone reported that a considerable number of backcountry users engaged in activities that could increase their probability of an encounter with a grizzly bear. Many visitors (21%) travelled in small groups (1-2 persons) which are more prone to observe or encounter wildlife than larger groups (>5 persons). Also, sixty percent of the backcountry users stated they used fresh or canned food during their trip, rather than the recommended less odorous freeze dried foods. It appeared that the current information program may not have been effective in changing visitors' behavior.

Consistent with Chester's findings, Sundstrom's (1985) evaluation of Denali National Park's efforts to educate visitors of the appropriate behaviors necessary for bear country revealed that visitors were engaging in behaviors that may increase the likelihood of an incident with a bear. Most respondents in Sundstrom's study felt that written information was the most effective interpretive method for communicating knowledge about

bears; however, when examining backcountry visitors' perceptions alone, oral information was regarded as the most effective. Additionally, an evaluation of the relationship between knowledge and behavior indicated knowledge was of little help in predicting behavior.

Ten years after Chester's study, Trahan (1987) found Yellowstone's information program to be somewhat more effective in altering human behavior. He examined visitor attitudes, the effectiveness of information programs and human behavior concerning grizzly bear dangers in the backcountry. Most respondents felt that grizzly bears did not represent a significant danger for hikers in the backcountry. However, many respondents indicated they would like to get close enough to a grizzly bear for a "good look", a behavior which is contradictory to minimizing confrontations with bears. Most visitors reported that they made noise while hiking, kept a clean camp and stored their food in trees; all of which are behaviors which should reduce the likelihood of a confrontation with a bear. Visitors reported that the most important sources of information about bear dangers were printed materials handed out at the park entrance,

and the information on signs and bulletin boards.

On the other hand, Maw's (1987) study of visitors to Waterton Lakes National Park in Canada determined that 80% of the respondents considered bears to be somewhat dangerous, however, the visitors generally had positive attitudes toward them. It was further determined that individuals with high knowledge levels concerning the biology of bears were more likely to exhibit positive attitudes toward bears. Identifying the most reliable characteristics for distinguishing grizzly bears from black bears was the basic gap in visitor knowledge concerning bear biology. Attitudes and knowledge were found to be related to actual behavior in some situations, but unapparent in others. For example, over 80% of the respondents considered bears to be dangerous; however, 55% indicated that they took no precautions to prevent an encounter with a bear. Therefore, the message that "bears are dangerous" is being transferred to the visitor, but the portion of the message indicating the need to engage in specific behaviors to reduce the amount of danger associated with travelling in occupied grizzly bear habitat either is not being received or accepted.

Very little research has investigated the effectiveness of information programs and visitor behavior in grizzly bear backcountry areas within the context of social group influences. Since managers rely heavily upon information programs to convey appropriate behaviors in backcountry areas, a better understanding of the current information programs, the effects of social group interaction on the effectiveness of these programs, and the interrelationship of knowledge, social influence and behavior is extremely important. With a better understanding of the visitors to their wildland areas, managers can improve public information programs and other actions to reduce the number of human-bear confrontations.

To summarize, (1) a large portion of bear management is actually the management of human visitors to bear country; (2) noted bear researchers and data from recent studies suggest that current people management approaches are somewhat ineffective in altering human behavior; (3) more research is needed concerning how people use information programs; and (4) a better understanding is needed concerning recreation group structures, the social

interaction of group members, and the influence on group members by internal and external forces. An increased understanding of the social and informational influences on backcountry visitors will enable managers to improve public information programs and other management strategies to reduce human-bear conflicts which pose a continual danger to the safety of recreationists and a threat to the survival of the grizzly bear population.

PROBLEM STATEMENT

This study is based on Fishbein's theory of reasoned action which explains individual behavior by examining individual attitudes, social norms, and behavioral intentions. A complete discussion of the model can be found in Chapter 2. Much of the research using this model has been successful in explaining recreation behavior (Anderson 1980, Cockrell 1981, Fedler 1981, and Robertson 1981). Much of this past research, however, has investigated recreation behavior on an individual level. Very little research has examined the behavior of recreation groups and how these groups influence an individual's behavior.

Cockrell (1981) states that there appear to be two independent "schools" of thought concerning the basic unit of analysis in recreation research. One approach has assumed the individual to be the basic unit of analysis, while the other has focused on the social group. Often personality characteristics, attitudes, need states, expected outcomes and other psychological variables are investigated in the attempt to predict behavior. On the other hand, social group theorists believe that individual recreationists can be influenced by a number of participant and non-participant referent groups during their engagement in a particular activity. The dynamics of social group influences on individual recreationists, however, has been relatively unexplored. One possible reason for this may be associated with the difficulty of measuring social influence. The mechanics of the social influence process are difficult to delineate and measure. For example, an individual will receive information from referent groups, process the information and then either reject or utilize it. There is much uncertainty about the methods necessary to investigate this process. Where does one phase of the

influence process start and the next begin? Which groups are the most effective in influencing others? What are the most effective channels of communication and influence? What individual behaviors are most likely to be altered by the influence of social group pressures?

The National Park Service recommends that overnight backcountry users in grizzly habitat not travel alone. If recreationists are following the recommended procedure, the recreation group becomes the major unit of analysis in determining why people may not be engaging in proper backpacking techniques in occupied grizzly backcountry areas. Since data show that bear-human encounters are increasing and the social group is an important unit of analysis, we need to examine group behavior, group structures, social interaction, and social influences in backcountry areas. Thus, this thesis will address the following research question: How do informational and social influences affect backcountry behavior and group dynamics in occupied grizzly bear habitat?

STUDY OBJECTIVES

This study seeks to enhance the understanding of how backcountry visitors behave within their backpacking group. Such understanding should help decrease bear-human confrontations. More specifically, an increase in our knowledge of backcountry visitors to occupied grizzly bear habitat will be achieved by addressing the following objectives:

1. Identify both the inter-group and intra-group sources of social influence that may occur in backpacking parties.
2. Determine the impact social influence may have on an individual's backcountry behavior. This will be measured by utilizing Fishbein's theory.
3. Measure how an individual in the backcountry feels regarding level of personal safety, amount of personal restriction and, finally, certainty of action should a confrontation with a grizzly bear occur. A knowledge of the perceptions an individual

has of the situation and environment may be an indicator of the level of susceptibility an individual may have to social influence.

4. Examine the cohesiveness of individuals within specific backcountry groups according to individually reported attitudes, social norms, and behavioral intentions. The cohesiveness of individuals' perceptions within a group may explain levels of sensitivity to inter-group and intra-group influence.

CHAPTER 2

CONCEPTUAL FRAMEWORK

Numerous recommendations from recreation researchers have been offered seeking the development of theoretical models for understanding recreation behavior. For instance, Brown, Dyer, and Whaley (1973) stated that past recreation research lacked the development of a theoretical orientation to guide it. Responding to these concerns, recreation researchers are making progress toward a more theoretical orientation of comprehending recreation behavior. A theory frequently applied to the study of recreation behavior, but originally developed from consumer behavior research, is Fishbein and Ajzen's (1975) Theory of Reasoned Action. This model attempts to predict an individual's behavior from attitudes, social norms, and behavioral intentions. Another theory that has tried to explain social influence, but not used in recreation research, is King's (1975) Model of Social Influence. King's model states that two types of social

influence, informational and normative, may affect an individual's behavior. The following section reviews the major components of the two theories and related recreation studies that have utilized the Fishbein model.

Fishbein and Ajzen's Theory of Reasoned Action

Fishbein and Ajzen's theory of reasoned action provides an influential model for the prediction of social behavior. According to this theory, two factors alone determine behavioral intentions (BI), the predictor of actual behavior (B). The first factor is the personal attitude component (AB); the second, the perceived social normative component (SN). The two components are given relative weights (w_1 and w_2), which vary depending on the individual, the behavior in question, and the situation. The central equation of Fishbein's theory is:

$$B \sim BI = AB(w_1) + SN(w_2)$$

The attitude component (an individual's attitude toward a specific behavior) is composed of the summated product of the beliefs about the consequences of the

behavior (b_i) and an evaluation of those consequences (e_i). This can be written as:

$$AB = \sum_{i=1}^n b_i (e_i)$$

The social normative component (external factors influencing behavior) is composed of the summated product of an individual's normative beliefs (nb_i) and his or her motivation to comply with a specific behavior (mc_i), written symbolically as:

$$SN = \sum_{i=1}^n nb_i (mc_i)$$

Basically, the model states that a person's intention to perform a behavior is a function of his attitude toward that behavior and his subjective norm about that behavior. A review of these components will provide a better understanding of the Fishbein model.

Beliefs and Attitudes

An individual's attitude toward a specific behavior is a function of the beliefs about an object's attributes

or consequences of a specific act and the evaluation of these attributes and consequences. Fishbein and Ajzen (1975, p. 216) define an attitude as a "person's general feeling of favorableness or unfavorableness toward some stimulus object." As a person develops beliefs from direct observations or inferences, attitudes toward that object are automatically established. Basically, an attitude is determined by a person's salient beliefs at a particular time.

Attitudes may also be assessed by utilizing the expectancy-valency model. According to the model, a belief associates a given object with some attribute. A person's evaluation of the attribute contributes to his attitude in proportion to the strength of his belief. Beliefs represent the information a person has toward an object, which creates an informational base for attitudes. Information accepted from an outside source (park managers, outfitters, etc.) may affect an individual's beliefs and attitudes. However, as mentioned previously, many factors (source credibility, message type, receiver ability) determine the likelihood of the information as being received and accepted.

Informational inputs from other individuals or sources may influence existing beliefs and attitudes. This leads to the second component of the Fishbein model, the normative component of subjective norms.

Subjective Norms

The normative component examines the influence of the social environment on behavior. Fishbein and Ajzen (1975, p. 302) define a subjective norm as a "person's perception that most people who are important to him think he should or should not perform the behavior in question." The subjective norm is comprised of the perceived expectations of specific referent individuals or groups (normative beliefs) and by the person's motivation to comply with these expectations. The importance of reference groups may vary depending upon the behavior in question and the situation.

The first component of the subjective norms is normative beliefs. The authors state that the beliefs about referents' preferences can be developed in two ways. First, a referent may tell the person what attitudes the referent holds toward a particular behavior

and what he thinks the person should do. Second, the individual observes an event or obtains some information that enables him to make inferences concerning a referent's expectations. The two methods of developing normative beliefs allows the individual to formulate beliefs about the types of behaviors various referents would like him to perform.

So one can conclude that if an individual perceives a referent as having a favorable attitude toward performing the behavior, the normative belief formed may be that the referent thinks the person should perform the behavior in question. For example, if an individual's referents (friends, land managers) engage in appropriate backcountry behaviors, the individual may believe he is expected to engage in the appropriate recommended behaviors also.

Major disagreement exists as to the importance of incorporating the subjective norm component into the overall model. Much of the disagreement stems from lack of understanding the formation of normative beliefs. For example, Miniard and Cohen (1981) state that attitudes and social norms overlap one another making the

construct of social norms superfluous. Ryan (1977) determined that the social normative score was not consistently correlated with motivation to comply, but was consistently correlated to attitudes. This indicates that the social normative component may be a subcomponent of the attitudinal portion of the Fishbein equation, where referents' expectations may lead to normative influence on individual attitudes rather than actual behavior. Additional research is necessary to address these concerns as well as to determine the influence referents place on an individual's behavioral intentions in a variety of situations.

King's Social Influence Model

King (1975) presented an analytic model of social influence (Fig. 1), which identified several factors that may influence an individual's behavior during social interaction. These factors may interact with one another and may not be equally important for every situation.

King identifies two major types of social influence, informational social influence and normative social influence, that may affect several of the components

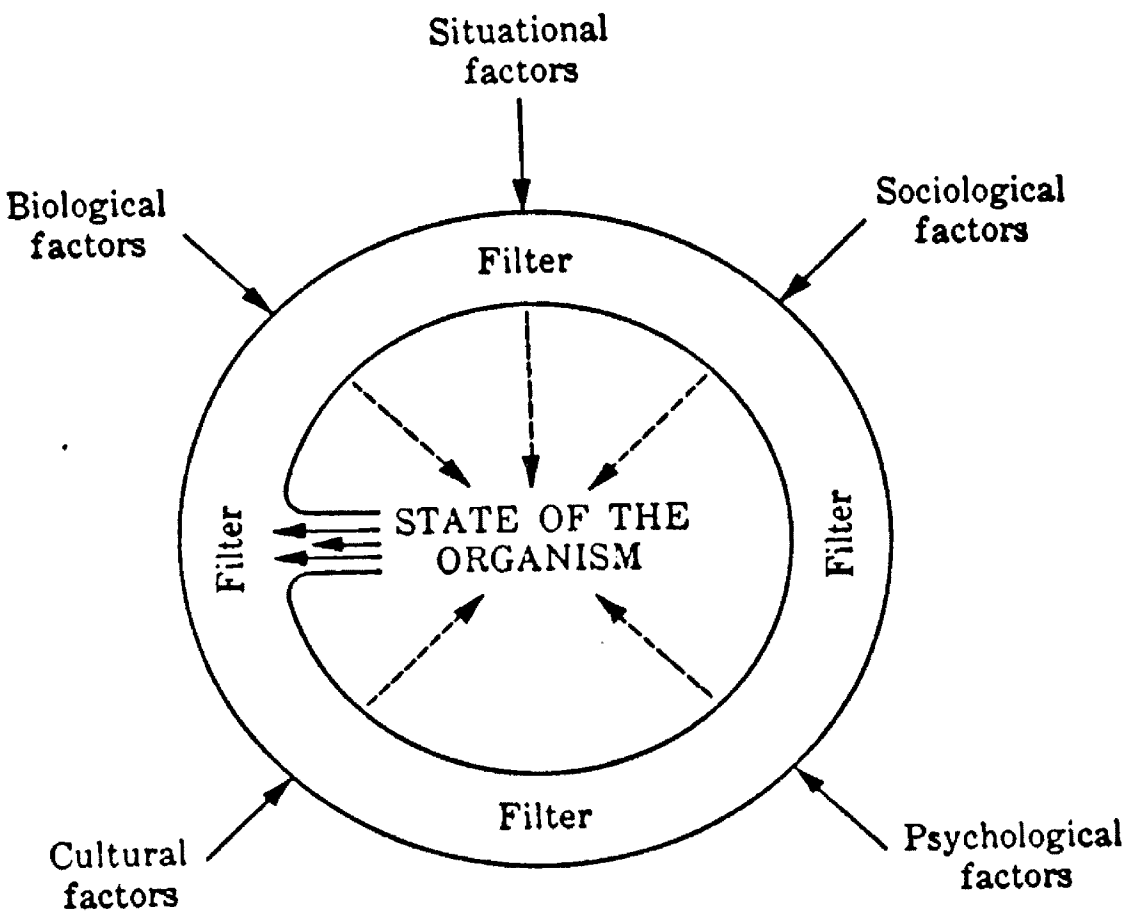


Fig. 1 Analytic Model of Social Influence

Adapted from King's (1975)

Communication and Social Influence

(i.e. situational factors, sociological factors).

Informational Social Influence

King defines informational social influence as "an influence to accept information obtained from another as evidence about reality" (p.21). Basically, informational social influence is nonmanipulative and is entirely dependent upon the receiver. If the receiver accepts another individual's behavior as a valid source of information about reality, that person has been socially influenced.

Informational sources of influence can be transferred in a variety of methods. One method of informationally influencing recreationists is through the utilization of interpretive programs. Recreationists may also obtain information from recreation literature, such as backpacking or hiking magazines and books. Another method of gaining information in a recreation setting is personal communication with recreation managers, experienced recreationists, and group members and friends. Also, a backcountry user may be informationally influenced by observing other individuals and group

behaviors from which "evidence about reality" is acquired.

This form of influence is generally dependent upon the receiver. An individual uses available information sources (written material, behavior of others) to assist him in determining his own thoughts or actions. King states that the greater one's level of uncertainty in a given social situation, the higher the probability of being informationally influenced. Therefore, the natural response to ambiguity is to seek informational sources to clarify any uncertainty that may exist.

Normative Social Influence

Normative social influence is the "influence to conform with the positive expectations of another" (p.21). This influence is a result of an individual desiring to achieve something beyond merely being correct. The source of influence in normative social influence arises from a situation where one individual is intentionally seeking to change another's behavior.

Similar to Fishbein and Ajzen's definition of subjective norms, King states that normative social

influence is composed of two sets of conditions. King defines these two components as (1) a situation in which another person exerts expectations on an individual (expectations of others) and (2) a situation in which an individual exerts expectations on himself (motivation to comply).

Rarely does either type of influence, informational or normative social influence, occur independently from one another. Most social situations involve both types of influence. For example, a backcountry group may receive information, such as "Cook 300 feet away from campsite.", from a backcountry ranger while obtaining their permit. The backpackers understand the reasoning and importance of this task. After they arrive in their campsite, however, the weather has turned cold and rainy. Several group members persuade the other members to cook in the campsite in order to allow them to stay relatively dry. Though the group members had been influenced by the information given at the ranger station, the social influence or persuasion together with the weather situation prevented the recommended behavior from occurring. In any given situation, social influence is

most likely the result of both informational and normative influence processes.

Situations and Social Influence

Fishbein and Ajzen state that behavioral intentions are expected to vary depending upon the situation in which they are performed. Since people tend to interpret situations differently according to their experiences, attitudes, and other factors (Mischel 1976), the amount of social influence that may occur in a given situation may vary (King 1975).

King maintains that characteristics of the behavior in question may affect the probability of social influence occurring. He states that as the difficulty and ambiguity of the task increase, the uncertainty felt by an individual increases, thus the susceptibility to influence increases.

Also, the restrictions a person perceives in a particular situation may affect the amount of social influence as well as actual behavior. The more restrictive a person perceives a situation the greater the probability of social influence occurring (Mischel

1976). Again, in a highly restrictive setting, such as occupied grizzly habitat, the level of uncertainty may be increased, thus increasing the potential for social influence.

Related Recreation Research Using Fishbein's Model

Fishbein and Ajzen's theory of reasoned action has been applied to a variety of situations in recreation research. Anderson (1980) utilized the theory to study visitor displacement in the Boundary Waters Canoe Area Wilderness. She determined that people's attitudes toward a campsite influenced their choice behavior. Riddle (1980) also applied the model in her study of jogging behaviors. Her results supported the model by concluding that intentions to jog could be predicted from a person's attitudes and social norms. She also reported that actual behaviors were highly correlated to behavioral intentions.

Robertson (1981) investigated visitor behavior in the Three Sisters Wilderness Area. Using the Fishbein model, she determined that beliefs and attitudes provide insight in the prediction of behavior. She indicated

that 35 percent of the variance in visitor behavior was explained by knowledge levels, thus supporting the use of information as a management tool. Cockrell (1981) examined the behaviors of river recreationists to determine how they chose which river to run. His results showed only a moderate correlation between attitudes, social norms and behavioral intentions. On the other hand, Fedler's (1981) study of water recreation participation reported that the attitude and normative components were strong predictors of participation behavior. In a later study, Fedler and Kuss (1986) determined attitudes toward hiking and land designation (i.e. wilderness vs. backcountry) has a strong correlation with behavioral intentions to hike.

CHAPTER 3

STUDY HYPOTHESES AND METHODS

This chapter provides an overview of the methods and procedures which were utilized to collect and analyze the data associated with the investigation of the following hypotheses. The previous chapter stated the need for a more theoretically oriented understanding of recreation behavior. The following study objectives and hypotheses were designed to test the usefulness of the previously discussed conceptual models to assist in increasing our understanding of recreation behavior.

Objectives and Hypotheses

This study explored and identified those social influence factors that may explain how groups behave in occupied grizzly bear backcountry areas. Social influence was examined by accepting or rejecting the hypotheses associated with each of the following objectives.

OBJECTIVE ONE: Identify both the inter-group and intra-group sources of social influence that may occur in backpacking parties, including both informational and normative social influence.

As stated previously, many forms of social influence exist. The influence may occur within the group or may come from sources outside the group. The sources will be assessed by examining:

1. a visitor's perception of sources of information, and
2. a visitor's perception of the expectations of significant others and the motivation to comply with these expectations.

The first factor is measured by asking respondents how important various forms of information were to them on their backpack trip, such as brochures, rangers and bulletin boards. The second factor, based on the subjective normative component of the Fishbein model, was investigated by questioning respondents regarding how important a specific group of referents were in influencing their behavior. Appendix A contains the observation instrument used to examine these factors.

Hypothesis 1: An individual's perception of the source of information as an important source of influence will be positively correlated with the individual's perception of significant others.

This hypothesis examines those types of information and social influence that respondents feel are important, as well as addresses the relationship between informational influence and normative social influence.

OBJECTIVE TWO: Determine the amount and importance of social influence on an individual's backcountry behavior through the use of the beta weights in the Fishbein model.

To assist resource managers in the understanding of human behavior and in effectively altering inappropriate behavior, an awareness of how social influence affects that behavior is necessary. Knowledge of the importance of social influence in the prediction of behavior will allow managers to communicate more effectively with recreation visitors. Fishbein's model states that behavior is a function of attitudes about a particular behavior and social norms.

$$B \sim BI = w_1 (AB) + w_2 (SN)$$

The beta coefficients or weights (w_1 and w_2) indicate the importance of each variable in relation to behavioral intentions (BI).

Hypothesis 2: The beta coefficient for the social normative component will be statistically different from zero at the 95% level of confidence.

Since much disagreement exists concerning the importance of the social normative component in the Fishbein model, Hypothesis 2 should indicate how important social influence may be in predicting behavior. If the null hypothesis ($w_2 = 0$) is rejected, it can be concluded that the social normative component may indeed aid in the prediction of the behavior of backcountry users.

Hypotheses 3, 4, and 5 examine how the social norm component may differ in its level of importance in predicting actual behavior by investigating specific subgroups of the total sample.

Hypothesis 3: The subjective normative score will be greater for those respondents who identify information sources as important than for those who respond that information sources were not important.

The social normative component should play a larger role in predicting behavior for persons who view information as being an important source for learning how to camp and behave in grizzly bear country than those individuals who view information as unimportant. It can be assumed that if a person identified information as being important, it was likely that the individual received and accepted the message.

Hypothesis 4: The subjective normative score will be greater for those respondents with no prior experience than for those who have high experience levels.

Huffman and Williams (1986) stated that more experienced visitors were not likely to seek out information, therefore the social normative component would be less likely to have an effect on their actual behavior.

Hypothesis 5: The subjective normative score will be larger for groups sized greater than two than for groups of size two or less.

Group dynamics play an important role in social influence processes, therefore the size of the group may be an important factor in determining how the social normative component may affect behavior.

Objective Three: Measure how an individual in the backcountry feels regarding level of personal safety, amount of personal restriction, and, finally, certainty of action should a confrontation with a grizzly bear occur.

To examine how susceptible an individual is to social influence while in grizzly bear country, it is necessary to determine how that individual perceives the environment and situation. Thus, to examine an individual's level of susceptibility, using King's discussion of situation and level of ambiguity, the following hypotheses are proposed:

Hypothesis 6: The subjective normative score will be greater for those respondents who feel unsafe or significant danger in the backcountry than for those who feel relatively safe.

Individuals may seek out and use information to lessen feelings of significant danger in grizzly bear country, therefore they may be more susceptible to social influence.

Hypothesis 7: The subjective normative score will be greater for those individuals who felt restricted on their backpack trip than for those who perceived no restrictions due to the presence of grizzly bears.

The more restrictive a person perceives a situation the greater the probability of social influence occurring (Mischel 1976).

Hypothesis 8: The subjective normative score will be greater for those respondents who felt unsure or did not know what to do should they encounter a bear than those who felt certain of what to do during an encounter.

As previously mentioned, King states that as the difficulty and ambiguity of the task increase, such as in grizzly country, feelings of uncertainty also increase, thus the susceptibility to social influence increases.

Also, to determine how people's perceptions of their environment and situation may affect the amount of social influence they receive, three separate backcountry areas were examined. The areas were defined as 1) an area where an individual had a relatively high probability of encountering a grizzly bear, 2) an area where an individual had a relatively low probability of encountering a grizzly bear, and 3) an area where an individual had a relatively high probability of encountering a grizzly bear and also received no on-site information pertaining to backcountry behaviors. Thus,

Hypothesis 9: The subjective normative score will be greater for visitors in an area with a high objective probability of encountering a grizzly bear than for those visiting an area with a low objective probability.

Hypothesis 10: The subjective normative score will be greater for visitors who receive on-site information about backcountry behaviors than for those who receive none.

OBJECTIVE FOUR: Examine the cohesiveness of individuals within specific backcountry groups according to individually reported attitudes, social norms, and behavioral intentions.

A thorough understanding of the structure and strength of groups and their behavior will provide managers with an enhanced knowledge of group behavior and improved ability to communicate effectively with these groups. Identifying the cohesiveness of the members of particular group types should define the structure, strength, group dynamics and susceptibility to social influence of specific groups. For example, a group of backpackers with similar positive attitudes toward the recommended behaviors would be expected to engage in those behaviors more frequently. On the other hand, a group exhibiting inconsistent attitudes among group members would be expected to engage in appropriate behaviors less frequently. Therefore,

Hypothesis 11: Reported backcountry behaviors will vary significantly between cohesive groups and non-cohesive groups.

Cohesiveness is defined by the absolute difference between group members' responses to questions pertaining to attitudes and social norms.

STUDY METHODS

Study Area

The study area consisted of three sites. The first area was the Jewel Basin Hiking Area located east of Bigfork, Montana, in the Flathead National Forest. The area is managed by the U.S. Forest Service and visitors currently receive no on-site information pertaining to appropriate backcountry behaviors. The other two sites are sections of Glacier National Park. One site is the Sperry Chalet - Gunsight Lake area located east of Lake McDonald and south of Logan Pass. The area is classified as having a low objective probability of encountering a grizzly bear. On the average twenty-two grizzly bear sightings per year were reported by backpackers and hikers in this area over the past three years (NPS 1987). Overnight backcountry use in this area was 2546 visitor nights in 1987, approximately 15% of the total

backcountry use in the park. The final area is the Many Glacier - Granite Park Chalet area located north of Logan Pass. The area is classified as having a high objective probability of encountering a grizzly bear, with an average over the past three years of 319 grizzly bear sightings per year reported by backcountry visitors. The overnight backcountry use in this area was 5432 visitor nights, approximately 31% of the total backcountry use.

Study Population

The population of interest in this study was all those backcountry visitors staying overnight in the three study sites. Since it was impractical and uneconomical to contact all backcountry visitors, a sample of this entire population was contacted.

One limitation in contacting all visitors is the large number of trailheads that allow recreationists to enter the study areas. Since Glacier National Park requires a backpacking party to obtain a backcountry permit, users were contacted at backcountry ranger stations where the permits are issued. Another restriction was placed on the age of visitors contacted

to insure that the visitor had the ability to respond to the study's inquiries. Therefore, an age restriction of 16 years and older was used. Since backcountry use is higher during the summer months, the population was further restricted to those individuals using the backcountry areas during the period of July 18 - August 30, 1987.

Sampling Plan

The goal of the sampling design was to arrive at a sample which was representative of backpackers in the study areas. Sampling sites (ranger stations) were based on estimates by Park Service personnel as to where the largest percentages of backcountry permits for the two study sites in Glacier National Park were issued. Therefore, three Glacier National Park backcountry ranger stations were sampled: St. Mary's, Many Glacier, and Apgar Ranger Stations. Travel constraints restricted sampling for the St. Mary's and Many Glacier Ranger Stations to thirteen weekdays only. Apgar Ranger Station was sampled twelve weekend days and six weekdays.

Visitors to the Jewel Basin area were contacted as they entered or left the principal trailhead, Camp Misery. Since it is estimated that a majority of the users are from local areas and use is highest on weekends, the area was sampled on weekends only. During the sampling period, visitors to the three study areas were approached after they obtained their backcountry permit or as they entered or exited the trailhead to Jewel Basin. Backpackers were informed of the purpose of the study and asked to cooperate. If the backcountry user agreed to participate, they were asked for their name and address only, so as to minimize disruption in their trip. International visitors, except for Canadians, were deleted from the sample because (1) return postage for the mailed questionnaire would be difficult to secure and (2) the number of international visitors other than Canadians was relatively insignificant.

Data Collection

All the data necessary to test the stated hypotheses were collected by means of a questionnaire mailed first

class to all those backcountry visitors contacted at the previously mentioned sample sites. The questionnaire was accompanied by a self-addressed stamped envelope and cover letter explaining the importance of visitor participation in the study (Dillman 1978). The following schedule indicates the mailing procedure:

Initial Mailing	September 3, 1987
Postcard Reminder Mailing	September 15, 1987
Followup Mailing	September 23, 1987
Second Postcard Reminder	October 8, 1987

Copies of the initial contact form, cover letters and postcards are located in Appendix B, C, D, and E.

Research Instrument

The Backcountry Visitor Survey (Appendix A) was a mail questionnaire consisting of 26 questions. The survey form was designed to solicit visitor information concerning nine areas of interest:

1. general visitation information (q. 1-7),
2. perceptions of personal safety, grizzly bear presence, and hazards (q. 8 -13),
3. frequency of reported backcountry behaviors (q. 14),

4. perceptions of social influences on actual backcountry behavior (q. 15 and q. 21),
 5. visitors' attitudes about bears (q. 16),
 6. perceptions of information about bears (q. 17),
 7. attitudes about recommended behaviors for grizzly bear backcountry areas (q.18 and q.20),
 8. knowledge about bear biology, ecology, and behavior (q. 19),
- and 9. social - demographic information (q.22 - q.27).

Sample Response

A total of 649 visitors were initially contacted. The cooperation of visitors was excellent and only three individuals preferred not to be sampled. Of the 646 questionnaires mailed to visitors, 580 were returned of which 568 (90% useable return) questionnaires were usable. Disaggregated by the three study areas, this resulted in a sample of 165 (90%) for Jewel Basin, 212 (95%) for Sperry Chalet - Gunsight Lake, and 202 (85%) for the Many Glacier - Granite Park Chalet areas. This excellent response rate could be attributed to a highly motivated population, personal contact, questionnaire mailing procedures and the general nature of the

questionnaire. The high response rate should make any non-response bias insignificant.

Statistical Analysis

All gathered data were compiled into an IBM compatible micro-computer. The data file was uploaded to the University of Montana's VAX computer to gain access to their SPSSx library in order to conduct all statistical analyses (SPSS 1983). For the purposes of the discussion in the following chapter, a significance level of .05 or less was considered support for an hypothesis.

CHAPTER 4

RESULTS

This chapter presents the empirical results derived from the statistical analyses employed in the study. The methods of analysis, the results and an interpretation are reported for each hypothesis. Before specific study hypotheses are addressed, a description of respondents is presented.

Visitor Characteristics

The social-demographic characteristics of the visitors to the three areas were considerably different. Respondents from the three study areas ranged in age from 14 (several questionnaires were returned by respondents under the 16 year old age restriction, but were included anyway) to 73, with a median age of 30. Median age varied somewhat with area visited. The Glacier National Park (GNP) areas (Many Glacier - MG and Sperry Chalet - SC) had a median age of 29, while Jewel Basin Hiking Area (JBHA) visitors were slightly older with a median age of 34. Approximately twice as many males as females visited

the study areas, with very little difference among the areas.

Table 2. Size of community in which visitors reside by area, in percent*

<u>Community Size</u>	<u>AREA</u>			<u>TOTAL</u> (N=563)
	<u>JBHA</u> (N=163)	<u>MG</u> (N=202)	<u>SC</u> (N=198)	
Large City (> 1,000,000)	4.9	28.2	28.8	21.7
Medium City (50,000 - 1,000,000)	5.5	22.8	29.3	20.1
Small City (5,000 - 50,000)	49.1	28.2	23.2	32.5
Town (1,000 - 5,000)	15.3	10.9	5.6	10.3
Rural	23.9	8.9	10.6	13.9
Farm	1.2	1.0	2.5	1.6

*Chi-square = 103.3, alpha = .001

Only 20% of the visitors to the two GNP areas were residents of Montana, whereas 80% of the visitors to the JBHA were Montana residents. Approximately 40% of the visitors live in cities with a population of 50,000 (Table 2). Over 70% of the JBHA visitors, however, resided in a small city or rural environment, while half of the visitors to the two GNP areas resided in medium to large cities.

Visitors' level of formal education was quite high, with 67% possessing bachelor's degrees, of which 44% of those possessing bachelor degrees have engaged in some graduate work. Since education levels were so high, it is understandable that over 40% of the visitors worked in occupations classified as professional or technical (Table 3). JBHA visitors were more likely to be craftsmen and less likely to be professional/technical workers and students than the visitors to other areas. The difference could be explained by the occupational composition of residents of the Flathead Valley, where a large percentage of JBHA visitors reside.

Table 3. Occupation by area, in percent*

<u>Occupation</u>	<u>AREA</u>			
	<u>JBHA</u> (N=162)	<u>MG</u> (N=201)	<u>SC</u> (N=196)	<u>TOTAL</u> (N=559)
Professional/ Technical	38.3	46.3	44.4	43.3
Managers/Administrators	8.0	9.5	7.7	8.4
Sales	3.7	3.5	5.6	4.3
Clerical	2.5	2.0	1.5	2.0
Craftsmen	13.6	1.0	5.6	6.3
Transport	2.5	0.5	1.5	1.4
Laborers	4.3	0.5	0.5	1.6
Farm Managers	0.0	0.0	0.5	0.2
Service Workers	4.9	6.5	7.1	6.3
Student	15.4	27.4	23.0	22.4
Housewife	4.3	0.5	2.0	2.1
Retired	1.2	1.0	0.0	0.7
Military	0.6	0.0	0.5	0.4
Unemployed	0.6	1.5	0.0	0.7

*Chi-square = 60.2, alpha = .001

Visitors varied in their amount of prior backpacking experiences in occupied grizzly bear habitat. JBHA visitors were more likely to have camped in occupied grizzly bear habitat than visitors to the two GNP areas (Table 4). Group type and size also varied significantly from area to area (Table 5 and 6). Visitors to JBHA were more likely to backpack in large groups primarily

consisting of family members. It is interesting to note the large percentage of visitors to GNP who camped alone or with one other person despite the recommendations of the Park Service for backpackers to camp in groups of five or more.

Table 4. Experience of respondents by area, in percent

Trips	Area			
	JBHA	MG	SC	TOTAL
First visit to area*	39.4	69.2	65.8	59.3
Four or more visits*	28.1	17.1	19.2	21.1
No previous visits to northern Rockies	14.7	66.3	60.3	49.2

*Differences among areas statistically significant at alpha = .01

Average overnight trip length was four days, ranging from a minimum of zero days (some visitors had a change in plans) to a maximum of 60 days. During the summer of 1987, a two month long organized hike through the Bob Marshall Wilderness (Bob Trek) passed through the JBHA, accounting for the 60 day trip lengths. Variations in average trip length among areas was minimal. Average trip length for JBHA was 3 days; MG, 5 days; and SC, 4

days.

Table 5. Group size by area, in percent*

<u>Group Size</u>	<u>AREA</u>			
	<u>JBHA</u> (N=164)	<u>MG</u> (N=197)	<u>SC</u> (N=195)	<u>TOTAL</u> (N=556)
1 - 2	43.9	58.9	67.2	57.4
3 - 4	32.3	28.9	24.1	28.2
5 - 6	15.9	3.0	8.2	8.6
7 - 10	5.5	6.1	0.5	4.0
11 or more	2.4	3.0	0.0	1.8

*Chi-square = 42.5, alpha = .001

Table 6. Type of group by area, in percent*

<u>Group Type</u>	<u>AREA</u>			
	<u>JBHA</u> (N=165)	<u>MG</u> (N=198)	<u>SC</u> (N=199)	<u>TOTAL</u> (N=562)
Alone	5.5	10.1	14.1	10.1
Family	45.5	20.2	34.7	32.7
Friends	27.3	52.0	40.7	40.7
Family/Friends	12.7	10.6	6.0	9.6
Guide/Outfitter	0.0	2.0	4.0	2.1
Club	9.1	5.1	0.5	4.6

*Chi-square = 63.89, alpha = .001

Visitors were asked if they observed any wildlife on their backpack trip. Table 7 indicates the observations of specific types of wildlife common to the Northern Continental Divide Ecosystem. The variation in the number of bear sightings among the three areas supports the assumption concerning the high and low probability of encountering a bear in specific sites. For example, twice as many grizzly bear sightings occurred in the Many Glacier area as in the Sperry Chalet area. Respondents were also asked whether the presence of grizzly bears in the backcountry had any effect on their decisions of where to go backpacking. Seventy percent stated the presence of bears did affect their decision making. The most common description (36%) of how the presence of grizzly bears may have affected trip plans was respondents spent more time determining where bears were active and travelled elsewhere, as well as engaged in recommended behaviors, such as hanging food and making noise. Twelve percent of visitors responding to the question stated the presence of bears attracted them to a specific area, since they wanted to see a bear.

Table 7. Wildlife observations by area, in percent

<u>Wildlife Type</u>	<u>AREA</u>			<u>TOTAL</u>
	<u>JBHA</u>	<u>MG</u>	<u>SC</u>	
Grizzly Bear	2.7	13.9	7.1	8.6
Black Bear	7.3	20.2	8.2	12.4
Unidentified Bear	0.9	6.1	2.2	3.4
Elk	7.3	5.6	7.1	6.5
Mountain Goat	10.0	63.3	76.6	56.1
Bighorn Sheep	0.0	30.6	8.2	14.8
Deer	38.2	60.6	40.8	47.7
Marmots	1.8	11.1	13.6	9.9
Moose	2.7	10.0	7.6	7.4
Small Mammals	40.9	26.7	39.7	35.0
Birds	50.9	20.0	22.8	28.3
Other	11.8	0.6	2.2	3.8

Tests of Study Hypotheses

The Fishbein Model hypothesizes that an individual's perceived expectations of a specific reference group concerning the proposed behavior, as well as the motivation to comply with those expectations, strongly influences behavioral intentions. To assess backcountry users' perceived expectations and their motivation to comply, subjects were asked to respond to two questions. The first, used to measure perceived expectations, asked

backcountry users how important different people or groups of people were in determining what camping techniques they practiced while in the backcountry. Subjects rated 9 referents on a 7-point scale ranging from "extremely important" to "not at all important," as well as a "did not use" category. Table 8 illustrates that "park and wilderness rangers who manage the area" was perceived to be the most important source of expectations, followed by "other members of your group" and "backcountry users that you know." For the purposes of this analysis, the 7-point scale was divided into two categories defined as "important" and "unimportant."

Similarly, motivation to comply was measured by asking respondents, "To what extent do you want to comply with the techniques that the following people or groups of people recommend?" Again, the same 9 referents were rated on a 7-point scale ranging from "generally want to" to "generally want not to," as well as a "don't know" category. As described above, the scale was divided into the two basic categories, "want to" and "want not to." Over 95% generally wanted to comply with the "park and wilderness rangers who manage the area." Similarly,

motivations to comply were also high for "other members of your group," "backcountry users that you know," and "family members on trip" (Table 9).

Table 8. Importance Levels of the Expectations of Significant Others, in percent.

<u>Referent Group</u>	<u>Expectations of Others</u>		
	<u>Important</u>	<u>Unimportant</u>	<u>Did Not Use</u>
Park & Wilderness rangers who manage area	85	13	2
Other members of group	68	25	7
Backcountry users you know	56	33	11
Family members on trip	49	21	30
Backcountry users in area but not in group	37*	50*	13*
Family members not on trip	28	53	28
Backcountry magazines	26	43	31
Society in general	23	59	19
People you know who would like to use the backcountry but haven't	12	65	22

*Glacier Park Data only

Table 9. Importance Levels of the Motivations to Comply with Significant Others, in percent.

<u>Referent Group</u>	<u>Motivations to Comply</u>		
	<u>Want To</u>	<u>Want Not To</u>	<u>Don't Know</u>
Park & Wilderness rangers who manage area	96	2	2
Other members of group	90	7	4
Backcountry users that you know	87	11	3
Family members on trip	75	14	10
Backcountry users in area but not in group	63	21	16
Family members not on trip	39	16	45
Backcountry magazines	26	22	52
Society in general	25	22	52
People you know who would like to use backcountry but haven't	20	12	68

Reference groups are not the only source of influence upon backpackers. Wilderness and backcountry managers utilize information programs to persuade visitors to engage in the appropriate behaviors. To assess the importance of the many types of information available to backcountry users, respondents were asked to indicate how important 14 sources of information were in

informing visitors on how to camp in grizzly bear country. Again, a 7-point scale was employed ranging from "extremely important" to "not at all important," as well as a "did not use" category. The 7-point range was similarly transformed into a dichotomous scale. Park rangers, previous experience, park literature, and group members were viewed as the most important sources of information (Table 10). As a supplement to this question, subjects were also asked to indicate which of these 14 sources of information they felt was the most reliable. As reflected in the perceived level of importance, the ranger who issued the permit, printed information, and previous experience were found to be the most reliable sources of information available.

Hypothesis 1 states that individuals' perceptions of the importance of information sources will be positively correlated with their perceptions of the influence of significant others. The individual items of the subjective norm scales were summated to create two variables, SN1 (the importance of the expectations of others) and SN2 (the motivation to comply with those expectations). A third variable, SG, Fishbein's social

Table 10. Sources of information, perceived importance and reliability, in percent.

<u>Source</u>	<u>Importance</u>		<u>Didn't Use</u>	<u>Most Reliable</u>
	<u>Great</u>	<u>Little</u>		
Previous experience	75	14	11	14
Ranger who issued permit	54	34	12	27
Printed information received with permit	51	35	14	16
Rangers met in backcountry	50	27	23	14
Signs and bulletin boards in park	50	46	4	4
Brochures handed out in park	47	43	10	7
Other members of group	35	51	14	2
Other users	32	56	12	4
Visitor center exhibits	18	55	27	1
Campfire programs	17	33	50	1
Park newspaper	17	54	29	0
Magazine articles	14	58	28	0
Films and TV programs	12	56	32	1
Newspaper articles	8	60	32	0

normative component ($\sum nb_i mc_i$), is the summated cross product of the respondent's normative beliefs (expectations) and the motivation to comply with these expectations. Finally, an information score (INFO) was computed by summing the level of importance of each of the sources of information listed in Table 10.

Using Spearman's rho nonparametric statistic, the three social normative scores were correlated with the information score (Table 11). As can be expected, the correlation coefficients among the three social normative scores were statistically significant. The relationship between the social normative scores and the information score was positive with the exception of SN1 (expectations of others); however, only the SG score was statistically significant. Perceptions of information sources appear to be correlated with perceptions of significant others (SG); however, the relationship is not strong.

Table 11. Spearman's rho correlations among social normative scores and the information score.

	SN1 (expectations)	SN2 (motivations)	SG
SN2 (motivations)	.4368 (.000)		
SG	.8833 (.000)	.6613 (.000)	
INFO	-.0120 (.784)	.0635 (.265)	.1502 (.009)

To examine these relationships in slightly more depth, the importance of each individual source of information was correlated with the main social normative score (SG) using Spearman's rho nonparametric statistic (Table 12). Several types of information had statistically significant correlations. Similar to the results in Tables 8 and 9, the perceptions of the importance of other backcountry users and other group members as information sources are somewhat correlated with perceptions of significant others (SG). Additionally, the perceived importance of signs and bulletin boards, park newspapers, printed information with backcountry permits, and visitor center exhibits has statistically significant correlations with social group influences.

Hypothesis 2 tests the strength of the social normative component in explaining backcountry behavior as defined by the Fishbein equation:

$$B = AB(w_1) + SN(w_2)$$

It was hypothesized that the beta coefficient of the social normative component (w_2) will be statistically different from zero. The mean scores for each of the

Table 12. Spearman's rho correlations among the level of importance of each information source and the social normative score (SG).

<u>Information Source</u>	<u>Social Normative</u>	
	<u>Score (SG)</u>	<u>Sign.</u>
Signs and Bulletin Boards	.1531	(.007)
Rangers in Backcountry	.0620	(.282)
Brochures	.0790	(.170)
Magazines	.1090	(.057)
Park Newspaper	.1317	(.022)
Printed information with permit	.1133	(.048)
Other users in backcountry	.2358	(.000)
Ranger issuing permit	.0686	(.234)
Films and TV programs	.0577	(.316)
Newspapers	.0687	(.233)
Other group members	.2066	(.000)
Campfire talks	.0189	(.743)
Previous experience	.0033	(.954)
Visitor center exhibits	.1427	(.013)

social normative subcomponents (SN1 and SN2) are located in Tables 13 and 14. The importance of the referents as a source of social influence varied considerably. Park and wilderness rangers who manage the area were viewed as the most important referent, indicating the potential for this group to influence behavior directly. Similarly, other members of the backpack group and other backcountry

users were viewed as important, suggesting agencies should use these groups as informal means of communication.

To test the hypothesis, a multiple regression equation predicting participation in the recommended behaviors (listed in Table 15) was developed by examining attitudes toward these behaviors and social normative factors. The multiple regression analysis resulted in the following equation:

$$B = 22.1 + .49(AB) - .03(SN).$$

The above equation had a multiple r of .49, indicating that attitudes and social normative factors explain 24% of the variance in backcountry behavior in grizzly habitat. Attitudes ($\alpha = .000$) toward the behavior derived from the summated cross product of the beliefs about the consequences (probability of reducing a confrontation), and the evaluation of the behavior (as easy or difficult) appears to be more statistically associated with actual behavior than social normative factors ($\alpha = .575$). If the social normative component is deleted from the analysis, relatively little change occurs in the multiple r value, the variance, or

the beta coefficient. Therefore, Hypothesis 2 will be rejected and it could be concluded that the social normative component has very little affect on predicting

Table 13. Mean Importance of Respondents' Referents, by area

<u>Referent</u>	<u>AREA*</u>				<u>Sign.</u>
	<u>JBHA</u>	<u>MG</u>	<u>SC</u>	<u>F</u>	
Other members of group	5.0**	5.0	5.0	.09	.91
Backcountry users you know	4.7	4.3	4.2	3.0	.05
Backcountry users in area but not in group	--	3.7	3.7		
People you know who would like to use backcountry but haven't	2.7	3.1	3.3	2.9	.05
Park & Wilderness rangers who manage area	5.2	6.1	5.8	18.6	.00
Family members on trip	4.9	3.3	3.7	20.6	.00
Family members not on trip	3.1	2.5	2.6	4.9	.00
Society in general	3.1	3.2	2.9	1.3	.29
Backcountry magazines	3.2	2.9	2.9	1.2	.30

*JBHA is Jewel Basin Hiking Area, MG is Many Glacier, SC is Sperry Chalet

**Values range from 1 (unimportant) to 7 (very important)

backcountry behavior in occupied grizzly bear habitat.

Since the overall SG variable was not found to be statistically associated with participation in recommended behaviors, perhaps examining the importance of the social normative component within different subgroups of the total sample may explain how and whether social influence plays an active role in groups that backpack in occupied grizzly bear habitat.

Hypothesis 3 proposes how the social norm score will vary between individuals who perceive information on camping in grizzly bear country as important and individuals who perceive the information as relatively unimportant. More specifically, it is hypothesized that individuals who view information sources as important means of learning how to camp in grizzly occupied habitat will have higher social normative scores than those individuals who view information as unimportant.

Table 14. Mean motivation to comply scores by referent and area.

<u>Referent</u>	<u>AREA'</u>				<u>Sig.</u>
	<u>JBHA</u>	<u>MG</u>	<u>SC</u>	<u>F</u>	
Other members of your group	6.0**	6.2	5.9	2.6	.07
Backcountry users you know	6.0	5.8	5.8	1.4	.25
Backcountry users in area but not in group	3.8	3.2	3.6	3.1	.05
People you know who would like to use the backcountry but haven't	5.7	5.8	5.5	0.8	.46
Park & Wilderness ranger who manages the area	6.4	6.7	6.5	5.1	.01
Family members on trip	5.7	5.5	5.4	1.0	.38
Family members not on trip	4.1	3.6	3.7	2.0	.14
Society in general	3.4	3.4	3.2	1.2	.30
Backcountry magazines	4.6	4.9	4.9	1.1	.34

*JBHA is Jewel Basin Hiking Area, MG is Many Glacier, SC is Sperry Chalet

**Values range from 1 (don't want to comply) to 7 (want to comply)

Table 10 shows backcountry users' perceptions of the importance of a variety of information available to them. Previous experience, backcountry rangers, and printed information handed out with backcountry permits were viewed as the most important sources of information. Additionally, backcountry rangers were perceived to be

Table 15. Appropriate Behaviors Studied

1. Store food in trees.
2. Make noise on trail.
3. Camp or hike in large group.
4. Wear or use bear bells.
5. Wash dishes after each meal.
6. Cook 300 feet away from campsite.
7. Cook fish/bacon for meals*
8. Use odor restrictive containers.
9. Wear clean clothes while sleeping.
10. Cook downhill from sleeping area.
11. Camp away from animal or hiking trails.
12. Carry garbage out.
13. Hike after dark.*

*Stated in reverse order of appropriateness.

the most reliable source of information. Other highly reliable sources of information as identified by respondents included printed information given out with the backcountry permit, prior experience, and rangers encountered in the backcountry.

Analysis of variance (ANOVA) was utilized to examine how the mean social normative score (SG) varied for those respondents who perceived a particular information source to be of great importance and those who perceived the information to be of little importance as well as those who did not use that source of information. To investigate this relationship, the types of information were divided into four subcategories. For example, Table 16 reports the results of an ANOVA for agency written

sources of information which are available to backcountry users. As hypothesized, the mean scores for the social normative component are consistently larger for those respondents who viewed that source to be of great importance, rather than those who viewed it to be of little importance. "Visitor center exhibits" was the only item in which the differences in the mean social normative scores were not statistically significant.

Table 17 shows an ANOVA for oral information backcountry users may receive from park or forest personnel. Similar to the results in the previous analysis the mean social normative scores are in the hypothesized direction. Only campfire talks, however, had statistically significant differences in the mean score.

A third category of information, group information, had similar ANOVA results (Table 18). Other backcountry users and other group members as sources of information for individuals had statistically significant differences in mean social normative scores. The ANOVA for the final category,

Table 16. Mean social normative score (SG) by level of importance of agency written information sources.

<u>Information Source</u>	<u>Level of Importance</u>		<u>Did Not Use</u>
	<u>Great</u>	<u>Little</u>	
Signs and Bulletin Boards	171.4*	154.7 ¹	141.2
Brochures	173.7*	153.5 ¹	152.3
Park Newspapers	183.7*	157.1 ¹	159.0*
Printed Info w/ Permit	169.1*	153.1 ¹	161.5
Exhibits	175.7	158.7	162.8

¹Significantly different from * at p = .05

Table 17. Mean social normative score (SG) by level of importance of oral information received from agency personnel.

<u>Information Source</u>	<u>Level of Importance</u>		<u>Did Not Use</u>
	<u>Great</u>	<u>Little</u>	
Rangers in Backcountry	170.5	151.8	156.8
Ranger issuing permit	167.9	154.9	158.0
Campfire Talks	170.7*	161.8 ¹	159.2

¹Significantly different from * at p = .05

mass media sources, indicated statistically significant differences in the social normative means for newspapers, films and TV programs, and magazines (Table 19).

The mean social normative scores for those individuals who did not use a particular source of information were consistently less than the mean social normative scores of the individuals who perceived the source of great importance (Tables 16, 17, 18, and 19). Several differences were statistically significant. The relationship between the social normative means for individuals who did not use a particular source of information and those who perceived it to be of little importance varied among the information sources. None of the differences, however, were statistically significant.

The results from Tables 8, 9, 12, and 18 would suggest agencies utilize group members and other backcountry users as a means of informal communication. Additionally, several interpretive methods of communication (signs and bulletin boards, brochures, newspapers, and magazines) may be highly effective methods for increasing compliance in the recommended behaviors necessary to reduce risks associated with backpacking in occupied grizzly bear habitat.

The importance of social influence in predicting behavior may also vary by a person's level of experience.

Table 18. Mean social normative score by level of importance of group information.

<u>Information Source</u>	<u>Level of Importance</u>		<u>Did Not Use</u>
	<u>Great</u>	<u>Little</u>	
Other backcountry users	185.1 *	152.2 ¹	144.1 ¹
Other group members	186.8 *	152.2 ¹	138.5 ¹
Previous Experience	165.2	160.0	149.8

¹Significantly different from * at $p = .05$

It would be expected that individuals with very low levels of experience would be more susceptible to social influence, therefore having higher social normative scores than those individuals with greater amounts of experience. Hypothesis 4 states the subjective normative score will be greater for respondents with no prior experience than those who have high levels of experience.

Table 20 shows the statistical differences among the experience levels of respondents. The relationship between level of experience and the social normative scores were examined by ANOVA (Tables 20 and 21). Respondents engaging in their first trip to Glacier and Jewel Basin backcountry have higher social normative scores with the exception of SN1 (expectations of

Table 19. Mean social normative score (SG) by level of importance of mass media sources of information.

<u>Information Source</u>	<u>Level of Importance</u>		<u>Did Not Use</u>
	<u>Great</u>	<u>Little</u>	
Newspapers	199.0	161.0	152.7
Films/TV programs	185.1	160.7	154.3
Magazines	204.8	156.8	151.3

¹Significantly different from * at $p = .05$

others). However, the differences among experienced and non-experienced individuals in the three study areas are not statistically significant.

To what extent does previous backpacking experience in other areas with occupied grizzly bear habitat in the Northern Rockies affect an individual's susceptibility to social influence? The results of this question contradict previous findings (Table 21). Individuals with no previous experience have lower social normative scores than those respondents with previous experience. Again, only one of the differences in the analysis was statistically significant.

Table 20. Mean social normative scores by experience in Glacier National Park and Jewel Basin

<u>Social Normative Score</u>	<u>First trip in Glacier Park</u>			<u>First Trip in Jewel Basin</u>		
	<u>Yes</u>	<u>No</u>	<u>F Sign.</u>	<u>Yes</u>	<u>No</u>	<u>F Sign.</u>
SN1 (expectations)	23.5	23.8	.668	26.4	26.9	.637
SN2 (motivations)	31.3	31.0	.742	34.9	31.2	.019
SG	163.2	154.3	.228	179.2	160.7	.105

Table 21. Mean social normative scores by backpacking experience in the Northern Rockies

<u>Social Normative Score</u>	<u>Previous Trips in Northern Rockies</u>				<u>F Sign.</u>
	<u>None</u>	<u>1 - 3</u>	<u>4 - 7</u>	<u>8+</u>	
SN1 (expectations)	23.7 ¹	24.2	26.2	26.3 ¹	.012
SN2 (motivations)	31.3	31.1	32.9	32.2	.623
SG	161.1	162.5	166.8	162.8	.955

¹ Significantly different from * at $p = .05$

Though an individual's level of experience explained very little variation in social normative scores, perhaps group size and group type are strongly associated with the social normative score. Hypothesis 5 posits that the subjective normative score will be greater for groups of 3 or more than for groups of fewer than 3. Table 22 shows the results of ANOVA with respect to the social normative score. A party of 2 or less had lower social normative scores than groups consisting of 3 or more members. No statistically significant differences were revealed in the social normative scores among different group sizes. Interestingly, social normative scores increase as group size increases; however, after group size increases to 6 individuals or more, social normative scores drop. However, the expectations of others score (SN1) does increase slightly for groups of more than ten members. The ability for social influence to occur when group size is small (3-5 individuals) is great, but lessens as group size increases to more than 5 individuals.

Unlike group size, the social normative components were strongly associated with group type. Table 23

illustrates the results of ANOVA and the least significant difference ex post facto tests with respect to the social normative score. Families and groups composed of family and friends had relatively large social normative scores. A small sample size and large degree of variance could explain the lack of a statistically significant difference between guided/outfitted groups and other group types. As can be expected, individuals travelling alone had the lowest social normative score.

Table 22. Mean social normative score by group size

<u>Social Normative Score</u>	<u>Group Size</u>					<u>F Sign.</u>
	<u>1 - 2</u>	<u>3 - 4</u>	<u>5 - 6</u>	<u>7 - 10</u>	<u>10+</u>	
SN1 (expectations)	23.9	25.2	25.7	25.1	25.9	.379
SN2 (motivations)	31.3	31.3	34.7	32.8	26.5	.118
SG	159.6	162.8	174.8	170.4	159.4	.665

King stated that environmental or situational factors affect an individual's level of ambiguity which ultimately should increase or decrease that individual's

susceptibility to social influence. Backpacking in

Table 23. Mean social normative score by group type

<u>Social Norm Score</u>	<u>Group Type</u>						<u>F Sign</u>
	<u>Alone</u>	<u>Family</u>	<u>Friends</u>	<u>Family/ Friends</u>	<u>Guide/ Outfitter</u>	<u>Organized Group</u>	
SN1 (expectations)	19.1*	26.1 ¹	24.4 ¹	26.5 ¹	23.8	22.9	.000
SN2 (motivations)	29.7	32.0	31.6	32.7	28.0	31.0	.641
SG	128.5*	173.4 ¹	158.7	172.9 ¹	187.0	148.9	.001

¹

Significantly different from * at $p = .05$

grizzly bear country has many situational and behavioral constraints that can affect social influence susceptibility. The relationship between social normative scores and the situational constraints, as well as levels of ambiguity, were examined by determining to what extent social normative influences were associated with (1) feelings of safety and danger while in the backcountry, (2) restrictions in behavior due to the presence of grizzly bears, (3) knowledge of what to do should a confrontation occur, (4) area visited, and (5) amount of on-site information available.

Hypothesis 6 asserts that the subjective normative score will be greater for those respondents who either felt unsafe or apprehended a significant amount of danger in the backcountry than for individuals who felt relatively safe. Tables 24 and 25 indicate respondents' perceptions of safety and danger while in the backcountry. JBHA visitors reported the safest feelings, and also reported grizzly bears represented an insignificant danger to visitors. Visitors to the SC area reported the highest feelings of being unsafe in the backcountry; however, they did not differ greatly from MG campers in terms of perceptions of grizzly bears representing a significant danger to backcountry campers.

Table 26 shows no significant differences among the social normative scores based on perceptions of safety. Since there is no tendency for mean social normative scores to increase as feelings of safety lead to feelings of not being safe, perceptions of safety have very little effect on susceptibility to social influence. Similar results were obtained when perceptions of danger were examined (Table 27). Again, no discernable pattern can be detected when examining social normative means along

the spectrum of very insignificant danger to extremely significant danger. Perceptions of danger in occupied grizzly bear habitat had very little association with social influences among backcountry users.

Table 24. Feelings of safety while in the backcountry by area, in percent.*

<u>Level of Safety</u>	<u>Area</u>			
	<u>JBHA</u>	<u>MG</u>	<u>SC</u>	<u>TOTAL</u>
Very Safe	30.9	19.5	13.5	20.9
Safe	60.6	69.7	72.5	67.9
Didn't think about it	1.8	2.6	1.6	2.0
Unsafe	6.1	8.2	9.3	8.0
Very Unsafe	0.6	0.0	3.1	1.3

*Chi-square = 25.22, alpha = .001

Table 25. Significance of danger grizzly bears represent to visitors by area, in percent.*

<u>Level of Danger</u>	<u>AREA</u>			
	<u>JBHA</u>	<u>MG</u>	<u>SC</u>	<u>TOTAL</u>
Very Insignificant	20.7	7.3	5.1	10.5
Insignificant	31.7	13.8	14.8	19.5
Some Significance	37.8	61.0	59.7	53.7
Significant	3.7	15.9	13.8	11.5
Extremely Significant	0.6	0.5	2.6	1.3
Don't Know	5.5	1.5	4.0	3.5

*Chi-square = 74.45, alpha = .00

Table 26. Mean social normative scores by perceptions of backcountry safety.

<u>Social Norm Score</u>	<u>Perceptions of Safety</u>				
	<u>Very Safe</u>	<u>Safe</u>	<u>Didn't Think About it</u>	<u>Unsafe</u>	<u>Very Unsafe</u>
SN1 (expectations)	23.1	25.1	21.1	24.0	26.1
SN2 (motivations)	31.2	31.9	26.8	31.3	26.3
SG	152.9	165.5	131.3	168.1	132.7

Table 27. Mean social normative scores by perceptions of grizzly bears as danger.

<u>Social Norm Score</u>	<u>Perception of Danger</u>					
	<u>Very Insigni- ficant</u>	<u>In- signi- ficant</u>	<u>Some signi- ficance</u>	<u>Signi- ficant</u>	<u>Extremely Signifi- cant</u>	<u>Don't know</u>
SN1 (expectations)	25.9	24.0	24.4	24.8	23.3	25.7
SN2 (motivations)	33.3	30.7	31.8	31.6	32.5	30.0
SG	160.9	158.0	162.7	166.5	180.0	172.1

Hypothesis 7 states the subjective normative score will be greater for individuals who feel restricted in their behaviors while backpacking in grizzly bear country than for individuals who perceive there to be no restrictions on their behavior. As stated previously, 70% of the respondents reported the presence of bears did affect their behavior. Thirty-six percent of these respondents stated they spent more time considering where to go hiking, as well as learning how to prevent encounters with bears. ANOVA (Table 28) indicates that, though the mean differences were not statistically

significant, with the exception of the SG score, the social normative scores for those individuals who responded that bears did affect their trip planning were consistently higher than those individuals who stated the presence of bears had no effect on trip planning. An individual's feeling concerning the presence of bears was associated with an individual's susceptibility to social influence; however, these differences are not statistically significant.

Table 28. Mean social normative scores by how presence of grizzly bears affected trip planning.

<u>Social Normative Score</u>	<u>Presence of Bears Affect Trip</u>		<u>F Sign.</u>
	<u>Yes</u>	<u>No</u>	
SN1 (expectations)	25.3	24.2	.124
SN2 (motivations)	31.9	31.4	.632
SG	171.4	158.0	.033

Knowing how to behave should an encounter with a bear occur is important for individuals who backpack in grizzly bear country. If an individual is uncertain of how to behave in grizzly bear country, it could be assumed that the individual would seek information to lessen the feeling of uncertainty. Therefore, Hypothesis

8 posits that the subjective normative score will be greater for those individuals who felt unsure or did not know how to behave should they encounter a bear than for those individuals who felt certain of what to do during an encounter. For the most part, respondents reported they knew how to behave in case of an encounter with a bear (Table 29); however, over 25% of the visitors to JBHA indicated they were unsure or did not know how to behave during an encounter. ANOVA (Table 30) indicates no statistical differences between the means of the social normative scores in association with knowledge of how to behave in the event of an encounter with a grizzly bear. A tendency in the direction hypothesized, however, does exist.

Table 29. Visitor knowledge of what to do in case of an encounter with a grizzly bear by area, in percent*

<u>Know What to Do</u>	<u>AREA</u>			
	<u>JBHA</u> <u>(N=164)</u>	<u>MG</u> <u>(N=197)</u>	<u>SC</u> <u>(N=197)</u>	<u>TOTAL</u> <u>(N=558)</u>
Yes	71.3	83.8	79.7	78.9
No	25.6	15.7	18.8	19.7
Uncertain	3.0	0.5	1.5	1.6

*Chi-square = 9.95, alpha = .04

Table 30. Mean social normative scores by knowledge of how to behave during an encounter with a grizzly bear.

<u>Social Normative Score</u>	<u>Know How to Behave</u>			<u>F Sign.</u>
	<u>Yes</u>	<u>No</u>	<u>Uncertain</u>	
SN1 (expectations)	24.3	25.4	27.1	.270
SN2 (motivations)	31.2	33.6	33.3	.061
SG	161.3	168.5	166.2	.612

Perceptions of individual situations and environments had little relationship with susceptibility to social influence. Physical constraints, such as the probability of encountering a bear or the amount of information available on-site, may influence an individual's susceptibility to social pressures. Hypothesis 9 states the subjective normative score will be greater for visitors to areas with a high objective probability of encountering a bear than visitors to areas with a low objective probability. Results of ANOVA (Table 31) indicate visitors to JBHA differ significantly from visitors to Glacier National Park (MG and SC) in their perceptions of the expectations of others. No other statistically significant differences exist,

however, among the other social normative scores. MG and SC are very similar in mean scores, even though the probability of encountering a bear is greater in MG than in the SC area. JBHA visitors had the highest social normative means among the three study areas. Though visitors to JBHA have a relatively high probability of encountering a grizzly bear and high social normative scores, other factors may explain why visitors to this area have larger social normative scores than the other two study areas.

Table 31. Mean social normative scores by area visited

<u>Social Normative Score</u>	<u>AREA</u>			<u>F Sign.</u>
	<u>JBHA</u>	<u>MG</u>	<u>SC</u>	
SN1 (expectations)	26.7*	23.4 ¹	23.7 ¹	.001
SN2 (motivations)	32.3	31.3	31.0	.490
SG	166.3	159.5	161.8	.624

1

Significantly different from * at $p = .05$

Hypothesis 10 states the subjective normative score will be greater for visitors who received on-site information about backcountry behaviors than for those

who received no information. Table 31 shows that JBHA, an area where no on-site information is available, consistently has higher social normative scores than the other two study areas, the opposite of the test hypothesis. Since family groups (Table 23) had higher social normative scores and Table 6 indicates 45% of the visitors to JBHA travelled with their families, these two factors (no on-site information and family groups) may explain why JBHA visitors are more susceptible to social influence.

The type of group visitors travel with has been identified as an important factor for determining susceptibility to social influence. Further examination of group dynamics should lead to a broader understanding of how individuals behave while members of a backpacking group in occupied grizzly bear habitat. Examining the cohesiveness of the responses of group members should lend insight to group structures, dynamics, and susceptibility to social influence. Specifically, Hypothesis 11 proposes that reported backcountry behaviors will vary significantly between groups that are cohesive in their attitude and social norm scores and

groups which are non-cohesive in their scores.

Cohesive groups and non-cohesive groups were defined by identifying the absolute difference between group members' responses to questions pertaining to attitudes, social norms, and reported behavior. Groups with absolute differences less than the overall sample median for each of the scores were labelled cohesive and groups with differences greater than the median were labelled as non-cohesive. The following analyses employed groups which had either two or three questionnaires returned from groups with two or more individuals, resulting in a sample of 180. Table 32 shows the mean and median, as well as the minimum and maximum values of the absolute differences, of the attitude, social normative, and reported behavior scores. Table 33 illustrates the percentage of cohesive and non-cohesive groups for each of the scores by area visited. Park visitors were consistently more cohesive for all the scores than visitors to JBHA, except for the reported behavior score, in which JBHA visitors were more cohesive than visitors to SC.

Limitations with the SPSSx Statistical Package made it necessary to separate groups of two individuals who returned questionnaires from groups which had three responses in order to address Hypothesis 11. Table 34 shows the results of ANOVA for both of these groups with respect to the mean reported behavior scores. It was hypothesized that attitude and social normative scores of cohesive groups would have higher reported behavior scores than non-cohesive groups. Though none of the differences in the mean behavior scores are statistically significant, a slight tendency in the direction hypothesized does exist.

Table 32. Summary statistics for absolute differences in responses among group members for attitude, social normative and reported behavior scores.

	<u>Summary Statistic</u>			
	<u>Mean</u>	<u>Median</u>	<u>Minimum</u>	<u>Maximum</u>
Attitudes	45.6	42	0	150
Social Norms	46.5	39	0	170
Reported Behaviors	3.7	3	0	14

Table 33. Cohesive and non-cohesive responses among group members for attitude, social normative and reported behavior scores by area, in percent

<u>Score</u>	<u>AREA</u>			<u>TOTAL</u>
	<u>JBHA</u>	<u>MG</u>	<u>SC</u>	
<u>Attitudes</u>				
Cohesive Groups	33	65	54	52
Non-Cohesive Groups	67	35	46	48
<u>Social Normative</u>				
Cohesive Groups	46	61	50	53
Non-Cohesive Groups	54	39	50	47
<u>Reported Behaviors</u>				
Cohesive Groups	60	63	53	58
Non-Cohesive Groups	40	37	46	42

Table 34. Mean reported behavior scores by level of group cohesiveness for attitude and social normative scores

<u>Groups with 2 responses</u>	<u>Level of Cohesion</u>	
	<u>Cohesive</u>	<u>Non-cohesive</u>
Attitude Score	33.1	32.5
Social Norm Score	32.8	32.1
<u>Groups with 3 responses</u>		
Attitude Score	31.7	30.3
Social Norm Score	31.5	29.1

Chapter 5

DISCUSSION

Methodological Issues

Table 35 summarizes the results for the 11 hypotheses tested in this study. The results indicate social normative pressures, as measured by the Fishbein and Ajzen (1975) behavioral model, add very little insight into the prediction of the behavior of backcountry visitors to occupied grizzly bear habitat. Though social influences were not highly correlated to reported behavior, informational and social normative influences do affect certain types of backpackers in various ways.

The data show that agency sources of information and social group information (other group members, previous experience) are frequently used, important, and viewed as highly reliable sources of information. Analyses indicated, however, a lack of association between social

Table 35. Summary of Hypothesis Testing.

<u>Hypothesis</u>	<u>Result</u>
Perception of info correlated with significant others	Supported, but no statistically significant correlations between information and social normative subcomponents (SN1 and SN2)
Social norm component not zero	Not supported
SN scores greater for those who feel info is important	Supported; several sources of information, however, were not statistically significant
SN scores greater for those with no prior experience	Data trend in hypothesized direction, but not statistically significant
SN scores greater for those in larger groups	Data trend in hypothesized direction, but not statistically significant (except groups > 6)
SN scores greater for those who feel unsafe	Not supported
SN scores greater for those who feel restricted	Supported for SG score, but not SN1 and SN2
SN score greater for those unsure of what to do during encounter	Data trend in hypothesized direction, but not statistically significant
SN score greater for visitors to areas of high probability of seeing a bear	Not supported
SN score greater for visitors who receive on-site information	Not supported
Greater AB scores for cohesive than non-cohesive groups	Data trend in hypothesized direction, but not statistically significant

SN - social normative; SN1 - expectations; N2 - motivation; SG - overall social norm score; AB - appropriate behavior

normative scores and appropriate behavior. Several reasons may explain the rather weak relationship. First, information and social influences may affect the attitudinal component of the Fishbein Model. A cluster analysis of the attitude scale and social normative scale items was utilized to examine the claim by Ryan (1977) and Miniard and Cohen (1981) that the social normative component may be a subcomponent of the attitudinal portion of the model. Table 36 indicates the six clusters derived from that analysis.

The attitudinal scale items, which address individuals' perceptions of how specific behaviors may reduce the likelihood of a confrontation with a bear, did indeed cluster into one group. The second cluster consisted of a mix of scale items from the two social normative scales. The remaining clusters, however, consisted of a mixture of several items from the social normative scales and attitude scale which addresses the ease or difficulty associated with specific behaviors. This supports Ryan and Miniard and Cohen's assertions that overlaps may exist between the attitudinal and social normative components of the Fishbein Model.

A second reason for a rather weak social normative component may be the specificity of the behaviors in question. When examining backpacker's behavior in grizzly bear country, the social normative portion of the model may provide more insight into where an individual decides to backpack rather than to participate in the recommended behaviors. Another explanation for a rather weak social normative component may be that over 57% of the respondents travelled alone or with one other person. Since group size was so small, the amount of social influence that could occur may be rather limited. Therefore, since backpacking in grizzly country appears to be a relatively individualized activity, an individual's attitude toward the behavior may be a better predictor of reported behavior than social pressures, as stated by McCool and others (1988). Also, demographic differences, personality, and other individual differences may explain behavior better than social pressures.

Young and Kent (1985) discuss how the relative importance of the main components of the Fishbein Model depends on the behavior in question. For behaviors which

Table 36. Resulting clusters of attitudes and social normative scale items.

CLUSTER 1

BA2 - how behaviors reduce likelihood of confrontation	
Store food in trees	Use odor restrictive containers
Make noise on trail	Wear clean clothes sleeping
Camp or hike in large group	Cook downhill from sleeping area
Cook 300 ft away from campsite	Camp away from trails
Wear or use bear bells	Carry out garbage
Wash dishes	Hike after dark
Cook fish/bacon	

CLUSTER 2

SN1 - expectations	SN2 - motivation to comply
People you know who would like to use the backcountry but haven't	People you know who would like to use the backcountry but haven't
Family members not on trip	Family members not on trip
Society in general	Society in general
Backcountry magazines	

CLUSTER 3

SN1 - expectations	BA1 - ease or difficulty of behavior
Other members of group	Camp or hike in large group
Backcountry users in area but not in group	Wear bear bells
	Cook fish/bacon

CLUSTER 4

SN1 - expectations	BA1 - ease or difficulty of behavior
Backcountry users you know	Cook 300 ft away from camp
Family on trip	Cook downhill from sleeping area
	Camp away from trails
SN2 - motivations	
Users in area but not in group	
Backcountry magazines	

CLUSTER 5

SN2 - motivations	BA1 - ease or difficulty of behavior
Members of group	Wash dishes
Users that you know	Carry garbage out
Rangers who manage area	

CLUSTER 6

SN1 - expectations	BA1 - ease or difficulty of behavior
Rangers who manage area	Make noise on trail
	Store food in trees
SN2 - motivations	Use odorproof containers
Family on trip	Wear clean clothes sleeping

require cooperation (such as backpacking in grizzly country), the social normative component has been found to be more important. In contrast, the attitude component has generally been found to be more important for competitive behaviors. This research, however, does not support Young and Kent's conclusion.

Additionally, this study investigated a series of complex behaviors. Much of the past research has examined more specific forms of behavior, such as camping, jogging, engaging in water activities, and practicing minimum impact camping techniques. Rather than examining many different forms of behavior (i.e. hang food in trees, make noise, etc.), perhaps the investigation of one general overall behavior, "Will you engage in those recommended behaviors which may reduce the likelihood of an encounter with a grizzly bear?" may result in greater association among attitudes, social norms, and behavior.

Since rangers within the resource area were perceived to be important sources of information, as well as highly influential in their expectations of backcountry users, they may have influenced the entire

group, rather than the individuals within the group. Having influenced the overall group, the amount of social influence occurring among group members may have decreased. Fishbein and Ajzen (1975) state that, as new information is obtained by an individual, behavioral intentions will change. Since the backcountry ranger issuing the permit is one of the last people spoken to before backpackers depart on their trip, this new information and influence may displace or override all other informational sources and social influence that may have occurred up to that point. Results indicated that the backpackers of Jewel Basin (who rarely speak with rangers) had a higher social normative score than those backpackers in Glacier National Park (Table 31). This may explain the role of park rangers as being highly influential in determining behavioral intentions, whereas in Forest Service areas group members are more influential in determining behavioral intentions.

Additionally, it could be argued that the use of parametric statistical tests (regression, ANOVA) with ordinal level data violates basic statistical methodologies. Unfortunately, the Fishbein model

suggests the use of Likert type scales to capture the attitude and social norm domains. Interval or ratio level scales for measuring the domains need to be constructed to alleviate the problems associated with using parametric tests with ordinal data.

For this study, analysis of variance was used to determine the mean differences for various ordinal levels of data. Though ANOVA is a rather robust statistical test, perhaps a nonparametric statistical test may have indicated more accurately the differences among social normative scores. A normal distribution is a basic assumption for ANOVA. Tests for skewness and kurtosis on the collected data indicate somewhat normal distributions for the three social norm scores. Additionally, very little difference (<2) existed between the mean and median for each score.

Finally, social influences are difficult to measure. The referents listed in the scales may not be the best suited to measure how persons perceive the manner in which others may want them to behave. For example, asking respondents how "society in general" and "people you know who would like to use the backcountry but

haven't" may influence an individual's behavior, appeared to cause confusion among respondents. Many respondents weren't sure as to what the expectations of the people within these groups were, as well as how they would be motivated to comply with the expectations of these groups. Also, the two scales used to measure the expectations and motivations were fairly similar in style. Since the scales appeared to be fairly parallel, many respondents felt the same questions were asked twice.

Of the 568 questionnaires returned, 238 of the respondents didn't fill out the second social normative scale question (Question 21, Appendix A). Table 37 indicates the differences of mean scores of the SN1 scale (expectations of others) for those individuals who did respond to both scales and for those who answered only the SN1 scale. A statistically significant difference exists between the two types of respondents, where individuals who replied to only the SN1 scale had much lower scores on that scale. Further research needs to examine why these differences exist, as well as to identify other possible differences between these two

groups.

Table 37. Mean differences of SN1 score among individuals who responded to both and individuals who responded to the SN1 scale only.

	<u>Response</u>		<u>F</u> <u>Sign.</u>
	<u>Both</u>	<u>SN1 Only</u>	
SN1 Score	26.1	22.7	.000

Additionally, various scales pertaining to a variety of referents need to be tested to determine a better method for measuring the social normative component of the Fishbein Model. In this research, the scales employed appear to be slightly inadequate for measuring social influence occurring among backpackers in grizzly bear country. Obviously, better scale construction is necessary. Perhaps, a qualitative research approach using in-depth interviews consisting of inquiries as to rationales for visiting a specific area, perceptions of agencies and their employees, and group processes and structures could identify social normative forces. Interviews could be based on the two subcomponents of Fishbein's social normative component to allow a more quantitatively oriented approach to follow naturally the

results of the interviews. Additional research should also investigate the overlap between the social normative component and the attitudinal component.

Another explanation for a weak association between reported behavior and the social normative component is the possibility that Fishbein's model was operationalized incorrectly. Upon further examination of Fishbein and Ajzen's (1975) discussion of the social normative component, it was discovered that perhaps normative beliefs or expectations of others (SN1) were measured inaccurately.

As stated earlier, Fishbein defines the subjective norm (SN) to be "the person's perception that most people who are important to him think he should or should not perform the behavior in question." Normative beliefs (SN1), on the other hand, were characterized as an individual's belief that specific reference groups or individuals think he should or should not perform a particular behavior. Appendix A, Question #15 illustrates how normative beliefs were measured. According to Fishbein's definitions, it could be argued that the question would have been a more appropriate

direct measure of subjective norms (SN), rather than normative beliefs (SN1).

A better measure of normative beliefs (SN1) would have been to have respondents indicate on a 7-point scale whether each referent "thinks I should/should not engage in the recommended behaviors necessary to reduce the likelihood of an encounter with a grizzly bear." Adding this question to the questionnaire would result in a direct measurement of subjective norms (SN), and the indirect measurement of SN, normative beliefs (SN1) and motivation to comply (SN2). Riddle (1980) and Young and Kent (1985) successfully measured all three social normative scores with significant multiple correlations between scores.

If the study were to be replicated with the above recommendations, similar analysis of the three social normative scores may indicate different conclusions. The normative beliefs or expectations of others score (SN1) reported in this study should be regarded as the direct measure of subjective norms, when making comparisons to similar data. Additionally, the computed social normative score (SG) reported in this study may not

reflect the true subjective norm as Fishbein describes it.

Substantive Issues

Though the social normative component offered very little assistance for explaining backcountry users' behavior in occupied grizzly bear habitat, the Fishbein model scales did prove helpful for examining the differences in levels of susceptibility to social influence for various types of users. As stated earlier, demographics, personality traits, and other individual differences may explain how susceptible an individual may be to social influence.

The data indicate that individuals' perceptions of information sources, experience levels, group types, feelings toward behavioral restrictions, and knowledge of how to behave all affect the level of susceptibility to social influence. Though in many cases the data were not statistically significant, trends were in the hypothesized direction.

Individuals who perceive information as important sources for learning how to behave in grizzly country

reported higher social normative scores. This points to the critical need for agencies to develop sound communication programs. The substance of persuasive messages, as well as the process of communication, may have a significant effect on visitor participation rates in recommended behaviors. The ranger issuing backcountry permits should be of utmost importance in the communication process.

The data also suggest that other members of the group are important in influencing backcountry users' behavior. This finding has implications for areas, such as JBHA, where permits are not required and little contact with rangers is made. Persuasive messages may need to incorporate a social normative component. For instance, a message could be designed that states "Members of your backpack group feel the following recommended behaviors will reduce the likelihood of a confrontation with a bear."

Social group factors, such as group type and experience levels, did influence susceptibility to social pressures. Families and groups composed of family and friends reported significantly higher social normative

scores than individuals camping alone. Surprisingly, group size had relatively little effect on social normative scores. Though social normative scores did increase as group size increased, the differences among scores were not statistically significant.

Interestingly, social normative scores decreased when group size exceeded six individuals. Perhaps this indicates intergroup social influence may be at a maximum when groups consist of three to six individuals. In occupied grizzly bear habitat groups of size seven or more may take on the characteristics of a crowd, therefore limiting the ability for social influence to occur among group members. Since sample size for groups of five and more was very small, additional research should investigate this phenomenon.

Additionally, respondents engaging in their first trip to Glacier or Jewel Basin reported higher social normative scores; however, differences were not statistically significant. The findings indicate that individuals backpacking for the first time with a family and/or friends are highly susceptible to social influence; therefore, persuasive communications stressing

the importance of engaging in recommended behaviors need to be directed toward this audience. Overall, results indicate visitors to the JBHA are a prime audience for persuasive messages consisting of strong social normative factors.

Contrary to King's (1975) contentions, perceptions of environmental or situational factors had relatively little effect on individual's susceptibility to social influence in occupied grizzly bear habitat. Social normative scores had no significant differences between individuals who perceived occupied grizzly bear habitat as unsafe and dangerous and those who felt safe and in little danger. Feelings of restrictions in behavior due to the presence of bears did have statistically significant differences in mean social normative scores for individuals who perceived their behavior to be restricted and for those who did not. Because individuals who responded that the presence of bears influenced them to seek further information concerning the current location of bears, it was not surprising these individuals had higher social normative scores. These individuals are actively seeking social normative

information to answer questions and lessen feelings of ambiguity. If such individuals could be identified prior to their trip, the ability to persuade them to engage in recommended behaviors is immense.

Finally, since group type has been identified as an important factor for determining susceptibility to social influence, the level of group cohesiveness were expected to explain differences in participation in recommended behaviors. In the overall analysis, social normative scores were not significantly correlated with reported behavior. By defining groups as being either cohesive or non-cohesive according to the absolute differences in attitude and social normative scores, data suggest that cohesive groups are more likely to engage in recommended behaviors than non-cohesive groups. Unfortunately, the differences were not statistically significant. If interpretive staff through persuasive communication techniques could direct groups to become more cohesive in their attitudes toward recommended behaviors and levels of susceptibility to social influence, eventually participation rates in appropriate behaviors, though fairly good now (Table 38), should increase.

Table 38. Reported frequencies of participation in recommended behaviors

<u>Behavior</u>	<u>Frequency of Participation in Percent</u>			
	ALWAYS	USUALLY	SELDOM	NEVER
Store food in trees	79.4	10.4	3.6	6.6
Make noise on trail	32.3	46.1	19.0	2.5
Travel in large group	7.6	9.2	24.5	58.7
Wear bear bells	21.7	13.3	7.2	57.9
Wash dishes	85.3	12.4	1.3	1.1
Cook 300' away from camp	50.8	19.2	11.0	19.0
Use odor proof containers	32.2	27.7	18.0	22.1
Wear clean clothes while sleeping	27.1	31.8	22.1	19.0
Cook downhill from camp	29.0	30.7	22.9	17.5
Camp away from trails	48.3	34.5	10.6	6.6
Carry garbage out	96.1	3.0	0.4	0.5

Future Research

Results of this study indicate the social normative component of the Fishbein model offers very little assistance for predicting backcountry user's behavior in occupied grizzly bear habitat. Individual characteristics (experience, group type, knowledge),

however, did explain partially the varying levels of susceptibility to social influence exhibited by backcountry visitors. The fact that many of the findings were in the hypothesized direction, but not statistically significant, suggests the need for further research, especially in the area of scale construction.

The social normative measures employed in this research attempted to define the strength of social influences, not whether they were negative or positive. It is possible, as stated earlier, that social influences could act to counterbalance agency recommended behaviors. Though several analyses indicate the influence to be in a positive manner (high participation rates in recommended behaviors, knowing what to do in case of an encounter), the direction of influence cannot be accurately determined. Additional research is needed to address directionality issues.

Though not statistically significant in this study, the relationship between group size and social influence needs to be examined further to determine what size groups are most susceptible to social influence, as well as to the type of social influence (channel and

technique). Since results indicate individual characteristics, such as experience, group type, perceptions of behavioral restrictions, and knowledge of how to behave, affect levels of susceptibility to social influence, persuasive communication techniques should be tested to determine the most effective means for positively influencing different types of individuals through persuasive messages.

Though this research has expanded on identifying specific problems with Fishbein's social normative component, the research has provided insight into backcountry visitors' susceptibility to social influence. Specific factors, such as experience levels and group type, can identify an individual's ability to be affected by social pressures. The most influential of all referent groups are rangers within a particular resource area. Therefore, persuasive communication programs should be channeled through park and wilderness rangers and directed at all backcountry users, but should be steered especially toward persons travelling with family and who have minimal experience, since this group of visitors is the most susceptible to influence.

APPENDIX A

BACKCOUNTRY VISITOR QUESTIONNAIRE

**BACKCOUNTRY
VISITOR SURVEY**



**School of Forestry
University of Montana**

UNIVERSITY OF MONTANA

School of Forestry
Missoula, Montana 59812

Backcountry Visitor Survey

Please answer all questions as they relate to your most recent backpacking trip in Glacier National Park.

Q-1. Was this your first visit to the Glacier National Park backcountry?
(Circle one number)

- 1 YES (Please go to Question 2)
2 NO (Please answer the following)

Including your recent visit, about how many times have you backpacked in this backcountry area?

- 1 ONE TO THREE TIMES 3 EIGHT TO TWELVE TIMES
2 FOUR TO SEVEN TIMES 4 OVER TWELVE TIMES

Q-2. Prior to this visit, about how many backpacking trips have you taken in Yellowstone National Park, or in wilderness areas in Montana?
(Circle one number)

- 1 NONE 3 FOUR TO SEVEN
2 ONE TO THREE 4 EIGHT OR MORE

Q-3. On this backpacking trip, what type of group were you with?
(Circle one number)

- 1 ALONE 4 FAMILY & FRIENDS
2 FAMILY 5 GUIDE OR OUTFITTER
3 FRIENDS 6 CLUB OR ORGANIZED GROUP

Q-4. About how many people were in your group including yourself?
(Circle one number)

- 1 ONE OR TWO 4 SEVEN TO TEN
2 THREE TO FOUR 5 ELEVEN OR MORE
3 FIVE TO SIX

Q-5. How many nights did you camp overnight in the backcountry on this visit?

NUMBER OF NIGHTS _____

Q-6. During this visit, did you observe any wildlife?

- 1 NO
2 YES, Please list _____

Q-7. What type of equipment did you take on this trip?
(Circle all numbers that apply)

- | | | | |
|---|----------------|----|------------------------------|
| 1 | FISHING ROD | 7 | BEAR SPRAY |
| 2 | ROPE | 8 | FIRE ARM |
| 3 | FRESH FOOD | 9 | CANNED FOOD |
| 4 | AIR HORN | 10 | BEAR BELLS |
| 5 | KNIFE | 11 | FREEZE DRIED/DEHYDRATED FOOD |
| 6 | SAW OR HATCHET | 12 | ODOR PROOF CONTAINER |

Q-8. Did the presence of grizzly bears in the backcountry have any effect on your decision on where to go backpacking?

- 1 NO
2 YES, Please describe how _____
-

Q-9. How did you feel about the likelihood of seeing a grizzly bear on this trip? (Circle one number)

- | | | | |
|---|-------------------|---|-------------------|
| 1 | EXTREMELY LIKELY | 5 | SOMEWHAT LIKELY |
| 2 | VERY LIKELY | 6 | NOT AT ALL LIKELY |
| 3 | MODERATELY LIKELY | 7 | DON'T KNOW |

Q-10. When you were planning your backpacking trip into this area, how close did you want to get to a grizzly bear? (Circle one number)

- 1 NEVER WANTED TO SEE ONE
2 WANTED TO VIEW ONE FROM A GREAT DISTANCE
3 WANTED TO GET CLOSE ENOUGH FOR A GOOD LOOK OR PHOTOGRAPH
4 DIDN'T THINK ABOUT IT

Q-11. To what extent do you feel grizzly bears represent a danger to backcountry campers in this area? (Circle one number)

- | | | | |
|---|---------------------------|---|------------------------------|
| 1 | VERY INSIGNIFICANT DANGER | 4 | SIGNIFICANT DANGER |
| 2 | INSIGNIFICANT DANGER | 5 | EXTREMELY SIGNIFICANT DANGER |
| 3 | SOME DANGER | 6 | DON'T KNOW |

Q-12. How safe did you feel while on this trip? (Circle one number)

- | | | | |
|---|----------------------------------|---|-----------|
| 1 | VERY UNSAFE | 4 | SAFE |
| 2 | UNSAFE | 5 | VERY SAFE |
| 3 | DID NOT THINK ABOUT BEAR DANGERS | | |

Q-13. Do you feel that you would know what to do if you encountered a grizzly bear in the backcountry?

- 1 YES
2 UNCERTAIN
3 NO

Q-14. Listed below are a number of backcountry camping techniques. Please indicate how frequently you practiced each during your backpacking trip. Please be frank.

	How frequently did you? (Circle one answer)			
	ALWAYS	USUALLY	SELDOM	NEVER
Store food in trees	ALWAYS	USUALLY	SELDOM	NEVER
Make noise on trail	ALWAYS	USUALLY	SELDOM	NEVER
Camp or hike in large groups (over 5)	ALWAYS	USUALLY	SELDOM	NEVER
Wear or use bear bells	ALWAYS	USUALLY	SELDOM	NEVER
Wash dishes after each meal	ALWAYS	USUALLY	SELDOM	NEVER
Cook 300 feet away from campsite	ALWAYS	USUALLY	SELDOM	NEVER
Cook fish/bacon for meals	ALWAYS	USUALLY	SELDOM	NEVER
Use odor restrictive containers	ALWAYS	USUALLY	SELDOM	NEVER
Wear clean clothes while sleeping	ALWAYS	USUALLY	SELDOM	NEVER
Cook downhill from sleeping area	ALWAYS	USUALLY	SELDOM	NEVER
Camp away from animal or hiking trails	ALWAYS	USUALLY	SELDOM	NEVER
Carry garbage out	ALWAYS	USUALLY	SELDOM	NEVER
Hike after dark	ALWAYS	USUALLY	SELDOM	NEVER

Q-15. How important are the following people or groups of people in determining what camping techniques you practice while on a backpacking trip?

	Check the appropriate box						
	Not at all Important	Slightly Important	Somewhat Important	Moderately Important	Very Important	Extremely Important	Did Not Use
Other members of your group	()	()	()	()	()	()	()
Backcountry users that you know	()	()	()	()	()	()	()
Backcountry users in the area but not in your group	()	()	()	()	()	()	()
People you know who would like to use the backcountry but haven't	()	()	()	()	()	()	()
Park and wilderness rangers who manage the area	()	()	()	()	()	()	()

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	Not at all Important	Slightly Important	Somewhat Important	Moderately Important	Very Important	Extremely Important	Did Not Use
Family members on trip	()	()	()	()	()	()	()
Family members not on trip	()	()	()	()	()	()	()
Society in general	()	()	()	()	()	()	()
Backcountry magazines	()	()	()	()	()	()	()

Q-16. The following statements ask for your opinions about grizzly bears. Please circle the response which most closely corresponds to your opinion.

To what extent do you agree?
(Circle one answer)

	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
I think grizzly bears are essential to the balance of nature.	SA	A	N	D	SD
There is nothing wrong with grizzly bears eating garbage.	SA	A	N	D	SD
Seeing a grizzly bear in the wild would be one of the greatest outdoor experiences of my life.	SA	A	N	D	SD
Grizzly bears should be eliminated in areas outside of national parks.	SA	A	N	D	SD
I think its wrong to kill grizzly bears.	SA	A	N	D	SD
To me, the grizzly bear symbolizes the beauty and wonder of nature.	SA	A	N	D	SD
I think grizzly bears are among the few animals who will kill for the pleasure of killing.	SA	A	N	D	SD
I think the hunting season on grizzly bears encourages more illegal killing of them.	SA	A	N	D	SD
Montana would be a nicer place to live if fewer dangerous animals, like grizzly bears were found here.	SA	A	N	D	SD
If oil or natural gas were discovered in grizzly habitat, the resource should be extracted even if it harmed bears.	SA	A	N	D	SD

	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
It is the presence of grizzly bears that makes a wilderness experience so wonderful. . . .	SA	A	N	D	SD
I believe so many grizzly bears are being illegally killed in Montana that if something is not done to stop it, the bear will soon disappear from the state.	SA	A	N	D	SD
I think when grizzly bears kill cattle and sheep they must be eliminated.	SA	A	N	D	SD
Because people and cattle live practically everywhere in the United States, and grizzly bears only in Montana and Alaska, I think Montana should make sacrifices when there is a conflict with the bear. . . .	SA	A	N	D	SD
Agencies should provide more natural conditions for grizzly bears, even if this means more visitor restrictions.	SA	A	N	D	SD
I would very much like to see a grizzly bear in the wild.	SA	A	N	D	SD
Some animals like grizzly bears, wolves, and rattlesnakes are naturally cruel.	SA	A	N	D	SD
In my opinion, the grizzly bear is essential for keeping other plant and animal species in proper balance with nature.	SA	A	N	D	SD
The current hunting season on grizzly bears confuses the public about the need to protect them.	SA	A	N	D	SD
I would be afraid if a grizzly bear lived near my house. . .	SA	A	N	D	SD
The relocation of problem grizzlies causes an interruption of the normal cycle of nature.	SA	A	N	D	SD
If farmers were more careful about how they take care of their cattle, there would be fewer livestock killed by grizzlies.	SA	A	N	D	SD
I think it would be wonderful to see grizzly bear sign in the wild.	SA	A	N	D	SD
Grizzly bears do not present problems to backcountry visitors in areas where they are hunted.	SA	A	N	D	SD

Q-17. Listed below are several sources of information people use in order to learn how to camp in grizzly bear country. Please indicate how important each source was for you on this trip. Then use a check (✓) beside the one source you feel is most reliable.

	Check the appropriate box						
	Not at all Important	Slightly Important	Somewhat Important	Moderately Important	Very Important	Extremely Important	Did Not Use
Signs and bulletin boards in park	()	()	()	()	()	()	()
Rangers you met in the backcountry	()	()	()	()	()	()	()
Brochures handed out at park entrance	()	()	()	()	()	()	()
Magazine articles	()	()	()	()	()	()	()
Park newspaper	()	()	()	()	()	()	()
Printed information received with camping permit	()	()	()	()	()	()	()
Other backcountry users	()	()	()	()	()	()	()
Ranger who issued you backcountry permit . . .	()	()	()	()	()	()	()
Films and TV programs . .	()	()	()	()	()	()	()
Newspaper articles . . .	()	()	()	()	()	()	()
Other members of your group	()	()	()	()	()	()	()
"Campfire" talks by park rangers	()	()	()	()	()	()	()
Your previous camping experience	()	()	()	()	()	()	()
Exhibits at visitor centers	()	()	()	()	()	()	()
Other _____	()	()	()	()	()	()	()

Q-18. When backpacking how difficult or easy do you find practicing each of the following?

About how difficult or easy?
(Circle the place that best represents your opinion)

	EASY		DIFFICULT
Store food in trees	_	_	_
Make noise on trail	_	_	_
Camp or hike in large group (over 5 people)	_	_	_
Cook 300 feet away from campsite	_	_	_
Wear or use bear bells	_	_	_
Wash dishes after each meal	_	_	_
Cook fish/bacon for meals	_	_	_
Use odor restrictive containers	_	_	_
Wear clean clothes while sleeping	_	_	_
Cook downhill from sleeping area	_	_	_
Camp away from animal or hiking trails	_	_	_
Carry garbage out	_	_	_
Hike after dark	_	_	_

Q-19. We are interested in your knowledge of bears. Please indicate whether you feel each of the following statements is basically true, basically false, or if you are unsure. Circle one answer.

	Basically True	Basically False	Not Sure
The grizzly bear is a threatened species in the lower 48 states.	T	F	NS
Black bears usually have a "dish" shaped face.	T	F	NS
The muzzle of a grizzly bear is straight and long.	T	F	NS
Bears are usually unpredictable in their behavior.	T	F	NS
The front claws of grizzly bears are often light colored.	T	F	NS

	Basically True	Basically False	Not Sure
The black bear has a prominent hump over the front shoulders.	T	F	NS
The color of grizzly bears may range from light brown to dark black.	T	F	NS
All sightings of bears should be reported to a ranger.	T	F	NS
Bears are usually shy.	T	F	NS
Bears usually do not have an excellent sense of smell.	T	F	NS
Black bears are never found in a color other than black.	T	F	NS
Bears can attack without warning. . . .	T	F	NS
Dogs can lead a bear back to you. . . .	T	F	NS
Bears go into a deep sleep during the winter months.	T	F	NS
Bears are primarily carnivores.	T	F	NS
It is usually not a good idea to get between a sow and cubs.	T	F	NS
Bears do not like fish.	T	F	NS
Grizzly bears have relatively poor eyesight.	T	F	NS
Bears that obtain human foods may lose their fear of people.	T	F	NS
Fewer than 1000 grizzly bears survive in the lower 48 states.	T	F	NS
All bears are potentially dangerous. . .	T	F	NS
Hiking after dark is acceptable in bear country.	T	F	NS
Dogs are useful in keeping bears away.	T	F	NS
It is usually impossible to outrun a bear.	T	F	NS
Female grizzly bears usually breed before they are 5 years old.	T	F	NS

	GENERALLY WANT TO	GENERALLY WANT NOT TO	DON'T KNOW
People you know who would like to use the backcountry but haven't	<input type="checkbox"/>	<input type="checkbox"/>	DK
Park and wilderness rangers who manage the area	<input type="checkbox"/>	<input type="checkbox"/>	DK
Family members on trip	<input type="checkbox"/>	<input type="checkbox"/>	DK
Family members not on trip	<input type="checkbox"/>	<input type="checkbox"/>	DK
Society in general	<input type="checkbox"/>	<input type="checkbox"/>	DK
Backcountry magazines	<input type="checkbox"/>	<input type="checkbox"/>	DK

Background Information

Finally, we have a few questions about you personally that provide information useful in management. Remember, you will not be identified with your answers, so please be frank.

Q-22. What is your present age? _____

Q-23. Are you?

- 1 FEMALE
- 2 MALE

Q-24. What best describes the area in which you live?

- 1 LARGE CITY OVER ONE MILLION PEOPLE
- 2 MEDIUM CITY 50,000 TO ONE MILLION PEOPLE
- 3 SMALL CITY 5,000 TO 50,000 PEOPLE
- 4 TOWN 1,000 TO 5,000 PEOPLE
- 5 RURAL
- 6 FARM

Q-25. What is the highest level of education you have completed so far? (Circle one number)

- 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 16+
- ELEMENTARY HIGH SCHOOL COLLEGE

Q-26. What is your occupation? (Please indicate what kind of work you do, not for whom you work. If you are a homemaker, student, or retired, please so indicate.)

Do you have any additional comments or suggestions on how to improve the management of this backcountry-area? Any general comments?

PLEASE PLACE YOUR COMPLETED QUESTIONNAIRE IN THE STAMPED, SELF-ADDRESSED ENVELOPE PROVIDED AND DROP IN ANY CONVENIENT MAILBOX

THANK YOU FOR YOUR HELP
School of Forestry
University of Montana

Reprints/Office Sales

APPENDIX B

INITIAL CONTACT RECORD

GROUP NUMBER _____

Location _____

Name _____

Street _____

City _____

State/Province _____ Zip _____

Sex: M () F () Age _____

Number of previous backpacking
trips in this area _____

Name _____

Street _____

City _____

State/Province _____ Zip _____

Sex: M () F () Age _____

Number of previous backpacking
trips in this area _____

Name _____

Street _____

City _____

State/Province _____ Zip _____

Sex: M () F () Age _____

Number of previous backpacking
trips in this area _____

Name _____

Street _____

City _____

State/Province _____ Zip _____

Sex: M () F () Age _____

Number of previous backpacking
trips in this area _____

Name _____

Street _____

City _____

State/Province _____ Zip _____

Sex: M () F () Age _____

Number of previous backpacking
trips in this area _____

Name _____

Street _____

City _____

State/Province _____ Zip _____

Sex: M () F () Age _____

Number of previous backpacking
trips in this area _____

APPENDIX C

FIRST COVER LETTER

School of Forestry

Dear Backcountry Visitor:

As you may recall, the School of Forestry at the University of Montana is conducting a study of backcountry visitor attitudes toward grizzly bears in Glacier National Park.

Our study involves identifying what visitors think about grizzly bears, as well as how they camp in grizzly bear country and where they receive their information about grizzly bears. You are one of a small number of visitors who have been randomly selected for participation in this study so your responses are important for the study's success. We certainly appreciate your cooperation.

Enclosed is a questionnaire which will take approximately 15-20 minutes to complete. Your responses will not only help us in our work, but will also be very useful in making overall decisions concerning management of backcountry areas. Please be assured that your responses will be tabulated in such a manner that no one individual can be identified. After you have completed the questionnaire, enclose it in the self-addressed stamped envelope and drop it in any convenient mailbox.

If you have any questions concerning this study, please contact us.

Sincerely,

Stephen F. McCool
Professor

enclosures

APPENDIX D

REMINDER POSTCARD

Dear Backcountry Visitor:

Several days ago we mailed you a questionnaire concerning your attitudes toward grizzly bears in Glacier National Park. Since only a small number of backcountry visitors were selected to participate in the study, the success of the study is dependent upon responses of participants such as you.

We appreciate your cooperation in the study and look forward to receiving your completed questionnaire.

Sincerely,

Stephen F. McCool
Professor

APPENDIX E

SECOND COVER LETTER

School of Forestry

Dear Backcountry Visitor:

Several weeks ago we sought your cooperation in a study of backcountry visitor attitudes towards grizzly bears in Glacier National Park. As of this day, we have not yet received your completed questionnaire.

The study involves such questions as what backcountry users think about grizzly bears, how they camp in grizzly bear country, and where they receive their information about grizzly bears. Because only a limited number of individuals have been included in the study, your cooperation is important in the success of it.

Enclosed is another copy of the questionnaire in the event that you have misplaced the original. Please take a few minutes to complete the questionnaire within the next several days. Place it in the stamped, self-addressed envelope and drop it in any convenient mailbox. Your help is greatly appreciated.

Thank you.

Sincerely,

Stephen F. McCool
Professor

enclosures

APPENDIX F

ABBREVIATIONS

ABBREVIATIONS

- AB - Attitude component of Fishbein Model
- ANOVA - Analysis of Variance
- B - Actual Behavior
- BA1 - Beliefs about consequences (same as b_1)
- BA2 - Evaluation of consequences (same as e_1)
- b_1 - Beliefs about consequences (same as BA1)
- BI - Behavioral intentions
- e_1 - Evaluation of consequences (same as BA2)
- GNP - Glacier National Park
- INFO - Information score
- JBHA - Jewel Basin Hiking Area
- mc_1 - Motivation to comply (same as SN2)
- MG - Many Glacier
- nb_1 - normative beliefs (same as SN1)
- SC - Sperry Chalet
- SG - Fishbein's social normative component (same as SN)
- SN - Fishbein's social normative component (same as SG)
- SN1 - normative beliefs (same as nb_1)
- SN2 - Motivation to comply (same as mc_1)
- w_1 ; w_2 - beta weights of Fishbein Model

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