

## Effect of Personality and Situational Factors on Intentions to Obey Rules in Outdoor Recreation Areas

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A laboratory experiment compared the effects of social responsibility (a personality trait) and two situational factors on intentions to obey regulations in outdoor recreation areas. The situational factors were the presence or absence of "awareness-of-consequences" information explaining the reasons for regulations and the presence or absence of probable and significant sanctions for violating regulations. Subjects projected themselves into six dilemmas, each of which involved a compelling reason to disregard a regulation. Subjects who received a message informing them of probable sanctions for rule violations were more likely to intend to obey regulations than those who did not receive this message. Awareness-of-consequences information also promoted rule obedience, especially among high social-responsibility subjects. The effect of sanctions was somewhat greater than the effect of awareness-of-consequences information. In two dilemmas that appeared to pose significant threats to the safety of the actors if rules were obeyed, none of the experimental factors affected rule-obedience intentions.

**KEYWORDS:** *Prosocial behavior theory, protection motivation theory, social responsibility, indirect management.*

### Introduction

Damage to natural and cultural resources due to visitors' violation of protective rules is a major problem facing outdoor recreation management agencies. Such damage can have adverse psychological effects on visitors, as well as major impacts on organizational budgets (Heywood, Mullins, & Blower, 1984). One estimate of the cost of repairing and preventing resource and facility damage in outdoor recreation areas placed the total at over \$500 million a year (Christensen, 1984).

Various strategies have been developed to protect recreational resources from harmful behavior by visitors. These can be divided into two general

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approaches: direct management and indirect management (Lucas, 1982). Under a direct-management approach, visitor behavior is regulated overtly through strict enforcement of regulations and by threatening sanctions for rule violations (Namba & Dustin, 1992). Indirect management focuses on the use of information and education to promote voluntary conformance to protective rules (Gramann, Christensen, & Vander Stoep, 1992). The purpose of this study is to examine the effectiveness of direct and indirect management strategies in promoting rule obedience in outdoor recreation contexts, and, further, to determine if a personality trait known as "social responsibility" mediates people's intentions to respond to direct and indirect approaches.

### Theoretical Background

#### *Indirect Management and Prosocial Behavior*

Several studies have evaluated the effectiveness of indirect management in reducing rule violations and damaging behavior in outdoor recreation settings. In a review of this research, Gramann and Vander Stoep (1987) argued that the results of these studies could be explained by prosocial behavior theory. Prosocial behavior is voluntary helping behavior carried out to benefit others without the incentive of material rewards for helping or the threat of probable punishment for not helping (Bar-Tal, 1982). Prosocial behavior often entails a sacrifice by the helper that may range from minor inconveniences to significant social, economic, and physical costs. Schwartz (1977) hypothesized that helping behavior is more likely to occur when potential helpers are made aware of the consequences of their helping (or not helping) for others, and when they feel personally responsible to help in specific situations. Schwartz referred to the first of these factors as "awareness of consequences," and to the second as "ascription of responsibility."

In recreation settings, visitors routinely conform to regulations that are designed to protect people, facilities, and natural or cultural resources. However, at times visitors may feel that a compelling reason exists to disobey a protective regulation. For example, prohibitions against dumping "gray water" from recreational vehicles may be ignored if sanitary dump stations are full or are not provided. Gramann and Vander Stoep (1987) argued that when protective rules are obeyed voluntarily, despite a temptation to disobey them, a prosocial act has occurred. This is because obedience exacts a perceived cost to the conformer without the benefit of material compensation for obeying, and because in outdoor recreation settings the probability of being detected and punished for disregarding regulations is often very small (Christensen, Istvan, & Sharpe, 1992).

Psychologists often distinguish between different types of prosocial actions (McGuire, 1994). Grace, Bell, & Sugar (1988) defined "spontaneous helping" as a decision to help strangers in surprise and/or emergency situations, while "asked-for" (or casual) helping entails a verbal or nonverbal request for help in a non-emergency situation. The second of these appears

to correspond most closely to the types of actions that occur when people voluntarily obey protective regulations in recreation areas, even when there may be reasons to disobey.

Prosocial behavior theory suggests that one key to promoting rule conformity in recreation areas is to use information and education to increase visitors' awareness of the negative consequences for resources of disobeying protective rules (Vander Stoep & Gramann, 1987). This approach should be especially effective if rules are being disregarded out of ignorance of the impact of violations on resources, rather than as a result of malicious or vindictive intent (Namba & Dustin, 1992), and if people perceive that conforming will not jeopardize their personal safety (Smitherman, 1992). Indeed, field experiments in outdoor recreation areas have shown repeatedly that educating both youthful and adult visitors about the reasons for a particular rule can reduce violations significantly compared to the level observed in control groups (Oliver, Roggenbuck, & Watson, 1985; Roggenbuck & Berrier, 1982; Vander Stoep & Gramann, 1987).

#### *Direct Management and Protection Motivation*

Field research in outdoor recreation settings also supports the efficacy of direct approaches in the form of sanctions in deterring rule violations (Johnson & Swearingen, 1992; Martin, 1992; Samdahl & Christensen, 1985). Although the theoretical basis for this research has not been discussed extensively, it appears to have its underpinning in various versions of persuasion theory, particularly protection motivation theory (Rogers, 1985). As its name implies, protection motivation theory assumes that people are motivated to defend themselves against physical, psychological, or social harm. The original version of the theory explained persuasion as a function of anxiety-producing messages called "fear appeals." These messages are designed to deter particular behaviors by informing people of the personal harm that engaging in such actions will produce. Examples of fear appeals include the Surgeon General's warning on cigarette packages and messages describing sanctions for littering and other forms of law-breaking. Fear appeals differ from awareness-of-consequences messages in that the former focus on harm *to the actor*, while the latter describe harm *to others or to the environment* arising from specific behaviors.

Protection motivation theory hypothesizes that the effectiveness of fear appeals in activating protection motivation is contingent upon three characteristics of a message: 1) the noxiousness or severity of the threatened harm, 2) the probability of the harm's occurrence, and 3) the efficacy of recommended coping responses. The more severe the danger, the more likely its occurrence, and the greater the perceived effectiveness of recommended actions to avoid harm, the stronger should be the motivation to engage in a coping response. In a revision of this theory, Maddux and Rogers (1983) added a fourth antecedent of successful persuasion: self-efficacy, or people's belief that they are capable of performing the recommended coping behavior.

Protection motivation theory has been applied primarily in health-related and marketing contexts (Robberson & Rogers, 1988; Tanner, Jr., Hunt, & Eppright, 1991). Research in these arenas has supported the importance of each of the four factors in producing positive attitudes and intentions to engage in recommended behaviors. In a recreation context, fear appeals, either in the form of threatened fines for rule-breaking (Johnson & Swearingen, 1992; Martin, 1992), or as warnings about health-related dangers (Schwarzkopf, 1984), has significantly increased rule-compliance by visitors. An experiment designed to reduce wildlife feeding in a national park (Schwarzkopf, 1984) is of special interest because it is the only one to directly compare the effectiveness of awareness-of-consequences messages and fear appeals in reducing rule violations in a recreation setting. In this study, a sign describing the danger of contracting bubonic plague from squirrel bites was more effective in reducing squirrel-feeding by visitors than a sign that described the harm to squirrels from a diet of visitor handouts.

### *Social Responsibility*

Despite successes, experimental research in recreation settings has left important theoretical questions unanswered. Among these is the role played by trait variables in affecting responses to educational messages and fear appeals. The distinction between the two forms of helping behavior described earlier becomes especially relevant in this regard, since previous research shows that they tend to have different determinants. Situational factors, such as the number of potential helpers present, often predicts spontaneous helping actions better than individual traits (Grace et al., 1988). On the other hand, individual characteristics appear to play a more important role in asked-for helping (Eisenberg, 1991; Grace et al., 1988; Knight, Johnson, Carlo, & Eisenberg, 1994). These personal traits include such characteristics as dominance, affective reasoning, perspective-taking, sympathy, and the trait that is the focus of this research: social responsibility.

Gough, McCloskey, & Meehl (1952) conceptualized social responsibility as a dispositional trait which reflects an individual's dependability, sense of obligation to the group, and willingness to accept the consequences of his or her own behavior. Subsequent research has demonstrated that socially responsible persons have an enhanced sense of commitment to the collective good, a strong tendency to delay personal gratification, and a proclivity to help others, even when there is nothing material to be gained by doing so (Batson, Bolen, Cross, & Neuringer-Benefiel, 1986; Berkowitz & Lutterman, 1968; Willis & Goethals, 1973; Witt, 1990). Indeed, Rushton (1981) has gone so far as to argue that social responsibility is a basic element of a person's "helping personality."

It seems probable that people who are more socially responsible will be more receptive to educational messages promoting their awareness of the negative environmental effects of violating rules in outdoor recreation areas. Since social responsibility correlates positively with educational achievement (Willis & Goethals, 1973), and many visitors to parks and similar rural rec-

reation settings tend to be highly educated, this may explain the success of information and education in reducing depreciative behavior in these areas. On the other hand, persons who are less socially responsible may be less likely to respond to awareness-of-consequences approaches, since these persons tend to elevate personal comfort and convenience above the welfare of others. Although we have not found research describing the relationship between social responsibility and responses to fear appeals, it seems reasonable to argue that the threat of a sanction for violating rules may be more effective than awareness-of-consequences messages in bringing about rule conformity in low social-responsibility visitors. This is because such visitors should be primarily concerned about their own welfare, and thus should be strongly motivated to avoid threats to their own well-being.

### Hypotheses

This experiment tested the following five hypotheses, which are based on the above review of research:

- H<sub>1</sub>: Intentions to obey protective rules will be stronger among high social-responsibility subjects than among low social-responsibility subjects (simple main effect of social responsibility on obedience intentions).
- H<sub>2</sub>: Subjects who receive awareness-of-consequences information about the negative impact of rule violations on the environment will exhibit stronger intentions to obey protective rules than those who do not receive this information (simple main effect of awareness of consequences on obedience intentions).
- H<sub>3</sub>: Subjects who receive probable-sanction information describing fines for violating protective rules will exhibit stronger intentions to obey rules than those who do not receive this information (simple main effect of fear appeals on obedience intentions).
- H<sub>4</sub>: Subjects who are high in social responsibility will be more likely to intend to obey protective rules after receiving awareness-of-consequences information than subjects who are low in social responsibility (interaction of social responsibility with awareness of consequences).
- H<sub>5</sub>: Subjects who are low in social responsibility will be more likely to intend to obey protective rules after receiving information on probable sanctions for violations than subjects who are high in social responsibility (interaction of social responsibility and fear appeals).

### Methods

#### *Measuring Social Responsibility and Rule-Obedience Intentions*

Although field conditions provide excellent opportunities for observing managerially relevant behavior, it is cumbersome to measure personality traits in these settings. Experimental research analyzing the theoretical role of personality in rule conformity is more easily conducted in the controlled environment of a laboratory.

Subjects in this laboratory experiment were students enrolled in undergraduate history and political science courses at Texas A&M University. In

June, 1992, 514 students completed a condensed version of Perloe's (1967) Social Values Questionnaire designed to measure their level of social responsibility. The questionnaire was self-administered and was completed during normal class hours. Subjects who scored above the median on the questionnaire were placed in a "high" social-responsibility group, while those scoring below the median were placed in a "low" social-responsibility group.

Of the original 514 subjects, 203 (39.5%) indicated that they would be willing to complete a second questionnaire at a later date. This second instrument was described as a "relatively short and interesting scenario questionnaire about outdoor recreation experiences." Students were told that they would receive \$5.00 for completing the second part of the study. The second questionnaire was developed originally by Kim (1990) and revised for the current study. Because it asks subjects to project themselves into scenarios that involve dilemmas related to either observing or violating a regulation in a recreation setting, it was labeled the "Social Dilemma Questionnaire" (SDQ).

The SDQ consists of six scenarios that describe dilemmas that might be faced by visitors in outdoor recreation areas. In each dilemma there is a compelling reason to disobey a regulation. The scenarios are: 1) a dilemma concerning camping at an unauthorized area in a wilderness; 2) a dilemma involving too many vehicles parked at a campsite during a family reunion; 3) a dilemma concerning the use of glass beverage containers at a beach; 4) a dilemma about building an illegal campfire during dry weather conditions; 5) a dilemma concerning a prohibition against wood fires in a backcountry area; and 6) a dilemma about not taking trail shortcuts during a thunderstorm.

Subjects were asked to project themselves into the specific situation described in each scenario and decide the likelihood that they would violate or not violate the rule in question. For each dilemma, subjects completed two six-point bipolar response scales ( $-3$  to  $+3$ ) measuring their behavioral intention. The first scale assessed the likelihood that the subject would break the rule, while the second measured the likelihood that the rule would be obeyed. Correlations between these two intention measures ranged from  $-0.64$  to  $-0.80$ , indicating, as expected, that persons who recorded a high probability of intending to disobey a rule in the first question indicated a low probability of conforming to the rule in the second response.

Subjects were also asked to indicate the number of times they had been camping or backpacking within the last two years. Responses were recorded in the following categories: none, one-to-two, three-to-four, five-to-six, and seven or more times.

Although measures of behavioral intentions, such as those employed in this study, cannot substitute for observations of actual behavior, intentions to perform various types of recreation-related activity have been shown to be significant predictors of overt behavior in previous research (Ajzen & Driver, 1992; Young & Kent, 1985). This is especially true when the intended actions are under the volitional control of the actor (Ajzen, 1991), as would seem to be the case in the scenarios employed in this study. In addition, as de-

scribed previously, several experiments conducted in naturalistic settings have shown that awareness-of-consequences messages and fear appeals have had significant impacts upon overt behavior. For these reasons, this laboratory experiment should provide useful insights into the psychological dynamics of rule-obedience in actual field situations.

### *Experimental Procedures*

Initial selection of the 120 participants from the pool of 203 volunteers was subject to two conditions. In order to obtain maximally different groups on social responsibility, students who scored at or near the median on the Social Values Questionnaire were not included among the pool of potential subjects. In addition, those who scored at the extremes of the scale were also excluded from consideration because of concern that their scores may have been an artifact of response set. From the remaining pool, 120 subjects were assigned randomly to one of four experimental conditions, such that each cell contained equal numbers of high and low social-responsibility subjects, as well as equal numbers of males and females. The experimental conditions were: 1) communication of an awareness-of-consequences (AC) message describing the reason for a rule, *plus* communication of a probable sanction for violating this rule; 2) communication of a probable sanction only; 3) communication of an AC message only; and 4) the absence of both probable-sanction and AC messages (control condition). In accordance with protection motivation theory, particular care was taken to make the sanctions seem both very likely and serious (\$100 fine). An example of a scenario representing the AC+Sanction treatment is shown in Figure 1. The full experimental design is illustrated in Figure 2.

Subjects were telephoned to arrange a convenient time to complete the SDQ in the laboratory. Depending upon which cell they were assigned to, subjects received one of the four versions of the SDQ. After completing the SDQ, subjects filled out a "rationale questionnaire" in which they explained the reasons for their decisions in each dilemma.

To check the internal validity of the experimental treatments, manipulation checks were performed after the SDQ and the rationale form were completed. For each of the six dilemmas, subjects replied to a set of three questions asking how aware they were of the reason for the regulation in the dilemma, and how aware they were of patrolling rangers and potential fines (described in treatments that included a probable-sanction message). If the treatments worked correctly, subjects in the AC and the AC + Sanction cells should have been more aware of the reasons for regulations than those in either the Sanction or Control groups, since these reasons were communicated only in the AC message. Similarly, subjects who received a probable-sanction message (Sanction or AC + Sanction cells) should have been more aware of patrolling rangers and fines than those who did not receive this message (i.e., the AC-only and Control groups).

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Put yourself in the following situation:

It is 6:30 p.m. You and a friend have been backpacking since 10:00 that morning on a wilderness trail in the Guadalupe Mountains of west Texas. When you reach your intended campsite (a flat area about one acre in size), it is approximately 30 minutes to sunset and the temperature has fallen from 70 degrees to 55 degrees in the last hour. The camping area is unoccupied, but a sign at the site reads, "This area closed to overnight camping. *Peregrine Falcon nesting in progress. Human activity can cause this endangered species to abandon nests.*" You and your friend know that the next authorized campsite is 2 miles farther along the trail. With your backpacks and the steepness of the trail, it will take an additional hour to reach the next site, by which time it will be dark and the temperature will have fallen even more. During previous hikes in the area, **YOU HAVE OFTEN SEEN RANGERS PATROLLING THE BACKCOUNTRY CAMPSITES, SO YOU KNOW THAT IT IS VERY LIKELY THAT YOU WILL BE CAUGHT AND FINED \$100 IF YOU CAMP IN THIS AREA.**

Suppose your friend suggests that you camp at the site where you are. How likely is it that you would agree to do this?

- |    |                    |                               |
|----|--------------------|-------------------------------|
| -3 | Extremely Unlikely | (Definitely would not do it.) |
| -2 | Very Unlikely      | (Probably would not do it.)   |
| -1 | Somewhat Unlikely  | (Might not do it.)            |
| +1 | Somewhat Likely    | (Might do it.)                |
| +2 | Very Likely        | (Probably would do it.)       |
| +3 | Extremely Likely   | (Definitely would do it.)     |

Suppose your friend suggests that you hike 2 miles to the next authorized site. How likely is it that you would agree to do this?

- |    |                    |                               |
|----|--------------------|-------------------------------|
| -3 | Extremely Unlikely | (Definitely would not do it.) |
| -2 | Very Unlikely      | (Probably would not do it.)   |
| -1 | Somewhat Unlikely  | (Might not do it.)            |
| +1 | Somewhat Likely    | (Might do it.)                |
| +2 | Very Likely        | (Probably would do it.)       |
| +3 | Extremely Likely   | (Definitely would do it.)     |

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NOTE: The italicized sentence was deleted from the two treatments that did not include an awareness-of-consequences message. (Italics were not used in questionnaires given to subjects.)

NOTE: The phrase in capital letters was changed in the two treatments that did not include a probable-sanction message to read, "... you have not seen any rangers patrolling the river, so you know that it is very unlikely that you will be caught and fined ..." (This phrase was not capitalized in questionnaires given to subjects.)

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*Figure 1.* One of Six Scenarios Included in the AC + Sanction Version of the Social Dilemma Questionnaire



|                   |     | AC Information        |      |                       |      |      |
|-------------------|-----|-----------------------|------|-----------------------|------|------|
|                   |     | YES                   |      | NO                    |      |      |
|                   |     | Social Responsibility |      | Social Responsibility |      |      |
| Probable Sanction |     | High                  | Low  | High                  | Low  |      |
|                   | YES |                       | 1.51 | 1.10                  | 0.87 | 1.45 |
| NO                |     | 1.35                  | 0.70 | 0.67                  | 0.40 | 0.78 |
|                   |     | 1.16                  |      | 0.85                  |      | 1.01 |

NOTE: The higher the score the more likely the intention to obey rules

Figure 2. LEISURE (NRPA) 7508 02 0207 Fold Experimental Design Showing Group Scores on Intention to Obey Rules ( $N = 120$ , Cell Size = 15).

## Results

### Preliminary Analyses

A check was made for significant differences in social-responsibility scores between the 120 subjects who participated in the study and the 394 persons who completed the Social Values Questionnaire, but did not take part in the experiment. No significant difference was found between participants and nonparticipants ( $F = 0.02$ ,  $df = 1/489$ ,  $p = 0.89$ ). There was also no significant difference in social-responsibility scores by gender or by academic classification (freshman, sophomore, junior, senior). However, subjects who filled out the Social Dilemma Questionnaire did report a somewhat greater amount of recent camping and backpacking experience than did students who did not complete the SDQ.

The means for each of the treatment groups on the manipulation-check items were consistent with expectations. Subjects who received an AC message scored significantly higher in their awareness of the reasons for a rule than did subjects who did not receive an AC message. Furthermore, those receiving a probable-sanction message scored significantly higher in their awareness of sanctions than did subjects who did not receive this message. Finally, subjects in the control group (who received neither the AC nor probable-sanction messages) scored significantly lower than other subjects in their awareness of reasons for a rule, and significantly lower in their awareness of sanctions and fines. Based on these results, it was concluded that the experimental treatments were internally valid and were understood by study participants.

### *Data Reduction*

Hypotheses were initially evaluated for each dilemma separately, and secondly by combining responses into a single composite "obedience-intention" score. To compute this composite measure, principal-components factor analysis with orthogonal varimax rotation was conducted on the answers to the six dilemmas. Four of the dilemmas loaded on a single factor. The scenarios included in this factor involved camping at an unauthorized area in a wilderness, parking too many vehicles at a campsite during a family reunion, using glass beverage containers at a beach, and building illegal campfires in dry weather conditions. The remaining two dilemmas loaded heavily on a second factor.

Responses to the four dilemmas in the first set were summed to yield a composite behavioral-intention score describing the subjects' self-reported likelihood of obeying the regulations described in that set. The reliability of this summated scale, as measured by a standardized Cronbach's alpha, was 0.73. When averaged to preserve the original metric, the composite score ranged from +2.90 (extremely likely to obey the rules) to -2.50 (extremely unlikely to obey the rules), with a mean of +1.01 and a standard deviation of 0.90. A composite scale constructed from responses to the two dilemmas that loaded on the second principal component achieved a standardized Cronbach's alpha of 0.69, and ranged from +3.00 to -3.00, with a mean of +0.06 and a standard deviation of 1.37.

### *Hypothesis Tests*

Hypotheses were evaluated at an alpha level of 0.05. Initially, hypotheses were tested on each of the six scenarios separately, using a series of three-way ANOVAs (Table 1). The first hypothesis, which concerned the effect of social responsibility on obedience intentions, was supported only for the fourth scenario. This dilemma dealt with a desire to build a campfire during dry weather conditions. High social-responsibility subjects were more likely than low-SR subjects to indicate that they would obey posted rules and not build a fire.

Support for the second hypothesis, which concerned the effect of AC messages on rule obedience, was found only in the case of the first dilemma. This scenario involved a choice between camping at a closed wilderness campsite near a peregrine falcon nesting area, or hiking two miles in approaching darkness to another site. Subjects receiving an AC message explaining the reasons for the closure were more likely to intend to hike to another site than those who did not receive this message.

The third hypothesis concerned the effectiveness of probable sanctions in deterring rule violations. This hypothesis was also supported in the case of the falcon dilemma, as well as in the case of Dilemma 2. This scenario concerned a choice between parking too many vehicles at a campsite during a family reunion (contributing to vegetation damage and soil erosion) or

**TABLE 1**  
*Summary of Three-way ANOVAs Showing Significance of Effects of Social Responsibility (SR), Awareness of Consequences (AC), and Probable Sanction on Intentions to Obey Rules in Each of the Six Dilemmas (N = 120)*

| Effects              | Dilemma Description                         |                                      |                                  |                                    |                                  |                                     |
|----------------------|---|--------------------------------------|----------------------------------|------------------------------------|----------------------------------|-------------------------------------|
|                      | Use Unauthorized Wilderness Campsite<br>(1) | Too Many Vehicles at Campsite<br>(2) | Glass Containers on Beach<br>(3) | Illegal Fire in Dry Weather<br>(4) | Wood Fires in Backcountry<br>(5) | Trail Shortcuts During Storm<br>(6) |
| SR                   | 0.60  | 0.90                                 | 0.24                             | 0.05                               | 0.61                             | 0.90                                |
| AC                   | <0.001                                      | 0.71                                 | 1.00                             | 0.59                               | 0.32                             | 0.75                                |
| Probable Sanction    | 0.04  | 0.02                                 | 0.11                             | 0.59                               | 0.12                             | 0.98                                |
| SR by AC             | 0.15  | 0.26                                 | 0.04                             | 0.89                               | 0.54                             | 0.64                                |
| SR by Sanction       | 0.25  | 0.58                                 | 0.11                             | 0.35                               | 0.38                             | 0.82                                |
| AC by Sanction       | 0.52  | 0.24                                 | 0.68                             | 0.59                               | 0.73                             | 0.33                                |
| SR by AC by Sanction | 0.44  | 0.76                                 | 0.26                             | 0.69                               | 0.19                             | 0.90                                |
| Model                | <0.001                                      | 0.25                                 | 0.10                             | 0.54                               | 0.46                             | 0.99                                |

moving to another site located some distance from the rest of the group. In both dilemmas, subjects who were aware of the probable sanctions for rule violations were more likely to say they would obey the rules described in the scenarios

Hypothesis 4, which involved the interaction of AC messages with social responsibility, was supported only in the case of the third dilemma. This scenario dealt with a choice between using glass beverage containers at a beach, despite a prohibition against them, or driving ten miles to a store to buy other beverages for a beach picnic. Subjects who were high in social responsibility indicated that they intended to obey the prohibition, but only when they received an explanation about the danger to wildlife and other users from broken glass. Otherwise, high SR-subjects intended to disobey the rule.

The fifth hypothesis was not supported in any of the six scenarios. In no case did a significant interaction between social responsibility and probable sanction occur. In other words, the effect of probable sanctions on obedience intentions was similar across both the high and low social-responsibility groups.

Table 1 also shows that none of the experimental factors affected obedience intentions in the fifth and sixth dilemmas. In the fifth scenario a decision had to be made between trying to use a small and inadequate camp stove to dry wet clothes in 40-degree cold during a backpacking trip, or to disobey a regulation by building a hotter and larger wood fire. The sixth dilemma involved a choice between taking shortcuts off a trail in order to reach shelter more quickly as a thunderstorm approached, or obeying a rule against hiking off trails and being caught by the full force of the storm.

The results of the initial hypothesis tests suggest that the effect of AC messages, probable sanctions, and social responsibility varies with the specific context being examined. While this seems like a reasonable conclusion, it is also possible that random measurement error affected responses to individual items. For example, measurement error could have occurred in this study if one or more of the six scenarios was seen by subjects as representing a more realistic dilemma because of recent news coverage of a similar situation. In general, a composite measure composed of several indicators of a single concept, such as rule obedience, is less affected by such confounding factors than are single indicators (Zeller & Carmine, 1980). Consequently, the hypothesis tests were repeated using the two composite scales of obedience-intention scores.

A three-way ANOVA employing the four-item index failed to find a significant effect of social responsibility on intentions to obey rules (Table 2 and Figure 2), even though SR had been a significant determinant in one of the individual dilemmas. However, in the case of the four-item index, subjects who were high in SR were only slightly more likely to intend to obey rules ( $m = 1.10$ ) than were those who were low in SR ( $m = 0.91$ ).

In contrast to the absence of an SR effect on the first composite score, a significant effect of AC information on composite intentions was found.

**TABLE 2**  
*Three-way ANOVA of Effects of Social Responsibility (SR), Awareness of Consequences (AC), and Probable Sanction on Intentions to Obey Rules in the Four-item Composite (N = 120)*

| Source of Variation  | df  | Mean Square | F    | Signif. | Eta  |
|----------------------|-----|-------------|------|---------|------|
| SR                   | 1   | 1.03        | 1.45 | 0.23    | 0.10 |
| AC                   | 1   | 3.05        | 4.28 | 0.04    | 0.18 |
| Probable Sanction    | 1   | 6.13        | 8.61 | 0.004   | 0.25 |
| SR by AC             | 1   | 3.55        | 4.98 | 0.03    | —    |
| SR by Sanction       | 1   | 2.24        | 3.14 | 0.08    | —    |
| AC by Sanction       | 1   | 0.90        | 1.26 | 0.26    | —    |
| SR by AC by Sanction | 1   | 0.69        | 0.98 | 0.33    | —    |
| Explained            | 7   | 2.51        | 3.53 | 0.002   | —    |
| Residual             | 112 | 0.71        | —    | —       | —    |
| Total                | 119 | 0.82        | —    | —       | —    |

Subjects who were exposed to the AC message reported stronger intentions to obey regulations ( $m = 1.16$ ) than those who did not receive this message ( $m = 0.85$ ).

The three-way ANOVA also revealed a significant effect of probable sanction on intentions. Those who were informed of a high probability of sanctions for rule violations were more likely to indicate that they would obey rules ( $m = 1.23$ ) than those who were unaware of sanctions ( $m = 0.78$ ).

A significant disordinal interaction between SR and AC also occurred. As illustrated in Figure 3, subjects who scored in the top half of the SR scale were significantly more likely to intend to obey rules after exposure to an AC message than those who scored in the lower half of the scale. Receipt of an AC message had no effect on the behavioral intentions of low-SR subjects.

As in the case of the individual dilemmas, the fifth hypothesis was not supported. No significant interaction occurred between SR and probable sanction. In other words, contrary to predictions, both high and low social-responsibility groups were affected equally by the sanction treatment.

The eta coefficient displayed in the right-hand column of Table 2 is a measure of the relative effect of each factor on the dependent variable. As can be seen, the greatest effect came from probable sanctions (0.25), followed AC (0.18), and SR (0.10).

A three-way ANOVA was also conducted using the second composite scale, formed from answers to the two remaining dilemmas. Neither social responsibility, awareness of consequences, nor awareness of a probable sanctions had significant effects on obedience intentions in this case. This outcome paralleled that from the analysis of the two dilemmas separately.

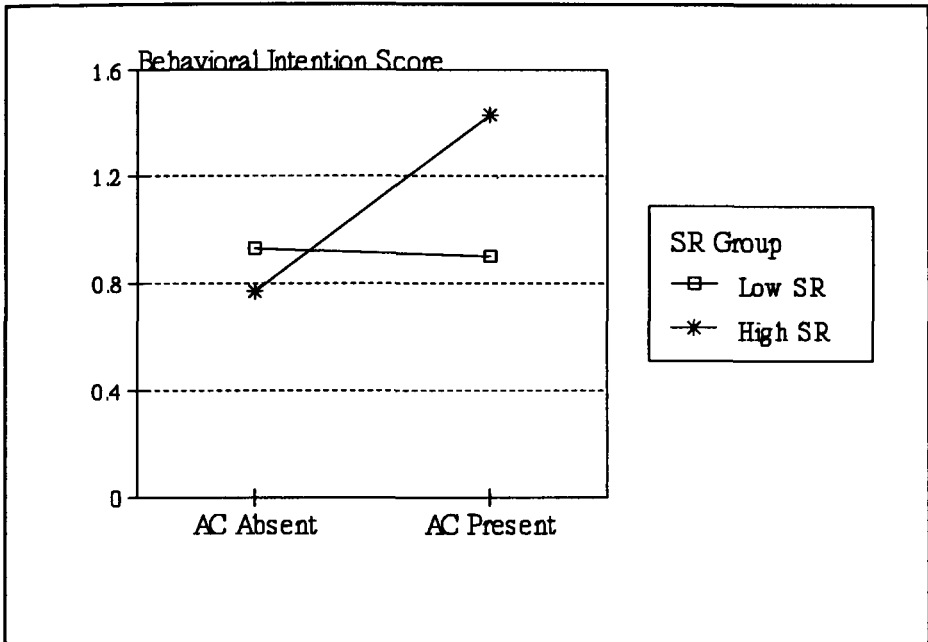


Figure 3. Disordinal Interaction Between Awareness of Consequences (AC) and Social Responsibility (SR)

#### *Effect of Camping/Backpacking Experience*

Because volunteers for the experiment had more recent backpacking and camping experience than persons who did not volunteer, it is possible that the experiment's subjects had more knowledge of consequences and sanctions typical of outdoor recreation settings than those who did not volunteer. This could bias the AC and probable-sanction treatments, limiting the generalizability of their effects to those persons with similar experience levels. The potential impact of this experience on obedience intentions was assessed using camping/backpacking experience as a covariate in an analysis of covariance. The covariate was insignificant, and its introduction into the model had only negligible effects on the other coefficients. Thus, the greater camping and backpacking experience of volunteers did not appear to bias the results of the experiment relative to AC and sanction effects.

#### Discussion

The objectives of this experiment were to: 1) offer a conceptual basis for visitor management in outdoor recreation settings based on prosocial behavior theory and protection motivation theory; 2) test whether or not

awareness-of-consequences information and probable sanctions increased intentions to obey rules in dilemma situations; and 3) examine how individual differences in level of social responsibility affected rule obedience in outdoor recreation areas.

The results of the hypothesis tests regarding AC messages are consistent with findings from field experiments on depreciative activity, where the dependent variable has been actual behavior or behavioral traces, such as litter (Vander Stoep & Gramann, 1987; Oliver, Roggenbuck, & Watson, 1985; Roggenbuck & Berrier, 1982; Schwarzkopf, 1984). When asked to project themselves into dilemmas where there was a temptation to violate a regulation, subjects were more willing to comply with regulations when they were told the reasons for the rule, as well as the negative consequences for resources or for others of not obeying them. This result supports the application of indirect management in outdoor recreation areas, including the use of interpretive programming to reduce depreciative actions and promote protective behavior by visitors.

However, this study also suggests that the effect of AC messages on obedience intentions cannot be generalized across all subgroups of potential visitors. In particular, subjects who scored low on the personality trait of social responsibility were generally unaffected by the communication of awareness-of-consequences information in this experiment. Only high-SR subjects responded positively to these messages. These latter individuals may have a deeper concern for the environment, or they may feel a stronger obligation to obey society's laws, even in cases where others feel they are justified in violating them.

The findings regarding probable sanctions supported the value of using this type of fear appeal as another means to control rule violations in outdoor recreation settings. Once again, this outcome is consistent with experimental research conducted in naturalistic settings. In the current study, sanctions were somewhat more effective in increasing intentions to obey rules than were AC messages. Moreover, the effect of sanctions on obedience intentions was similar for both high and low-SR subjects, indicating that probable and significant costs for disobedience may have a more general utility in curbing rule violations than AC messages. Nevertheless, the value of indirect approaches should not be discounted, since in many real-world situations it is frequently easier to implement indirect management strategies than it is to impose sanctions for rule violations that are truly probable. Awareness-of-consequences information may be especially useful in rural national parks and similar settings where visitors tend to be more highly educated than the population as a whole. In fact, it is interesting to note that the strongest intentions to obey rules in this experiment were achieved in the treatment that combined AC information with probable sanctions, while the weakest intentions occurred in the absence of both of these factors. Thus, these strategies should be viewed as complements to one another, rather than as competing managerial approaches.

The experimental factors had no effects on obedience intentions in the fifth and sixth scenarios, either when analyzed separately or in combination. In retrospect, these two scenarios appeared to pose a greater threat to the personal safety of the actors if rules were obeyed than was the case in the other dilemmas. Specifically, characters could have been threatened with hypothermia had they obeyed a regulation prohibiting wood fires, or they could have been struck by lightning had they obeyed a rule against taking shortcuts off a trail. Although these risks would have to have been inferred by the subjects (they were not stated explicitly in the dilemmas), the failure to find any influence of the study's experimental factors in these two cases raises the theoretically interesting possibility that AC messages and probable sanctions might be ineffective in certain "life-threatening" dilemmas. This would not be surprising in light of research that has shown that people are unlikely to help others if they fear that they will suffer significant personal costs as a result (Schwartz & Howard, 1981; Smitherman, 1992). It is also consistent with the proposition in protection motivation theory that people must feel they are capable of performing recommended actions if fear appeals are to be successful. In this case, the threat of personal harm may have undermined this feeling of self-efficacy.

The conjecture about the findings concerning the fifth and sixth scenarios was reinforced by responses to the rationale questionnaire in which subjects explained their answers to each dilemma. In the scenario involving the prohibition against wood fires, rationales relating to the health and safety of the actors were the most common reasons given for decisions, while in the dilemma involving the thunderstorm the danger of injury or death was the most common reason given for answers.

In summary, when evaluated in the light of previous field studies, the results of this experiment support the utility of awareness-of-consequences information and probable sanctions as deterrents to rule violations in outdoor recreation areas. Although the effectiveness of these strategies may vary from situation to situation, recreation managers have little choice, beyond outright closure of areas, to the two alternatives examined in this study. The results of this experiment also provide insight into the psychological dynamics of rule obedience in outdoor recreation. In particular, AC messages may work by activating existing dispositions in visitors to behave in a socially responsible manner. In contrast, the presence of this disposition may be less important in determining responses to probable sanctions.

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