# Articles

# Attitude-Strength and Support of Recreation Management Strategies

Alan D. Bright Recreation and Leisure Studies Program, Department of Kinesiology and Leisure Studies, Washington State University

Obtaining quality information about public attitudes toward recreation management issues requires information about the strength of attitudes. This study examined (a) the moderating effects of attitude-certainty and personal relevance on the relationship between attitude-extremity and prediction of support for management strategies and (b) public perceptions of arguments for management strategies. High levels of certainty and personal relevance allowed for better prediction of support for specific recreation management strategies from attitudes than low levels. Predictive validity was also related to the nature of beliefs about arguments for specific strategies. Implications suggest expanding the type of attitudinal information obtained in public surveys in order to improve the quality of attitudinal information and the effectiveness of communication campaigns.

KEYWORDS: Attitude-certainty, attitude-extremity, attitude-strength, personal relevance, predictive validity, recreation management

# Introduction

The effectiveness of recreation managers often depends on their ability to obtain a wide variety of information about the public. For example, information about future recreation demand, the quality of existing programs, the nature of new and diverse user groups, the extent to which the public will support specific management practices, and the nature of such support is important to managers providing recreation opportunities efficiently. A key to obtaining this information is assessing public attitudes toward recreation management issues. Gathering attitudinal information has, in recent years, become an important task of recreation managers because it (a) aides in the provision of a quality recreation product for the public, and (b) increases knowledge about new and diverse user groups. However, problematic of gathering attitudinal information from the public is that individuals, when indicating their attitudes on a questionnaire, often provide an attitude toward a resource management issue simply because the researcher asked for

Address correspondence to Alan Bright; Department of Kinesiology and Leisure Studies; Washington State University; Pullman, WA 99164-1410.

it. Often called *non-attitudes*, the quality of such attitudinal information is suspect.

One way of assessing the quality of attitudinal information is to examine its ability to predict behavior (Bright & Manfredo, 1995). For example, attitudes that accurately predict behavior may be seen as higher quality than attitudes that fail to predict behavior. In fact, behavioral prediction has been an important use of attitudinal information addressed by researchers. Recreation researchers have increasingly drawn on attitude research in an effort to explore the ability of attitudes to predict behavior in a recreation/natural resource setting. This research has focused on factors such as the specificity of attitude-measurement (e.g., Bright, Manfredo, Fishbein, & Bath, 1993), characteristics of the individual from which the attitude was assessed (e.g., Manfredo, Yuan, & McGuire, 1992), and characteristics of the attitude (e.g., Bright & Manfredo, 1995). Research on the characteristics of the attitude have focused primarily on the strength with which the attitudes are held and the most effective ways of measuring that strength.

Although it does not have a precise, agreed upon meaning in the social psychology literature, attitude-strength, in its most general sense, is viewed as the extent to which an individual's attitude is formed. While social scientists have identified many measures of attitude-strength (see Petty & Krosnick, 1995), the most commonly used measure is the *extremity* of the attitude (Petty & Krosnick, 1995; Raden, 1985). Most attempts to define attitude-extremity point to its operationalization, describing this dimension in terms of distance from a neutral point on an interval level attitude-scale. That is, respondents whose attitudes fall close to either end of a bi-polar scale are said to have more extreme attitudes than those whose attitudes fall somewhere in the middle. However, a limitation of sole use of attitude-extremity as a measure of attitude-strength is that it doesn't allow for highly formed "neutral" or "moderate" attitudes. Given this limitation, the extremity of reported attitudes may actually provide less real information about the attitude than researchers would like. This suggests that additional information about an individual's attitude may shed light on how strongly that attitude is actually held. Two key descriptors of attitudes that have been addressed by social psychological researchers include attitude-certainty and personal relevance of the attitude-object or issue (Krosnick & Abelson, 1992). These were recommended as key attitude-strength factors due to their ability to provide additional attitudinal information over and above the traditional extremity measure. Presupposing that the predictive validity of an attitude is an effective indicator of it's quality, this study examined the effects of attitudeextremity on the ability of those attitudes to predict voting behavior and the extent to which the predictive validity of extreme versus moderate attitudes is influenced by (a) the certainty by which those attitudes are held and (b) the personal relevance of the attitude-object or issue. In addition, this study further explored the nature of attitudes by determining if the structure of specific beliefs held about an issue was related to the predictive validity of the attitudes.

#### **Theoretical Background**

Research on attitude-strength has generally been conducted piecemeal, examining different dimensions of attitude-strength separately. Most of this research has treated the dimensions of attitude-strength as dependent variables, examining the effects of situational and personal factors on the strength with which attitudes are held. Recently, however there is a growing amount of research that has examined the consequences of holding "strong" versus "weak" attitudes.

# Previous Research on Attitude-Strength and the Predictive Validity of Attitudes

#### Attitude-Extremity

Attitude-extremity refers to the notion that attitudes not only vary in direction (favorable toward and attitude object versus unfavorable), but also in degree of favorableness or unfavorableness. Recognizing the conceptual vacuity of defining attitude-extremity based simply on its operationalization, Abelson (1995) suggested several definitions of attitude-extremity. First attitude-extremity may be described as the "intensity of feeling on the issue" (Abelson, 1995, p. 38). Clues to the intensity of feeling toward an issue can be depicted by noting an individual's tendency toward argument, temper loss, or enthusiasm in participating in activities. A second meaning refers to the "unqualifiedness of the position" on an issue. For example, saying "all natural areas should be managed in order to provide a primitive recreation experience" is a more extreme position than saying "there should be an appropriate balance between providing primitive and developed recreation experiences." In studies that examined the effect of attitude-extremity on the predictive validity of attitudes, extreme attitudes were more predictive of behavior than moderate attitudes. For example, Peterson and Dutton (1975) found that the extremity of student attitudes toward the Vietnam War was directly and positively associated with related behaviors such as voting and activism. Bright and Manfredo (1995) found that extreme attitudes were more predictive of support of natural resource management strategies related to issues such as the management of old growth forests, unroaded areas, and grazing than were more moderate attitudes.

#### Attitude-Certainty

Attitude-certainty is defined as "..a subjective sense of conviction or validity about one's attitude or opinion" (Gross, Holtz, & Miller, 1995, p. 215). Subjective sense of conviction, or subjective certainty, does not require that an individual's attitude conforms to some external reality, but instead, suggests a sense of attitude confidence or correctness. Attitude researchers generally agree that people are motivated to hold "correct" attitudes (Petty & Cacioppo, 1986), however people are more confident in the correctness of some attitudes than others. In this sense, attitude-certainty refers to the extent to which an individual is confident in his or her attitude toward an object.

Early attitude researchers saw attitude-extremity and attitude-certainty as being equivalent (Osgood, Suci, & Tannenbaum, 1957), however, later researchers do not (Krosnick & Abelson, 1992; Krosnick, Boninger, Chuang, Berent, & Carnot, 1993). While people who hold extreme attitudes generally hold them with high levels of certainty, people with moderate attitudes often vary in the certainty with which they hold those attitudes (Gross, et al., 1995). While some people who hold moderate attitudes may be unsure of those attitudes, others may, in fact be very sure of their "near-neutral" attitudes.

Attitude-certainty has several characteristics suggesting a highly-formed attitude. Attitudes held with certainty are more stable (Swann, Pelham, & Chidestar, 1988), and behaviors associated with highly certain attitudes should be similarly stable (Fishbein & Ajzen, 1975). Research in social psychology has provided evidence that attitudes held with high certainty predict voting behavior better than those held with low certainty. Davidson, Yantis, Norwood, and Montano (1985) found that certainty about one's attitude toward a political candidate predicted the consistency between attitude toward the candidate and future voting behavior, especially when the individual had high previous voting experience.

#### Personal Relevance of the Issue

For decades, a variety of constructs have been used to examine the importance of an attitude or attitude-object to an individual. These include ego involvement (Sherif & Cantril, 1947), attitudinal involvement (Ostrom & Brock, 1968), personal relevance (Petty & Cacioppo, 1986), attitudeimportance (Krosnick, 1988) among others. While often addressed as different constructs, these factors all suggest that "individuals are personally involved with an issue, event, object, or person to the extent that they care about that entity and perceive it as important" (Thomsen, Borgida, & Lavine, 1995, pp. 191). A significant amount of research has explored the effects of this construct on attitudes. Attitudes toward an issue that is personally important have been found to be more stable over time (Krosnick, 1988). In addition, research has found a strong positive relationship between level of involvement and attitude-behavior consistency (Krosnick, 1988; Leippe & Elkin, 1987). For example, in an analysis of data collected during the 1968, 1980, and 1984 American presidential campaigns, Krosnick (1988) found that attitudes toward government policies perceived as important were more predictive of related voter preferences than were attitudes toward unimportant policies. The direct effects of personal importance on attitude-behavior consistency have also been addressed in the natural resource and recreation fields. Bright and Larson (1991) found that persons with high levels of enduring involvement (a factor that may be interpreted as personal relevance) toward taking trips to view wildlife displayed behavioral intentions more consistent with attitudes toward taking such trips than persons with low levels of enduring involvement.

# The Concurrent Effects of Attitude-Strength Dimensions on the Predictive Validity of Attitudes

Given the piecemeal nature of research on attitude strength, Bright and Manfredo (1995) proposed a model that explored the concurrent effects of several dimensions of attitude-strength on the ability of attitudes to predict behavior. The model proposed that attitude-extremity, attitude-certainty, and personal relevance would all have direct, positive relationships with the ability of attitudes to predict voting behavior regarding specific strategies. These researchers found that all three measures of attitude-strength predicted a significant amount of the variance in correct predictions of support for strategies related to management of old-growth forests, livestock grazing, and unroaded areas. While the proposed model suggested all three attitudestrength dimensions influenced the predictive validity of attitudes, it did not examine the extent to which the attitude-strength dimensions may interact in influencing the ability of attitudes to predict behavior.

# Study Goals and Hypotheses

There were two primary goals of this study. The first goal was to examine the interactive effects of attitude-extremity, attitude-certainty, and personal relevance of the issue on the ability to predict support for a specific recreation management issue. In this study the ability of attitudes to predict behavior (Att-Beh) is seen as a function of attitude-extremity (AE), the traditional measure of attitudes. However, the effects of attitude-extremity may be moderated by other attitude-strength dimensions, specifically, the certainty with which those attitudes are held (AC), and the personal relevance of the issue (PR). This is noted by the following functional equations:

Att-Beh = 
$$f(AE) \times f(AC)$$
  
Att-Beh =  $f(AE) \times f(PR)$ .

These equations suggest two specific hypotheses.

- H1: The relationship between the extremity of attitudes and their predictive validity is moderated by the certainty with which those attitudes are held.
- H2: The relationship between the extremity of attitudes and their predictive validity is moderated by the personal relevance of the issue.

The second goal of this study was to explore the nature of underlying beliefs about a recreation management strategy. More specifically, the extent to which an individual's belief structure regarding a recreation management issue is related to the predictive validity of attitudes toward the issue was examined. While no previous research was identified that connected the structure of one's beliefs (also called belief systems) directly to the ability of attitudes to predict behavior, this provides a deeper understanding of the empirically identified relationships among attitude-strength dimensions and behavior. Therefore, a third hypothesis was addressed.

H3: Individuals whose attitudes that successfully predict voting behavior hold different belief systems than do individuals whose attitudes do not successfully predict voting behavior.

#### Methods

#### Research Design

Potential respondents were contacted by telephone and asked if they would be willing to complete a mail-back questionnaire. To provide for subsequent analysis of non-response to the mail-back questionnaire, respondents were asked questions about the nature of their participation in outdoor recreation. Willing respondents were immediately sent a mail-back questionnaire. Follow-up procedures included a postcard, sent ten days after the initial mailing, reminding subjects of their promise to return a completed questionnaire. If subjects had not returned a questionnaire after ten more days, a second questionnaire was mailed.

#### Sampling

The target population was residents of the Northern Front Range region of Colorado, with Fort Collins and suburbs to the north and the Denver metro area to the south. A random sample of the target population was drawn by selecting telephone numbers from the directories of all Northern Front Range communities falling within the target area. To insure that households with listed and unlisted telephone numbers were included, the last two digits of the telephone number were replaced with two random numbers. Subjects were limited to those persons 18 years of age and older. The phone number was discarded if, after the initial call and four callbacks, no contact was made. Five-hundred and sixty individuals were contacted by telephone of which 485 (86.6%) agreed to complete the mail-back questionnaire. Of the 485 questionnaires mailed, 365 (75.3%; 65.2% of the original contacts ) were returned. Nonresponse tests found no significant differences between nonrespondents and respondents in the nature of their outdoor recreation participation in Colorado.

#### Development of the Research Instrument

Prior to responding to questions about their attitudes respondents read a message about a recreation management issue. The message included (a) a brief description of the issue written by United States Forest Service personnel and (b) three arguments for supporting a motorized emphasis and three arguments for supporting a nonmotorized emphasis. The arguments represented the most salient public comments gathered at public forums across the Northern Front Range region of Colorado in conjunction with the Arapaho and Roosevelt National Forests (ARNF) and Pawnee National Grassland (PNG) Forest Plan revision (USFS, 1991). The paragraph read as follows:

There is considerable controversy regarding the merits of motorized (automobiles, off-highway vehicles) and nonmotorized (hiking, mountain biking, horseback riding) uses of the Arapaho and Roosevelt National Forests and the Pawnee National Grassland. At one end of the spectrum are those persons who demand primitive recreation opportunities in wilderness or unroaded areas with no contact with motorized uses. On the other hand, there are persons who desire backcountry recreation while still able to travel by automobile or other motorized vehicles.

Some people believe we should emphasize motorized recreation opportunities because:

a. Driving for pleasure is the most frequent recreation on the forests and grasslands.

b. It will provide for recreation involving four-wheel drive and off-highway vehicles, such as ATVs and motorcycles.

c. It will allow persons with disabilities and older person an opportunity to enjoy the wilderness.

Some people believe we should emphasize nonmotorized recreation opportunities because:

d. It will reduce the need for more roads to be developed.

e. It will reduce the impact of recreation on wildlife, soils and vegetation.

f. It will enhance the recreation experience of those who prefer nonmotorized recreation.

After reading this information respondents were asked to answer several questions about their attitude toward two management strategies. These strategies were (a) managing the ARNF with an emphasis on nonmotorized recreation and (b) managing the ARNF with an emphasis on motorized recreation. Respondents also indicated the personal relevance of the issue, their support of one of the strategies, and the relative importance of the arguments for emphasizing each strategy. Variables measured in this study were (a) dimensions of attitude (direction, extremity, and certainty), (b) voting behavior, (c) personal relevance of the issue and (d) the importance of arguments about the issue.

#### Attitude Dimensions

For each management strategy, three dimensions of attitude were measured; attitude-direction, attitude-extremity, and attitude-certainty. *Attitudedirection* for each strategy was measured using a 5-point Likert-type scale. Subjects were asked if managing the ARNF emphasizing nonmotorized or motorized recreation would be "extremely good" (+2), "moderately good" (+1), "neither good or bad" (0), "moderately bad" (-1), or "extremely bad" (-2). Attitude-extremity for each management strategy was measured utilizing the same questions used to measure attitude-direction. Scoring for attitudeextremity was done considering Abelson's (1995) two meanings of attitudeextremity; intensity and unqualifiedness of position. Using the two traditional attitudinal scales, attitude-extremity was measured as the difference between the respondent's attitude toward emphasizing nonmotorized recreation ( $A_{NON}$ ) and their attitude toward motorized recreation ( $A_{MOT}$ ), shown by the following formula:

 $A_{NON} - A_{MOT} = Attitude-extremity.$ 

This resulted in an attitude-extremity scale that ranged from -4 to +4. For example, if a respondent's attitude toward nonmotorized recreation was "extremely good" (+2) and their attitude toward motorized recreation was "extremely bad" (-2), this would result in an attitude-extremity score of +4, representing an extreme attitude toward the issue and favoring nonmotorized recreation. On the other hand, reversing these two scores would result in an extremity score of -4 (-2 - 2), representing an extreme attitude favoring motorized recreation. This scale suggests that the extreme attitudes would be held with more intensity, being at the polar ends of the scale, and represent an unqualifiedness of position, that is, the individual holds a definite attitudinal preference toward one strategy or the other.

After each attitude question, subjects made a single overall rating of the confidence with which they held the attitude just expressed. Measurement of *attitude-certainty* was based on a 5-point scale ranging from "not at all certain" (+1) through "very certain" (+5). An overall attitude-certainty index was computed as an average of the two certainty questions (for attitude toward motorized and nonmotorized recreation). This represented an overall measure of the certainty with which attitudes toward the issue were held. Respondents were then placed in one of two groups, a low attitude-certainty group and a high attitude-certainty group based on the median score.

### Personal Relevance of the Issue

Personal relevance of the issue was measured using a single 5-point question. Subjects rated how important the issue of motorized/nonmotorized recreation was to them using a scale of "not important" (+1) through "very important" (+5). Respondents were then placed into one of two groups, a low personal relevance group and a high personal relevance group based on the median score.

#### Voting Behavior

After responding to the attitudinal questions for each management strategy, the behavioral component was measured. Called *voting behavior*, subjects voted directly for (a) emphasizing motorized recreation in managing the ARNF or (b) emphasizing nonmotorized recreation in managing the ARNF.

#### Importance of Arguments for Each Strategy

After responding to the attitudinal and strategy support questions, subjects were asked to return their attention to the six arguments provided in the message. Respondents ranked, in order from first through sixth, the importance of each argument in influencing their attitude. In order to analyze these belief assessments, respondents were placed into one of four groups based on the extent to which their attitudes were consistent with their vote on a management strategy.

#### Voting Behavior Prediction

The voting behavior prediction variable represented the consistency between an individual's attitudes and his or her voting behavior. First, for each individual, the predicted voting behavior was the strategy alternative (motorized versus nonmotorized) toward which the most positive attitude was held<sup>1</sup>. If neither attitude was more positive (or less negative) than the other, no prediction of voting behavior was possible. Second, the predicted voting behavior was compared to the actual voting behavior. If they were the same, then voting behavior prediction was correct and attitude predicted voting behavior. If they were not, attitude did not predict voting behavior. Respondents were then placed into one of four "prediction/support" groups (see Table 1).

	Predicted motorized recreation support	Predicted nonmotorized recreation support	
Actual motorized recreation support	Group 1	Group 3	
Actual nonmotorized recreation support	Group 2	Group 4	

 TABLE 1

 The Breakdown and Description of Prediction/Support Groups

Group 1—the most positive attitude was held toward emphasizing motorized recreation and the individual actually voted for motorized recreation (correct voting behavior prediction). Group 2—the most positive attitude was held toward emphasizing motorized recreation and the individual actually voted for nonmotorized recreation (incorrect voting behavior prediction). Group 3—the most positive attitude was held toward emphasizing nonmotorized recreation and the individual actually voted for motorized recreation (incorrect voting behavior prediction). Group 3—the most positive attitude was held toward emphasizing nonmotorized recreation and the individual actually voted for motorized recreation (incorrect voting behavior prediction). Group 4—the most positive attitude was held toward emphasizing nonmotorized recreation and the individual actually voted for nonmotorized recreation (correct voting behavior prediction).

The consistency between an individual's attitude and voting behavior was computed based on the *behavioral alternative model of social behavior* (Jaccard, 1981). According to this model, in situations where individuals must make a choice between n mutually exclusive behaviors, the behavior that will be performed is the one for which the most positive attitude is held.

#### Analyses

The first goal of the study was to examine the effects of attitudeextremity, moderated by attitude-certainty and personal relevance of the issue on the predictive validity of attitudes. First, the relationship between attitude-extremity and predictive validity was compared across the two attitude-certainty groups. Using logistic regression analysis (Norusis, 1993), voting behavior was regressed on three variables; certainty group, attitudeextremity, and an extremity by certainty-group interaction term. A significant interaction term indicates a significant difference in the effects of attitudeextremity on predictive validity across the two certainty groups. Second, a similar comparison of the extremity-predictive validity relationship was conducted across the personal relevance groups, again regressing voting behavior on attitude-extremity, personal relevance group, and an interaction of the two. To determine the nature of significant interactions, the correlation between attitude-extremity and voting behavior was computed for each certainty and personal relevance group. Differences between correlations were then tested for significance using Fischer's z transformation technique (Cohen & Cohen. 1983).

The second goal of the study was to examine the nature of the underlying beliefs and their relationship to the predictive validity of attitudes. This was done using the Friedman test, a nonparametric within-subjects method of comparing the mean rankings of the six arguments. This test was conducted for each prediction/support group to determine if the groups differed in their rank ordering of the importance of arguments for emphasizing motorized and nonmotorized recreation.

#### Results

This study examined (a) the relationship between attitude-extremity and the predictive validity of attitudes and the moderating effects of attitudecertainty and personal relevance of the issue and (b) the importance of specific arguments for each strategy.

# The Effect of Attitude-Extremity on the Predictive Validity of Attitudes

The effects of attitude-extremity on voting behavior prediction were examined in two separate analyses. First, the extent to which attitude-certainty moderates the effects of attitude-extremity were examined. Second, the moderating effects of personal relevance were examined (see Table 2).

# The Moderating Effects of Attitude-Certainty

Hypothesis one stated that the relationship between attitude-extremity and the predictive validity of attitudes would be moderated by the certainty with which those attitudes were held. The logistic regression analysis indicated a significant attitude-extremity by attitude-certainty group interaction

	В	SE	Wald	df	р
Attitude-Certainty					
Certainty-Group	-0.23	0.21	1.22	1	.269
Attitude-Extremity	1.57	0.20	63.30	1	.000
Extremity $\times$ Certainty	-1.04	0.72	56.27	1	.000
Constant	-0.22	0.21	1.12	1	.290
Personal Relevance					
Personal Relevance Group	0.16	0.21	0.57	1	.450
Attitude-Extremity	1.60	0.19	64.31	1	.000
Extremity $\times$ Personal Relevance	-1.13	0.65	43.98	1	.000
Constant	-0.24	0.21	1.29	1	.255

 TABLE 2

 The Effects of Attitude-Extremity on the Predictive Validity of Attitudes:

 The Moderating Effects of Attitude-Certainty and Personal Relevance

effect (*Beta* = -1.04; *Wald* = 56.27; p < .001). This indicates that the effects of attitude extremity on their ability to predict voting behavior was different for each level of attitude-certainty. To examine the nature of this difference, the correlation between attitude-extremity and voting behavior was computed for each of the two levels of attitude-certainty. Using Fischer's z' transformation technique(Cohen & Cohen, 1983), it was determined that the correlation between attitude-extremity and voting behavior was significantly higher for the high attitude-certainty group than the low attitude-certainty group (*Eta* = .86 versus .67, respectively; p < .001). Hypothesis one was therefore supported.

# The Moderating Effects of Personal Relevance of the Issue

Hypothesis two stated that the relationship between attitude-extremity and predictive validity would be moderated by the personal relevance of the issue. Again, logistic regression analysis indicated a significant attitudeextremity by relevance group interaction effect (*Beta* = -1.13; *Wald* = 43.98; p < .001), indicating that the effects of attitude-extremity on predictive validity differed across level of personal relevance of the issue. Again, Fischer's z' transformation technique showed that the correlation between attitudeextremity and voting behavior was significantly higher for the high personal relevance group than the low personal relevance group (*Eta* = .85 versus .71, respectively; p < .002). Hypothesis two was therefore supported.

The Importance of Arguments for Management Strategies

Each respondent ranked the six arguments in order of how important they would be in influencing their attitudes toward managing the ARNF for motorized or nonmotorized recreation. Table 3 presents the mean rank for

	Mean Ranks by Prediction/Support Group				
	Predict Motorized		Predict Nonmotorized		
	Support motorized (Group 1) (n = 76)	Support nonmotorized (Group 2) (n = 68)	Support motorized (Group 3) (n = 78)	Support nonmotorized (Group 4) (n = 143)	
Some people believe we should emphasize motorized recreation opportunities becar	ise:				
a. Driving for pleasure is the most frequent recreation on the Forests and Grasslands.	$3.88^{(1)}$	4.58(1)	$3.24^{(2)}$	$1.58^{(5)}$	
b. It will provide for recreation involving four-wheel drive and off- highway vehicles, such as ATVs and motorcycles.	2.52 <sup>(3)</sup>	2.71 <sup>(5)</sup>	$1.65^{(5)}$	0.81 <sup>(6)</sup>	
c. It allows persons with disabilities and older persons an opportunity to enjoy the wilderness.	3.77 <sup>(2)</sup>	4.16 <sup>(2)</sup>	3.36 <sup>(1)</sup>	2.41 <sup>(4)</sup>	
Some people believe we should emphasize nonmotorized recreation opportunities because:					
d. It will reduce the need for more roads to be developed.	$1.60^{(5)}$	$3.55^{(4)}$	$2.29^{(4)}$	$3.12^{(2)}$	
e. It will reduce the impact of recreation on wildlife, soils, and vegetation.	$2.27^{(4)}$	3.71 <sup>(3)</sup>	2.78 <sup>(3)</sup>	4.28 <sup>(1)</sup>	
f. It will enhance the recreation experience of those who prefer nonmotorized recreation.	0.96 <sup>(6)</sup>	$2.29^{(6)}$	$1.54^{(6)}$	2.66 <sup>(3)</sup>	
Friedman chi-square	92.40*	20.26*	34.69*	93.96*	
Attitude-Extremity (see note 2)	$-1.82^{a}$	-0.04 <sup>b</sup>	0.59°	$2.70^{d}$	

 TABLE 3

 Comparison of Mean Ranks of Arguments and Attitudes by Prediction/Support Group

Note 1. The order of ranking for each group is indicated by the superscript in parentheses next to the mean rank. The mean ranks ranged from 0 (lowest rank) to 5 (highest rank).

\* Chi-square is significant at  $p \leq .001$ 

Note 2. Attitude-extremity ranges from -4 to +4; the poles representing the most extreme attitude. One-way analysis of variance was conducted to compare the attitude-extremity scores to determine if the prediction/support groups differed on the extremity of their attitudes (F = 353.4;  $p \le .001$ ).

a,b,c,d Mean extremity scores with different superscripts are significantly different at  $p \leq .001$ .

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each of the six arguments separately for each prediction/support group and the results of the Friedman test for comparing the mean ranks of the arguments.

All four prediction/support groups showed a significant relationship between specific argument and the mean ranking (Group 1;  $X^2 = 92.40$ ,  $p \le .001$ : Group 2;  $X^2 = 20.26$ ,  $p \le .001$ : Group 3;  $X^2 = 34.69$   $p \le .001$ : Group 4;  $X^2 = 93.96$ ,  $p \le .001$ ). For group 1, the most important arguments pointed out the (a) frequency of driving for pleasure on forests and grasslands (m = 3.88), (b) accessibility of these areas to persons with disabilities (m = 3.77), and (c) opportunities for four-wheel drives and ATVs (m = 2.52). all arguments for emphasizing motorized recreation. For both groups 2 and 3, the most important arguments addressed (a) driving for pleasure (m =4.58, 3.24 respectively), (b) persons with disabilities (m = 4.16, 3.36 respectively), and (c) reducing impacts on wildlife, soils, and vegetation (m = 3.71, m = 3.71)2.78 respectively), representing arguments for emphasizing both motorized and nonmotorized recreation. Finally, the most important arguments for group 4 pointed out (a) the reduced impact on wildlife, soils, and vegetation (m = 4.28), (b) the reduced need for more roads (m = 3.12), and (c) enhanced nonmotorized recreation (m = 2.66), all arguments for emphasizing nonmotorized recreasion. Given that the relative rankings of beliefs differed across prediction/support groups, hypothesis three was supported.

# Discussion

The goals of this study were to (a) determine if extreme attitudes predicted voting behavior better than moderate attitudes while exploring the effects of attitude-certainty and/or personal relevance of the issue and (b) examine the nature of beliefs underlying the attitude-behavior relationship. This was done in the context of public support of two mutually exclusive recreation management strategies.

# The Concurrent Effects of Attitude-Strength Factors on Voting Behavior Prediction

While extreme attitudes were significantly better predictors of voting behavior than moderate attitudes, these effects were stronger (a) for attitudes held with high certainty than low certainty and (b) when the issue was of high personal relevance than low personal relevance. While this lends credibility to the notion that a highly formed (strong) attitude predicts behavior better than an attitude that is not highly formed (weak), it also supports the notion that factors beyond the valence of attitudes toward a behavior influence accurate behavioral prediction.

The apparent difference between attitude-extremity and attitudecertainty was borne out in this study for a couple of reasons. First, extremity had different effects on the ability to predict behavior for those with highly certain attitudes than those with uncertain attitudes. In addition, individuals with moderate attitudes were, overall, just as certain about those attitudes as individuals with extreme attitudes (m = 1.21 versus 1.08, respectively; t = 1.08; p = .280). However, the certainty of moderate attitudes were much more varied ( $s^2 = 4.65$ ) than the certainty of extreme attitudes ( $s^2 = 0.81$ ), suggesting that these two strength-related dimensions do provide different attitudinal information.

Personal relevance of the issue also had a key influence on behavioral prediction. For someone to make a choice between competing management strategies, the relevant attitude must be cognitively accessible when the attitude-object is evaluated (Fazio, 1986). Cognitive accessibility is determined by one of three factors (Higgins & King, 1981); the frequency of activation, the distinctiveness of the attitude, and the extent of links between the attitude and other psychological elements. Because important attitudes are frequent subjects of conscious thought (Wood, 1982) and are linked to other psychological elements (Judd & Krosnick, 1989), they are likely to be highly accessible. Attitudes regarding important recreation management issues would be expected to be better predictors of support for specific management strategies than attitudes toward unimportant issues.

#### The Relative Importance of Arguments for Each Management Strategy

It would be expected that if an individual's most positive attitude was toward a specific management strategy, arguments supporting that strategy would be ranked more important than arguments opposing that strategy. This was the case in this study where a correct prediction of voting behavior was made. The most important arguments for group 1 (correct prediction of support for a motorized strategy) were those supporting the motorized strategy. On the other hand, the most important arguments for group 4 (correct prediction of support for a nonmotorized strategy) were those supporting the nonmotorized strategy. More interesting, however, is the nature of rankings when the most positive attitude did not accurately predict support of a specific strategy (groups 2 and 3). In these cases, arguments supportive of the predicted strategy were not necessarily ranked higher than those that were supportive of the other strategy, that is, there was a mix of importance rankings between management strategies.

Why would attitudes that do not predict voting behavior be characterized by such an ambiguous pattern of perceived argument importance? One explanation may be found in the role of cognitive complexity on attitudeextremity. A cognitively complex perception of an issue might be suggested when individuals perceive arguments toward an issue that may appear contrary to their attitudes regarding that issue as just as important as those that are consistent with their overall attitudes. This could lead to more moderate attitudes as was tested by Linville (1982) who found that people with complex belief systems about senior citizens held more moderate attitudes toward that age group than those with simple belief systems. In applied research, Bright and Manfredo (1992) found that greater cognitive complexity toward natural resource management issues resulted in more moderate attitudes. This was supported in this study, where attitudes that correctly predicted voting behavior were significantly more extreme than were those that did not correctly predict voting behavior (table 3).

# **Management Implications**

A better understanding of public attitudes can help recreation professionals more effectively manage recreation opportunities and the natural resources that support them. Among other benefits, this involves understanding diverse opinions about an issue and predicting public support of management policies. One way these benefits can be realized is by enhancing the quality of attitudinal information. This study defined high quality attitudinal information as that which predicts voting behavior. While there may be several ways of defining high quality attitudinal information, this study focused on the predictive validity of attitudes because predicting or understanding public behavior has been an important use of attitudinal information by recreation researchers and managers.

There are several implications of this study which address the type of information managers should have at their disposal when analyzing the attitudes of the public. First, traditional methods of measuring attitudes have an inherent extremity component. Use of this traditional "extremity-based" attitudinal information alone could result in managers inferring characteristics about the public that may not be accurate, such as their support of management actions and their behavior while recreating on-site. Results of this study suggest that knowing the extremity of public attitudes may provide different information depending on the levels of other attitude-strength dimensions. For example, the public may hold varying degrees of extreme attitudes toward a management issue, however, if managers do not have a clear sense of how important the issue is to the public, attempts to predict how the public will behave or react toward management policies may be unsuccessful. Similar problems with assessing public reaction may occur without information about the public's certainty with which they hold their attitudes.

A second implication lies in the effects of communication strategies designed to educate or even influence public attitudes about a management issue. Given the growing emphasis on integrating social information into management planning, managers are increasingly communicating with various stakeholders and other interested parties. Often, this communication involves the development of persuasive messages intended to influence public attitudes and behaviors. Social psychological research on the effects of information has found that attitudes held with greater certainty and/or related to important issues tend to be more stable. Such attitudes may show resistance to persuasion, the levels of which may not be entirely explained by the intensity with which attitudes are held.

A third implication of this study goes beyond the strength of attitudes toward issues and directly addresses the beliefs the public hold about an issue in developing persuasive or educational messages. Bright, et al. (1993) suggested that one way of influencing the public is to develop messages that specifically target public beliefs. However, the nature of belief systems held by the public about a particular issue may be very diverse. As illustrated by the ambiguity of some respondents' belief systems, it is evident that the public may not view most management issues as straightforward two-sided issues. Given that different groups likely hold different belief systems, creating appropriate messages for all groups may be both difficult and costly. Therefore, managers must be creative in how they get information out to their respective publics.

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