# AN EVALUATION OF THE "AUTHORITY OF THE RESOURCE" INTERPRETIVE TECHNIQUE BY RANGERS IN EIGHT WILDERNESS/ BACKCOUNTRY AREAS

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**Abstract**

The Authority of the Resource Technique (ART) is a multi-pronged interpretive approach for dealing with undesirable visitor behavior in protected areas. Although ART has been used and supported anecdotally by agency personnel since 1991, this study provides the first systematic field evaluation of its use. During the 1998 field season, 25 USFS and NPS wilderness/backcountry rangers from seven areas were given training in the use of ART and asked to make structured journal entries each time they chose to use ART while addressing undesirable visitor behaviors. An elaboration of the theoretical grounding for ART was used to help frame the evaluation. Among the results were findings that rangers using only ART with no law enforcement recorded high levels of verbalized intention to comply, observed compliance, and rated ART contacts as very or moderately effective for more than 75% of those contacts. Contacts rated as "very effective" were likely to include more of the multiple intervention strategies made available by the ART approach. Recommendations are given that could improve the effectiveness of ART and its ability to influence visitor beliefs, attitudes, intentions, and behaviors.

**Keywords**

Interpretation, persuasion, education, law enforcement, undesirable or depreciative behavior, visitor management, behavior-change interventions, wilderness, protected areas, resource impacts, visitor experience.

## Introduction

It is generally accepted among U.S. protected area managers that visitor management in wilderness and backcountry areas

should, when possible, be indirect and unobtrusive (Hendee et al., 1990). This favors the use, whenever possible, of situation and site-specific information, interpretation and education, and selective contacts by rangers (Cole, 1996; Doucette & Cole, 1983; Washburn & Cole, 1983; Martin & Taylor, 1983). This approach embodies the "minimum tool" principle as it is applied to the human resource. It is seen as being in keeping with wilderness values and the wilderness or backcountry[1] experience that with a minimum amount of agency presence, regulation, and good pre-trip information, users should choose an appropriate and intrinsically motivated course of action. Given that most wilderness visitors are repeat visitors who are both well educated and well intentioned (Watson et al., 1996 and 1995, see also website sources for "wilderness users" at Besancon, 2000), and tend to seek out information (Graefe et al., 2001), it seems to follow that an educational approach can also be extended even to most routine law enforcement[2] situations where visitors have not chosen an appropriate course of action. After a review of the literature on managing depreciative behavior in outdoor settings, Manning (1999) gives guidelines for using information and education as part of the solution. Among the effective strategies given are: personal contact by rangers, role modeling by park rangers and volunteers, and providing information on the impacts, costs and consequences of problem behaviors. Although Manning notes that personal contact is highly supported by mangers, it must also be noted that a number of studies have looked at the use of personal contacts for reducing specific undesirable or depreciative behavior or vandalism (graffiti, littering, etc.) and produced mixed results (Roggenbuck, 1992). These studies, however, have not typically looked at the quality of personal contacts or the number of interventions utilized during a contact or probed the perceptions of rangers. Widner and Roggenbuck (2000) are among an increasing number of researchers who point out that due to the complexity of non-compliant behaviors, multi-pronged approaches employing a number of theoretically grounded behavior-influencing strategies are likely to be more successful at dealing with undesirable behavior.

Undesirable visitor[3] behavior in wildland settings typically results in some negative impact to resources like soil, vegetation, water quality, and wildlife, or negatively impacts the experience of other users (Hammit & Cole, 1998). For our purposes here, the more typical types of undesirable behavior can be categorized as: a) uninformed, b) unintentional, c) unskilled, or d) careless[4] (Hendee et al., 1990; Gramann & Vander Stoep, 1987). Additionally, Gramann and Vander Stoep (1987) have described three less typical or special categories of depreciative behavior: e) "responsibility-denial," f) "releasor-cue," and g) "status-conforming" behaviors where either moral obligation does not transfer to a particular circumstance, there is evidence of unmitigated prior impacts, there is inconsistent enforcement of regulations, or the desire to conform to (undesirable) group behavior is a priority—any of which can prompt visitors to compromise what they know to be appropriate behav-

[1] Henceforth referred to in most cases as "wildland" and meant to include designated wilderness, backcountry and other similar settings

[2] "Law enforcement contact is used here for contacts involving any undesirable behavior, recognizing that some will not be covered by laws or regulations. Leaving a flagging trail of bright plastic ribbon to mark a route, for example, is undesirable but may not be covered by regulations.

[3] We use the term "visitor" to also denote that of "user" since we wish to include others like researchers, grazing permitees, outfitters, local people and others who may not see themselves as typical recreational visitors.

[4] Hendee et al. (1990), also include an "unavoidable" behavior category (loss of vegetation at designated campsites etc.) which the authors feel is generally only dealt with by rangers if it performed at a level which is not acceptable and may actually be seen as "unskilled"or "uniformed" or "careless" behavior that can be improved on.

iors ("why should I do the right thing, nobody else seems to").

Most law enforcement or undesirable behavior contacts in wildland areas involve one or more of the non-criminal categories above. Ranger contacts that deal with these behaviors are typically personalized, verbally interactive, and take place in a naturalistic field setting. Such contacts are seen by the authors and others (Roggenbuck, 1992; Ham, 1992; Roggenbuck & Manfredo, 1990; Hendee et al., 1990) as potentially persuasive or "teachable moments"—especially for behaviors in categories a, b, and c above. That is, they are opportunities to expose the intent of a regulation and help visitors understand how their behavior is affecting a given resource (Dustin and McAvoy, 1985), provide them with new information and skills, enable them to transfer existing knowledge and good intentions to new situations, and modify beliefs, attitudes, and future behavioral intentions. As such, these contact opportunities are deserving of an approach that provides careful arguments, pays attention to information processing, and at the same time attends to peripheral factors like distraction and source credibility. This will be more effective if it builds on the existing knowledge and beliefs and interests of the visitors contacted. One multi-pronged and interpretive approach for dealing with undesirable behavior in wildland settings that departs from more traditional law enforcement techniques has been described by Wallace (1990) as the Authority of the Resource Technique (ART).

**A Brief Review of the Authority of the Resource Technique**

In 1987, while participating in several ranger[5] training activities, the lead author began keeping notes regarding the way contacts with visitors exhibiting undesirable behaviors were taught or made in the field. He observed that rangers,[6] especially commissioned rangers, frequently chose to use a traditional law enforcement approach to address most of the undesirable behaviors discussed above. They relied largely on the "authority of the agency" as manifested in the badge, uniform, body language, regulations, verbal or written warnings, and occasional citations. It seemed that they often missed natural opportunities to inform and educate or that the information given was less effective than it might have been. Other studies have supported these observations and suggested alternative approaches (Manning et al., 1996; Vander Stoep; 1995, Fish & Bury, 1981). Wallace also noted that a number of rangers combined law enforcement with educational or interpretive approaches naturally and effectively. This motivated him to develop a more comprehensive rendering of this approach which evolved to become the "Authority of the Resource Technique" (Wallace, 1990; Wallace, 1991). In part, ART can be seen as a technique used for the ongoing, on-site-specific, interactive, and personalized delivery of the type of information developed by Hampton and Cole (1995) and the National Outdoor Leadership School (1993) to educate users (off-site) about ethical behavior in wildland settings.

ART helps visitors to understand the "natural authority"[7] and requirements inherent in

[5] "Rangers" is a general term meant to include park and forest rangers, wilderness or forest guards, wildlife officers, or other protected area personnel or volunteers with similar responsibilities.

[6] By "commissioned" rangers, we mean those that have had law enforcement training that enables them to issue citations or make arrests.

[7] According to Webster, "authority" means "the power to influence or command thought, opinion or behavior." Wild nature can be said to have its own authority. Nature has her own rules, operates in certain ways, and has certain laws; there are consequences when we violate that authority. Wildlands are among the few places on earth where we have agreed, for the most part, to allow nature to operate on her own terms. Desirable behavior is more likely to occur if people understand how their actions affect the way nature operates.

objects and processes in nature as well as within the experiences sought by most people visiting wildland areas. It assumes that the reasons behind most regulations or appropriate behaviors can be revealed in ways that are interesting, enlightening, and persuasive. Although the ART concept is intuitive for some, the need to describe it systematically so that it could then be incorporated into training for field personnel (Olson et al. 1984) soon became apparent. In its current form, ART can be described as having four basic steps, and within those, a number of suggested practices and nuances that can be used during a visitor contact (Table 1). After a) an announced approach, introduction, and the initiation of ice-breaking conversation, the ranger b) gives the visitor an objective (non-judgmental) description of the undesirable behavior that was observed. Then, c) the ranger shifts the focus of the contact to the resource (physically and mentally) and uses the interpreter's art to reveal the implications of the behavior for the resource or the visitor experience. Ideally, soon after the contact is initiated, the shift of attention away from the ranger to the resource creates a type of interaction where both parties are "shoulder to shoulder" and engaged (physically and mentally) with some third phenomena in nature. If done well, the tension of a "face to face" encounter with agency authority is partially alleviated without giving up agency presence. In the final step, the ranger d) describes, and if the opportunity presents itself, models or demonstrates all or part of the desired behavior.

In the following example based on an actual 2001 contact, a ranger approaches a fisherman after passing by a restless saddle horse which has been tied to a tree for some time. The horse had gotten a foot over his halter rope and in reaction to this and having been left alone, had pawed the ground around the tree down to mineral soil.

RANGER: Good morning. I'm Denise Johnson, a wilderness ranger for the Elk Mountain District.

VISITOR: Morning. Ed Taylor.

RANGER: (After ice-breakers, in this case talk about fishing conditions and approaching rain clouds) I noticed a bay gelding in the trees about 200 yards north of here that was tangled up in his halter rope.

VISITOR: Oh-oh, that must be my horse Spud.

RANGER: (Turning towards the place the horse is tied) I freed him up and re-tied him, but maybe we should walk over there and check on him while we are talking.

VISITOR: Ok. We are just getting used to trail riding and being up here together. (They walk to the site, look the horse over to see if he has injured himself. Then the ranger reaches over and puts a hand on the tree examining the spot where the rope was first tied)

RANGER: This is a common problem here where we have a lot of people using horses or packstock. If horses are tied to a tree for very long without the rider or packer around they start to fight the rope, it cuts into the bark and eventually into the cambium layer here that transports water and nutrients. Most restless or tangled horses will paw the ground like this (reaches down to pick a handful of mineral soil), which disturbs the vegetation and exposes tree roots (touches top of a root). All of these things add up and can make a tree more vulnerable to disease or wind throw.

VISITOR: Well, I am sorry about this, the fishing was good and I was gone longer than I intended to be.

RANGER: I understand. I would like to mention some things that other stock users and the Forest Service are doing to help their horses and mules get used to the routines up here and minimize the impacts they can cause. We have developed a handout here that

summarizes part of it (reaches into daypack).

VISITOR: Sure, a person can always pick up some pointers.

RANGER: When I patrol on horseback, I tie off to a small highline with "tree saver straps" that won't cut the bark (opening the brochure). This diagram shows how to rig one up (diagram is discussed). If you do have to tie off to a tree, it is good to look for a resistant spot and tie high and short like I have done here with a quick release knot (moves to the knot and snugs it). Now he can't step over the rope or walk around the tree and you can loose him off quickly if there is a problem.

VISITOR: What would be a resistant place to tie up?

RANGER: In a spot like this, you could move a little further back into the trees (turning or walking towards an ideal spot) where there is mostly pine duff and not much vegetation to impact. Even there (here) the highline is still the best way to tie if you are going to be more than a few minutes. (Moving back to the horse) I also throw in some equine insect repellent for the nose and deer flies and a pair of hobbles. The repellent helps a horse to stand quiet (puts a hand on the horse's shoulder) and the hobbles will keep them from pawing the ground until they are accustomed to backcountry routines. If a horse is used to a picket stake and rope, the grasses at the dry edge of the meadow are quite resistant. Picketed stock are more content because they can graze some.

VISITOR: Well, I will have to get my two used to the hobbles and picket rope before we come up here again.

RANGER: You're onto something there. Conditioning them to these routines at home is key. (Stepping back from the horse) Well, I can tell you care about your horses and are on the right track to solving this problem. (Ranger moves some dirt back around the roots.)

VISITOR: I will cover those roots back before I go.

RANGER: That would be good. Now I better let you get those fish cleaned before it starts to rain. It was nice talking to you.

The ART steps themselves are straightforward, but the technique involves many subtleties that are grounded in theory. The practices available for use during a contact and described in Table 1 can be viewed as multiple interventions. With practice and field experience, ART can be used to respond to many different situations and user types. It requires that rangers continue to learn about and are able to articulate (sometimes translating technical terms as vernacular) an area's unique resource characteristics, natural processes, user characteristics, and institutionalized values. They must also be able to articulate how each of these can be negatively impacted. Careful listening to visitors provides cues about how to present information that is relevant to the visitors and builds on their existing knowledge and beliefs. An internalized respect for different user types and the ability to combine empathy with a non-threatening but confident bearing are among the subtle things that make ART work well. While some of these things come naturally for many agency personnel, others will require practice or conscious reconciliation with other law enforcement training. During ART training sessions, participants are asked to list the most frequently encountered types of undesirable behavior in their areas and then to develop, critique, and role-play responses for each of them. Participants may be assigned to play the roles of either visitors or agency representatives. These hypothetical contacts are then critiqued by the role players themselves and by peers and instructors both for their strengths and areas needing improvement. Improving message content, eliminating value judgements, becoming more aware of body

**Table 1. A Theoretical Grounding for the Authority of the Resource Technique (ART)**

| Basic ART Steps and Suggested practices | Supporting References |
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| **STEP 1**. Approach visitors in a non-threatening way that does not startle them. Introduce your self and initiate ice-breaking conversation - *"these kids look like they are having a good time".* | Classical Persuasion Theory, suggests that the alleviation of fear or emotional tension enhances persuasion (Hovland group, 1953; Laswell,1948). |
| **STEP 2.** Give an objective description of the undesirable behavior that was observed. Be non-judgmental. *"I noticed that your boys have built a small campfire out of driftwood""* – rather than, *"don't you folks know that it is illegal to gather firewood in the canyon."?* | Classical Persuasion Theory, suggests that a source that appears to be objective and unbiased source reduces suspicion and fear factors and is viewed more favorably (Hovland et al. 1953) |
| **STEP 3.** Shift the focus to the resource. A "shoulder to shoulder" interest in some third thing rather breaks the tension of a face to face encounter. with visitors. Reveal the implications of the undesirable behavior for the resource or the visitor experience. Use the interpreter's art. *"With the dams upstream, we no longer see a swollen river carrying ample driftwood to these sandbars in the Spring. The debris that does manage to arrive, like this log here, provides important habitat for a variety of creatures. Here for example, we have...".* Listen carefully to visitors. Use the cues they give you about their motivations, beliefs and current level of understanding about the issues to structure your description of the implications and make them relevant. Respond carefully to questions they may have as they consider your message. Questions are an indicator that the visitor is engaging the issue.<br><br>This step is the heart of ART where you focus carefully on the natural reasons behind the regulations, create a strong case for protecting the resource or the quality of the visitor experience while helping visitors engage the issue in ways that are relevant or meaningful to them. | Martin Buber (1970) discussed the psychology of reciprocal interaction created by an interesting phenomenon. The approach is supported by Post-Classical theories like the Elaboration Likelihood Model (ELM), (Petty et al., 1992; Petty and Cacioppo, 1986; 1984); Theory of Reasoned Action, (Fishbein & Ajzen, 1980), and The Theory of Planned Behavior, (Ajzen, 1985,1988). These researchers consider argument scrutiny and active deliberation ("elaboration") to be the "central route" to persuasion. Active cognition and testing of beliefs yields changes in attitude and behavioral intention that are more accessible, persistent, resistant & predictive of behavior. Attitudes should be primed and linked to a given situation (Fishbein & Manfredo, 1992). ELM stresses the importance of argument relevance, quality and integration with the recipient's existing cognitive structure and beliefs. It also recognizes that the central route requires the recipients to be motivated and able to process the information. They also point out that this is more likely in a naturalistic setting (Ajzen,1992). |
| **STEP 4**. Describe the desired behavior clearly and if needed, explain how to do it. *"and so we ask that anyone wishing to have an open fire on the river to carry a fire pan like this one I carry in my boat, and some processed fuel like charcoal briquettes along. These fuels burn completely and the ashes from such fuels can be easily carried out with other solid waste".* Model or demonstrate all or part of the desired behavior if the situation lends itself to that.<br><br>After describing the desired behavior, if the visitor appears to be giving only half-hearted consideration to your message, it may be best to refer to the regulation as well. *"That way, people can still enjoy a fire and be in compliance with the regulation that prohibits the collection or burning of wood in Red Canyon ".* | Persuasive messages must be linked to specific target behaviors (Vande Kamp et al., 1994; Eagly & Chaiken, 1993). Then, ELM, the Theory of Reasoned Action and the Theory of Planned Behavior all posit that even if people agree that x is a desirable behavior, they must see themselves as able to do x or control an outcome before they act (Petty & Cacioppo, 1984; Fishbein & Ajzen, 1980; Ajzen, 1985, 1986). Likewise, Social-Cognition Theory suggests that newly acquired attitudes and behavioral intentions may require new skills and self-perceptions (confidence etc.) to be activated (Bandura, 1982); Expectancy Valence Theory says that people will consider the probability desirability of a behavior's outcomes (Lawler, 1973); and Classical Persuasion Theory, points out the importance of stating conclusions for complex arguments (Hovland group, 1953). Moral Reasoning Theory, Kholberg, (1980) and others suggest that young people and some adults may be using pre-conventional stages of moral reasoning and need to be reminded of rules and consequences even as values are tested to promote moral development. |
| **Suggested Practice a:** Try to eliminate or reduce the distractions often caused by weather, noise, discomfort, the activities of other people etc. | Elaboration Likelihood Model, suggests that minimizing distraction enhances the ability to process information (Petty and Cacioppo, 1986) |

language, and incorporating a "hands-on" approach while interpreting the resource are frequently singled out as areas needing improvement. Training also includes how to make the shift back to traditional law enforcement practices if the person is not receptive and when not to use ART. It should be noted that ART is not appropriate for use with potentially dangerous or violent situations, or to address willfully illegal behaviors such as poaching, drug cultivation, arson or motorized entry into non-motorized areas.

Although the ART is currently used by many state, federal, and international protected area personnel, is included in a variety of published agency training materials, and has been featured several times in the popular press, its use in the field has not yet been systematically evaluated. There are reasons for believing that, for most undesirable behaviors, ART can

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| **Suggested Practice b:** Look for opportunities to refer to the values and norms shared by most wildland users when an undesirable behavior is impacting the experience of others. *"Many visitors tell us they come here to escape the sounds of the city and to listen to the sounds of nature"*, might be used with boy scouts whose radio is audible from across a lake. | Group membership (and group norms) are very important for some recipients, (Hovland group, 1953). Those with low levels of involvement in or active deliberation about an issue message may still search for a "correct" position as it is held by others, (Chaiken, 1980). Theory of Reasoned Action suggests that behavioral intentions are influenced by a subjective norm which is the perceived social pressure to perform certain behaviors (Fishbein & Ajzen, 1980). |
| **Suggested Practice c:** It often helps to engage the visitor or reveal some aspect of the resource if you approach, touch or handle things in nature. You might lift up a rock to look for aquatic insects while talking to someone who was washing dishes in a small stream; or pull an invasive weed while talking about changes in vegetative composition that occur at disturbed sites. | Touching objects that are being studied enhances information processing for some people and forms a bridge between cognitive and affective learning (Hawkins, 1969, 1965). |
| **Suggested Practice d:** Be conscious of being a desirable role model in appearance, manner, expertise and bearing. The uniform you wear can be a positive influence on the contact if you imbue the agency presence it provides with your own "persona", a sense of resource stewardship and a concern for the visitor. There are other unspoken qualities (self-confidence, fitness, competence etc.) which silently engender respect and contribute to the effectiveness of a contact. | Classical Persuasion Theory, "peripheral route," source factors, the credibility of source, perceived attractiveness, expertise and trustworthiness can persuade and are more important for those less engaged in or able to think about the issue per se (Ajzen, 1992; Hovland et al., 1953; Laswell, 1948). Normative Social Influence Theory suggests that a uniformed ranger primes visitors to utilize existing norms (Eagly & Chaiken, 1993; Cialdini, 1993) and to (silently) remind people of possible consequnces (Vande Kamp et al., 1994). |
| **Suggested Practice e:** Model desirable practices and behaviors with your own camp, equipment, stock, and actions at all times. Also carry the equipment, that can be used during step 4 to demonstrate how the visitor can address common impacts in a given area (for example, trowel, lighter, strainer, fire pan or cloth, leashes, hobbles, highline, repellent and other "Leave No Trace" items). | Expectancy Valence theory, posits that even if people agree that x is a desirable behavior, they must see themselves as able to do x before they act (Lawler, 1974). Social-Cognitive Theory, learning the skills necessary to activate behavioral change can be accomplished by observing others before the new behavior is practiced (Bandura, 1986; 1982) |
| **Suggested Practice f:** Use the less blaming "passive voice" when describing either undesirable or desired behaviors. *"Camps that are close to a stream tend to displace more wildlife than"* is better than, *" your camp is close to the stream and will displace more wildlife than... "*. | The Elaboration Likelihood Model (Petty and Cacioppo, 1986, Petty et al., 1991) It is important to create a favorable affective and cognitive response from those attending to a message. Blaming can detract from such a response; reducing blame even when blame may be deserved may make the ranger (source) seem more respectful, therefore, more likeable or attractive and effective as an agent of change (Chaiken, 1980). |
| **Suggested Practice g:** Routinely remove evidence of prior impacts or undesirable behavior in an area where ART is to be used. Deal equitably and consistently with all violations or undesirable behaviors. | Unattended evidence of impact or unequal enforcement may create "releasor-cues"(Gramann and Vander Stoep, 1987) or "responsibility-denial (Roggenbuck, 1992) both of which may keep people from doing what they normally consider to be the right thing. Cialdini (1996) calls this the discrepancy between injunctive and descriptive norms. |
| **Suggested Preparation:** In preparing to use ART, list the types of undesirable behaviors that are common for your area, prepare a message (step 3, implications and step 4, desired behavior) that you might use for each of these situations. Then role-play and critique these ART scenarios. | A good overview of the theoretical basis for role-playing and experiential and field-based approach to training is given by M. Manning and associates (1998). |

produce changes in the beliefs, attitudes, and behaviors of visitors that are longer lasting than those produced by traditional law enforcement practices. The theoretical grounding for these reasons can be found, in part, in the literature on persuasion, attitude, and behavior or cognition, and later used to help evaluate the effectiveness of ART in the field.

### A Theoretical Grounding for Evaluating the "Authority of the Resource"

Table 1 not only summarizes the basic ART steps and suggested practices but also provides references from the literature that is relevant to particular ART elements. These references and the concepts they offer can then be used to help develop a format for a field–based evaluation of ART. The Authority of the Resource technique relies heavily on what has been called the

"central route" to persuasion as described in the Post-Classical Persuasion, Attitude/Behavior, and Social-Cognitive Theories like the Elaboration Likelihood Model (Petty & Cacioppo, 1986); the Theory of Reasoned Action (Fishbein & Azjen, 1980) and the Theory of Planned Behavior (Ajzen, 1988) and others. The theoretical assumptions directly or indirectly shared by these schools of thought are: a) if changes in beliefs, attitudes, and behavioral intention occur as a result of using active thought processes, deliberation, and the testing of beliefs while scrutinizing a persuasive message, then such changes will be integrated into the person's cognitive structure. As such, they will be more accessible, resistant to change, and predictive of actual behavior than changes prompted by other forms of persuasion; b) even then, most people will weigh the implications of their actions before they decide to engage or not engage in a given behavior; and c) those with newly acquired beliefs, attitudes, and behavioral intentions must be able to see themselves as being in control or able to perform the behavior before they act. All of these assumptions fit well with ART since our goal as resource managers should be to move beyond temporary compliance and reduce undesirable behavior via lasting changes in beliefs, attitudes, and behavioral intentions that are acted on. Moreover, the likelihood of wildland visitors taking the central route or engaging a persuasive message in a thoughtful way is high given the naturalistic setting (Ajzen, 1992), the good intentions, and educational background of most wildland users (Watson et al., 1996) and a desire for more information than that which is sought by other user types (Graefe et al., 2001).

This is not to say that all people will carefully deliberate or "elaborate" on the arguments presented by an ART message. A few may not be motivated to do so and a few may not have enough prior knowledge (or be lacking in other abilities) to engage or process the message (Petty et al., 1992). For those with low levels of elaboration there is another route to persuasion described as the "peripheral route" that has less to do with the message strength or relevance and more to do with: the source of the message (does the ranger appear to be attractive, expert, credible, etc.); how the message is presented (using emotional or non-emotional appeals, etc.); or attention to the characteristics, state, and needs of the person receiving the message (some visitors may be persuaded by references to the norms of others if they have a strong need to conform or for group acceptance). These and other peripheral factors were described by Classical Persuasion theorists like those in the Hovland group (1953) as source, message, channel, and receiver factors. They can often be included in persuasive strategies as relatively simple cues that require only limited information processing and which can still modify behavior, though such changes may be shorter lived (Ajzen, 1992). Some of the source and receiver factors with consistent support in the literature correspond to established ART practices (rangers who are credible and likeable role models, or describing the norms reported by other users). ART elements that use the peripheral route should complement the otherwise central route focus of the technique, making it more robust and effective with a wider range of visitors and situations. ART also includes practices that attend to minimizing situational factors like distraction or biasing in order to allow the deliberating and reasoning process to prosper within an otherwise rich setting. Linking ART to the literature that supports it has helped the authors to develop part of the methods for measuring its effectiveness in the field.

**Methods Used**

The evaluation of the Authority of the Resource Technique: 1) utilized rangers themselves to chronicle the use of ART in the field; 2) documents how and when rangers choose to

utilize ART; and 3) attempts to assess its effectiveness, appropriate application, and needed refinements. The study utilized systematic participant observation (Babbie, 1995) by wildland rangers in a naturalistic setting. In the Spring of 1998, eight different wildland units in the Bridger-Teton, Tongass and White River National Forests, Great Sand Dunes National Monument, and Rocky Mountain National Park were contacted to see if they would participate in the study. These areas provide a diversity of situations found in the western US where ART might be used. Twenty-five rangers (profiles to follow) were recruited to participate in the study. They agreed to use a structured journal format for approximately 30 days during July and August to record their observations each time visitors exhibiting some type of undesirable behavior were contacted. Participating rangers were given an average of six hours of pre-season training in ART that included issue and message development, role-playing, training in the use of the structured journals, and the protocol for entries. Each, for example, practiced classifying visitor behaviors based on pre-established definitions (Hendee et al., 1990; Gramann & Vander Stoep, 1987). Each was given an instruction sheet to take with them that reinforced training activities and protocol. They were instructed to use ART when they thought it would be appropriate and to record the contact in their journal if ART was used[8]. To improve participation and journal content, it was agreed that the reporting of results would not refer to individual rangers or feature comparisons between the wilderness areas they worked in.

The journal sheets contained 24 items that asked about the details of each contact and several of these asked for comments or descriptions. A sheet was filled out after each contact where, in the rangers opinion, ART was used alone or in combination with traditional law enforcement to address an undesirable behavior. Thirteen of those items were informed by the literature review of persuasive communication. These items enabled rangers and researchers to evaluate: a) the degree to which the transactional elements known to contribute to a central route to persuasion were realized during the contact (visitor's ability to focus, distractions, message theme quality, what questions were asked, opportunities to model or demonstrate the behavior and message acceptance, etc.), as well as b) the ranger's perceived effectiveness of the contact (message acceptance, verbal intention to comply, observed compliance, overall effectiveness, anecdotal comments, etc.). Also recorded were contact numbers, the ranger's name, date, time, geographic location, distance from the trailhead, type of behavior encountered, visitor's mode of travel, visitor characteristics, and visitation patterns.

Structured journals were complemented by a preseason ranger profile that recorded age, education, experience, training, and previous exposure to ART as well as a follow-up survey after the 1999 season. An analysis of 1998 results prompted a 1999 follow-up with those who had returned to work as rangers and asked: a) to what extent they had continued to use ART, b) in what situations they chose to use traditional law enforcement instead of ART, c) which approach takes the most effort for them, and d) if they had any suggestions, in retrospect, for improving ART training.

Descriptive and bi-variate statistical analysis of results was done on fixed-format items, and thematic analysis (Boyatzis, 1998; Babbie, 1995; Stankey, 1972) was used to analyze qualitative data. Cross-tabulations were used to test relationships between a number of vari-

[8] Researchers reserved the right to make final judgements as to whether or not a contact employed an ART approach. Cases judged as non-ART were not included in the analysis of results related to the use of ART.

ables ("type of behavior" and "perceived contact effectiveness," etc.) as well as the relationship between a number of persuasion variables (ability to focus, acceptance of the message, modeling, etc.) and indicators of effectiveness (observed compliance, overall effectiveness of contact, etc.). The reporting of results is enhanced by the use of narrative excerpts from the journals. Follow-up survey comments are not reported separately but integrated into the discussion and recommendations where appropriate.

## Results

*Ranger Profiles*

Of the 25 rangers participating in the study, 17 were from the U.S. Forest Service and 8 were from the National Park Service. Most were male (21) and the average age was 28. Sixteen had been rangers previously, and the average wilderness or backcountry experience for all participants was four years. Twelve participants had been to either Forest Protection Officer training or a Law Enforcement Academy. One-third had previous training in ART. Most (16) had a four-year degree and 15 had completed studies in a natural resource field.

*Results from Structured Field Journals*

NUMBER AND LOCATION OF CONTACTS MADE. Participating rangers made 242 contacts where undesirable behavior by visitors was observed, ART used, and journal entries made. Of these contacts, 53% were made in camp, 37% on the trail and the rest in other locations. Most of these contacts (91%) occurred in remote wilderness or backcountry settings. Of the 242 contacts where ART was used, 42% came from the White River National Forest, 39% from the Bridger-Teton National Forest, 11% from the Great Sand Dunes National Monument, 7% from Rocky Mountain National Park, and only 1% from the Tongass National Forest where the ranger was assigned to a cruise ship in Glacier Bay and ultimately found few opportunities to use ART.

VISITOR CHARACTERISTICS. A total of 1008 visitors were involved in the 256 contacts. Seventeen percent traveled alone, 37% in groups of two and most (73%) were in groups of fewer than four. While 22% of the visitors were in groups ranging in size from 5-10 and 13 groups had more than 10, if tour boats are discounted, the average group size was 3.9. A majority of visitors contacted were male (68%) and ages were fairly evenly distributed across four age categories: less than 15 (21%), 16–20 (20%), 21–35 (27%), and 36–50 (29%) with the remaining 3% being over 50 years of age. Of those contacted, 39% were day users, 34% stayed from two to four days, 12% from five to seven days, 4% > seven days and 12% planned to stay overnight but had not yet decided or rangers did not determine how many nights. Most traveled by foot (83%), some by horse or with packstock (12%), 3% by watercraft, and 3% by other means when encountered outside of wilderness. As findings for most of these visitor characteristics are consistent with previous studies of wildland visitors (Hendee et al., 1990; Roggenbuck & Lucas, 1987; Cole et al. 1985), visitors contacted for exhibiting undesirable behavior do not appear to differ from other visitors for the characteristics reported above, though data on other variables like experience and education were not gathered.

[8] Fifteen other recorded contacts were later determined to be traditional law enforcement contacts where rangers, in the opinion of researchers, did not really use ART. These cases were not utilized during the analysis of ART contacts.

*Table 2. Approach chosen by rangers for contacting visitors who exhibited undesirable behavior*

| Contact Method | Number (N = 240) | Percent |
|---|---|---|
| ART used exclusively | 161 | 67 |
| ART and verbal warning | 36 | 15 |
| Verbal warning then some ART | 32 | 13 |
| Written warning then some ART | 5 | 2 |
| Citation then some ART | 2 | 1 |
| ART and then written warning | 1 | -- |
| ART and then citation | 3 | 1 |
| Total | 240 | 100 |

Swain, in his study of wilderness violators (1986) also found similar characteristics between violators and non-violators.

UNDESIRABLE BEHAVIORS ENCOUNTERED. Forty different kinds of undesirable behavior were reported. Most often encountered were "dog off leash/not controlling pets" (36%), "camps that were visible or too close to trails" (22%), and "camps that were too close to lakes or streams" (17%). Other behaviors that were noted were "collection of natural resources" (3.7%), horse or packstock violations (3.7%), and "burning fires where prohibited" or "having a fire that was too large" (3.3%). Group size violations, dispersed camping in sensitive areas, harassing or feeding wildlife, and poor solid and human waste management were all reported on multiple occasions.

APPROACH CHOSEN FOR VISITOR CONTACT. Rangers could choose to use ART exclusively or in combination with verbal or written warnings or citations. They were told in training to do what felt best to them given the situation and to record the sequence in which techniques were used. Table 2 shows that rangers chose to use ART exclusively 67% of the time. Another 15% used ART but felt it necessary to include a verbal warning. In some situations, rangers began with a verbal (13%) or a written warning (2%) or a citation (1%) and then moved to ART. Interestingly, three rangers began with ART and ended up giving a citation and one began with ART and ended with a written warning indicating a decided shift of emphasis for each. In the follow-up surveys, rangers were asked what most often prompted them to begin with or revert to traditional law enforcement techniques. Rangers reported three types of reasons: a) if they sensed people were belligerent or had a bad attitude {"…if I got phrases like 'I have done it this way for many years.'"}; b) if it was an undesirable behavior that occurred often {"Usually if ART was not used, it was because of reoccurring problems—for example, there are only so many times one can use ART to get a group to move their camp out from the shadow of a sign that says 'no camping here'."}; or c) if they were fatigued and felt that ART was too much work {"When I am too busy, I don't have time to think through an ART rationale."}.

*Table 3. Type and frequency of undesirable behavior encountered by wildland rangers during the study*

| Typical category | Number of cases | Percent of total |
|---|---|---|
| Uninformed | 68 | 24 |
| Careless | 60 | 21 |
| Unintentional | 34 | 12 |
| Unskilled | 30 | 11 |
| Combination | 23 | 8 |
| Willful violation | 3 | 1 |
| **Special case category** | | |
| Releasor-cue, regulations not enforced | 21 | 7 |
| Responsibility-denial | 18 | 6 |
| Status-conforming | 15 | 5 |
| Combinations | 11 | 4 |
| Total | 283 | 99 |

TYPOLOGICAL DISTRIBUTION OF BEHAVIORS ENCOUNTERED. Rangers classified the type of undesirable behavior or behaviors observed for each encounter and often commented on them. These are summarized in Table 3. There were 218 typical cases with: 68 uninformed {"They were unaware of the regulations or the visual impact they were causing."}; 60 careless {"It was raining when they got to camp and they camped right on the trail."}; 34 unintentional behaviors {"These were young boys who wanted to ride their bikes…and for whom wilderness was…an abstract concept…their first experience with it"}; 30 unskilled {"…they seemed very inexperienced, had brand new low-end gear but were receptive to the message about picking an appropriate campsite"}; 23 behavior combinations, and what turned out to be 3 willful violations {"He then said he knew he was in violation…but couldn't resist the view from that site."}, which were initially judged as another type of behavior and addressed with ART before shifting to law enforcement. Rangers also observed 65 special case behaviors including 21 visitors who used releasor-cues {"…other rangers have let us stay at this site in the past"}; 18 who used responsibility-denial {"They had the 'my dog is a good dog' attitude"...so felt they were exempt from the leash regulation."}; 15 who exhibited status-conforming behaviors and 11 combinations of these behaviors. Together, special case behaviors represent 23% of all observed undesirable behaviors—perhaps more than expected.

INDICATORS OF CONTACT QUALITY. As summarized previously in Table 1, within a contact that employs ART well, we would expect to find elements that facilitate effective engagement, information processing, elaboration, etc., which have a theoretical grounding. Table 4 displays six indicators that were tracked by rangers who recorded whether or not an indicator variable was enacted or observed during the contact. Results show that 65 separate distractions were noted and affected nearly a third of the contacts (31%). Common distractions were other people (39%), environmental factors like wind or ice calving from a glacier (14%), dogs (11%), and people being engaged in some task when contacted (10%). Several rangers indicated that they dealt with distractions before proceeding {"I pulled the group together for what ended up being a 20-minute talk."}.

***Table 4. Selected indicators of contact quality recorded by rangers using the Authority of the Resource Technique***

| Indicator | % Yes | % Partially | % No | (N) |
|---|---|---|---|---|
| Were there distractions? | 31 | NA | 69 | 236 |
| Was visitor able to focus? | 92 | NA | 8 | 225 |
| Did visitor understand the message? | 89 | 10 | 0 | 237 |
| Did visitor accept the message | 78 | 15 | 8 | 228 |
| Did visitor ask questions? | 44 | NA | 57 | 239 |
| Did ranger model correct behavior? | 37 | NA | 63 | 234 |

In spite of distractions, rangers reported that 92% of those contacted showed an ability to focus on the situation and message. Thematic analysis of comments related to focusing yielded three main categories: a) initial attitude – both good and bad influenced the ability to focus {"The visitor was defensive from the moment I approached… could tell by his body language."}; b) timing both good and bad made a difference {"I contacted the group while they cooked breakfast, they were very open…sitting around…seemed at ease…"}; and c) what can be described as ranger initiative, or a good lead-in to the ranger's ART message. It should be pointed out that, contrary to the norm of minimizing camp contacts in order to minimize obtrusiveness, in-camp contacts for dealing with undesirable behavior were generally described as being good timing by the rangers.

Rangers judged that visitors understood their message 89% of the time, partially understood it 10% of the time, and seemingly accepted that message 92% of the time. Somewhat troubling is the result showing that visitors only asked questions about a message 44% of the time. A thematic analysis was done on the 103 questions noted by rangers. It produced four categories of questions: a) questions seeking more information or to improve skills (45%) {"How high should food be hung…how do bears get habituated to human food?"}; b) argumentative questions (19%) {"How do you know for sure it was us?"}; c) questions about regulations (18%) {"Is the leash law in effect for all wilderness areas?"}; and d) a variety of other questions. Since questions are good indicators of a visitor's engagement with and active elaboration of a message, results suggest that the way messages are presented can be improved by inviting questions during or after the message. One would hope that questions, even of the argumentative sort, would accompany most ART contacts using the central route to persuasion.

Rangers reported that they were able to model or demonstrate the appropriate behavior 37% of the time, which is encouraging since not all behaviors lend themselves to modeling and it usually requires extra time to demonstrate proper equipment or techniques or to show visitors a better site for a given activity. In addition to possibly contributing to the attractiveness and credibility of the source, modeling enhances message quality by improv-

***Table 5. Researcher's rating of message quality for messages used by rangers to contact wildland visitors who exhibit some type of undesirable behavior***

| Rating | Number of cases | Percent of all cases |
|---|---|---|
| Appropriate/accurate themes | 164 | 69 |
| Somewhat appropriate or indirect themes | 42 | 18 |
| Weak or inappropriate themes | 14 | 6 |
| Used law enforcement or agency authority theme | 8 | 8 |
| Total | N=228 | 100 |

ing perceptions of self-efficacy or the visitor's ability to perform or to visualize themselves performing the desired behavior.

MESSAGE QUALITY. Researchers content-analyzed the journal entries where rangers described the themes they used in ART (step three) to reveal the authority of the resource. Themes were classified as containing messages that were either: a) "appropriate and accurate;" b) "generally or indirectly appropriate;" c) "weak" or marginally appropriate; or d) "closer to traditional law enforcement." Results summarized in Table 5 show that 69% of the rangers were judged to have used appropriate and accurate themes {"I showed her the fire ring, she showed me the where she had gotten the firewood. I was able to use that spot to explain how/why firewood is a limited resource here."} or {"…their location too close to the lake ...was an eyesore to others… other visitors had brought this group to my attention…explained why area is sensitive to impacts"}; that 18% had used somewhat appropriate themes, {"…talked about the need to break into smaller groups to disperse the impact… did not discuss the impacts"}; that 14% used a weak message, {"…explained the (unleashed) dog could run onto the road and get hit by a car"}; and 8% which, upon analysis and checking other variables, seemed to rely largely on the regulation itself with ART as an afterthought. Many journal entries for this question tended to be brief, listing the themes used but with only modest details about how they were presented.

PERCEIVED EFFECTIVENESS OF ART CONTACTS. Three items among the structured journal entries are more directly concerned with evaluating the overall effectiveness of ART contacts: 1) the visitor's verbal acknowledgement of intention to comply, 2) observed compliance behavior and, importantly, 3) the ranger's overall evaluation of contact's effectiveness. The first two entries were analyzed by the type of contact made. "Verbal intention to comply" was very high and differed only slightly among contacts where rangers used only ART (97%), ART with some law enforcement (98%), or law enforcement followed by ART

***Table 6. Ranger evaluations of effectiveness for encounters where ART was used to initiate an encounter with visitors exhibiting undesirable behavior***

| Type of Contact | Not effective % | Marginally Effective % | Moderately Effective % | Very Effective % | Total N |
|---|---|---|---|---|---|
| ART | 8 | 16 | 31 | 46 | 160 |
| ART with verbal warning | 6 | 33 | 50 | 11 | 36 |
| ART with written warning | | | 100 | | 1 |
| ART with citation | | 33 | 33 | 33 | 3 |
| Total N | 15 | 43 | 90 | 84 | 232 |

(97%). Observed compliance is highest with those using more law enforcement (ie. verbal or written warnings or citations) occurs 65% of the time with ART-only contacts, and 60% of the time for those combining ART with some law enforcement (usually a reference to the regulation).

These results may be explained by the fact that ART contacts are often brought to closure once intention to comply is achieved (Table 1). This imparts a positive expectation and is in keeping with the emphasis on the resource and maintaining an unobtrusive and non-intimidating agency presence. This also means that observed compliance is witnessed less often since moving an illegal camp or taking dishwater to camp instead of washing in a stream, for example, would require surveillance longer than is necessary or appropriate. Given these circumstances, observed compliance may be expected to be higher for the more traditional law-enforcement contact where the warning or possibility of a citation, and a ranger who waits to see that compliance has begun, brings with it a more immediate response from visitors

After each contact, rangers rated its effectiveness. Table 6 lumps all the contacts that were initiated using ART (that followed the four steps as prescribed) and reveals that 77% of those using only ART from start to finish (N=160), were rated as very effective or moderately effective. Looking at all contacts where rangers followed ART with verbal warnings, written warnings or citations (N= 40), such contacts were rated as being very or moderately effective 62% of the time. Contacts that did not begin with the ART steps but instead with verbal or written warnings or citations and ART as an afterthought (N= 32) are largely traditional law enforcement contacts and their effectiveness as a central route approach that focuses on a message and its elaboration is questionable. Even if short-term compliance is achieved, the question of long-term attitude or behavioral change would remain in doubt. This is not to say that taking a law enforcement approach is not warranted. In some cases it puts an effective end to undesirable behavior that needs to be halted quickly before damage or injury occurs.

***Table7. Ranger evaluations of the effectiveness of ART contacts for each type of Undesirable Behavior exhibited by wildland visitors***

| **Typical behaviors** | **Not Effective %** | **Marginally Effective %** | **Moderately Effective %** | **Very Effective %** | **Total (N)** |
|---|---|---|---|---|---|
| Uninformed | 6 | 10 | 39 | 46 | 52 |
| Careless | 7 | 24 | 31 | 38 | 29 |
| Unintentional | 0 | 5 | 24 | 71 | 21 |
| Unskilled | 0 | 21 | 33 | 46 | 24 |
| Combination | 0 | 0 | 41 | 59 | 17 |
| Total (N) | 5 | 18 | 49 | 72 | 144 |
| % of Total | (4%) | (13%) | (34%) | (50%) | (100%) |

$\chi 2$ =17.43, Significant at p=0.05

| **Special case behaviors** | | | | | |
|---|---|---|---|---|---|
| Releasor-cue | 0% | 42% | 25% | 33% | 12 |
| Responsibility-denial | 71 | 14 | 7 | 7 | 14 |
| Status-conforming | 0 | 17 | 33 | 50 | 6 |
| Combination | 0 | 0 | 50 | 50 | 2 |
| Total (N) | 10 | 8 | 7 | 9 | 34 |
| % of total | (29%) | (24%) | (21%) | (27%) | (100%) |

$\chi^2 = 23.58$, Significant at $p < 0.05$.

A more meaningful look at effectiveness can be found in Table 7, which describes effectiveness ratings for each type of undesirable behavior (both typical and special case behaviors) addressed with ART only. These contacts were rated as very or moderately effective with 100% of those visitors who exhibited some combination of undesirable behavior (often some combination of uninformed, unintentional, and unskilled behavior), 95% effective with unintentional behaviors, 85% with uniformed, 79% with unskilled, and 69% careless behaviors. These findings reinforce predictions by Hendee et al. (1990), and reviews by Roggenbuck (1992) regarding the use of education to deal with such behaviors. Contact effectiveness is not as high for "special case" behaviors with only 48% of the 34 cases evaluated as either very effective or moderately effective. Especially difficult to deal with were those visitors with responsibility-denial behaviors. ART contacts addressing releasor-cue and status-conforming behaviors showed somewhat different results than those predicted by Gramman & Vander Stoep (1987). Although the number of cases is very modest, ART was more effective with releaser-cue behaviors, less effective with responsibility-denial, and more effective with status-conforming behaviors than Gramman & Vander Stoep predicted a persuasion intervention would be.

ART VARIABLES ASSOCIATED WITH EFFECTIVENESS. The strength of association between seven variables thought to contribute to a well-managed or persuasive ART contact

***Table 8. The strength of association between seven persuasion variables and visitor "contact effectiveness" ratings made by rangers using the ART to address undesirable behavior in wildland settings.***

| Persuasive Element | | Not Effective % | Marginally Effective % | Moderately Effective % | Very Effective % | Total (N) | $\chi^2$ |
|---|---|---|---|---|---|---|---|
| Visitor was able to focus. | | | | | | | |
| | Yes | 5 | 16 | 39 | 41 | 202 | 32.1 |
| | No | 38 | 31 | 31 | | 16 | |
| Message quality[1]. | | 4 | 16 | 37 | 43 | 158 | 21.41 |
| Visitor understood the message. | Yes | 6 | 15 | 38 | 41 | 205 | |
| | No | | 100 | | - | 1 | 27.79 |
| | Partially | 13 | 39 | 48 | | 23 | |
| Visitor accepted the message. | Yes | | 8 | 44 | 48 | 172 | |
| | No | 72 | 22 | 6 | - | 18 | 221.72 |
| | Partially | 7 | 57 | 33 | 3 | 30 | |
| Visitor asked questions. | Yes | 5 | 10 | 41 | 44 | 102 | 11.27 |
| | No | 7 | 26 | 37 | 30 | 129 | |
| Ranger modeled the appropriate behavior. | Yes | 6 | 10 | 35 | 50 | 84 | 14.85 |
| | No | 7 | 24 | 42 | 27 | 142 | |

All $\chi^2$ were significant at $p < 0.05$.
1.was determined by researcher analysis of ranger's descriptions of the theme and presentation they used

and the effectiveness ratings assigned to contacts by rangers was tested using cross-tabulations with Chi-Square tests. Table 8 summarizes the results. All seven variables showed significant interrelationships with perceived effectiveness. The strongest association occurs between rangers who modeled the appropriate behavior and those contacts rated as very effective (rangers had modeled or demonstrated the appropriate behavior for visitors in 50% of the cases with contacts were rated as "very effective"). Other variables like the visitor's acceptance of the message and the asking of questions, an indicator that the visitor is elaborating (Petty & Cacioppo, 1986), were also associated with a ranger's perception of effectiveness. These results seem to suggest that attention to including multiple theory-based components known to enhance persuasion, attitude and behavior change, and the other theoretically grounded interventions inherent to ART (Table 1) can improve the perceived effectiveness of a contact.

## Discussion and Recommendations

The evaluation of ART does not rely on comparisons of its effectiveness with the results from other studies that evaluate law enforcement techniques or other specific interventions. Instead, it reports and analyzes the perceptions of rangers who use it in the field and establishes a baseline for future comparisons. It also provides data for predictions about the effec-

tiveness of a technique that merges education and interpretation while addressing different kinds of undesirable behaviors in wildland areas, and it identifies which behaviors ART works the best with. It provides information about how and when rangers themselves choose to use ART and evaluates to what extent they incorporate appropriate messages and other theory-based ART components in the process. Since they did in fact choose ART to deal with most problems and rated its use as effective for most of the behaviors encountered, confidence in the technique begins to move from anecdotal to empirical. At the same time, results identify a number of improvements that can be made in both the training for and use of ART. The order in which these will be discussed does not indicate their priority.

*When to Interject Agency Authority*

The Authority of the Resource Technique can be used alone or in conjunction with varying amounts of agency authority. Step four of the basic ART steps, the explanation of the desired behavior, can avoid any reference to the regulation, it can include a reference to the regulation, or it can be followed by a verbal or written warning or even a citation, though the ideal is to avoid doing so. Of the contacts that began with rangers using ART (82%), 15% ended up incorporating a verbal warning. Those contacts were rated as less effective than ART only contacts. One could conceive of several possible reasons for adding a verbal warning: a) the verbal warning might be compensating for a weak message, b) the ranger may sense that the message is not being accepted, or c) or because the visitor gives no verbal indication of compliance. Any of these things might also leave the ranger feeling that the encounter was less effective as well. When tested, the strength of association between ART/verbal warning contacts and each of these three variables was not significant.

If it is not cues from the visitor that causes the shift to traditional law enforcement, it might be a force of habit add-on or a product of the ranger's own frame of mind. Comments by rangers did point out that the tendency to favor law enforcement over interpretation was often triggered by violations that were aggravated or less suitable for ART (involving an injury for example), visitors who seemed to have a negative attitude, or when the ranger was irritated or fatigued. The latter two can be dealt with but it must be expected that there will always be a few visitors who are not ready to engage an ART message, who are belligerent, or who for other reasons require a traditional law enforcement approach. A rule of thumb that has been learned not only from this study but from previous field experiences is that it is more appropriate to begin with an educational approach and tighten up with warnings or citations if necessary than it is to begin with law enforcement and then try to move into an educational approach. Lastly, it is possible to reference regulations (not a warning) without detracting from an ART approach {"..and that is why we have developed the regulation that permits open fires with the use of firepans and fuel that you bring, but prohibits the gathering or burning of firewood in the canyon"}. As Table 1 points out, there are good reasons to include this type of peripheral route intervention for some visitors who are slow to accept a message or who seem to be using pre-conventional moral reasoning (Kholberg, 1971).

*Dealing with Fatigue or Irritation*

The reported tendency to stop using ART when fatigued or irritated by having to repeat messages for the same violations {"There are only so many times you feel like using an ART message for dogs off leash."} is understandable. At such times, rangers pointed out, it may take more effort to create an ART message and it is easier to fall back on the authority of

the agency[9]. Knowing this, pre-season or in-service training may be able to help rangers anticipate such situations and miss fewer opportunities for constructive intervention. Rangers encountered 40 types of undesirable behaviors in the seven areas, but six common types of violations accounted for 85% of the contacts made. It is possible to develop strong messages and practice presenting them well for an area's most common violations. If this is done, then the mental effort associated with generating the content for an ART contact can be greatly reduced for the fatigued ranger. Fatigue and irritation might also be addressed by cultivating a sense of professional responsibility, providing the theoretical grounding for the benefits of long-term vs. short-term compliance, and by giving rangers some new coping skills. It would be considered unprofessional, for example, for teachers, bus drivers or receptionists to allow their technical and social skills to decline as the day wears on. The dental hygienist cannot, by definition, bemoan yet another set of teeth to clean. Teaching or interpretation of any kind is sometimes like performing (Timpson & Toban, 1982), and the show must go on. During training, rangers and others may benefit from acquiring some of the skills of the actor who can not afford to let down and who calls on voice, gestures, and movement to energize the moment.

Persistent violations that irritate (dogs off leash, improper campsite locations, etc.) will not only require motivating personnel to "step up" again, but also arming them with the recent research or factual anecdotes that can help to strengthen a message. A message that includes new information about the insidious displacement effects that dogs running loose in wildland areas have on wildlife (Miller et al. 2000) or a detailed description of vegetative impacts, damaged equipment, injuries and user conflicts that were caused the month before when a pack string was spooked by a loose dog on their uphill side, may be enough to cause visitors to reconsider their existing beliefs about a leash regulation. Factual knowledge and site-specific examples of this sort can be chronicled, filed, updated, and made available to new agency personnel. Databases are now used to develop responses for most management issues but are still underutilized when it comes to crafting responses to undesirable visitor behavior.

*What Behaviors to Expect and Prepare For*

Only 18 out of the 298, or 6% of the undesirable behaviors observed were classified by rangers as willful violations. This includes the 15 strictly law enforcement (non-ART) contacts recorded by rangers but which were not included in most of the analysis, as well as the three that ended up being classified as willful even though rangers utilized an ART approach when initiating the contact. This would suggest that 94% of all undesirable behavior contacts would have at least some potential for using an ART approach. Noticeable, however, are the approximately 42% of all contacts that fell under either the "careless" or one of the special-case typologies, both of which proved to be somewhat less amenable to an educational approach. We may expect then, that in US western wilderness and wildland settings, only slightly more than half of all contacts will be uninformed, unintentional, unskilled, or a combination—the behavior types ART was rated as most effective with and which respond more readily to a purely central route approach. This does not mean we should abandon the use of educational/interpretive approaches with these behaviors; rather, it means that rangers need to be better prepared to deal with careless and special case behaviors given their apparent frequency of occurrence. Special-case behaviors should

[9] Some rangers, however, found that using ART was easier and less stressful than using law enforcement.

be included in the message preparation or role-playing activities for ART to a greater degree than they have been. Rangers should be able to recognize them and know that, while they are not usually malicious behaviors, both special-case and careless behaviors may require higher message quality, the priming and linking of visitor beliefs and attitudes to the specific situation, added references to the norms of other wilderness users, descriptions of agency efforts to mitigate noticeable impacts, explanations for changes in management actions or regulations, {"*Because of increased use and the proliferation of sites like this one where the soils tend to be wet, we have had to change the dispersed camping policy that you are referring to and concentrate campsite impacts at a few more resistant sites on that bench there above the lake where it is ….*"}, and references to existing regulations, depending on the specific behavior (Roggenbuck, 1992; Fishbein & Manfredo, 1992; Gramann & Vander Stoep, 1987).

*Improving Contact and Message Quality*

Given that distractions were present 31% of the time, it will often be necessary to take measures to counteract them. Gathering people together, moving out of the wind or away from the noise of running water are small measures that can improve interaction and message engagement and which should become a routine part of an effective contact. Rangers in the study seemed to deal with distractions well and reported that most wildland visitors were able to focus. This and the fact that they reported that nearly all visitors were capable of understanding the messages presented likely reflects the higher levels of education, increasing wilderness experience, and generally good intentions of wilderness visitors (Watson et al., 1995). Both findings bode well for the ability of visitors to engage or elaborate on the messages presented to them (Petty & Cacioppo, 1986).

Other important variables contributing to the effectiveness of ART's central route approach include message quality, the message's relevance to the visitor, and the visitor's ability to see themselves performing the desired behavior. Study results and the past experience of the authors during multiple training sessions indicate that improving message quality is one of the most important areas for increasing the effectiveness of ART. The analysis of message themes and comments, the finding that nearly 25% of all the contacts analyzed had themes that were either weak or only somewhat appropriate, that fact that the mean effectiveness of contacts was low in most cases where weak themes were used, and the fact that less than half of the visitors contacted asked questions during the message delivery, all bear this out.

Although it may be possible for an ART contact to be somewhat effective if other interventions are done well (ranger is a desirable role model, seems concerned about the resource, tactfully references the norms of other users and the regulation, etc.), a strong message that uses natural authority is still the heart of the ART approach. Since ART assumes that most visitors care about the resource and other users and will want to do the right thing once they understand what that is, message quality is dependent on carefully revealing to the visitor how a behavior is in fact affecting the resource or the visitor experience. The scope and scale of the revelations in a message can be quite varied. They could use an object of the visitor's interest to create a broad historical perspective {"*These are obsidian chips… from a scraper judging by their size and shape…the work of an ancient tool maker. Interestingly, this is one of a very few wilderness areas where people are allowed to experience Anasazi sites and artifacts in a natural setting that isn't highly regulated like parks or monuments. This rare privilege is only possible if people leave these things in place…for their grand-*

*children to rediscover*."}, be narrowly focused on the organisms living in and under a drift-wood log on a sandbar, or utilize a large landscape mosaic in order to talk about the habitat needs of wildlife.

Message quality can be greatly improved during pre- or in-service training where area personnel identify the undesirable behaviors that are most frequently encountered in their protected area, detail-specific resource impacts associated with those behaviors, and describe the desired behaviors that can counteract each problem. Specialists who are knowledgeable about the resource issues identified, be they water quality, wildlife impacts, noxious weed or visitor conflicts, can help provide the information needed to improve message strength. It is likely they will be able to point out things in the field that can be used to illustrate the effects of inappropriate behavior on the resource that seasonal rangers might not know about. During training, technical information should be simplified and incorporated into the interpretive themes used in ART messages. Once message content is developed, role playing can pay attention to other things that encourage the engagement and active deliberation on the part of the visitor. Study findings suggest that more pauses and interjections may be needed in order to induce comments and questions from visitors {"*Have you seen cryptogramatic soils before?, "Did I explain that in a way that was understandable?*", or "*Can I answer any questions?*"}. It is not until we know what visitors are thinking that we find the cues that enable us to make messages more relevant or build on what they already know.

Finally, we can help visitors to see themselves as able to perform the suggested behavior. The importance of modeling or demonstrating was born out by the results which showed the association between modeling and contact effectiveness ($\chi^2 = 14.853$, $p=.002$). Rangers who rated contacts as very effective were twice as likely to have modeled or demonstrated the desirable behavior for or with visitors. Not every situation lends itself to modeling the exact desired behavior. It may be enough to show someone an appropriate campsite location, or take out a piece of mesh to explain how visitors strain the food scraps from their dishwater so that they can be packed out, or to go over a diagram that shows how to make a high line. Other times it is possible to directly model the behavior, showing someone how to put on a set of hobbles, help them build a mound fire that leaves no charred rocks, or how and where to collect firewood that is the right size and burns cleanly. This requires that for each frequently observed undesirable behavior, rangers should carry with them the props, equipment, or information needed for modeling desired behaviors. Messages that are complex may also benefit from being reinforced by written materials (Roggenbuck, 1992). Addressing impacts during the fall hunting season (high impact camps, flagging, game poles, entrails, etc.), caused by an influx of users that may not be typical of regular season visitors, can be a challenge. Handing out a small plasticized card that summarizes appropriate behaviors may be a good way of summarizing and concluding an ART contact. It may also disseminate the message to other group members.

In summary, this study documented considerable information about how rangers choose to employ the ART interpretive approach to deal with undesirable behavior. It provides evidence that ART is an effective intervention that complements the anecdotal support that it has received over the years. It provides reasons to believe that, for some undesirable behaviors, ART's theory-based, multiple behavior-influencing strategies are effective in promoting changes in undesirable behavior that may be longer lasting than those provided by traditional law enforcement techniques. Emerging from the study are a number of specific recommendations for managers about how pre- and in-service training can improve on

the effectiveness of ART and related approaches and, for rangers on how to get the most out of the technique as they use it in the field. This first study can be considered to be exploratory to some degree. It establishes a baseline for future comparisons where these improvements are incorporated into the training of protected area personnel.

### Suggestions for Future Research

*Improving the Use of Structured Journals*

The use of structured journals proved to be a good method for involving practitioners in the evaluation of techniques used in the field. Using journals, however, requires consistency in the way the questions are interpreted and in the way entries are made. Some open-ended items require journal or narrative type entries, others may only require keywords or a single sentence. Participants must know when some items are more important and require more detailed comments in order to utilize thematic analysis effectively. We did not give sufficient emphasis to this, and the descriptions rangers wrote about the themes used for the ART message were often too brief and made the classification of message quality difficult at times. Field conditions tend to promote brief entries, and the importance of detail must be given added emphasis if good qualitative data is to be obtained in wildland settings.

*Subsequent Studies of ART and Related Interventions*

As mentioned, it would now be interesting to do a similar study where the suggested improvements that emerged from this first study are incorporated into the preparation of the next group of rangers who agree to carry journals. Those who participated in this first study, for example, were not exposed to the theoretical grounding for the various behavior-influencing strategies embedded in ART. Doing so may enable rangers to better understand the importance of including a range of strategies during a contact and which ones are the most important for particular kinds of behaviors. The preceding results and discussion have pointed out a number of ways to improve the training for and application of ART, which should be tested and compared with the first study.

Any follow-up study might consider using an experimental design that would allow for a more direct comparison with traditional law enforcement approaches. A control group made up of rangers from several protected areas that offer no formal exposure to ART training prior to the field season could be included. These rangers would simply handle contacts with undesirable behavior as they normally would. Their journals could be modified to exclude references to ART per se, but a relatively detailed description of the approach they employed and the sequence of events during the contact could be requested. A number of the same variables like types of behavior encountered, perceived acceptance, compliance, and effectiveness could be included. This might also provide an indication of the degree to which rangers naturally use educational approaches and what behavior-influencing strategies they employ. The design might include phone interviews with small subsets of visitors who were contacted by rangers using ART and non-ART approaches.

Subsequent studies should include a "wilderness experience" variable that would allow researchers to see if responsiveness to the ART approach varies among wilderness visitors with different wilderness use histories. Given that the sample for the current study was limited to rangers and visitors in western U.S. wilderness areas, one could ask about possible differences in the results that would come from wilderness areas in the east, the south, at the urban interface, or in international wildland protected areas. We might ask if wilderness

users with their typically high levels of education, income, and concern for nature are more responsive to an ART approach than other protected area visitors? Forest Service or Bureau of Land Management multiple use areas, National Park "frontcountry" or local government open space, for example, have higher visitation levels, may deal with a broader range of undesirable behaviors, and often have a diversity of visitors that may present greater challenges to the ART approach. Would personnel in those areas have a different reaction to using the technique? Can the volunteers that so many programs now count on for interacting with visitors be as effective using such a technique?

Each generation of protected area managers will have to deal with depreciative or undesirable behavior. The evolving body of knowledge about how to deal with such behaviors can make this less problematic – especially if managers themselves are involved in the research. Research that continues to probe what interventions or combinations thereof work best in specific situations can have a cumulative effect. The role of interpretation in this effort is clearer to those involved in this study.

**Literature Cited**

Ajzen, I. (1992). Persuasive communication theory in social psychology: a historical perspective. In M. Manfredo (Ed.), Influencing human behavior: theory and applications in recreation, tourism, and natural resource management. Champaign, IL: Sagamore Publishing.

Ajzen, I. (1988). *Attitudes, personality, and behavior.* Chicago: Dorsey Press.

Ajzen, I. & Madden, T.J. ( 1986). Prediction of goal-directed behavior: Attitudes, intention, and perceived behavioral control. *Journal of Experimental Social Psychology,* 22: 453-474.

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckman, (Eds.), *Action-control: From cognition to behavior.* Heidelberg: Springer: 11-39.

Babbie, E. (1995). *The practice of social research.* Belmont, CA: Wadsworth Publishing Company.

Bandura, A. (1986). *Social foundations of thought and action.* Englewood Cliffs, NJ: Prentice Hall

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist,* 37: 122-147.

Besancon, C. (2000). National Wilderness Preservation Website. URL http://www.wilderness.net/nwps.

Boyatzis, R. E. (1998). Transforming qualitative information: thematic analysis and code development. Thousand Oaks, CA: Sage Publications.

Brown, P. J., McCool, S. F., & Manfredo, M. J. (1987). Evolving concepts and tools for recreation user management in wilderness: a state-of-knowledge review. In Lucas, R.C., (Ed.), Proceedings--national wilderness research conference: current research; 1985 July; Fort Collins, CO. Gen. Tech. Rep. INT- 212. Ogden, UT: USDA Forest Service: 320-3.

Buber, M. (1970). I and thou. New York: Charles Scribner and Sons.

Chaiken, S. ( 1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Personality and Social Psychology,* 39: 752-766.

Cialdini, R.B. (1996). Activating and aligning two kinds of norms in persuasive communications. *Journal of Interpretation Research,* 1(1), 3-10.

Cialdini, R. B. (1993). *Influence: Science and practice* (3rd ed.). New York: Harper Collins.

Cole, D. N. (1996). Wilderness Recreation Use Trends, 1965 through 1994. Res. Pap. INT-RP-488. Ogden, UT: USDA Forest Service.

Cole, D. N. (1996). Wilderness recreation in the United States: Trends in use, users, and impacts. *International Journal of Wilderness,* 2(3), 14-18.

Cole, D. N., Watson, A. E., & Roggenbuck, J. W. (1985). Trends in wilderness visitors and visits: Boundary Waters Canoe Area, Shining Rock, and Desolation. Res. Pap. INT-RP-483. Ogden, UT: USDA Forest Service.

Doucette, J. E., & Cole, D. N. (1983). Wilderness visitor education: information about alternative techniques. Gen. Tech. Rep. INT-295. Ogden, UT: USDA Forest Service.

Dustin, D., & McAvoy, L. (1985). Interpretation as a management tool: A dissenting opinion. *The Interpreter.* 16: 18-20.

Eagly, A.H., & Chaiken, S. (1993). *The psychology of attitudes.* Fort Worth, TX: Harcourt Brace Jovanovich.

Fish, L. B. & Bury, R. L. (1981). Wilderness visitor management: diversity and agency policies. *Journal of Forestry,* 79(9), 608-612.

Fishbein, M., & Manfredo, M. (1992) A theory of behavior change. In M. Manfredo (Ed.), *Influencing Human Behavior.* Champaign, IL: Sagamore Publishing.

Fishbein, M. & Azjen, I. (1980). *Understanding attitudes and predicting social behavior.* Englewood Cliffs, NJ: Prentice-Hall.

Gramann, J. H. & Vander Stoep, G. A. (1987). Prosocial behavior theory and natural resource protection: a conceptual synthesis. *Journal of Environmental Management,* 24, 247-257.

Ham, S. (1992). *Environmental Interpretation: A practical guide for people with big ideas and small budgets.* Golden CO: North American Press.

Hammit, W.E., & Cole, D.N. (1998). *Wildland recreation ecology and management* (2nd ed.). New York: John Wiley & Sons.

Hampton, B. & Cole, D.N. (1995). *Soft Paths.* National Outdoor Leadership School, Mechanicsburg, PA: Stackpole Books.

Hawkins, D. (1969). I, thou, it. In *Bulletin of the Association of Teachers of Mathematics,* No. 46 (Spring). Boulder, CO: University of Colorado.

Hawkins, D. (1965). The informed vision: An essay on science education. Daedalus: *The Journal of the American Academy of Arts and Sciences,* 94(3).

Hendee, J. C., Stankey, G. C., & Lucas, R. C. (1990). *Wilderness management.* Golden, CO: North American Press.

Hovland, C. I., Janis, I. L., & Kelley, H. H. (1953). *Communication and Persuasion.* New Haven: Yale University Press.

Kholberg, L. (1971). From is to ought. In T. Mischel (Ed.), *Cognitive Development and Epistomology.* New York: Academic Press.

Laswell, H. D. (1948). The structure and function of communication in society. In L. Bryson (Ed.), *Communication of ideas.* New York: Harper.

Lawler, E.E. (1973). *Motivations in work organizations.* Monterey, California: Brooks/Cole Publishing Company.

Manning, M., Harris, J.A., Maher, W.A. &McQueen, K.G. (1998) Learning in the field: A manual for conducting field classes. Refereed monograph, Higher Education Research and Development Society of Australia, HERDSA Gold Guide; No. 5. Jaimison, Australia.

Manning, R., (1999). *Studies in outdoor recreation* (2nd ed.). Corvallis: Oregon State University Press.

Manning, R., Ballinger, N. L., Marion, J. & Roggenbuck, J. (1996). Recreation management in natural areas: problems and practices, status and trends. *Natural Areas Journal*, 16(2), 142-146.

Martin, Burnham H. & Taylor, D.L. (1983). Informing backcountry visitors: A catalog of techniques. Research Department, Appalachian Mountain Club.

Miller, S.C., Knight, R.L., & Miller, C.K. (2000). Wildlife response to pedestrians and dogs. *Wildlife Society Bulletin*, 29(1), 124-132.

NOLS. (1993). Leave no trace outdoor skills and ethics series. Lander, WY: National Outdoor Leadership School.

Olson, E. C., Bowman, M. L., & Roth, R. E. (1984). Interpretation and nonformal environmental education in natural resources management. *Journal of Environmental Education*, 15(4), 6-10.

Petty, R. E., Unnava, R., & Strathman, A. (1991). Theories of attitude change. In H. Kassarjian & T. Robertson (Eds.), *Handbook of consumer theory and research.* Englewood Cliffs, NJ: Prentice-Hall.

Petty, R. E. & Cacioppo, J. T. (1986). *Communication and persuasion: Central and peripheral routes to attitude change.* New York: Springer/Verlag.

Petty, R. E. & Cacioppo, J. T. (1984). The effects of involvement on responses to argument quantity and quality: Central and peripheral routes to persuasion. *Journal of Personality and Social Psychology*, 46, 69-81.

Petty, R. E., McMichael, S., & Brannon, L. A. (1992). The elaboration likelihood model of persuasion: applications in recreation and tourism. In M. Manfredo (Ed.), *Influencing human behavior.* Champaign, IL: Sagamore Publishing.

Roggenbuck, J. (1992). Use of persuasion to reduce resource impacts and visitor conflicts. In M. Manfredo (Ed.), *Influencing human behavior.* Champaign, IL: Sagamore Publishing.

Roggenbuck, J. & Manfredo, M. (1990). Choosing the right route to wilderness education. In D. Lime (Ed.), Managing America's Enduring Wilderness resource; conference proceedings; September 11-17, 1989; Minneapolis, MN: Minnesota Agricultural Experiment Station, University of Minnesota: 103-112.

Roggenbuck, J. W. & Lucas, R. C. (1987). Wilderness use and user characteristics: a state of knowledge review. In R. Lucas (Ed.), Proceedings: national wilderness research conference: issues, state-of knowledge, future directions; July 23-26, 1985; Ft. Collins, CO. Gen. Tech. Rep. INT-220. Ogden, UT. U.S.D.A., Forest Service, Intermountain Forest and Ranger Experiment Station: 204-245.

Stankey, G. H. (1972). The use of content analysis in resource decision making. *Journal of Forestry,* 70(3), 148-151.

Swain, R. W. (1986). Colorado wilderness violators: who they are and why they violate. Thesis, Colorado State University, Fort Collins, CO.

Timpson, W.M. & Tobin, D.N. (1982). *Teaching as performing: A guide for energizing your public presentation.* Englewood Cliffs NJ: Prentice –Hall.

Vande Kamp, M., Johnson, D., & Swearingen, T. (1994). Deterring minor acts of noncompliance: A literature Review. Seattle: Cooperative Park Studies Unit, College of Forest Resources, University of Washington. Technical Report NPS/PNRUN/NRTR-92/08.

Vander Stoep, G. A. (1995). Expanding roles of recreation resource communications: moving beyond traditional campfire programs. *Trends*, 32(4), 14-18.

Wallace, G. N. (1990). Using the Authority of the Resource as an interpretive technique. *Legacy,* 1(2), 4-9.

Wallace, G.N. (1991). Law enforcement, interpretation and the Authority of the Resource Technique, In Proceedings, National Interpreters Workshop, Vail Colorado, November 10-13, National Association for Interpretation.

Washburn, R. F. & Cole, D. N. (1983). Problems and practices in wilderness management: a survey of managers. Res. Paper INT-304. Ogden, UT: U. S. Department of Agriculture, Forest Service, Intermountain Range and Experiment Station.

Watson, A. E., Cole, D. N. & Roggenbuck, J. W. (1995). Trends in wilderness recreation use characteristics. In J.L. Thompson, D. W. Lime, B.Gartner, and W. M. Samus, (Eds.), Proceedings--fourth international outdoor recreation and tourism trends symposium and the 1995 national recreation resource planning conference: May 14-17, 1995, St. Paul, MN.

Watson, A. E., Hendee, J. L. & Zaglauer, H. P. (1996). Human values and codes of behavior: changes in Oregon's Eagle Cap wilderness visitors and their attitudes. *Natural Areas Journal,* 16(2), 89-93.

Widner, C., J., & Roggenbuck, J. (2000). Reducing wood theft at Petrified Forest National Park. *Journal of Interpretation Research,* 5(1), 1-18.