Tests of Perceived Risk and Attention Paying to Bear Safety Signs in Yosemite National Park

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Executive Summary

Overview of Three Year Effort. A three-year study examined how Yosemite National Park addresses the continuing problem of human-black bear interactions with its interpretation and communication efforts, and the extent to which these efforts are guided by contemporary communication theory. This report summarizes the results and findings from research efforts conducted in 2002 (the final year of the study). It also provides a series of recommendations for strengthening the current interpretive communication program, with the ultimate goal of improving the human-black bear management program and reducing the number of problem bear incidents in Yosemite.

Research Overview. The research conducted in 2002 used two field experiments to test bear-related messages and to increase understanding of visitors' perception of risk associated with human-bear interactions. Testing the effects of different messages included on-site observations to assess attention-paying behavior, and interviews that were conducted to examine visitor perceptions, preferences, and attitudes about attention paying to bear-related messages. Visitor surveys were used to describe visitor characteristics, risk perception, knowledge, and behavioral intention in order to better understand which beliefs might best be targeted in future interpretive communication messages.

Overview of Methods. Five message treatments were designed to assess attention-paying behavior in three different types of areas in Yosemite Valley: Upper Pines Campground, the Wilderness Trailhead, and Curry Village. As a complement to our evaluation of test messages, interviews were conducted in Upper Pines and near the Wilderness Trailhead to assess visitors' perceptions, preferences, and attitudes about paying attention to different types of bear-related messages. Additionally, two messages were designed to manipulate perceived risk and to sharpen our understanding of its relationship to visitors' familiarity with the park and the topic of bears, knowledge transfer, and the vividness of written communication devices.

Methods for Study 1: Attention Paying and Visitor Opinions of Signs. Five test treatments were designed: (1) "Attention Humans" appealed to peoples' emotions and was written from the perspective of the bears; (2) "My Bear Story" incorporated a personal story of a young person whose family had a bear incident; (3) "Top 10 Reasons to Put Your Stuff in the Locker" was a humorous message; (4) "Leave it in the Locker – Not in Your Car!" was designed so that the title alone conveyed the message without needing to read the sign further; and (5) a control condition, "Black Bears and Human Food," was developed using existing park message text.

Observations and interviews occurred during multiple two-hour blocks throughout the study period at test installations at Upper Pines, and the Wilderness Trailhead, with observations only conducted at Curry Village. Observations documented attention paid to the sign by each individual that passed (ignored, glanced, extended viewing). Semi-structured tape-recorded interviews were conducted with 69 groups at Upper Pines and 95 groups near the trailhead. Interviews asked respondents to: (1) describe aspects of the signs that attracted their attention, (2) give their immediate reactions to signs, (3) compare the test signs with others park signs, and (4) give their opinions about the narrative structure or tone of the signs. Group size, gender, and behavior (ignored, glanced, extended viewing) were recorded. A coding scheme was developed by one reader and 10% of all interviews were independently coded by two additional coders. The inter-rater reliability was 0.87, considered high for this type of research.

Study 1 Findings. Among the entire population of campers, hikers and Curry Village visitors,

and for all five treatments combined, 423 (44%) were observed ignoring the test messages, 309 (32%) glanced for less than 2 seconds, and 231 (24%) engaged in extended viewing. In Upper Pines Campground, 314 observations were made; 326 individuals were observed near the trailhead, and a total of 323 observations were made at Curry Village. Most subjects (54%) at Upper Pines ignored the signs. About 28% viewed them for an extended period. At the trail, the greatest percentage (48%) of subjects only glanced at the signs, while 26% viewed the signs for an extended period of time. Of the Curry Village subjects, only 18% viewed the signs for an extended period with 52% ignoring them. Of those among the entire population who exhibited extended viewing, 37% (85) of the respondents stopped to read signs for 2-10 seconds; about 46% (106) viewed them for 11-20 seconds; and about 17% (40) viewed them for 21 or more seconds. Among the people who viewed the signs for an extended period, the inclusion of emotion, vividness, and humor in the test signs appeared to increase the proportion who viewed for more than 20 seconds.

Based on the interviews, the most commonly mentioned sign elements that attracted attention were the yellow color and the graphic of a bear on the sign, which were included on all five treatments. A majority (87%) of respondents were interested in information about bears and most viewed the topic of bears to be important or relevant to them. Most (84%) described the sign information as familiar. Visitors responded positively to the test signs that incorporated emotional appeal, a personal story, and humor into the narrative structure.

Methods for Study 2: Perceived Risk and Knowledge Transfer. Two experimental treatments were used by placing 1 of 2 test messages or no message on campers' vehicle windshields in the early morning of treatment days. Both treatments sought to influence perceptions of bear-related risks, though one used a vivid story format, while the other used vivid statistical information. In late afternoon of each treatment day surveys were administered to campers at campsites in Lower and North Pines campgrounds. Risk perception was evaluated by measuring perceived vulnerability, perceived severity, response efficacy, and self-efficacy according to constructs from protection motivation theory (Rogers & Prentice-Dunn, 1997). Knowledge transfer was examined using recall with true-false questions. The survey questions also addressed campers' level of familiarity with various aspects of the park and asked about the amount of information campers had received from Yosemite pertaining to various topics, including bear-related information.

Study 2 Findings. Overall, the experimental treatments using vivid statistics and vivid story had no effect on campers' perception of risk regarding bear-related incidents. In fact in many cases, the control group of respondents exhibited higher levels of perceived risk. These results could be reflective of the high degree of visitor familiarity with Yosemite. We do not interpret this as a failure of the treatments, but instead, that despite the treatments, visitors' own direct experience in Yosemite National Park (dominated by an absence of negative bear encounters) may have been more compelling and convincing to them than the comparatively hypothetical risks described in the treatments.

Three-Year Recommendations

A comprehensive look at our findings for the entire 3-year study would suggest the following: Yosemite Valley is aggressively delivering information to park visitors about the human-bear problem in the park. Generally, park visitors are receiving the information that Yosemite is providing about bear safety, and they are highly familiar with the problems and how to prevent incidents from occurring. Visitors have a positive attitude towards the bears in the park and want them to be protected. For the small percentage of non-compliers, modifying the

current communication system probably will not produce significant change in behavior. First time visitors tend to be seeking information about bears, while the majority of overnight visitors who have been coming to the park for years generally are not seeking this information. These repeat visitors admit to needing the reminders, and admit that they get lazy. Personal contacts by park staff (such as campground patrol rangers, roving interpreters and those conducting evening programs) need to be maintained to provide timely on-site reminders temporally close to visitors' opportunities to perform the desired behavior.

While we are not recommending specific message texts, we provide the following general suggestions for combating the "I already know it all" syndrome, as well as for improving the overall effectiveness of the current interpretive communication system that targets the human-bear problem:

- The need to combat the "I already know it all" syndrome is needed (1) when new information is developed or (2) when people are not behaving properly and wrongly say they know what to do. If visitors see a sign that at first glance appears familiar, they are unlikely to read it thoroughly. Thus, new information buried within a seemingly "old" message will not reach the audience. New information might best be presented in very brief messages, ideally with a header that telegraphs the information or indicates that there is something new to learn. This would ensure that those who only glance will obtain the information.

- Sign messages must be brief and vivid. The vividness concept can be applied to a sign's color, font, other design elements, and a clear, bold theme-title that challenges the prevailing schema (e.g., "You Don't Know This—Bears Really Are Dangerous" or "What You As An Experienced Visitor Needs to Know," or "The Problem We Have At Yosemite Is That You Think You Already Know This").

- Three communication outcomes are important to differentiate: (1) Attention capture, (2) information processing and influencing peoples' beliefs, and (3) influencing people's behavior. Our findings indicate that if a goal of the park is to convey new information about bears to visitors, capturing attention may be a limiting factor, especially in certain locations. To increase attention capture, signs should be vivid and the location of the signs is key. Influencing people's beliefs may be more difficult than capturing their attention. The manner in which a person processes information is based in part on a person's prior knowledge and first hand experience, and it may be the case that highly experienced Yosemite visitors rely on their experience rather than signs to guide their behavior. Thus, another challenge for the park is to change visitors' perceived vulnerability. Influencing behavior is more difficult than influencing beliefs. In Yosemite, people think bear incidents are serious, but unlikely. Unless both are high (i.e., bear incidents are considered serious and likely), then behavior change is unlikely. Our findings indicate that visitors' behavior is usually appropriate and that the park generally experiences a high level of compliance. We know why some violators do not comply. Reasons include laziness, the belief that "I didn't think it would happen to me," and a lack of convenience and ease of compliance. To better ensure compliance, the park should focus its' efforts on the ease of compliance, recall of proper behavior and law enforcement. It is inaccurate to assume that non-compliant behavior is a result of lack of knowledge.

- According to the readability analysis of 140+ bear-related messages located in the Valley, most messages are at an appropriate reading ease level for park visitors, but dull to read. Sign texts throughout the Valley can be edited to increase their human interest level. Refer

to the Message Catalog (Lackey, Ham, & Quigley, 2002) for examples of current park messages that are ideally written with a high level of human interest and at an easy reading level.

- Visitors stated repeatedly that they wanted to see more information about bear biology, and less about proper food storage. The park should consider expanding its interpretation of bears as wildlife (to balance the current preponderance of regulatory messages focused on food storage) in order to create greater understanding about bears' conditioned behavior and why they behave the way they do.

- The communication efforts made by the park to date are largely effective. The park might consider the following as general guidelines as it continues to strengthen its bear communication program:

    - Development of a strong policy environment with consistent training and updating of all employees to better ensure visitors are receiving accurate, thorough, and consistent bear-related messages from all park employees. Currently some messages are inconsistent.

    - Improvement of the parks' interdivisional work unit efforts that focus on the human/bear management program. One individual should be assigned the leadership role, charged with coordinating the communication and management of human/bear-related tasks to all other park division staff.

    - Strong corrective action and enforcement for the small percentage of non-compliers and hard core deviants. Establish stronger Title 36 language for improper food storage violations (36 CFR section 2). Improper food storage violations are a primary concern, but a related concern is enforcement of campground site capacity regulations in the park.

    - Assurance that the food storage system is easy, accessible and convenient for visitors throughout the Valley (see Adams et al., 1998). In some cases it is not convenient. For example, for many visitors the storage lockers at Curry Village are located quite a distance from the overnight lodging units.

    - A sign system with a suite of duplicated messages located strategically (e.g., in locations where the decision is being made to store food properly or not). Use the Message Catalog (Lackey et al., 2002) as a tool for identifying where current bear messages are located in the Valley.

    - A change to visitors' existing Yosemite schema (Werner et al., 1998) by designing messages in a new temporary look, in a relevant, and unexpected fashion. Messages are currently falling on deaf ears. An example of a temporary look with updated information is to place a dry erase board in campgrounds that would provide up to the moment bear-related information in that area.

    - Consider incorporating messages that target visitors' salient beliefs about proper food storage more, with less focus on targeting the problem only (see Interim Report May 2001). For example, a message that targets campers' concern about having food to

eat might be: "ACTIVE BEAR AREA – If you want enough food for breakfast, then store your food and all smelly things in your storage locker!" (Include a bulleted list of items to store in locker).

- Continue providing bear messages via a wide variety of media to meet the different needs and preferences of the range of park visitors. Consider using multiple languages more often to convey this information. We heard this request repeatedly from visitors.

- Do not focus communication efforts solely on signs. Behavioral problems are generally not due to a widespread lack of knowledge about bears and proper food storage behaviors. If the park does focus on signs, the information must look new or else it may be ignored.

Introduction

This study addresses the human component in a three year comprehensive study of the human-bear interaction conflict at Yosemite National Park (YOSE) by evaluating information about bears the park provides to visitors (i.e., information dissemination), visitors' information use and retention, visitors' food storage behavior, and a variety of other visitor behaviors. This report will address the following: (1) describe the research conducted during year three (2002) of the study; (2) provide a summary of law enforcement efforts to take corrective action for improper food storage violations during a five-year period (1997-2001); and (3) provide recommendations for improving the current interpretive communication program that targets the human-bear problem, based on results from the 3-year study.

Research Conducted in 2002

Last year's study (2001) revealed potentially effective message content by determining the strength and prominence of particular beliefs about compliance and noncompliance with YOSE food storage regulations. The intent of this year's phase (2002) of the study was twofold: (1) to test the effectiveness of new message content in targeting the human-bear interaction conflict, and (2) to manipulate risk and examine the relationship of familiarity and message vividness with visitors' perceptions of risk associated with bear incidents in the park. The results of this phase of the research will be applied to developing and recommending messages for interpretive services aimed at increasing visitor compliance with YOSE food storage regulations and decreasing the number of bear incidents, thereby strengthening NPS efforts to assure both visitor safety and bear protection.

In 2002, a visitor survey was developed based on what was learned in prior research on visitors' beliefs regarding proper food storage procedures. An interview was designed to assess visitors' preferences for message content and design. The research in year 3 relied on two field

studies to understand risk perception related to human-bear interactions. On-site observations were conducted to assess visitor attention-paying behavior and interviews were conducted to examine visitor perceptions, preferences, and attitudes about attention paying to bear-related messages. Visitor surveys were used to examine visitor characteristics, risk perception, knowledge, and behavioral intention, to better understand which beliefs might best be targeted in future interpretive communication messages.

This research will provide park managers with information about visitor perceptions of human-bear interactions. It will also provide insight into attention paying that will include visitors' reactions to message design and content. Additional benefits from this research will be contributions to the fields of persuasion, communication, human information processing, and interpretation, by exploring the relative importance of several variables likely to be related to risk perception and attention paying to messages.

STUDY 1: Attention Paying and Visitor Opinions of Signs

Objectives

A sign will convey information only if it captures attention. Based on prior years of research and other studies (Hall et al., 2001), we believed that few people attended to signs in Yosemite. The objectives of Study 1 were (1) to first determine how well newly designed test messages attracted the attention of visitors and how long people read them; (2) to understand, in visitors' own words what aspects of the messages caught their attention, how they compared the messages to other park messages about bears, how familiar they felt they were with the topic, how novel or new the narrative structure or tone of the messages was, and how relevant the information was to them; and (3) to compare five different versions of bear message content in three types of Valley locations.

Message Treatment Justification

Message designs for testing vividness, novelty, and attention paying were based on studies that addressed (1) moral and emotional appeal, (2) anecdotal or story type of evidence, (3) humor, and (4) the role of titles.

Moral and emotional appeal. Emotional content has been shown to increase attention paying (Lang, 2001). The literature indicates increasing emphasis on the role of affect and emotion in the persuasive context of communication (Guerrero, Anderson, and Trost, 1995; Jorgensen, 1995). Nabi (1999) discussed the role of emotion on information processing, attitude change and recall, and found the need to bridge the gap between the emotional and rational approaches to persuasion. We used this type of appeal by writing the message from the perspective of the bears.

Personal Anecdote. According to Baesler and Burgoon (1994), stories are more concrete than statistical data. The vividness of a story and the structure of its components engage attention without requiring concentrated effort on the part of message recipients (De Young and Monroe, 1996). Stapel and Veithuijsen (1996) discussed self-relevance, and suggested that exposure to information that involves persons who are very similar to the subjects may result in the information being just as self-relevant and impressive as a direct experience. We used this format to tell a child's story of experiencing a bear incident.

Humor. Using humor appeals in a persuasive context of changing attitudes has generated mixed results in the literature (Lee and Mason, 1999; Weinberger and Gulas, 1992). A general conclusion is that humor may be persuasive but probably no more so than non-humor. The mixed findings in the literature led us to develop a message to test humor effects.

Telegraphic title. To design effective titles Bitgood (2000) described three characteristics

of attention: (1) attention is selective, (2) attention has focusing power, and (3) the capacity of attention is limited. According to Ham (1992), most people read the title of a written message before they read anything else. Many people read only the title. Ham argues that therefore the message theme should be incorporated into the title. Because they convey a complete idea, theme titles can be more attention grabbing than topic titles (such as the topic title "Bears," compared to the theme-title "Bears Are Curious Creatures."). We used this sign to test the effects of "telegraphing" the main points of the message.

Standard Park Message. This test message served as control and did not incorporate the use of emotional appeal, personal story, humor or telegraphic title?

Methods

Study Area and Population

The study population was defined as all visitors to Yosemite National Park who camped at the Upper Pines Campgrounds, stayed at Curry Village, or hiked from the Wilderness Trailhead between August 1 and September 30, 2002. Although we would prefer to generalize to a larger population of Yosemite National Park visitors, the practical logistics of erecting signs and placing test messages at individual campsites required us to restrict our sampling primarily to locations in Yosemite Valley. Study area locations were chosen to conduct unobtrusive observations of visitors' attention paying behavior (ignore, glance, extended viewing) and oral interviews by including locations representative of campers, hikers and visitors who stay in more developed accommodations.

Upper Pines Campground. Upper Pines appeared to be representative of the typical camping experience in Yosemite Valley. Test messages were placed at each of the 10 restroom facilities (rotated between data gathering sessions) in the campground throughout the study

period. At the beginning of a session one sign was placed on the wooden barricade located at one of two restroom entrances (women or men). Sign location was chosen where visitors could view the message either entering or exiting the restroom, yet where behavior could be visible to the researcher as well. Signs could only be observed at one restroom entrance at a time, so signs were rotated once during the session between the men's and women's entrances (see Figure 1). Both males and females were sampled during each data collection session.

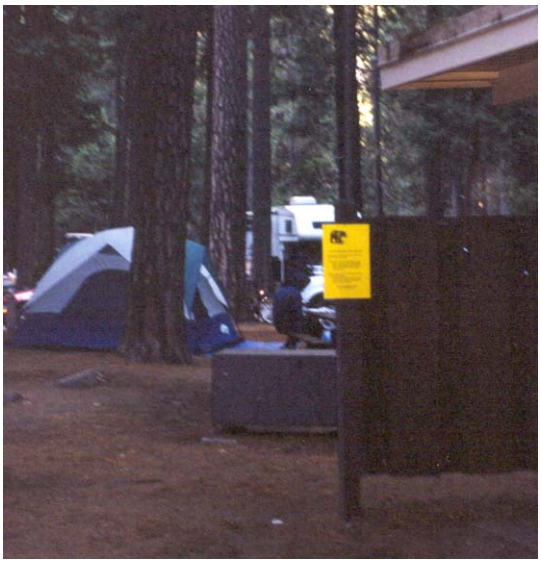


Figure 1. Display of Sign at Campground Restroom Location

Wilderness Trailhead. The trail chosen for the study was a popular hike from the Wilderness Parking Lot. This type of test site (near a parking lot) was chosen for the purpose of noting if behavior was immediately impacted due to a visitor reading the message (e.g., a visitor returned to the parking lot after reading the message to check that all scented items were removed from the vehicle). Such observations were not possible in the campground. We also looked at attention paying behavior of trail users. During the initial stages of the study, the test message was placed in various locations near the parking lot to determine the greatest amount of

traffic flow. Multiple trails lead from the parking lot to the main trail. Due to the initial difficulty of finding an observation location near the Wilderness trailhead that received consistent traffic flow, a small percentage (16%) of trail observations were conducted at other similar sites, though not in Yosemite Valley.

An existing park sign post was used (with permission from park officials) to mount test messages. A wooden support frame was constructed to hold the sign post in place in order to avoid disturbing vegetation and soil. On treatment days, the support frame and sign post with a test message were placed about 100 yards from the parking lot along the trail. The wooden frame was camouflaged with natural materials lying nearby (see Figure 2).

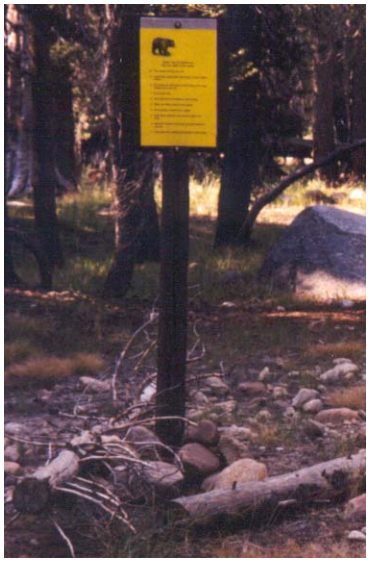


Figure 2. Display of Sign Post and Support Frame Along Trail

Curry Village. Curry Village was chosen as a site representative of more developed accommodations. Test messages were placed near the campground registration area. Only observations of attention-paying were made at Curry Village. Interviews were not conducted. Signs were initially placed just outside the registration area at the Front Office, near the exit door. We quickly discovered that the test sign was competing with other factors for visitors'

attention. For example, people exiting were usually looking at a map to find their tent cabin or distracted and talking with group members following the registration process. The sign was moved about 10 yards away from the registration area to the Lounge and old Post Office building. The sign was mounted to a support post near the main path of travel.

Experimental Stimuli

Five message treatments were designed for use in this experiment. Because we were interested in testing the narrative structure and tone of the messages, we held most formatting aspects of the signs constant and varied only the content (e.g., emotional appeal, story format, humor). All signs were 11 inches by 17 inches; yellow in color and laminated; included a line drawing of a black bear; and had similar text length (94 to 108 words). Only the text font differed between signs. See Figure 3 for an example of the sign format used for message treatments.

Figure 3. Example of Sign Layout for 5 Treatments in Study 1

Message Treatment Content

Treatment 1 – Moral, Emotional Appeal (titled "Attention Humans!"). Our research indicated visitors have positive attitudes towards bears in Yosemite. This message targeted

peoples' values with an emotional appeal. Emotional content has been shown to increase attention-paying (Lang, 2001). The use of first person and the appeal to saving life are message elements used in this treatment to increase persuasiveness. When people are exposed to a highly emotional image they may suppress counter arguments. Message text in Kristen ITC font (24 point):

Attention Humans!

This is our home, and we've been here for a long time, living off natural food. But we're really tempted by your human food. Did you know that we can smell anything with an odor, including canned food, drinks, toiletries (like sunscreen, soap, toothpaste), and trash? When you don't store these things properly, we might break into your car, a backpack, or an ice chest that's left out. Sometimes we get hurt or killed just for liking your food. Don't help a good bear go bad.

Please do us both a favor and store your food and scented items the right way!

The Bears

Treatment 2 – Personal Anecdote (titled "My Bear Story"). Treatment 2, like treatment 1, is designed to capture and sustain attention. Whereas treatment 1 used emotion, treatment 2 tested other elements shown to increase attention-paying – novelty and narrative. Information will more likely be selected for encoding into working memory if it is novel, unexpected or representative of environmental change. Message text in Kristin ITC font (24 point):

My Bear Story

A bear broke into my family's car last night. I was real scared. We accidentally left some cans of food, drinks, and trash in the car trunk. The bear made a huge mess of our car. It broke the back window and ripped up the backseat. Bears can sure smell things better than I can. Last we heard, they were tracking him down. It's too bad bears get hurt or killed just for liking our food.

Please be sure to put all of your food and smelly things in a locker!

Troy

Treatment 3 – Humor Combined with Targeting of Salient Beliefs (titled "Top 10 Reasons to Put Your Stuff in the Locker"). In addition to testing the use of humor appeal in this message, some of the content in treatment 3 is based on visitors' salient beliefs that have thus far emerged from our research. These include behavioral, normative, and control beliefs that emerged in regard to proper food storage in Yosemite Valley, such as rangers and fellow campers will approve if food is stored properly; and having food to eat and keeping bears wild are good reasons for storing food the right way (see Lackey & Ham, 2003); Middlestadt et al., 1996). Message text in Tahoma font (24 point):

Top 10 Reasons to Put Your Stuff in the Locker

10. The rangers will like you a lot.
9. Avoid being dubbed the "park dunce" by your fellow visitors.
8. No forking out 500 bucks for the window that a bear busted out of your car.
7. Keep bears wild.
6. Have food left for breakfast in the morning.
5. Make your fellow campers way happy.
4. Avoid getting a ticket from a ranger.
3. Keep bears, squirrels, and raccoons away from camp.
2. Avoid the "aromas" that bears can leave behind in your car.
1. Keep bears from drinking all the beer in your cooler.

Treatment 4 – Telegraphic-Title (titled "Leave it in the Locker – Not in Your Car!).

Message text in Tahoma font (24 point):

Leave it in the Locker – Not in Your Car!

How do you keep your car, truck or van from being mangled by a bear?

- Don't leave food or scented things in autos.
  Bears break into cars for canned foods, drinks, toiletries (like sunscreen, soap, toothpaste), or trash. So thoroughly search your car!

- Store all food and scented things in the bear-proof storage lockers.
  Lockers are provided for your use and should be kept closed and latched at all times (not just at night)!

Protect your property and the lives of Yosemite bears!

Treatment 5 – Example of Existing Park Message Text (titled "Black Bears and Human Food"). Treatment 5 serves as control. The message does not incorporate novelty, narrative, humor, or emotion. This message contains examples of existing park message text. Message text in Tahoma font (24 point):

Black Bears and Human Food

Bears are active day and night. Proper food storage is required by federal law. Help protect your property and yourself. Do not leave food (even canned food), drinks, toiletries (like sunscreen, soap, toothpaste), and trash, or other items with an odor, in vehicles. When bears obtain human food, they lose their natural fear of people. Some bears with histories of threatening behavior must be killed.

Please be a responsible park visitor and store your food properly!

Manipulation Checks

A series of manipulation check statements (e.g., "the text catches my attention," "the message makes me sympathize with bears") were developed for subjects (independent of the study) to provide validation that the five test treatments varied as intended. The purpose of these questions was to determine if the variables we were interested in manipulating with each individual treatment were conveyed accurately to the study respondents. In other words, were we measuring what we thought we were measuring? For example, we tested a treatment with a humor element. To draw conclusions about the effects of humor, we needed to know if representatives of our population (overnight park visitors) believed that the message was actually humorous. About 250 manipulation checks (50 per treatment) were administered to randomly chosen campers and hikers on days between the occurrence of attention paying observations, interviews, and written surveys. Respondents were asked to read the test message and then respond to the statements. The two final questions asked about respondents' gender and number

of visits to the park. See Appendix A for manipulation check forms.

Treatment Holding Times

To assist in explaining the extended viewing findings, we averaged the reading time that it took10 people unfamiliar with the study to read each of the five test messages. This generated an estimate of the holding times, the time required by the typical visitor to read the entire message at a natural pace. As shown below, the holding times range from 18 to 23 seconds:

- "Attention Humans!" – 22.8 seconds
- "My Bear Story" – 19.2 seconds
- "Top 10 Reasons" – 23.1 seconds
- "Leave it in the Locker – Not in Your Car!" – 19.9 seconds
- "Black Bears and Human Food" (Park Message) – 18.7 seconds

Sampling Schedule

Scheduling of days (and therefore respondent selection) was not formally random. However, we anticipated that the convenience sample collected several times at each location approximated a random sample. No systematic bias should be introduced, because during low-use times all visitors present during study sessions were sampled, and during high-use times an interval sample with a random start was used.

Sampling was divided into four weekend (Fri., Sat., Sun. & Mon.) and three weekday (Tues., Wed., and Thurs) blocks at the three locations, with two-hour blocks of time during the nine-week study period (see Table 1 for sampling schedule). More sessions were scheduled at Upper Pines and Wilderness Lot than Curry Village due to fewer potential respondents during the 2-hour period. We conducted 4 sessions per each of the 5 treatments at Upper Pines and

Wilderness Lot, and 3 sessions per treatment at Curry Village.

Table 1. Sampling Schedule for Study 1 at Upper Pines, Curry Village, and Wilderness Trailhead (observe/oral interview).

Location	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5
Upper Pines 8 – 10 a.m. observe & interview	August 1 (Th) August 19 (M) Sept. 9 (M) Sept. 26 (Th)	August 8 (Th) August 21 (W) Sept. 12 (Th) Sept. 27 (F)	August 4 (Su) August 28 (W) Sept. 14 (Sa) Sept. 29 (Su)	August 7 (W) August 30 (F) Sept. 18 (W) Sept. 30 (M)	August 3 (Sa) 10-12p.m. August 13 (Tu) Sept. 2 (M) Sept. 20 (F)
Curry Village 3:30-5:30 p.m. observe only	August 1 (Th) August 19 (M) Sept. 12 (Th)	August 22 (Th) Sept. 5 (Th) Sept. 13 (F)	August 8 (Th) August 27 (Tu) Sept. 15 (Su)	August 9 (F) Sept. 9 (M) Sept. 18 (W)	August 14 (W) August 30 (F) Sept. 21 (Sa)
Wilderness Trailhead 7:30-9:30 a.m. observe & interview	August 2 (F) August 27 (Tu) Sept. 7 (Sa) Sept. 10 (Tu)	August 5 (M) August 24 (Sa) Sept. 8 (Su) Sept. 13 (F)	August 9 (F) August 29 (Th) Sept. 23 (M) Sept. 15 (Su)	August 14 (W) August 31 (Sa) Sept. 27 (F) Sept. 21 (Sa)	August 18 (Su) Sept. 4 (W) Sept. 25 (W)

Sampling

For the test locations, observational data were collected from visitors who passed close enough to the study sign for it to enter their visual field. An effort was made to keep the sampling times consistent across treatments in case time of week or day influenced visitors' sign viewing (Tables 2 and 3). For trail users, we found the need to add sampling days to increase the number of observations during early mornings (the peak data collection time for these users). To accommodate the existing schedule for other study activities, we ended up with more weekend than weekday sampling sessions. This should not present a bias because weekday and weekend visitation is fairly consistent during the busy summer months. Sessions in Upper Pines Campground and near the Wilderness Trailhead were conducted in the morning when most visitors were preparing to leave the campground or those hikers just starting on the trail. Curry

Village subjects were sampled during the afternoon when many visitors were registering for their stay.

Table 2. Distribution of Observation/Interview Sessions by Treatment

		Attention Humans	My Bear Story	Top 10	Leave it in the Locker	Park Message
Day of week						
	Weekend	5	7	7	7	6
	Weekday	6	4	4	4	4
Time of day						
	Morning	8	8	8	8	7
	Afternoon	3	3	3	3	3

Table 3. Distribution of Observation/Interview Sessions by Location

		All Treatments
Location	Day of Week	
Upper Pines	Weekend	11
	Weekday	9
Curry Village	Weekend	7
	Weekday	8
Wilderness Trail	Weekend	13
	Weekday	6

Data Collection. Observational data were collected for over 100 hours at the test locations in Upper Pines, Curry Village, and the Wilderness Trailhead. The observer was positioned unobtrusively in a place from which the sign was visible and it could be determined whether passersby ignored, glanced at or viewed the sign for an extended time period. Every person who approached to a point at which the sign was within his or her field of vision was

recorded (between 3 and 5 feet). If groups approached the sign, one member was randomly selected to observe their viewing behavior. For each individual observed, gender, group size, the presence or absence of children, and attention to the sign were documented to determine if these variables impacted attention-paying behavior. Attention to the sign was monitored as ignored the message (no overt attention directed at the sign), glanced (physically oriented toward the sign, but for 2 seconds or less) at the message, or stopped to read the message for an extended period of time (greater than 2 seconds).). Those who viewed for extended periods were timed until they ceased reading. At busy times it was not always possible to observe every group; if others passed while the observer was tracking one group, they were not included. However, because observers attempted to include all groups, this should not have introduced any systematic bias in the results.

Semi-structured oral interviews were conducted with campground and trail visitors to obtain more in-depth information about perceptions of signs. The intent was to achieve balanced sampling between groups that stopped for extended viewing and groups that did not stop to read the message for extended viewing (ignored or glanced). Of the 164 visitors interviewed, about 50% stopped to read the message beyond two seconds, and the remaining half glanced at or ignored the message. All respondents who were selected for interviews had been observed first for attention-paying behavior. Those selected for interviews were chosen based on closest proximity to the interviewer. For example, campers who exited the restroom going in the opposite direction from the interviewer were not approached, and the hiker (when in a group) walking nearest to the interviewer was approached. An attempt was made to select every third or fourth visitor who had been observed, depending upon the amount of traffic flow during the observation session. Refusals to participate were recorded.

The semi-structured interviews began with questions asking visitors' for aspects of the

sign that caught their attention and their immediate reactions to the sign (see Appendix B for the interview protocol). The same set of questions was asked for all five treatments. A series of questions asked what aspect of the sign caught respondents' attention, how new or familiar the information was, if the information was unexpected or similar to other messages respondents had seen in the park before, how the message compared with others in the park about bears, and how much information respondents had seen about bears during this visit. The interview concluded with questions about how long visitors had been in the park and prior visits they had made. To establish face validity, these questions were reviewed by several faculty members at the University of Idaho.

Data Analysis. For each treatment sign, the proportion of individuals that stopped for extended viewing was computed. Among those who stopped for an extended period, the duration of attention was also computed. Bivariate analyses were used to investigate the relationship between each independent variable (e.g., gender, group size) and attention capture. Interviews were tape-recorded and later transcribed verbatim. Using standard content analytic procedures, the researcher read through the interviews and examined them for major ideas, patterns of responses, or themes. A final list of categories was developed into which all responses were coded. Two graduate students not involved with the study independently coded a random sample of 10% of the interviews. If the coders disagreed about the interpretation of a given statement, this response was omitted. By conducting this inter-rater coding process, researchers were able to determine a reliability index that was computed based on the number of agreements between coders. Inter-coder agreement was generally high. Of the randomly sampled 10% of interview responses, the two independent coders coded only two statements (1%) differently than the first author. Over 87% of the 179 coded statements were in complete agreement among the three coders, and nearly 12% of the statements were agreed upon between

two of the three coders, indicating high reliability.

Manipulation Check Summary

The manipulation for Treatment 1 ("Attention Humans!") was intended to evoke sympathy for bears by writing the message from the perspective of the bears, to catch attention, and to be vivid and novel. Treatment 2 ("My Bear Story") was written using a personal story format. This message was intended to catch attention, to create a mental picture in the readers' mind (vivid), and to be novel. Treatment 3 ("Top 10 Reasons to Put Your Stuff in the Locker") was designed using humor and a series of salient beliefs that emerged from visitors about proper food storage in our previous research. We intended for this manipulation to be funny, to catch attention, to be novel, unusual, and vivid. Treatment 4 ("Leave it in the Locker – Not in Your Car!") was designed using a telegraphic-title , a title that tells the main points that the reader needs to know. We intended for this treatment to catch attention with the title, to be vivid and novel. Finally, Treatment 5 ("Black Bears and Human Food") was designed using existing park message text. The intent was to present the information in a factual and typical style that resembles other existing park messages about bears.

We anticipated the treatments would differ among variables such as sympathy for bears and humor in the message (Table 4). Using a ten point scale with 1=strongly disagree and 10=strongly agree, treatments differed significantly ($p<.05$) with the statement "The message makes me sympathize with bears." Significant differences occurred between Treatment 3 ("Top 10 Reasons"), which averaged a response of 4.34, and the other four treatments. Significant differences also occurred between the telegraphic-title "Leave it in the Locker" (an average response of 7.96) and two other treatments "Attention Humans" and "My Bear Story" treatments on responses to the statement "The title of the message tells me what I need to know." The statement "A mental picture came to mind when reading the message" resulted in significant

differences between “My Bear Story” (average of 8.30) and “Attention Humans” (average of 6.66). The statement “The text in this message seems like most other park signs I’ve seen in Yosemite” resulted in differences between treatments. “Top 10 Reasons” averaged 4.12, while “Leave it in the Locker” averaged 6.70 and the park message “Black Bears and Human Food” averaged 6.42.

Table 4. Differences Among Treatment Variables

Variable	Attention Humans	My Bear Story	Top 10 Reasons	Leave it in the Locker	Park Message	F	p
	----------*Average*----------						
Message evokes sympathy for bears	7.35	7.16	4.34	6.36	6.04	8.55	.000
Title told me what I needed to know	6.16	5.10	6.64	7.96	6.46	5.85	.000
Mental picture came to mind	6.66	8.30	7.08	7.02	6.96	2.79	.027
Text seems like other messages I’ve seen in the park	5.55	5.62	4.12	6.70	6.42	6.89	.000
Text catches my attention	7.78	6.96	7.42	8.20	7.86	2.12	.079
Park should have more messages like this one	7.74	7.68	7.14	7.84	8.34	1.56	.185
Message tells me something new	5.02	3.88	3.86	4.68	4.86	1.76	.138

Scale: 1=Strongly Disagree; 10=Strongly Agree

Additional manipulation check questions evaluated how well signs evoked the feelings or thoughts they were intended to evoke, such as emotions vs. factual (Table 5). Applying a scale of 1=emotional and 10=factual, respondents rated “Top 10 Reasons” as significantly more emotional (5.73) than “Attention Humans,” “Leave it in the Locker,” and the “Park Message.” In addition, “Attention Humans (7.14) was significantly more emotional than the “Park Message,” and “My Bear Story” (6.02) was considered significantly more emotional than “Leave it in the Locker” and the “Park Message.” “Top 10 Reasons” was viewed as more “unusual”

(5.16) than all other treatments except “Attention Humans (5.90),” which was significantly more “unusual” than “Leave it in the Locker” and the “Park Message.” In rating messages for humor, “Top 10 Reasons” was seen significantly more “Funny” (5.04) than the other treatments, while the “Park Message” was significantly “Not Funny” (9.27), compared to all other treatments. In rating the believability of the message, respondents rated the “Park Message” as most “believable” (2.19) and “Top 10 Reasons” as most “not believable” (4.29). “Top 10 Reasons” was rated as most “unique” (4.49), compared to “Leave it in the Locker” (6.37) and the “Park Message” (6.63), which were believed to be more “ordinary.” “Top 10 Reasons” was viewed as being most “abstract” (6.51) compared to “Leave it in the Locker” (8.08) and the “Park Message” (8.50), both considered more “concrete.” In addition, “My Bear Story” was significantly more “abstract” than the “Park Message.”

Table 5. Differences Among Treatment Variables

Variable and Scale	Attention Humans	My Bear Story	Top 10 Reasons	Leave it in the Locker	Park Message	F	P
	----------*Average*----------						
Emotional (1) vs. Factual (10)	7.14	6.02	5.73	8.25	8.65	13.84	.000
Unusual (1) vs. Typical (10)	5.90	6.84	5.16	7.45	7.67	7.81	.000
Funny (1) vs. Not Funny (10)	6.88	7.34	5.04	7.40	9.27	13.77	.000
Believable (1) vs. Not Believable (10)	2.98	3.58	4.29	3.02	2.19	3.45	.009
Unique (1) vs. Ordinary (10)	5.14	5.44	4.49	6.37	6.63	5.34	.000
Abstract (1) vs. Concrete (10)	7.82	7.12	6.51	8.08	8.50	5.44	.000
Boring (1) vs. Interesting (10)	7.88	7.18	7.04	6.94	7.61	1.19	.314
Convincing (1) vs. Not Convincing (10)	3.78	4.18	4.94	3.69	3.83	1.32	.263
Vivid (1) vs. Not Vivid (10)	4.39	4.82	4.63	4.33	5.36	1.05	.382

Too Long (1) vs. Too Short (10)	5.38	5.80	4.86	5.27	5.45	1.66	.159

The findings from the manipulation checks indicate that for the most part the four treatment messages conveyed the intended message when compared to Treatment 5 (park message titled "Black Bears and Human Food").

- Treatment 1 ("Attention Humans") was intended to evoke sympathy, which it did effectively. This message was considered more unusual or novel than many other park signs readers had seen.
- Treatment 2 ("My Bear Story") evoked a mental picture (vividness) compared to the existing park message treatment; it was also considered more abstract, and it was more emotional than factual when compared to the park message treatment.
- Treatment 3 ("Top 10 Reasons") was found to be more humorous, novel, unusual, and unique when compared with the existing park message treatment.
- Treatment 4 ("Leave it in the Locker") included a title that was effective in telling the reader what they needed to know, more so than any other treatment.
- Treatment 5 (Park Message "Black Bears and Human Food") was considered to be most typical, factual, and concrete compared to the other treatments.

Respondents agreed fairly strongly that all five treatments caught their attention. A disappointing indication from the manipulation checks was that the four treatments manipulated for vividness were not considered significantly more vivid to respondents than the control treatment. This could be due to a misunderstanding of the concept of "vividness" by respondents. We were repeatedly asked to clarify the meaning of this word by respondents. It is possible that the physical characteristics (yellow sign) shared by all five treatments led to the similarity in "vividness" ratings.

In general, however, the manipulation checks showed that the treatment designed to elicit sympathy for the bears (Attention Humans) did so more than other signs; the treatment designed to create a mental image (My Bear Story) did so more than other signs; the treatment designed to be humorous (Top 10 Reasons) was rated as funnier than other signs; the treatment designed to have a telegraphic title (Leave it in the Locker) was judged as having a more informative title than other signs; and the standard park message was considered more typical than other signs. Thus, if differences emerge among treatments, it may be the case that the differences in tone and structure were the cause.

Results – Study 1: Attention Paying and Visitor Opinions of Signs

Gender and Group Size

Upper Pines Campground. In the campground, 314 observations were made with people across all sample sessions. The characteristics of observed groups were similar across the five treatments. A few more females were observed than males (see Table 6).

Table 6. Gender Distribution of Subjects in Campground Observations

Gender	Attention Humans	My Bear Story	Top 10 Reasons	Leave it in Locker	Park Message
	----------*Percent*----------				
Male	48	56	35	49	51
Female	52	44	65	51	49

Chi-square = 5.86, p=.21

Average group size (people observed together when passing by the signs) was 1.1 across all treatments, with 285 (91%) of the observations being of individuals alone. This low group size average is explained by the location of observations (restroom facilities). An additional 20 (6%) were observed in groups of two, 7 (2%) were observed in a group of three, and 2 (1%)

observations were made of groups of four people.

Wilderness Trailhead. At the trailhead a total of 326 observations were made. More males than females were observed (see Table 7), possibly due to a greater ratio of men than women heading out on this trail for overnight backpacking trips.

Table 7. Gender Distribution of Subjects in Wilderness Trailhead Observations

Gender	Attention Humans	My Bear Story	Top 10 Reasons	Leave it in Locker	Park Message
	----------*Percent*----------				
Male	45	64	52	47	51
Female	55	36	48	53	49

Chi-square = 4.88, p=.31

Unlike the observations collected in the campground, the average group size at the trailhead was 2.9 people. A majority of observations (54%) was made of visitors in pairs. Only 13% were hiking alone. Group sizes ranged from 1 to 25 hiking along the trail.

Curry Village. At Curry Village a total of 323 observations were made. The gender distribution among treatments was similar, with a few more males observed than females (see Table 8).

Table 8. Gender Distribution of Subjects in Curry Village Observations

Gender	Attention Humans	My Bear Story	Top 10 Reasons	Leave it in Locker	Park Message
	----------*Percent*----------				
Male	54	57	55	47	43
Female	46	43	45	53	57

Chi-square = 3.6, p=.46

The average group size observed at Curry Village was 1.97, with about 40% of the subjects observed walking by alone, and an additional 40% in groups of two.

Observation of Test Signs

Among the entire population of campers, hikers and Curry Village visitors, 423 (44%) were observed ignoring the test messages, 309 (32%) glanced for less than 2 seconds, and 231 (24%) engaged in extended viewing. Of those who exhibited extended viewing, 37% (85) of the respondents stopped to read signs for 2-10 seconds; about 46% (106) viewed them for 11-20 seconds; and about 17% (40) viewed them for 21 or more seconds. No significant differences were found in viewing time across categories of gender and group size.

Most subjects at Upper Pines (54%) ignored the message treatments, in comparison with 28% who stopped and 18% who glanced at the sign. The distribution of attention behavior varies somewhat, but not significantly, across treatments (see Table 9).

Table 9. Attention Behavior Distribution Campground Observations (n = 314)

Attention	All Treatments	Attention Humans n=69	My Bear Story n=72	Top 10 Reasons n=55	Leave it in Locker n=71	Park Message n=47
	----------*Percent*----------					
Extended Viewing	28	23	38	29	30	19
Glanced	18	12	21	13	20	23
Ignored	54	65	42	58	51	57

Chi-square = 11.96, p=.15

Fewer visitors ignored the treatments along the trail than in the campground, and a greater percentage (48%) was observed glancing at the sign than were observed stopping (26%) or ignoring (26%). More variation in attention occurred among treatments with hiker subjects than with Upper Pines campers or Curry Village visitors (see Table 10). The differences in viewing across treatments at the trailhead were highly significant.

Table 10. Attention Distribution of Wilderness Trailhead Observations (n = 326)

Attention	All Treatments	Attention Humans n=67	My Bear Story n=50	Top 10 Reasons n=63	Leave it in Locker n=70	Park Message n=76
	----------*Percent*----------					
Extended Viewing	26	30	48	22	13	23
Glanced	48	45	32	35	69	55
Ignored	26	25	20	43	18	22

Chi-square = 36.67, p=.000

Fewer visitors (18%) stopped to read the messages at Curry Village than at the campground or the trailhead; 30% of the Curry Village subjects glanced at the message, and 52% ignored the messages. More variation occurred in attention paying to each treatment by subjects at Curry Village than at the campground or trailhead (see Table 11). This may be due to more distractions that catch the attention of these visitors (e.g., looking up at Glacier Point or the lure of food and drink concessions) compared to campers or hikers.

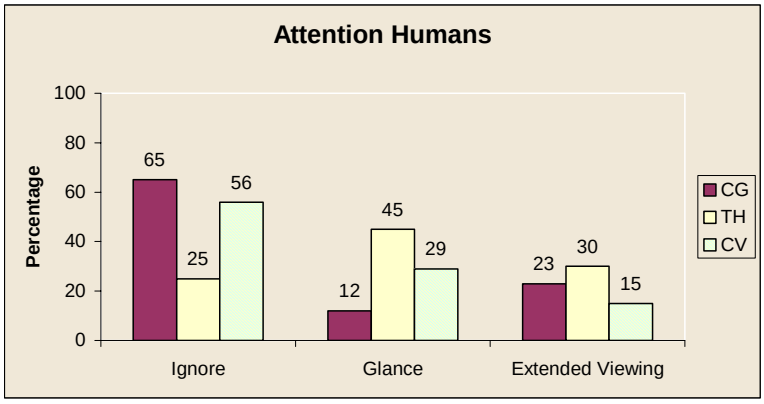
Table 11. Attention Distribution of Subjects in Curry Village Observations (n = 323)

Attention	All Treatments	Attention Humans n=59	My Bear Story n=51	Top 10 Reasons n=69	Leave it in Locker n=70	Park Message n=74
	----------*Percent*----------					
Extended Viewing	18	15	41	15	8	17
Glanced	30	29	35	30	23	32
Ignored	52	56	24	55	69	51

Chi-square = 33.3, p=.000

Treatments and Attention Paying Behavior

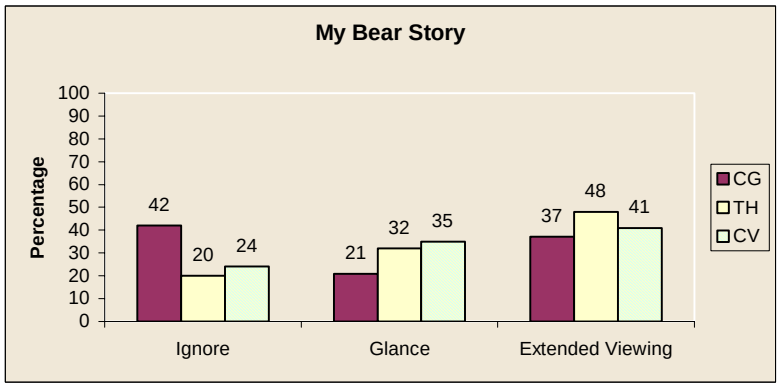
The following series of figures display the attention-paying behavior observed for each of the five treatments at the three types of locations (campground, trailhead, Curry Village).



CG= Campground; TH=Traihead; CV=Curry Village

Figure 4. Attention Paying Behavior of "Attention Humans" by Location.

Most Upper Pines (CG) campers (65%) and Curry Village (CV) visitors (56%) ignored the "Attention Humans" message, while hikers (TH) tended to glance at (45%) or view the message for an extended period of time (30%) (Figure 4).

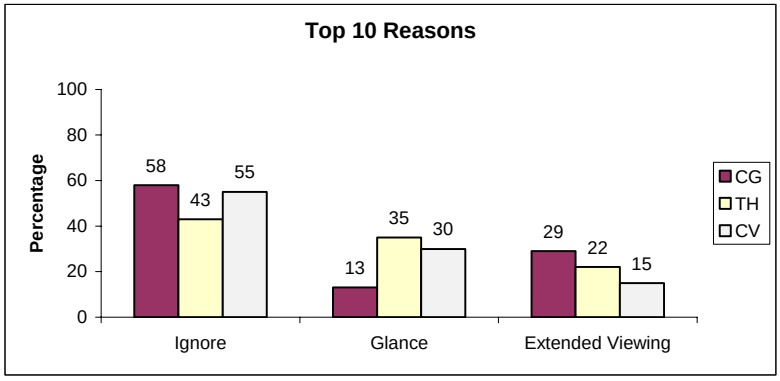


CG= Campground; TH=Traihead; CV=Curry Village

Figure 5. Attention Paying Behavior of "My Bear Story" by Location.

Compared to "Attention Humans," the "My Bear Story" message was less likely to be ignored by Upper Pines campers (CG) and was more likely to engage (glance) and hold visitors' attention longer (Figure 5). Both hikers (TH) and Curry Village (CV) visitors also tended to

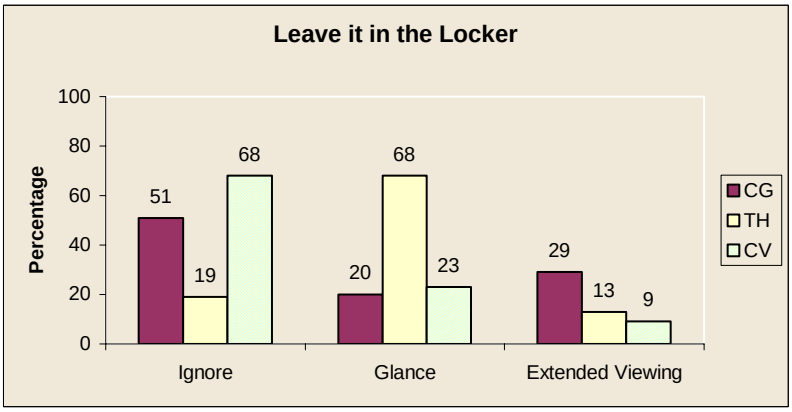
view this message for extended periods of time.



CG= Campground; TH=Traihead; CV=Curry Village

Figure 6. Attention Paying Behavior of "Top 10 Reasons" by Location.

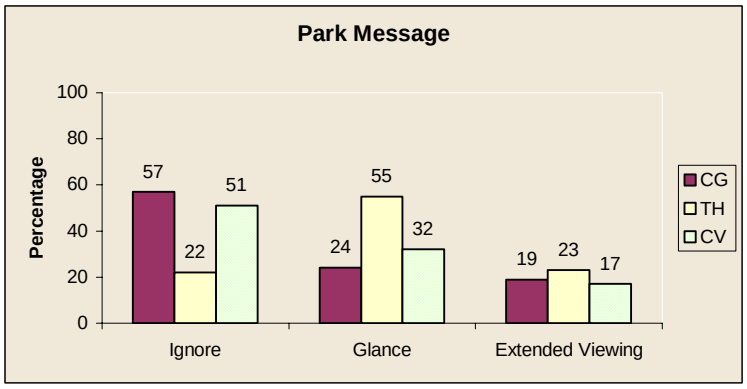
Upper Pines campers (CG) were more likely to ignore "Top 10 Reasons" and to view the message for an extended amount of time rather than to glance at the sign, compared to hikers (TH) and Curry Village (CV) visitors who were more likely to ignore the message but less likely to view the sign for an extended time period (Figure 6). This could be explained by the apparent length of this message in comparison to the other treatments. As shown earlier in the report, the holding time was the longest for this treatment compared to the other treatments, although not by much.



CG= Campground; TH=Traihead; CV=Curry Village

Figure 7. Attention Paying Behavior of "Telegraphic-Title" by Location.

Most Curry Village visitors (68%) and Upper Pines campers (51%) ignored the "Leave it in the Locker" message, while a majority of hikers engaged (81%) with it. In terms of extended viewing, campers were more likely to read the sign beyond a couple of seconds (Figure 7).



CG= Campground; TH=Traihead; CV=Curry Village

Figure 8. Attention Paying Behavior of "Park Message" by Location.

Campers at Upper Pines (CG) and Curry Village (CV) visitors primarily ignored the "Park Message" (57% and 51% respectively), with fewer exhibiting glancing behavior, and even fewer showing extended viewing behavior. Hikers were less likely to ignore the message and were most likely to be engaged, at least by glancing. Of the three location groups, this group was slightly more likely to view the sign for more than two seconds (Figure 8).

Overall, Upper Pines campers tended to ignore the signs most often, and the next most common tendency was for campers to view the signs for an extended period, with glancing behavior occurring least often. The only exception to this was with the control treatment "Park Message" in which campers were more likely to only glance at the sign and least likely to read it beyond two seconds. Curry Village visitors fairly consistently exhibited the same attention paying behavior for all treatment messages. Most Curry visitors ignored four of the five messages; the next most likely behavior observed was glancing at the sign; and the least likely

behavior was extended viewing of the signs. The only exception to this was with the treatment "My Bear Story", in which the inverse was true. The most likely behavior was for people to stop for an extended period to view the sign, while visitors were least likely to ignore this message. Wilderness Trail hikers were most often observed glancing at all the signs for less than two seconds, with the exception of "Top 10 Reasons." Hikers ignored this sign more often than any other sign. The other exception was "My Bear Story." Hikers tended to view this sign for longer periods rather than glancing at or ignoring the sign.

These findings indicate that location is an important factor for the park to consider. The "My Bear Story" message was most likely to elicit extended viewing in all three locations, but the second most "viewed" sign varied depending on where it was placed. The most ignored sign varied across locations. "Attention Humans" was ignored by 65% of campers but only 25% of hikers. At the trailhead, "Top 10 Reasons" was most ignored, while at Curry the "Leave it in the Locker" sign was most ignored. Such interactions between signs and locations make it difficult to generalize about the effectiveness of signs per se. Such findings highlight the need to understand what frame of mind visitors have when they are engaging in different park activities.

Extended Viewing

Upper Pines Campground. A total of 89 subjects read the test messages for an extended viewing time at Upper Pines. Table 12 shows the amount of time campers spent reading the various treatments. "Attention Humans" held attention for the longest time period (beyond 20 seconds). Campers rarely (only 11%) read "My Bear Story" and the "Park Message" for the shortest period of time (2-10 seconds). They were more likely to read beyond 11seconds. These findings, combined with the holding time information, suggest that most of those who viewed for extended times probably absorbed all of the message content.

Table 12. Distribution of Extended Viewing Times in Campground Observations (n = 89)

Time	Attention Humans n=16	My Bear Story n=27	Top 10 Reasons n=16	Leave it in Locker n=21	Park Message n=9
	----------*Percent*----------				
2-10 seconds	31	11	38	38	11
11-20 seconds	25	59	31	48	67
21+ seconds	44	30	31	14	22

Chi-square = 12.44, p=.13

Wilderness Trailhead. A total of 84 subjects viewed the test messages for an extended period of time along the trail. More variation occurred in time spent reading the various treatments than in the campground (Table 13). Hikers also tended to spend longer time viewing "Attention Humans" and the great majority (82%) viewed the "Park Message" for the shortest amount of time. Possibly the title of this sign, ("Black Bears and Human Food") more quickly told the reader what the sign was about and was an indication to the reader that they already knew the information. The relatively small percentages who read for more than 20 seconds probably indicates that even those who did engage in extended viewing probably did not absorb all the message content.

Table 13. Distribution of Extended Viewing Times in Wilderness Trailhead Observations (n = 84)

Time	Attention Humans n=20	My Bear Story n=24	Top 10 Reasons n=14	Leave it in Locker n=9	Park Message n=17
	----------*Percent*----------				
2-10 seconds	30	42	36	44	82
10-20 seconds	55	58	57	56	18
21+ seconds	15	0	7	0	0

Chi-square = 17.58, p=.025

Curry Village. A total of 58 Curry Village subjects viewed the test messages for some

length of time. More variation occurred in time spent reading the various treatments than in the campground (Table 14).

Table 14. Distribution of Extended Viewing Times in Curry Village Observations (n = 58)

Time	Attention Humans n=9	My Bear Story n=21	Top 10 n=10	Leave it in Locker n=6	Park Message n=12
	----------*Percent*----------				
2-10 seconds	11	38	60	83	25
11-20 seconds	33	62	10	17	50
21+ seconds	56	0	30	0	25

Chi-square = 24.55, p=.002

Location of bear related information seems to be an important consideration for the park. Hikers and Curry Village visitors walking by a sign were less likely to spend as much time reading the sign, compared to campers (see Table 15). This indicates the need for brief messages, especially for hikers and Curry Village visitors. Campers reading signs at restroom facilities were more likely to read for longer periods of time, possibly because they were often by themselves and not in a group. Campers also tended to be in a more leisurely, slower pace mode, compared to hikers or Curry Village visitors. Apart from the general need for short signs, the sign itself mattered a great deal and there was an interaction between sign and location.

Table 15. Distribution of Extended Viewing Times by Location

Time	Campground (n= 89)	Trailhead (n=84)	Curry Village (n=58)
	----------*Percent*----------		
2-10 seconds	26	44	40
11-20 seconds	46	41	41
21+ seconds	28	15	19

Visitors' Opinions of Signs

A total of 69 interviews were conducted in Upper Pines Campground, with 90% of those held with individual campers, and 10% conducted with groups of 2 or more (Table 16). Of these interviews, about half (49%) had at least one member who was observed to stop to read the sign.

Table 16. Characteristics and Behavior of 69 Groups Interviewed in Upper Pines

		Extended Viewing	Glanced at Sign	Ignored Sign
		----------*Number of Groups*----------		
People in Group	One	29	8	25
	Two or more	5	1	1
Prior Experience	First trip to park	9	2	4
	Been to park, first in campground	7	2	11
	Camped here before	18	5	8
	Visit Info. Not Recorded	0	0	3

Table 16 also provides information on prior experience or level of familiarity with Yosemite and Upper Pines. Assuming that the accumulated familiarity of the most knowledgeable person in a group is freely shared with other group members, groups were categorized according to the highest level of experience of any member within the group. For example, if one member had previously camped in Upper Pines but another had not, the group was classified as having camped there before. Based on these limited data, it seems that the more experienced visitor who had stayed at Upper Pines before stopped to read the signs nearly as often (58% of observations) in comparison to first-time visitors to the park (60% of observations), and visitors new to the campground but not to the park stopped to read the signs least often (35% of observations). A possible explanation for repeat visitors in Upper Pines stopping to read the messages was reflected in comments made by campers. Campers repeatedly commented that they read the sign because it looked new or that they had not seen it at the restroom before. Possibly due to their high degree of familiarity and experience with Yosemite,

this group of repeat visitors displayed a strong sense of vestedness in the park and was curious about any new information.

At the Wilderness Trail, over half of the 95 groups interviewed were observed to read the signs (Table 17). Unlike the interviews at Upper Pines, a substantial majority (74%) of interviews were conducted with groups of two along the trail, compared to 12% conducted with 1 visitor, and 15% conducted with three or more visitors.

Table 17. Characteristics and Behavior of 95 Groups Interviewed at Wilderness Trail

		Extended Viewing	Glanced at Sign	Ignored Sign
		----------*Number of Groups*----------		
People in Group	One	7	1	3
	Two	33	25	12
	Three or more	11	3	0
Prior Experience	First trip to park	28	13	4
	Been to park, first time on trail	8	6	4
	Hiked trail before	13	10	6
	Visit Info. Not Recorded	2	0	1

Unlike Upper Pines interviews, nearly half of the trail interviews occurred with first time visitors to the park. First time visitors to the park stopped to read the signs most (62%), compared to repeat park visitors new to this trail (44%) and visitors who had hiked the trail before (45%). These differences in park experience between campers and hikers may suggest that if attention-paying behavior differs, it may be the result of differences in the populations of visitors instead of differences in the signs. Alternatively, it may be that there is something about placing signs in different locations that influences behavior, even within a single population.

Response Codes and Interview Summary

For each of the ten interview questions that addressed visitors' opinion about the test messages, we included the following: (1) the set of response codes developed for that question; (2) a summary of the most common responses; and (3) notable comments about the differences between treatments and between hikers' and campers' responses to that question. In the summaries, we indicate what comments varied the most across the five treatments (that is, the range of variability).

Interview Question #1 – What attracted your attention to this message?

Response Codes

1 – color of sign
2 – graphic on sign, picture of bear
3 – sign looked new or different, "I hadn't seen it before"
4 – general concern about human/bear problems, bear activity, direct experience
5 – seeking information, "I usually read signs," curiosity, new visitors
6 – title of message
7 – other appearance characteristics (e.g., narrative structure, format, size, font)
8 – familiarization mentioned, topic of bears impacted whether read message or not
9 – didn't notice sign
10- ambiguous, doesn't address question
11- other
12- location of message

Summary of Results (3 most common responses) n=262

- **Color of sign** – (35% of responses overall)
  Between treatments – Park Message (30%) compared to Leave it in the Locker (39%)

- **Graphic of sign** – (20% of responses overall)
  Between treatments - Top 10 Reasons (12%) compared to Leave it in the Locker (29%)

- **Did not notice sign** – (10% of responses overall)
  Between treatments - Park message (5%) to Top 10 Reasons (14%)

Other aspects of the signs accounted for less than 7% each.

The color of the sign (which was constant across all five treatments) was mentioned slightly more often by campers (38% of 98 responses) than by hikers (31% of 164 responses). The picture of the bear seemed to get the attention of hikers (24%) more than it did campers (12%). Hikers more often mentioned that the picture of the bear or the color of the sign was the signal to them that this was "another bear message," so they did not stop to read it, implying they knew the information already. For example, one visitor said "But seeing the bear I didn't bother to read it, because I know." Another said, "I knew it was a bear warning when we walked by and so I didn't even read it."

Interview Question #2 – What was your immediate reaction?

Response Codes

1 – Repeat content of message (e.g., to store food, some bears with threatening behavior must be killed)
2 – It's new or different
3 – Message makes sense, it's obvious, believable, that's what happens
4 – Familiar message (I know this, reinforcement, nothing new, another bear message)
5 – Tells own bear story, conveys frustration at visitors doing wrong thing in kid story of bear incident, seems to draw on personal experiences, etc.
6 – Hope this convinces other people to do the right thing, to be careful, these messages are necessary
7 – Specific comments about message:
    7.01 – cute, too cute
    7.03 – easy to understand
    7.04 – empathy for bears, moral
    7.05 – friendly, personal, can relate to
    7.06 – good detail
    7.07 – informative, learned something, helpful
    7.08 – sad or scared, safety concern
    7.09 – child-like style, childish
    7.10 – perspective of bear
    7.11 – story format
    7.21 – humor positive
    7.22 – humor negative
8 – Mention impact to own behavior (e.g., I wondered should I go back to check my car?)
9 – Format comments (color, font)
10- General positive comments (I like it, it's good)
11- General negative comments (mixed messages, question credibility)
12- No reaction
13- Other
14- Ambiguous, don't address question

<u>Summary of Results</u> (4 most common responses) n=250

- **Familiar message** – (20% of responses overall)
- **Mentioned impact to own behavior** – (8% of responses overall)
- **Told own bear experience** – (6% of responses overall)
- **Humor positive** – (6% of responses overall)

<u>Between Treatments:</u>
Attention Humans – "Familiar" response most frequent (32%)
My Bear Story – "Tell own bear experience" response most frequent (23%)
Top 10 Reasons – "Humor positive" response most frequent (27%)
Leave it in the Locker – "Familiar" response most frequent (41%)
Park Message – "Impact to own behavior" response most frequent (25%)

Of the 155 coded responses to this question by hikers, 25% mentioned that the message was "familiar," in comparison to 13% of the 95 responses made by campers.

Interview Question #3 – Does this message seem relevant or important to you?

Response Codes

1 – Yes
2 – Yes, with a personal story, concern of damage, safety concern, etc.
3 – Yes, especially for other less familiar visitors, for us as 1st time visitors
4 – Yes, important for the bears, mention consequences for bears
5 – Unsure, kind of
6 – Relevant to all visitors or most people, even if know info. or camp often
7 – Only relevant for overnight visitors
8 – No, not really
9 – Ambiguous, doesn't address question

Summary of Responses (3 most common responses) n=160

- **Yes** – (68% of responses overall)
- **Yes with a personal story** – (nearly 12% of responses overall
- **Yes, especially for other less familiar visitors** – (7% of overall responses)

One first-time visitor stated, "It's important because we are here for the first time in the United States. It's very new for us that we can meet a bear in the forest. We don't have bears in Europe." No notable differences were observed between responses of hikers and campers or across treatments. It is important to note that in this type of face-to-face interview, some respondents may give favorable replies in order not to offend the interviewer.

Interview Question #4 – Do you like it more or less than other messages you've seen in Yosemite?

Response Codes

1 – More (due to the following):
- 1.01 - more information, detail
- 1.02 - addresses child
- 1.03 - helps bears, perspective of bears
- 1.04 - interesting, personal, more like a story, friendly style
- 1.05 - humor

2 – Less
3 – Same, similar, same but different
4 – Like it, It's fine, a good message, OK
5 – Neutral or Don't Know, haven't paid attention to other messages, just arrived, haven't seen many messages
6 – Ambiguous, doesn't address question

Summary of Results (4 most common responses) n=169

- **More** (38% of responses overall)
- **Same** (24% of responses overall
- **Like** (12% of responses overall)
- **Less** (8% of responses overall)

Across Treatments
Like it More:
Attention Humans – 50%
My Bear Story – 44%
Top 10 Reasons – 41%
Leave it in the Locker – 22%
Park Message – 27%

Comparing hikers to campers, the most variation in response to this question occurred in the response code "the message is the same or similar to other messages." Specifically, this response was recorded for 29% of hikers as compared to 16% of campers. In looking across treatments, subjects liked "Attention Humans," "My Bear Story," and "Top 10 Reasons" substantially "more" than "Leave it in the Locker" and the "Park Message."

Interview Question #5 – Would you describe the information in this message as new or familiar to you?

Response Codes

1 – Familiar, may include familiar even as 1st time visitors, familiar content but different format (narrative structure)
2 – Both familiar and new (e.g., mentions toiletries that need to be stored)
3 – New
4 – Ambiguous, doesn't address question

Summary of Responses (3 most common responses) n=160

- **Familiar** – 84% of overall responses
- **New** – 9% of overall responses
- **Both familiar and new** – 5% of overall responses

Responses to this question by hikers and campers and across treatments were found to be similar. One hiker stated that "if I was a first-time visitor or someone who didn't come here frequently, I'd be more inclined to notice what's out here and the whole situation with bears." Another visitor described a test message as being "…different. That draws our attention to it." A repeat visitor acknowledged that "it's good to be reminded. We've been coming here for probably 18-20 years. Things have changed a bit. You almost don't want to be told because you've been here enough and you feel like you know better, but we were cooking dinner and not six feet from our bear box a bear came right in. They are a lot more assertive than what they used to be. We need reminders because we get lazy." Even first time visitors considered the bear information as familiar. One visitor stated, "when we came 2 days ago it was new, but now it's familiar."

Interview Question #6 – For you personally, is this information unexpected or similar to what you've seen before?

Response Codes

1 – Similar, the same
- More details, more informative
- More personal, friendly
- Better

2 – Unexpected or different (no detailed comments)
2.01 – Unexpected or different (detailed comments):
- Different narrative structure (tone), but same content, delivered differently
- Haven't seen humor before, not typical NPS message
- Personal story not seen before
- Mention child style, bear perspective, title, location

3 – Both
4 – 1st visit, 1st message seen, Don't Know
5 – Ambiguous, doesn't address question

Summary of Responses (2 most common responses) n=149

- **Similar** – 47% of overall responses
- **Unexpected** – 42% of overall responses

Across Treatments
Similar response:
Attention Humans – 46%
My Bear Story – 31%
Top 10 Reasons – 11%
Leave it in the Locker – 89%
Park Message – 75%

Unexpected response:
Attention Humans – 29%
My Bear Story – 51%
Top 10 Reasons – 82%
Leave it in the Locker – 4%
Park Message – 18%

From these data, the humor in the "Top 10 Reasons" treatment emerges as the least similar (11%) and most unexpected (82%) sign text to current park visitors, a possible indication of its vivid and novel quality. One visitor stated that the message was "probably unexpected due to the humor." Responses to this question varied little between hikers and campers.

Interview Question #7 – Are there any things you particularly like about this message?

Response Codes

1 – writing style, narrative structure, delivery
2 – color of sign
3 – location of sign
4 – title
5 – message focuses on bears, help the bears, interested in bears
6 – learned something new
7 – information is important, true, it's informative, convincing, helpful
8 – bear graphic
9 – format of sign (font, length, size, etc.)
11- humor
13- good overall, it was fine
15- detail is good (about what items to store in locker)
16- caught and held my attention
17- no
18- neutral, Don't Know
19- ambiguous, doesn't address question

Summary of Responses (4 most common responses) n=186

- **Writing style/Narrative structure** – 20% of overall responses
- **Color** – 17% of overall responses
- **Bear graphic** – 9% of overall responses
- **Important/Informative** – 9% of overall responses

Across Treatments
Like Writing style:
Attention Humans – 29%
My Bear Story – 40%
Top 10 Reasons – 13%
Leave it in the Locker – 9%
Park Message – 6%

Responses to this question varied little between hikers and campers. More often subjects liked the writing style or narrative structure of "Attention Humans" and "My Bear Story," and were less likely to mention that attribute with respect to "Top 10 Reasons," "Leave it in the Locker," and the "Park Message." Although humor was not a most common response to this interview question, 34% of the responses for "Top 10 Reasons" stated the humor was what they liked about the treatment.

Interview Question #8 – Are there any things you particularly dislike about this message?

Response Codes

1 – No, none
2 – Narrative structure, tone, way it's written, lacks credibility, content
3 – Needs format help (length of text, font, size, etc.)
4 – Location of sign
8 – Want more bear biology info.
9 – Too many yellow signs
10- Want more detail
11- Ambiguous, doesn't address question

Summary of Responses (3 most common responses) n=151

- **No, None** – 61% of overall responses
- **Needs format help** – 19% of overall responses
- **Narrative structure** – 13% of overall responses

Across Treatments
No, None:
Attention Humans – 50%
My Bear Story – 63%
Top 10 Reasons – 52%
Leave it in the Locker – 71%
Park Message – 72%

Of the 86 coded statements made by hikers, 26% mentioned the sign "needs format help," (e.g., need bullets, larger font) compared to 9% of 65 responses made by campers. Across treatments, subjects more often mentioned disliking particular elements of treatments "Attention Humans," "My Bear Story," and "Top 10 Reasons," compared to treatments "Leave it in the Locker" and the "Park Message." More responses (23%) revealed that subjects disliked the narrative structure of "My Bear Story" compared to other treatments (3%-16%). Nearly 30% of the responses indicated that "Attention Humans" needed format help, compared to other treatments (8%-24%).

Interview Question #9 – Are you interested or disinterested in information about bears in Yosemite?

Response Codes

1 – Interested
2 – Disinterested, I come here so often, I have enough information
3 – Ambiguous, doesn't address question

Summary of Responses (2 most common responses) n=145

- **Interested** – 87% of overall responses
- **Disinterested** – 8% of overall response

Responses to this question varied little between hikers and campers, or between treatments.

Interview Question #10 – How much bear information have you seen this visit?

Response Codes

1 – Lots of information, quite a bit, it's all over, enough (mention 3+ sources; e.g., visitor center, entrance, signs, etc.)
2 – Not much information, none (mention 0-2 sources)
3 – Ambiguous, doesn't address question

Summary of Results (2 most common responses)

- **Lots of information** – 56% of overall responses
- **Not much information, none** – 30% of overall responses

Responses to this question are similar between hikers and campers. One camper stated, "The second you get into the park to the second you leave, it's everywhere". Another camper said, "Yeah, everywhere you are, there's the bear message. The ranger was yelling at our neighboring camper last night. And I said, 'My god, out of the 200 posters that are posted in the park, which one didn't they understand?'"

Evaluation of Sign Elements-Treatment Summary

Four of the five treatments were designed with the intent to incorporate an element of vividness (e.g., imagery, story format) to increase attention paying, while the fifth treatment was a control using the previously described existing park message text. Following is a summary of findings and evaluation of each treatment based on observations of attention-paying behavior, oral interviews, and the treatment manipulation checks:

"Attention Humans"

- Based on observations of visitors' reading time, park visitors stopped more often to read this message for a longer period (greater than 21 seconds), than the other messages. Overall, about 44% who stopped to view this message stopped between 6-9 seconds.
- In response to the interview question "What was your immediate reaction?" about one third of respondents said that the message was "familiar." In response to the question "Do you like it more or less than other messages you've seen in Yosemite?," the largest percentage (50%) of responses within treatments was that visitors liked this message "more" than other messages they had seen (see Table 18). One visitor said, "It was written in a very simple way. We as Germans could read it very properly. We can understand this message." Another said, "I like the perspective of the bears much more than other messages we've seen."
- Based on the manipulation checks, respondents validated that this message appealed to emotions and generated a sense of empathy for the bears, more so than other test messages. It was least effective between treatments in creating a mental picture in the mind of the reader. This message appeared to evoke the emotional appeal that we expected.

Table 18. Percentage of Response "I Like Message More" by Treatment (n=64)

Interview Question 4. Do you like it more or less than other messages you've seen in Yosemite?	
Treatment	---------*Percent Responded "More"*--------
Attention Humans	50
My Bear Story	44
Top 10 Reasons	41
Leave it in the Locker	22
Park Message	27

"My Bear Story"

- Overall, more visitors (42%) stopped to view this message for an extended period than the other messages. Specifically, campers were observed stopping to read 38% of the time, hikers stopped 48% of the time, and Curry Village visitors stopped 41% of the time. Based on the time observed stopping to read this message, most of the visitors who stopped (67%) viewed this message between 6 and 9 seconds
- During interviews, many visitors responded to the question "What was your immediate reaction?" by conveying their own personal bear story or conveying their frustration with the story of Troy as if the message was based on a real occurrence. One visitor said, "The person Troy sounds at first like 'Oh poor more me, this happened to me.' Well, I thought, you should have known better." About 23% of the responses to this question reflected this type of reaction, compared to 0% to 9% for other treatments. When asked "Do you like it more or less than other messages you've seen in Yosemite?," about 44% of the responses indicated visitors like this message "more." About 56% of the responses to the question "Is this information unexpected or similar…?" reported this message was unexpected (see Table 19). Of the wide range of responses to the question "Are there any things you particularly like about this message?," 40% indicated they liked the writing style (narrative structure) of this message (see Table 20). One visitor stated, "I like this one more because it's more like a

story."

- Based on manipulation checks: the title did the poorest job of telling the reader what they need to know compared to the other messages; this message was found most likely to create a mental picture in the mind of the reader; and it was considered to be less factual and more emotional than a majority of the other messages. One visitor stated, "it's just not as boring as reading some long sentences with big words that just goes on forever, repeating itself. This is very straightforward and fun to read." This message is more engaging, which is what we had anticipated.

Table 19. Percentage of "Similar" and "Unexpected" Message Responses (n=133).

Interview Question 6. Is this information unexpected or similar to what you've seen before?			
Treatment	Similar	Unexpected	Other Response
	----------*Percent of Responses*----------		
Attention Humans	43	36	21
My Bear Story	31	56	13
Top 10 Reasons	7	86	7
Leave it in the Locker	92	8	0
Park Message	71	18	11

Table 20. Percentage of "I Like Narrative Structure" Response by Treatment (n=38)

Interview Question 7. Are there any things you particularly like about this message?	
Treatment	-----*Percent Responded "Narrative Structure"*-----
Attention Humans	29
My Bear Story	40
Top 10 Reasons	13
Leave it in the Locker	9
Park Message	6

- More than half the visitors (52%) observed ignored this message, more often than any of the other messages. Hikers tended to ignore the message more often than campers or Curry Village visitors. Overall, 43% of the visitors who read the message spent between 6 and 9 seconds.
- More comments were made about this message being too lengthy than the other test messages. In interviews, 27% of responses to the question "What was your immediate reaction?" stated that this message was humorous in a positive way. About 41% of the responses to the question "Do you like it more or less than other messages?," indicated visitors liked this message "more." Compared to all the treatments, visitors claimed this message to be least "similar" to other messages they had seen in the park (only 7% said it was similar), as well as the most "unexpected" (86%) compared to other messages they had seen previously. Despite these assessments, this message was ignored more than any other message.
- Based on manipulation checks and comparison with other test messages, visitors were least likely to agree that the park should have more messages like this one. They were least likely to agree that this message tells them something new. They were least likely to think the message makes them sympathize with bears. They were least likely to agree that this message is similar to other park signs. This message was rated near the neutral point, yet was slightly more factual than emotional and rated near the mid-point between unusual and typical. Respondents were more likely to think the message was too long; people rated this message as slightly more humorous than not humorous. This message was rated as more believable than not believable, as more unique than ordinary; and finally as more concrete than abstract. Apparently the humorous message design served the intended purpose of being funnier than the other message treatments. Nevertheless, it was least effective in

capturing attention, suggesting that humor alone may not be an effective appeal in a national park setting.

"Leave it in the Locker"

- Based on observations conducted, overall about 17% of the subjects actually viewed this message for an extended time period, the lowest stopping rate of any other message. Most hikers (69%) were observed to only glance at this message, compared to glances by 20% of the campers and 23% of Curry Village visitors. Most campers (51%) and Curry Village (69%) subjects ignored this message, compared to 16% of hikers ignoring the message. Of those subjects who did stop, fewer people (8%) viewed the message beyond 21 seconds, compared to the other messages. Overall, about 47% of those who stopped viewed the message for only 2-5 seconds.
- Responses to interview questions reveal that among treatments, the immediate reaction visitors had to this message was that it was "familiar" (41% of the responses). Of the comments to the question "Do you like it more or less than other messages?," visitors replied they liked this message "more" less often (22%) compared to the other treatments (See Table 18). In addition, this message was seen as most similar (92% of the responses) and least unexpected (8%) compared to the other treatments (See Table 19). One visitor stated, "I'm looking for just quick things. I read the first line and get the main points." A possible explanation is that hikers tended to be in a hurry to start their day hike or overnight backpacking trip.
- According to the manipulation check, this message is most likely to catch attention compared to the other messages (Table 4). However, it is important to remember that the message didn't actually capture attention more than the others. Subjects were most likely to agree that the title of this message tells the reader what they need to know. This reinforces that the

message conveyed what we expected. The text in the message is considered most similar to other messages in the park. Overall, this message was rated as more interesting than boring, more vivid than not vivid, and more convincing than other test messages.

"Park Message"

- Overall, about 19% of the visitors we observed stopped to read this message for an extended period of time. A majority (58%) of those who stopped viewed the message for 6-9 seconds, and none were observed viewing beyond 20 seconds.
- According to the interviews, when visitors were asked their immediate reaction to the message, 25% of the responses conveyed some type of impact to their behavior (e.g., I thought about going back to the car to make sure), compared to 0%-8% with the other treatments. A possible explanation is that the more authoritative message (i.e., "proper food storage is required by federal law") influences behavioral decisions more than other messages. In response to the question "Are there any things you like about this message?," the narrative structure was mentioned less often (6%) compared to other treatments (9%-40%).
- Based on the manipulation check, people more strongly agreed that the park should have more messages like this one (Table 4). This message was considered the most factual of all the test messages as well as the most typical. This message was found to be least humorous and most believable compared to other treatments. The park message was rated as being more ordinary, and less unique. The message was also considered the most concrete of the test messages, and was found to be least vivid. Generally, this message served as an adequate control message with it being rated as more typical and ordinary, and less vivid.

Discussion and Implications

Attention Paying and Visitor Opinions of Signs

Manipulation Checks. Based on the manipulation checks, the "Attention Humans" message effectively tested the emotional or moral appeal. "My Bear Story" was effective in creating a mental image in the minds of respondents. Such elicitation of elaboration – causing people to think about the message – and emotion are desirable outcomes for message designers. Messages that generate emotion and elaboration are more likely to be retained in memory, and therefore to be available at a later time to influence behavior. "Top 10 Reasons" was considered to be most humorous as expected. The telegraphic-title treatment "Leave it in the Locker – Not in Your Car" was successful in telling respondents what the message was without reading further. The park message "Black Bears and Human Food" was rated as least vivid of the message treatments, which was also expected.

Observations. According to our sign experiment that tested different narrative structure using vividness and novelty, we found that 50-70% of the time people engaged with the signs (either glancing or viewing the message for an extended period). Interviews with visitors revealed that most often the bright yellow color and the graphic of the bear on the sign attracted their attention. Thus, short, bright signs are able to capture attention. More variation in attention paying behavior occurred between hikers and Curry Village visitors than with Upper Pines campers. Fewer Curry Village visitors stopped to read the signs. These findings suggest that the location of a sign will affect how often it is read, and moreover, that the reading patterns across locations for a given sign will vary with the sign itself.

Interviews. According to interviews with campers and hikers, sign design elements (i.e., color, graphics) had the most influence in capturing attention of passersby. The topic of bear safety is highly familiar to Yosemite visitors, and measures of their preference for delivery of

information (narrative structure) produced mixed results. The telegraphic-title message "Leave it in the Locker – Not in Your Car" and the park message "Black Bears and Human Food" were seen as more similar to other park messages, while the other three test messages were considered more unexpected due to the narrative structure. Messages "Attention Humans" and "My Bear Story" received more positive comments about the narrative structure. Most statistically significant differences between sign treatments were found between the humor message "Top 10 Reasons" and the existing park message "Black Bears and Human Food." This indicates that the humor message may be most novel and unexpected to visitors compared to existing park messages.

Additional implications for YOSE include the possible need to stop making messages people like, and make ones that encourage them to think about their behavior. The standard "Park Message" treatment was the only sign that mentioned law. Maybe stressing enforcement has more impact on behavioral intention than funny, novel signs. These findings are consistent with other research. Although visitors may like a message, this doesn't mean they will either read it or conform to suggested behavior. These findings reinforce the need for observational data.

STUDY 2: Perceived Risk and Knowledge Transfer

Objectives

Past research has shown that the great majority of Yosemite Valley visitors know about proper food storage, and that overnight visitors generally have a high level of familiarity or experience with the park. The objectives of Study 2 were (1) to determine the effects of different message formats and visitors' familiarity with the park on visitors' perceptions of risk related to human-bear interactions, and (2) to understand how the different messages affect knowledge

gained.

Study Area and Population

The study population was defined as all visitors to YOSE who camped at North and Lower Pines Campgrounds between August 1 and September 30, 2002. As with Study 1, we would prefer to generalize to a larger population of YOSE visitors, yet the logistics required to place treatment flyers on the windshields of vehicles in the early morning hours required us to restrict our sampling to locations in Yosemite Valley.

North and Lower Pines Campgrounds. The primary campgrounds involved in this study were North and Lower Pines, chosen to represent the typical camping experience in Yosemite Valley. To better ensure that respondents were exposed to test messages (flyers), they were placed on vehicle windshields at individual campsites. This method would have proved difficult at other more developed accommodations with parking lots because of the need to cross reference license plate numbers with the cabin, canvas tent or lodge room number.

Message Treatment Justification

Both treatments in study 2 were designed to test visitors' perceived risk, which is important to consider because it has the potential to influence a visitor's intent to seek out, attend to, and encode warning information related to bears and to comply with warnings. According to Young and Lovvoll (1999), the most commonly researched attitude in the warning and safety literature is perceived risk, defined as the perceived chance of injury, damage, or loss. A well-tested theory that helps in understanding perceived risk is Protection Motivation Theory (Rogers & Prentice-Dunn, 1997). According to this theory, recipients' perceptions of vulnerability, severity, response efficacy, and self-efficacy arouse "protection motivation," which then

supports acceptance of the message recommendation. In the context of designing effective warning messages that target food storage behavior in Yosemite, this theory proposes that protection motivation behavior is a person's desire or willingness to store their food properly. Perceived vulnerability (PV) reflects the person's judgement of the likelihood that they will have a bear-related incident. Perceived severity (PS) judges the severity of the consequences, should a bear-related incident occur. Response efficacy (RE) is based on the belief that the recommended action of proper food storage is effective in reducing the risk and/or mitigating the effects of a bear-related incident. Self-efficacy (SE) reflects the belief that one can successfully perform the coping response (properly store food). To summarize, visitors will be more likely to engage in self-protective behaviors (1) if they perceive that they are vulnerable to a risk and that the risk is severe; (2) if they know the behavior to do and they think it will help remove the risk; and (3) if they feel able to engage in the behavior. The two treatments targeted these factors in different ways.

Experimental Stimuli

Two messages were designed to test the effects of familiarity with the park on visitors' perceived risk and the topic of bears, and the concept of vividness. Messages were printed on 8 ½" x 5 ½" colored paper. The titles were identical, both used a bullet format, the messages were similar in length (101 & 115 words), and both messages had a line drawing of a black bear (Figure 9). Message content was similar in addressing the four concepts of Protection Motivation Theory: perceived vulnerability, perceived severity, response efficacy, and self-efficacy. The primary difference between the messages was the type of vividness style. One style incorporated statistical evidence, the other used a narrative or story format.

Treatment 1 – Vivid statistic. Statistical evidence can be persuasive (Slater & Rouner,

2002). However, it's often not highly engaging. Treatment 1 used statistics, but tried to make them engaging by making them vivid (see Figure 9).

ACTIVE BEAR AREA:
AVOID DAMAGE & EMBARRASSMENT

Did You Know:

- In 2000, a total of 431 bear incidents were reported in Yosemite Valley. Many more were never reported. Don't become a statistic yourself.
- Yosemite visitors suffered more than $500,000 in property damage by leaving things like baby seats and empty ice chests in their locked cars.
- In 2001, visitors reduced bear-caused property damage by 85% just by using their food storage lockers 24 hours a day.
- Using storage lockers is easy and it only takes 2-3 minutes of your time.

Avoid property damage and an embarrassing moment!

Figure 9. Treatment Design for Study 2

Treatment 2 – Vivid Story. Whereas treatment 1 used vivid statistics, treatment 2 used a vivid story. Anecdotes or narrative forms have been found to be inherently engaging and easily processed, partly because concrete examples are more readily assimilated and memorable (David, 1998; Anderson, 1983).

Methods

A questionnaire was administered after individuals had an opportunity to be exposed to the messages. Questions pertained to visitors' perceived vulnerability, perceived severity, response efficacy, and self-efficacy regarding experiencing a bear incident. Questions also included several test-like recall questions about topics presented in the messages.

Message Treatment Content

Message Treatment 1 (Vivid Stats). Message text in Tahoma font (12 point):

ACTIVE BEAR AREA: AVOID DAMAGE & EMBARRASSMENT

Did You Know:

- In 2000, a total of 431 bear incidents were reported in Yosemite Valley. Many more were never reported. Don't become a statistic yourself.
- Yosemite visitors suffered more than $500,000 in property damage by leaving things like baby seats and empty ice chests in their locked cars.
- In 2001, visitors' reduced bear-caused property damage by 85% just by using their food storage lockers 24 hours a day.
- Using storage lockers is easy and it only takes 2-3 minutes of your time.

Avoid property damage and an embarrassing moment!

Message Treatment 2 (Vivid Story). Message text in Tahoma font (12 point):

ACTIVE BEAR AREA: AVOID DAMAGE & EMBARRASSMENT

Consider the case of Pat:

- Pat's been coming to Yosemite for years.
- Pat knows that bears damage cars and she often uses park storage lockers, even for canned goods, toothpaste, soap, and trash.
- On a recent visit, Pat was lazy one evening. She left a baby seat and empty ice chest in her locked car. At 2:00 a.m., a bear crushed her car window looking for food.
- After paying a fine and replacing the car window, Pat was upset with herself. It would have been so easy to use the locker. All of the other campers near Pat used lockers and had no problem!

Manipulation Checks

Similar to study 1, a series of manipulation check statements (e.g., "the message says

how likely visitors are to have a bear incident while visiting Yosemite," "the message explains how a visitor can reduce the chance of bear damage") was developed for subjects independent of the study to provide opinions about the two test treatments. As before, the purpose of these questions was to determine if the variables we were interested in manipulating with each individual treatment were conveyed accurately to the study respondents. Ideally, each construct would be rated similarly for the two treatments. If so, then any differences generated by the treatments could be attributed to narrative structure, rather than differential success in manipulating PMT constructs. About 100 manipulation checks (50 per treatment) were administered to randomly chosen campers on days between the occurrence of attention paying observations, interviews, and written surveys. Respondents were asked to read the test message and then respond to the statements. The final two questions asked about respondents' gender and number of visits to the park. See Appendix A for manipulation check forms.

Sampling Schedule

Sampling occurred on 30 days (3 treatment levels with 10 sessions per treatment). Each session lasted about 3 hours, (an hour in the morning to administer the treatment, followed by two hours of surveying in the evening), and the sample size was 100 per treatment, for a total sample of 300 (Table 21).

Table 21. Sampling Schedule for Study 2 at North and Lower Pines Campgrounds

Location	Treatment 1	Treatment 2	Control
Lower Pines	August 3 (Sa)	August 6 (Tu)	August 4 (Su)
	August 14 (W)	August 22 (Th)	August 15 (Th)
6:00-7:00 a.m. Treatment	August 27 (Tu)	September 20 (F)	August 28 (W)
4:30-7:00 p.m. Questionnaire	September 5 (Th)	September 11 (W)	September 6 (F)
	September 22 (Su)	September 28 (Sa)	September 23 (M)

North Pines 6:00-7:00 a.m. Treatment 4:30-7:00 p.m. Questionnaire	August 3 (Sa) August 14 (W) August 27 (Tu) September 5 (Th) September 22 (Su)	August 6 (Tu) August 22 (Th) September 1(Su) September 11 (W) September 28 (Sa)	August 7 (W) August 23 (F) September 2 (M) September 12 (Th) September 29 (Su)

Experimental Design

Visitors' perception of risk and knowledge of behavior were evaluated through written surveys administered to campers at their campsite at Lower and North Pines campgrounds. The experimental design is a 2 (sites) x 3 (treatments) design. Each treatment was administered on several different occasions – weekend blocks and weekday blocks (see Tables 22 and 23).

Table 22. Distribution of Written Questionnaires by Treatment

		Number of Sampling Periods		
		Vivid Stats	Vivid Story	Control
Day of week				
	Weekend	4	4	6
	Weekday	6	6	4

Table 23. Distribution of Written Questionnaires by Location

		All Treatments
Location	Day of Week	
North Pines	Weekend	7
	Weekday	8
Lower Pines	Weekend	7
	Weekday	8

On treatment days, one of two test messages was placed on 25-30 randomly selected vehicle windshields at individual campsites in the early morning (6 a.m.-7 a.m.). Campsite

numbers and vehicle license numbers were recorded where message flyers were placed. If campsite occupants were visibly awake around the campsite, no flyer was left, to avoid biasing responses. On control days, messages were not placed on vehicles. In late afternoon of the same day (between 4:00 p.m. and 6:30 p.m.) written surveys were administered to campers at their campsite. In order to assure individuals at that campsite had received a flyer in the morning, reference checks were made between site numbers and license plate numbers. An attempt was made to give a survey to one adult (16 years or older) at each campsite. The adult who was approached was randomly selected, and refusals were documented. We cannot guarantee that survey respondents were exposed to the message treatment, because it is possible that someone else in the group retrieved the flyer. However, we did ask a question on the survey to determine whether respondents saw the flyer. Campsites occupied by campground hosts, other Park volunteers, or staff were avoided during administration of the survey.

Instrument. The survey consisted of several components: A series of questions asked about visitors' perception of risk associated with various recreational activities while in the park; questions about visitors' familiarity with Yosemite and about a variety of activities they may have done while visiting; another series of questions asked about the amount of information they had received from the park with respect to various topics. The next series of questions asked specific questions about black bears and visitor safety while visiting Yosemite. Questions addressing visitors' perception of risks associated with bears asked the following: "How likely or unlikely is it that the following will occur during your camping trip to Yosemite Valley?," with options such as "my tent or camper is damaged by a bear looking for food," or "the window of my vehicle is broken by a bear," "How good or bad do you think the following situation would be for you if it happened to you during this visit?," with options such as "having a face to face encounter with a bear at my campsite" or "a bear eats food scraps it finds in my campsite," and

"How much do you agree or disagree with these statements about bears and your safety?," with statements such as "it's quite easy to scare bears away" or "it's no trouble for me to put my food and scented items in a storage locker." Knowledge questions were evaluated using 10 true-false questions about proper behavior in bear country. Finally, visitors were asked for demographic information and asked "Did you read the bear-related message left on the windshield of your vehicle?" Appendix C contains the survey instrument.

Data Analysis. The effect of test signs on perceived risk and knowledge was evaluated using ANOVA to compare the two treatments with the control. Bivariate and descriptive statistics were used to determine scores for ANOVA. The true-false test questions were coded as incorrect if respondents answered by marking "don't know" or gave the wrong response. Visitor responses about the amount of information they had received, and the demographic characteristics are presented as descriptive frequencies because these variables are not expected to vary with treatments.

Manipulation Check Summary

Both messages in study 2 were designed to attract and hold attention by being interesting and vivid. Manipulation checks confirmed that both messages achieved these characteristics to an equal degree (Table 24). The primary difference between the two was in the structure and tone – emotional story vs. concrete facts. Though respondents scored both as highly concrete, they rated the story as significantly more emotional (p=.000) and unusual (p=.020). Therefore, any differences created by the treatments could more plausibly be attributed to the narrative structure of the messages. Following Protection Motivation Theory, both messages were intended to convey vulnerability (PV) and severity (PS) and to increase response efficacy (RE) and self-efficacy (SE). Both messages rated highly on all four constructs.

Table 24. Mean Responses to Manipulation Checks

	Vivid Statistics	Vivid Story	F	p
Message indicates how likely visitors are to have a bear incident while visiting Yosemite (PV).	6.21	5.45	1.61	.207
The park should have more messages like this one.	7.86	7.18	1.88	.173
When I read this message, an image of a car came immediately to mind.	5.08	6.14	3.24	.075
Message tells how severe the consequences are if visitors don't store items properly (PS).	7.58	7.96	.468	.495
Message explains how a visitor can reduce the chance of bear damage (RE).	8.36	8.08	.392	.533
It will make most visitors worry about bear incidents.	6.18	6.22	.005	.942
Message will convince visitors to do the right thing.	7.16	7.08	.029	.865
Message addresses how much effort it takes visitors to store their items properly (SE).	6.80	6.10	1.65	.201

Scale: 1=Strongly Disagree; 10=Strongly Agree

Message Text is:

Unusual (1) vs. Typical (10)	7.98	6.84	5.60	.020
Abstract (1) vs. Concrete (10)	8.04	7.56	1.22	.272
Too Long (1) vs. Too Short (10)	5.91	5.60	.962	.329
Familiar (1) vs. Not Familiar (10)	3.96	4.87	2.68	.105
Believable (1) vs. Not Believable (10)	3.23	3.60	.351	.555
Boring (1) vs. Interesting (10)	7.15	6.72	.697	.406
Emotional (1) vs. Factual (10)	8.40	6.43	18.21	.000

Results – Study 2: Perceived Risk and Knowledge Transfer

Response Rates

In the campgrounds, 320 surveys were completed (114 control, 102 vivid statistics, and 104 vivid story). Response rates were high (93.3%) for this 7-page survey instrument. Among non-respondents, about 5% of all the visitors initially contacted refused to participate, most often due to limited time and being in a hurry to leave the campground. Slightly less than 2% of all

who agreed to participate in the survey failed to complete the questionnaire or leave it for the researcher to pick up at the campsite.

In response to the question "Did you read the bear-related message left on the windshield of your vehicle?," nearly one-third of the visitors in the control group (29%) said "yes" even though they did not receive a treatment flyer (see Table 25). This could in part be explained by violation warning flyers that were issued by rangers in the campground and left on the windshields of vehicles also. A greater percentage (83%) of the subjects who received the vivid story treatment said "yes," compared to 73% of the subjects who received the vivid statistics treatment. In considering results presented below, it is important to bear in mind that a reasonably large percentage of respondents may not have seen or read the flyers. To the extent that this occurred, any real differences among those who did actually read the flyers would be muted.

Table25. Responses to Receiving Bear-Related Message by Treatment

	Did you read the bear-related message left on your windshield?		
Treatment	----------*Percent*----------		
	Yes	No	Don't Know
Vivid Statistics	73	18	9
Vivid Story	83	14	3
Control	29	55	16

Demographic & Visit Characteristics

The average age of respondents was 43 years, with an even split between men and women (50.3% and 49.7% respectively). Campers were on average in groups with 4.5 people. No sociodemographic differences were found between treatment groups.

Overall, about 87% of the respondents were repeat visitors to YOSE. About 19% (59) had visited 2-3 times, 29% (90) visited 4-10 times, 16% (49) visited 11-20 times before, and 23% (73) visited more than 20 times prior. As indicated in other studies, the high levels of experience among campers may mean that campers have a high level of knowledge about park rules, management, the black bear problem, and other issues, because they may have been previously exposed to a variety of information about these topics.

Risk Perception

Visitors were asked to consider how risky nine activities would be to them personally if they were involved in them during their visit to Yosemite Valley (Table 26). The purpose of this question was to gain insight into visitors' perceptions of risk regarding a bear encounter in comparison with other park-related activities. Treatments were intended to influence perceptions of bear risks, but did not do so. The only differences were unrelated to the messages – campers in the control condition considered going on a guided nature walk significantly more risky than campers given the vivid statistics treatment ($F=6.34$, $df=2$, $p=.002$). The control group also considered bicycling along the valley bike path significantly more risky than the vivid statistics treatment group ($F=4.25$, $df=2$, $p=.015$). However, no significant differences across treatments were found in campers' risk perception of encountering a bear in their campsite. Risk was high (greater than 5.5) for all groups and did not increase with messages describing the risk. The perception of bear risk was almost as high as the risk of wading in the river above Yosemite Falls and hang gliding off Glacier Point.

Table 26. Perceptions of Recreational Activities and Risk Level[1]

Activity	Vivid Stats	Vivid Story	Control	p
	--------*Average*--------			
Hiking up Half Dome	4.85	4.72	5.05	.383
Feeding the squirrels	4.46	4.43	4.25	.698
Taking a float trip down the Merced River	2.93	3.16	3.16	.541
Going on a guided nature walk	1.28	1.57	1.76	.002
Encountering a bear in your campsite looking for food	5.57	5.64	5.59	.960
Wading in the river above Yosemite Falls	5.62	5.85	5.59	.520
Feeding the deer	5.13	5.30	5.02	.552
Bicycling along the valley bike path	2.30	2.58	2.92	.015
Hang gliding off Glacier Point	6.35	6.54	6.33	.490

[1]Scale: 1=Not risky at all; 7=Very Risky

We compared visitors' degree of familiarity or experience with Yosemite and their perceptions of risk related to human-bear interactions. First time visitors were compared to repeat visitors (those having visited the park more than one time). First time visitors perceived all activities (Table 26) as being less risky than repeat visitors. Significant differences were found for the following activities: Hiking Half Dome (F=4.22, df=2, p=.041), feeding squirrels (F=18.27, df=2, p=.000), wading in the river above Yosemite Falls (F=6.25, df=2, p=.013), feeding deer (F=18.52, df=2, p=.000), and hang gliding off Glacier Point (F=5.75, df=2, p=.017). No difference was found between the two groups pertaining to encountering a bear in camp. Both first time and repeat visitors considered this fairly risky.

Familiarity

Campers were asked how familiar they were with seven aspects of Yosemite Valley (Table 27). Again, the purpose was to compare visitors' familiarity with bear-related activities to their familiarity with other activities in Yosemite Valley. Campers consider themselves very familiar with the use of food storage lockers and knowing what items need to be stored,

compared to many other aspects of the valley. Respondents who were given the vivid narrative treatment were significantly less familiar with dangerous wildlife in the park than the group receiving the vivid statistics treatment (F=3.29, df=2, p=.038), though neither differed from the control. Those who were given the vivid statistics treatment were significantly more familiar with how to use food storage lockers (F=5.31, df=2, p=.005), and with what items to store in the lockers (F=4.19, df=2, p=.016) than campers given the vivid story treatment. It is important to note that mean scores were so high on this 7-point scale (>6.5) that a ceiling effect may have occurred. Nevertheless, the finding that all three bear-related items scored more highly for the vivid statistics treatment may suggest that the flyer had some influence on respondents in that treatment group.

Table 27. Familiarity with Yosemite Valley[1]

Aspect	Vivid Stats	Vivid Story	Control	p
	---------*Average*---------			
Where to purchase food in the valley	6.61	6.28	6.27	.077
The Yosemite Valley Plan	4.25	4.22	4.15	.934
Things to see and do in the valley	5.99	5.65	5.71	.166
*Dangerous wildlife in the park	6.21	5.75	6.03	.038
*How to use food storage lockers	6.93	6.64	6.84	.005
Shuttle bus schedule in the valley	5.54	4.94	5.19	.099
*What items need to be kept in food storage lockers	6.84	6.52	6.74	.016

[1]Scale: 1=Not at all familiar; 7=Very Familiar
* Denotes items related to human-bear-related conflicts

Behavioral Intention

We asked campers to answer a series of eight questions about their behavioral intent regarding various activities during their visit, with the purpose of comparing activities related to bear safety and other activities in the park (Table 28). The only significant difference among the three treatments was that respondents exposed to the vivid story treatment had significantly less

intention of attending an evening campfire program compared to the control treatment (F=3.33, df=2, p=.037). In the case of responses related to human-bear issues (see asterisked items in Table 28), no significant differences emerged across treatments. Thus, even though those receiving the vivid statistics felt more knowledgeable, their behavioral intentions were no stronger than members of the other two groups.

Table 28. Visitor Activity Intentions During Visit[1]

Activity	Vivid Stats	Vivid Story	Control	p
* Drive at safe speeds in the park	6.69	6.63	6.75	.668
Have a campfire during my visit	6.23	6.57	6.12	.139
Recycle glass and cans	6.19	6.00	5.94	.469
Go to the visitor center	5.85	5.51	5.55	.309
*Put my dishes in the storage locker when not using them	5.17	4.97	5.24	.681
Attend an evening campfire program	4.11	3.64	4.37	.037
* Use my dishwater to put out my campfire	2.61	2.47	2.88	.375
* Lock my cooler in my vehicle at night	1.63	1.96	1.76	.465

[1]Scale: 1=I definitely won't; 7=I definitely will
* Denotes items related to human-bear conflicts

In comparing first time and repeat visitors and their perceived risk of bear-related incidents, the less familiar group had a greater intention to put dishes in the locker when not using them (F=6.12, df=2, p=.014). In comparing the other bear-related items in terms of behavioral intent, no other major differences were found between these two groups.

Information Recalled

We evaluated the amount of information that visitors recalled seeing or reading about various topics during their park visit to assess whether visitors feel they are being exposed to too much or too little information about bears. The question asked them to indicate, for each individual topic, if they had seen or heard "not enough information," "too much information,"

"just the right amount," or if they "didn't know" (Table 29). As expected, none of the variables showed significant differences between treatments. Of interest is that the three highest percentages in the "too much information" category are about bear safety information (in bold font). Yet, the majority of responses to the bear related topics indicate that the amount of information received is "just right."

Table 29. Amount of Information Recalled by Visitors

Topic	Not enough info.	Just right for me	Too much info.	Don't Know
	----------*Percent*----------			
* How to store my food properly	3.8	66.5	**29.4**	.3
* What to do if I encounter a bear	6.7	64.4	**26.3**	2.6
* What items to store in lockers other than food	16.2	59.4	**21.2**	3.2
Campground rules and regs.	10.5	70.2	18.7	.6
Activities to do during my visit	9.9	69.6	17.9	2.6
Directions on how to get around	13.2	70.6	14.5	1.6
History of Yosemite	23.1	61.4	11.0	4.5
Meadow restoration	29.8	46.8	10.9	12.5
What to do if I encounter a deer	23.0	47.3	8.9	20.8
Pets in Yosemite	22.7	52.4	8.3	16.6
What to do if encounter a mountain lion	43.5	34.3	7.3	14.9
Yosemite Valley Plan	25.3	35.8	7.1	31.6

* Denotes items related to human-bear conflicts

Recent Bear Incidents

The majority of the remaining questions asked campers about black bears and human safety while visiting Yosemite. When asked if the number of problems with bears and visitors had increased or decreased from recent years in Yosemite Valley, over 132 (40%) respondents stated they had increased, but 90 (30%) said they had decreased (Figure 10). We realize visitors could have interpreted this question in different ways. Yosemite officials reported that the

incidents have decreased (since 1998), but visitors to the valley in 2002 heard and saw information about increases in incidents from 2001. This could confound interpretation of these results. No statistically significant differences were found between treatments in response to this question. Thus, treatments did not appear to influence perceived vulnerability, at least according to this measure.

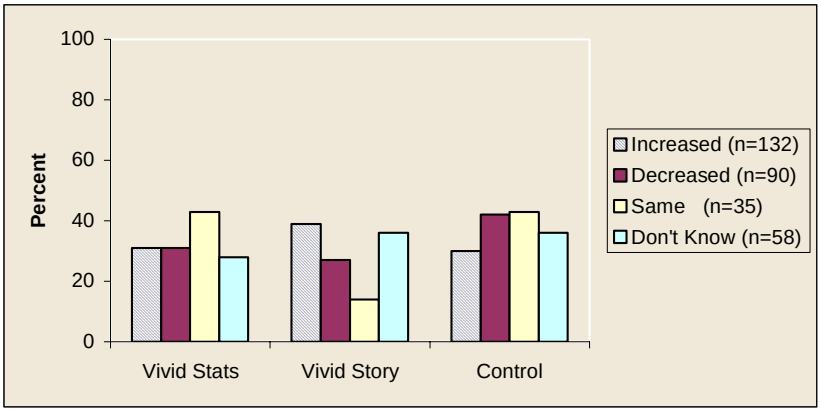


Figure 10. Visitor Knowledge of Bear Incidents in Yosemite Valley by Treatment

Perceived Vulnerability

A set of nine questions addressed visitors' perceived vulnerability to experiencing specific types of bear related incident during their visit. The question asked respondents to rate how likely they thought various situations would occur during their camping trip, with 1=not likely at all, and 7=very likely (Table 30). The only significant difference between treatments was with the vivid story treatment. Visitors receiving this treatment were significantly more likely to believe a ranger would give a citation for not storing food correctly, compared to responses from the vivid statistics treatment ($F=3.55$, $df=2$, $p=.030$). There were no significant differences between the treatments and the control. Thus, the treatments did not alter perceptions of vulnerability.

Table 30. Mean Ratings of Perceived Vulnerability to Bear Related Incidents

	Vivid Stats	Vivid Story	Control	p
	----------*Mean*----------			
I see a ranger during my visit.	6.59	6.49	6.46	.731
A bear is seen in the campground.	5.20	5.52	5.23	.342
A bear wanders through my campsite.	4.67	4.91	4.76	.601
My tent or camper is damaged by a bear looking for food.	2.13	2.51	2.50	.110
The window of my vehicle is broken by a bear.	1.97	2.30	2.24	.220
A ranger gives me a citation for not storing my food the right way.	1.74	2.42	2.05	.030
A bear gets food from my cooler.	1.58	2.07	1.99	.066
My vehicle hits a bear along the roadway.	1.44	1.74	1.65	.127
A member of my group gets injured by a bear.	1.41	1.52	1.60	.364

Scale: 1=Not likely at all; 7=Very Likely

Campers did not consider it very likely that a bear would break into their vehicle, that their vehicle would hit a bear on the road, that a bear would get food from their cooler, that a member of their group would get injured by a bear, or that a ranger would give them a citation for improper food storage. Visitors considered it more likely that they would see a ranger and see a bear in the campground, even in their campsite.

Less familiar park visitors considered it more likely that a bear would damage their tent or camper (F=9.91, df=2, p=.002) than more familiar visitors. The degree of familiarity with the park did not seem to influence visitors' responses about perceived vulnerability toward other bear-related incidents.

Perceived Severity

Campers were next asked a set of eight questions that assessed the perceived severity of various bear-related incidents. Respondents were asked to rate how good or bad they thought various situations would be for them if they occurred during their visit (Table 31). The only

significant difference was that the control group believed it would be significantly more serious to see a bear wandering around on the other side of the campground, compared with responses from visitors who received the vivid statistics treatment (F=3.06, df=2, p=.049). Thus, the treatments did not alter perceived severity. Several of the items were rated as very serious by all groups, and therefore a ceiling effect may have occurred.

Table 31. Mean Ratings of Perceived Severity of Bear Related Incidents

	Vivid Stats	Vivid Story	Control	p
	----------*Mean*----------			
A bear injures someone in my group.	6.84	6.67	6.87	.247
My vehicle hits a bear while driving in the park.	6.48	6.43	6.52	.869
A bear breaks a window of my vehicle.	6.13	5.89	6.34	.076
Being issued a fine by a ranger for not using my food locker.	5.94	5.80	5.97	.714
Having a face to face encounter with a bear at my campsite.	5.39	5.51	5.81	.237
A bear eats food scraps it finds in my campsite.	5.42	5.41	5.61	.686
My ice chest is damaged by a bear.	4.66	4.63	4.96	.403
Seeing a bear wandering around on the other side of the campground.	2.76	3.32	3.37	.049

Scale: 1=Not at all serious; 7=Very Serious

In terms of park familiarity, first time park visitors rated the situations in Table 31 as less serious than repeat visitors. Repeat visitors considered it significantly more serious if a bear injured someone in the group (F=8.29, df=2, p=.004) and if a bear ate food scraps at their campsite (F=7.12, df=2, p=.008). The exception was that first time visitors considered it more serious if a bear was seen wandering on the other side of the campground (F=11.62, df=2, p=.001) than did more experienced or familiar visitors.

Overall, people think most consequences are serious, but they do not think that those events are likely to happen. Damage to vehicles is perceived as much more serious than other types of incidents; therefore the park should focus messages on the likelihood of damage to cars.

Self-Efficacy

The next ten questions addressed campers' evaluation of their perceived ability to take various actions (self-efficacy) that relate to human-bear incidents. Respondents were asked to indicate how much they agreed or disagreed with the statements about bears and their safety (Table 32). No significant differences were found between treatments and the control. Many of these statements were not the direct target of the treatments, so the similarity among the groups was not surprising.

Table 32. Mean Ratings of Perceived Ability to Act in Bear Related Situations

	Vivid Stats	Vivid Story	Control	P
	----------*Mean*----------			
Making noise, yelling, and clapping if a bear comes around will better assure that nobody in my group is injured by a bear.	5.76	5.76	6.02	.402
It's no trouble for me to put my food and scented items in a storage locker.	5.95	5.97	5.85	.876
If I remove every scrap of food and other items with odors from my locked vehicle, the bears won't be interested in breaking into it.	5.14	5.21	5.28	.873
I know that I can fit everything into the storage locker, including my cooler, canned goods, and other scented items.	5.45	5.38	5.22	.752
Bears will come through the campground no matter what I do to store my food.	4.50	4.52	4.66	.841
It's quite easy to scare bears away.	4.56	4.18	4.15	.192
It's inconvenient to have to put things away every time I leave my campsite unattended.	3.21	3.20	3.32	.915
Leaving my dishes out during the day has little effect on what bears do.	2.46	2.92	2.53	.169
At night I may be too tired to check that all my food, toothpaste, and other items are stored in the locker.	1.84	2.21	2.05	.301
For me it is a hassle to empty my vehicle of food and other scented items and place them in a storage locker.	1.91	2.38	1.95	.107

Scale: 1=Strongly Disagree; 7=Strongly Agree

Campers more familiar with Yosemite agreed more strongly than less familiar campers

that bears will come through camp no matter what is done (F=9.87, df=2, p=.002), and repeat visitors disagreed more strongly than less familiar visitors that at night they may be too tired to check that all items are stored in the locker (F=4.80, df=2, p=.029).

Overall, campers considered it somewhat difficult to scare bears away and believed there was a good chance that bears would come through the campground no matter what they did to store their scented items. Even though respondents said it was no trouble to put things away every time they left the campsite unattended, it was inconvenient for many people.

Knowledge Transfer

Altering specific knowledge about behaviors was not the primary purpose of this study. Instead, the treatments sought to alter perceptions of vulnerability, severity, and ability to control outcomes. However, the flyers did address a few behaviors and items to be stored in lockers. Therefore, we examined the data to determine whether knowledge differed across treatments. Although we did not expect many differences, the pattern of findings for the respondents as a whole may be of interest to park staff.

Respondents were asked a series of true-false questions that included a “don’t know” option. Campers seem accurately informed about four of these items, but responses to a majority of items indicate campers need to be better informed. Of interest is the only significant difference among treatments. Both the vivid statistics and vivid story treatments included information about not leaving baby seats in vehicles. Respondents who received the control treatment answered this knowledge question incorrectly significantly more than the other two treatment respondents (p=.020). Additionally, the vivid story treatment respondents correctly answered this question more often (58%) than the vivid statistics treatment respondents (52%), although this difference was not significant. Both vivid treatments included statements about bears being attracted to toothpaste and soap and being tempted by empty ice chests left in

vehicles. The question most difficult to respond to was "It's OK to leave a sleeping bag in my vehicle." The question was designed to see if visitors know that items such as covers or sleeping bags left in a vehicle are potential temptations for bears to "investigate further." The park may be concerned that only 24% of the respondents answered this question correctly. Table 33 provides the correct answers in bold type.

Table 33. Campers' Knowledge about Bears and Visitor Safety for All Treatments[1]

	True	False	Don't Know
	--------*Percent*-------		
Bears are attracted to toothpaste and soap.	**93.9**	1.0	5.1
If a bear approaches, your group should spread out.	5.4	**70.5**	24.1
The less equipment you keep in your vehicle, the less likely a bear will break into it to investigate.	**79.3**	9.9	10.8
I need to store my food, scented items and trash in my vehicle after dark only, not during the day.	1.3	**97.8**	.9
*It is OK to lock my canned goods, bottles and drinks in my vehicle if they're covered and unopened.	12.9	**81.7**	5.4
*Campers should store baby seats in their locked vehicle.	15.9	**48.4**	35.7
*Leaving an empty ice chest in my locked vehicle is a temptation to a bear.	**94.0**	2.5	3.5
A bear may check storage lockers to see if they're secured.	**92.4**	1.9	5.7
It's OK to leave a sleeping bag in my vehicle.	49.5	**23.5**	27.0
It's OK to leave pots and pans out over night if they're clean.	**31.3**	55.0	13.7

[1] **Correct answers in bold type**
* addressed in flyers. Note: no significant differences across treatments

Of potential concern to the park is that nearly 30% of the campers did not know that campers should stay close together, not spread out when near a bear. Nearly 20% of respondents were not sure about canned goods, bottles and drinks being safe in a vehicle if covered and

unopened. Obviously not all campers were concerned about baby seats, yet less than 50% realized that this was also a potential bear attractant. Generally, respondents in all three experimental conditions answered about 70% of these knowledge questions correctly (Figure 11), with the vivid story group answering correctly more often (74%) and the control group responding correctly 69% of the time. It is no surprise that the treatments did not increase knowledge scores because only a few of the knowledge items were targeted in the treatments. Evidently the treatments did not increase information seeking behavior among respondents.

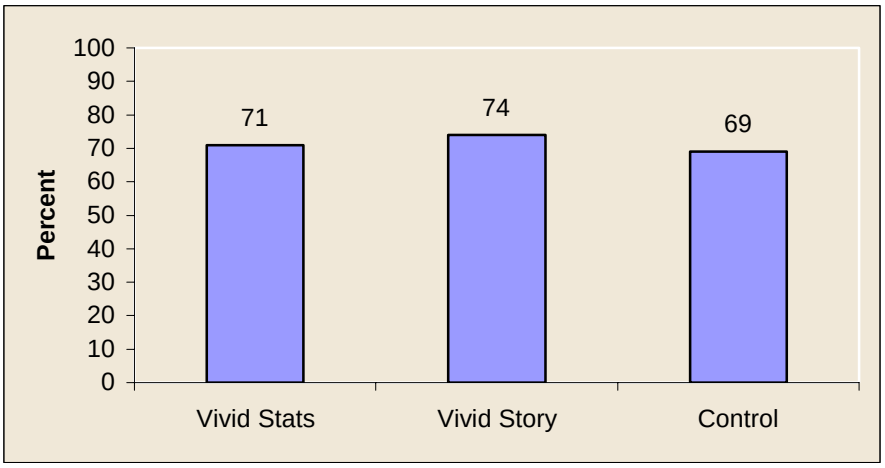


Figure 11. Overall Percentage of Correct Scores for Each Treatment

Figure 12 displays the distribution of correct knowledge scores and visitors' level of familiarity with Yosemite in terms of number of visits made to the park (e.g., first time visitors up to 20 or more visits). The data indicate that whether visitors were in the park for their first time or had been coming for years did not make a substantial difference in correct knowledge scores. Visitors who had been to park the most (20 or more times) did not know it all, and in many cases were no more likely to score higher in real knowledge than first-time visitors, despite the fact that some may perceive themselves to be experts. These findings demonstrate to the

park that even the seasoned veterans who claimed to know about the bear-related problems may not know everything necessary to avoid experiencing a bear related incident.

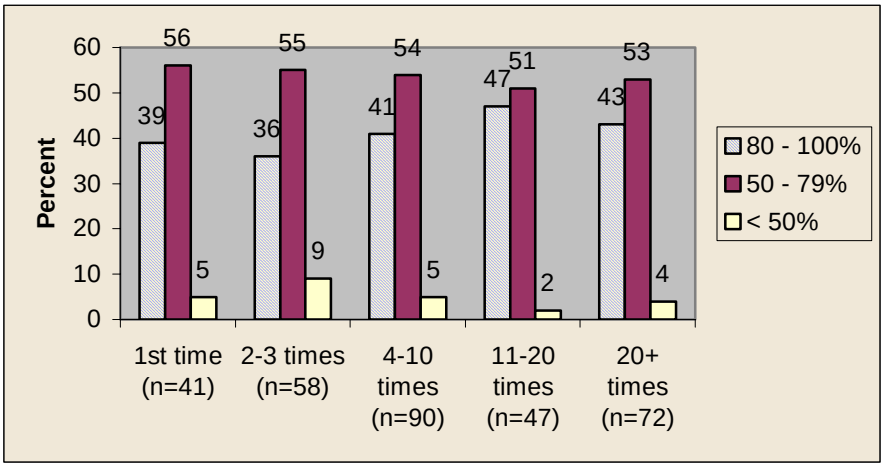


Figure 12. Percentages of Correct Knowledge Scores by Park Familiarity (n=308)

The final knowledge question assessed whether visitors knew the current fine for improper food storage. The question gave a series of options to choose from: $25, $45, $90, $300, and "I don't know." As shown in Figure 13, a large majority (83%) of the respondents did not know. We were told by park officials that the current fine was $45, although we found out later that there is actually a citation fee range between $45 and $150. A majority of citations were written for $45 up until 2002, but then the amount increased. The park may choose to reevaluate whether the fine for improper food storage should be publicized to visitors as a behavior motivator. In other studies, law enforcement presence or messages have been shown to be most effective in deterring non-compliant behavior (Swearingen & Johnson, 1995). It is likely the park realizes that the fee is not high enough to strongly motivate this relatively high-income visitor population. Based on our previous research, Yosemite Valley visitors' average income was high. Over 30% made more than $100,000 in 1999. Thus, a $45 fine may not be a deterrent.

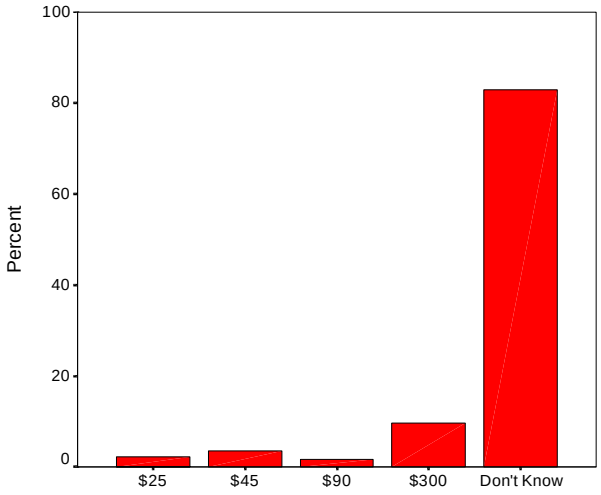


Figure 13. Campers' Knowledge of Improper Food Storage Citation Fine

Discussion and Implications

Perceived Risk and Knowledge Transfer

Familiarity. Generally, Yosemite Valley visitors are familiar or highly experienced park visitors who believe they "know about the bears" and many other park-related topics. These visitors are highly educated and they care about the bears in the park. Familiarity may relate to perceptions of risk due to first time visitors perceiving various park related activities as being less risky overall, compared to more familiar visitors. However, it seems that familiarity doesn't really relate to knowledge. Our study and others (e.g., Hall et al., 2001) indicate that substantial numbers of people could not answer important questions correctly. It is possible that Yosemite visitors have an established "going to Yosemite" schema, a term for a variety of memory structures that lead people to expect to see or experience certain things in certain settings.

Perceived Vulnerability. On the whole, the data indicated that visitors did not feel especially vulnerable to negative experiences involving black bears in the park. Campers

perceived themselves as not likely to have a member of their group injured by a bear, or to hit a bear while driving in the park, or to experience a bear getting food from their cooler, or to be issued a citation by a ranger for not storing food and items correctly. As most people's behavior is correct, it seems natural that the majority would not feel vulnerable. They considered it more likely that they would see a bear in the campground, that a bear would wander through their campsite, and that they would see a ranger during their visit. First time visitors considered it more likely that a bear would damage a tent or camper compared to repeat visitors.

Perceived Severity. Visitors thought that most consequences involving bears were serious, yet they did not believe that those events were likely to occur. Campers perceived the most serious bear-related incidents to include a member of their group being injured by a bear, their vehicle hitting a bear along the road, or if a bear broke a window of their vehicle. They were least concerned if they saw a bear wandering around on the other side of the campground or if their ice chest was damaged by a bear. First time visitors were generally less seriously concerned about bear incidents compared to more familiar visitors.

Self-Efficacy. On the whole, respondents felt they were capable of reducing the chances of having a negative experience involving a bear. Campers most strongly agreed that making noise, yelling, and clapping if a bear comes around would help to ensure that nobody in their group was injured by a bear, and that it was no trouble to put food and scented items in the storage locker. Campers most strongly disagreed that at night they may be too tired to check that all food and scented items were stored in the locker, or that it was a hassle to empty their vehicle of food and other items to store in the locker. Repeat visitors were more skeptical than first time visitors that they could prevent a bear incident, no matter how many precautions were taken.

PMT argues that to stop risky behaviors, people must feel sufficiently vulnerable, consider outcomes severe, and feel capable of acting effectively. In our study, visitors did not

feel vulnerable to the consequences they considered to be severe. The events they considered likely were not generally considered to have serious consequences. Our treatments did not succeed in changing their perceptions of risk, and therefore were unlikely to influence behavior.

In considering these outcomes, we believe that peoples' experience (e.g., "I've been coming to Yosemite for years and never had a bear problem") may be a more compelling source of evidence about the dangers associated with black bears than messages delivered to them by the park. This could explain why messages that were rated by visitors as interesting, and which targeted key points about risk and reducing risk, nevertheless failed to influence beliefs. Other studies (Manfredo & Bright, 1991; Roggenbuck, 1992) indicate that first hand experience is of key importance.

Behavioral Intent. In terms of behavioral intention, campers responded strongly that they would not lock a cooler in their vehicle at night, would not use dishwater to put out their campfire, and they intended to drive at safe speeds in the park. No notable differences were found between first time and repeat visitors' intentions. People thus have the right intentions, and it seems unnecessary for the park to focus additional efforts on communicating these behaviors. Instead, the park might consider focusing on factors that intervene between good intentions and actual behavior. Many factors can interfere between intentions and the behavior or action, such as food storage lockers that (1) are poorly designed, (2) are in need of maintenance or are dirty, (3) are too small in size, or (4) are inconveniently located.

Information Recall. Overall, campers considered the amount of bear information they were receiving as just right for them, although, compared to other park information, more campers commented that there was too much information about bear safety in the park.

Knowledge. On average, 70-75% of the campers were accurately knowledgeable about bear safety in Yosemite. Yet, despite the current communication effort targeting this problem,

visitors seemed to be missing some potentially important information. For example, a substantial percentage of visitors were not certain about what to do if they encountered a bear, or that canned goods, bottles and drinks needed to be stored in the locker, or that items such as a baby seat left in a vehicle were temptations for a bear. Additionally, a majority of campers did not know what the current fine is for improper food storage. If the park considers any of these items (e.g., baby seats) to be important for visitors to know, then signs must have an appearance that breaks through the initial "scan and judge" reaction of visitors. This is because many visitors believe they already know what to do and only glance at signs that seem to be giving a familiar message.

Summary of Enforcement Activities Monitored at YOSE

Following is a summary of our efforts over the three-year period to monitor the law enforcement activities, as requested by park staff. We addressed the findings from the first two years (2000 and 2001) in previous reports, and present findings from 2002 in this report.

Summer 2000

- Researchers atttended an Interpreter Training Session in the Valley to observe how rangers were trained for bear roving activities.
- A series of 13 formal interviews conducted throughout the summer with interdivisional bear program park staff – discussed enforcement and other issues
- Conducted a series of observations with the four divisions responsible for bear patrol efforts and other bear program tasks (Wildlife Mgmt., Visitor Protection, Campground Rangers and Interpretive Roving Rangers).

  Wildlife Mgmt. – On 3 separate occasions observed multiple individuals
  Visitor Protection – On 1 occasion observed 2 individuals
  Campground Rangers – On 3 occasions, observed 2 individuals
  Interpretive Roving Rangers – Observed 7 individuals

- Collected documentation regarding enforcement activities in the park

Summer 2001

- Made several requests for a report of food storage related citations during 1996-2000. Told information was not available via a database, and that only hard copies of warnings and citations were maintained by the park. Our data on the number of citations for 2001 was based on a database of bear incidents maintained by Wildlife Mgmt.
- Examined and collected data from interdivisional bear program log sheets and summarized efforts of park staff during 2000 and 2001 (See Interim Report November 2001).

Summer 2002

- Park officials were not easily able to provide these data because the written warnings and citation records were not maintained with any type of electronic database. As a result, we had to conduct a hand tally of these files with the assistance of park officials.
- Tallied the number of citations and written warnings issued for Improper Food Storage (IFS) 36 CFR section 2, for the five districts within the park (Valley, Wilderness, El Portal, Mather, and Wawona).

Following is a summary of law enforcement (LE) actions targeting IFS violations between 1997-2001. During the five-year period, approximately 429 warnings and citations were issued within the entire Park. Of those, 75.2% (321) were citations and 24.7% (106) were written warnings. Table 34 displays the number of citations and warnings issued by each Park District during the entire five-year period.

Table 34. District and LE Actions in YOSE (1997-2001).

	Citation	Warning	Total
District			
Valley	120	56	176
Mather	147	27	174
Wilderness	46	20	66
Wawona	2	2	4
El Portal	1	1	2
Total	**316**[1]	**106**	**422**

[1]Not equal to total of 321due to absence of location/district information on 5 citations.

Figure 14 displays the distribution of law enforcement actions across locations within the Park between 1997 and 2001. Of all five districts, the Mather District issued a greater proportion

of citations than warnings, while the other four districts issued a greater proportion of warnings than citations.

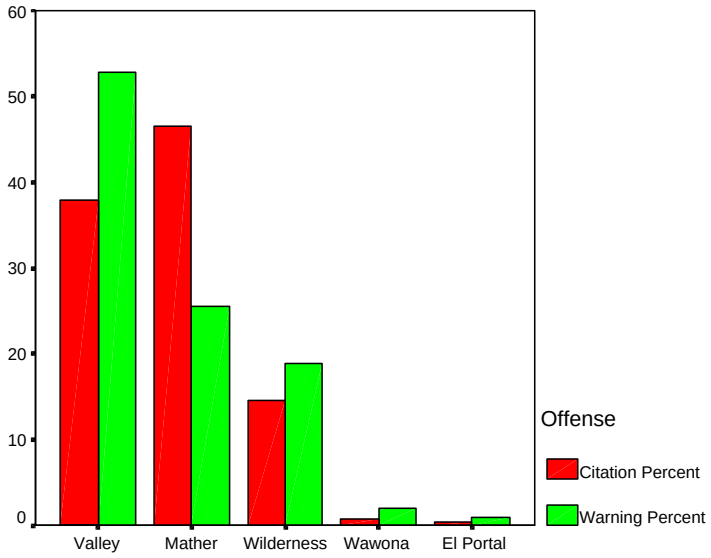


Figure 14. Percentages of LE Actions by District (1997-2001)

We looked at the breakdown of LE actions taken by Yosemite by individual year (see Figure 15). The peak effort occurred in 2000 with 83 citations issued and 52 warnings written. The least amount of LE action occurred in 1999, with 48 citations issued and 4 written warnings.

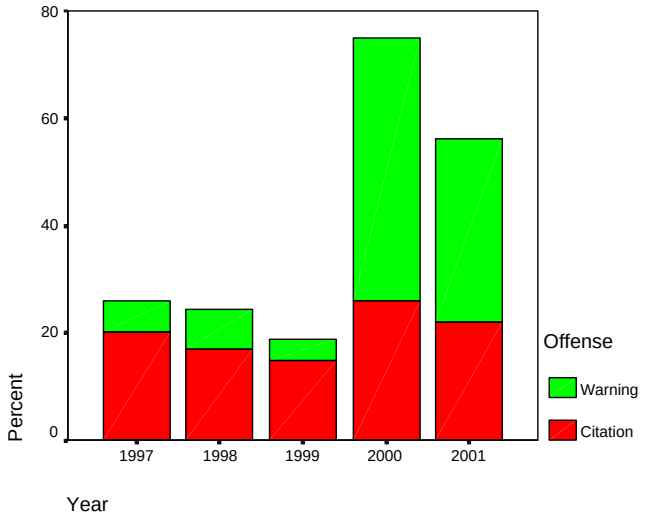


Figure 15. LE Actions of Park by Year

To break down this information further, we examined these efforts each year by individual district within the Park. In 1997, the Valley District issued 71.4% (45) of the citations and 33.3% (2) of the warnings. In 1998, the Valley issued 37.7% (20) of the citations with 50% (4) of the warnings. In 1999, 23.4% (11) citations were written in the Valley District, with no warnings written. In 2000, the Valley District issued 48.8% (40) citations and 55.8% (29) warnings. During 2001, a total of 5.6% (4) of the citations were written in the Valley District, with 58.3% (21) of the warnings issued for the entire Park. Table 35 provides a complete summary of law enforcement actions taken during each year and within each district.

Table 35. LE Actions by District by Year

Year	District	Citation	Warning	Total
1997	Valley	45	2	47
	Mather	15	4	19
	Wilderness	3	0	3
Total		63	6	**69**

Year	District	Citation	Warning	Total
1998	Mather	27	2	29
	Valley	20	4	24
	Wilderness	5	2	7
	Wawona	1	0	1
Total		53	8	**61**

Year	District	Citation	Warning	Total
1999	Mather	32	0	32
	Valley	11	0	11
	Wilderness	3	3	6
	Wawona	1	0	1
	El Portal	0	1	1
Total		47	4	**51**

Year	District	Citation	Warning	Total
2000	Valley	40	29	69
	Mather	34	17	51
	Wilderness	8	4	12
	Wawona	0	2	2
Total		82	52	**134**

Year	District	Citation	Warning	Total
2001	Mather	39	4	43
	Wilderness	27	11	38
	Valley	4	21	25
	El Portal	1	0	1
Total		71	36	**107**

Recommendations

Based on our findings during this 3-year research project, we note the following: Yosemite Valley is aggressively delivering information to park visitors about the human-bear problem in the park. Generally, park visitors are receiving the information that Yosemite is providing about bear safety, and they are highly familiar with the problems and how to prevent incidents from occurring. Visitors have a positive attitude towards the bears in the park and want them to be protected. For the small percentage of non-compliers, modifying the current communication system probably will not produce significant change in the behavior of those visitors. First time visitors tend to be seeking information about bears, while the majority of overnight visitors who have been coming to the park for years generally are not seeking this information. These repeat visitors admit to needing the reminders, and admit that they get lazy. Personal contacts by park staff (such as campground patrol rangers, roving interpreters and those conducting evening programs) need to be maintained to provide timely on-site reminders temporally close to visitors' opportunities to perform the desired behavior.

While we are not recommending specific message texts, we provide the following general suggestions for combating the "I already know it all" syndrome, as well as for improving the overall effectiveness of the current interpretive communication system that targets the human-bear problem:

- The need to combat the "I already know it all" syndrome is needed (1) when new bear related information is developed or (2) when people are not behaving properly and wrongly say they know what to do. If visitors see a sign that at first glance appears familiar, they are unlikely to read it thoroughly. Thus, new information buried within a seemingly "old" message will not reach the audience. New information might best be presented in very brief messages, ideally with a header that telegraphs the information or indicates that there is something new to learn. This would ensure that those who only glance will obtain the information.

- Sign messages must be brief and vivid. The vividness concept can be applied to a sign's color, font, other design elements, and a clear, bold theme-title that challenges the prevailing schema (e.g., "You Don't Know This—Bears Really Are Dangerous" or "What You As An Experienced Visitor Needs to Know," or "The Problem We Have At Yosemite Is That You Think You Already Know This").

- Three communication outcomes are important to differentiate: (1) Attention capture, (2) information processing and influencing peoples' beliefs, and (3) influencing people's behavior. Our findings indicate that if a goal of the park is to convey new information about bears to visitors, capturing attention may be a limiting factor, especially in certain locations. To increase attention capture, signs should be vivid and the location of the signs is key. Influencing people's beliefs may be more difficult than capturing their attention. The manner in which a person processes information is based in part on a person's prior knowledge and first hand experience, and it may be the case that highly experience Yosemite visitors rely on their experience rather than signs to guide their behavior. Thus, another challenge for the park is to change visitors' perceived vulnerability. Influencing behavior is more difficult than influencing beliefs. In Yosemite, people think bear incidents are serious, but unlikely. Unless both are high (i.e., bear incidents are considered serious and likely), then behavior change is unlikely. Our findings indicate that visitors' behavior is usually appropriate and that the park generally experiences a high level of compliance. We know why some violators do not comply. Reasons include laziness, the belief that "I didn't think it would happen to me," and a lack of convenience and ease of compliance. To better ensure compliance, the park should focus its' efforts on the ease of compliance, recall of proper behavior and law enforcement. It is inaccurate to assume that non-compliant behavior is a result of lack of knowledge.

- In Study 1, "My Bear Story" consistently received the most extended viewing, regardless of location. This message appeared to elicit mental imagery, evoke emotion, and cause visitors to think about the message. Other messages (such as "Top 10 Reasons") were rated as humorous and novel, but did not succeed in attracting attention very well. Thus, we tentatively suggest that new messages use the narrative story format, rather than relying solely on humor or other "novel" features.

- The narrative type messages could be complemented with more traditional messages that emphasize law enforcement and punitive outcomes. Visitors did not react negatively to such messages, and even said they caused them to consider their own behavior more often than the other signs.

- An important finding from Study 1 was that the location of the sign affected whether visitors attended to it. Not only were certain locations more likely to elicit attention, there was an interaction between location and sign, such that different signs were ignored in different locations. This suggests a need to carefully consider what information visitors may already possess and what their receptivity is at different locations. Before placing signs, the park should devote some time to observing behaviors in candidate locations.

- In study 2, we expected that the personal delivery of a flyer to campsites would be much more effective than signs placed at locations around the park. Unfortunately, this was not the case. Our two treatments had virtually no effect, despite their vivid designs. Although results may have been confounded by ceiling effects and by some respondents not actually seeing the treatments, it does not appear that this particular type of intervention is particularly useful in altering perceptions or stimulating knowledge search.

- According to the readability analysis of 140+ bear-related messages located in the Valley, most messages are at an appropriate reading ease level for park visitors, but dull to read.

Sign texts throughout the Valley can be edited to increase their human interest level. Refer to the Message Catalog (Lackey, Ham, & Quigley, 2002) for examples of current park messages that are ideally written with a high level of human interest and at an easy reading level.

- Visitors stated repeatedly that they wanted to see more information about bear biology, and less about proper food storage. The park should consider expanding its interpretation of bears as wildlife (to balance the current preponderance of regulatory messages focused on food storage) in order to create greater understanding about bears' conditioned behavior and why they behave the way they do.

- The communication efforts made by the park to date are largely effective. The park might consider the following as general guidelines as it continues to strengthen its bear communication program:

    - Development of a strong policy environment with consistent training and updating of all employees to better ensure visitors are receiving accurate, thorough, and consistent bear-related messages from all park employees. Currently some messages are inconsistent.

    - Improvement of the parks' interdivisional work unit efforts that focus on the human/bear management program. One individual should be assigned the leadership role, charged with coordinating the communication and management of human/bear-related tasks to all other park division staff.

    - Strong corrective action and enforcement for the small percentage of non-compliers and hard core deviants. Establish stronger Title 36 language for improper food storage violations (36 CFR section 2). Improper food storage violations are a primary concern, but a related concern is enforcement of campground site capacity regulations in the park.

    - Assurance that the food storage system is easy, accessible and convenient for visitors throughout the Valley (Adams et al., 1998). In some cases it is not convenient. For example, the storage lockers at Curry Village are located quite a distance from the overnight lodging units.

    - A sign system with a suite of duplicated messages located strategically (e.g., in locations where the decision is being made to store food properly or not). Use the Message Catalog (Lackey et al., 2002) as a tool for identifying where current bear messages are located in the Valley.

    - A change to the existing Yosemite schema (Werner et al., 1998) by designing messages in a new temporary look, in a relevant, and unexpected fashion. Messages are currently falling on deaf ears. An example of a temporary look with updated information is to place a dry erase board in campgrounds that would provide up to the moment bear-related information in that area.

    - Consider incorporating messages that target visitors' salient beliefs about proper food storage more, with less focus on targeting the problem only (see Interim Report May

2001). For example, a message that targets campers' concern about having food to eat might be: "ACTIVE BEAR AREA – If you want enough food for breakfast, then store your food and all smelly things in your storage locker!" (Include a bulleted list of items to store in locker).

- Continue providing bear messages via a wide variety of media to meet the different needs and preferences of the range of park visitors. Consider using multiple languages more often to convey this information. We heard this request repeatedly from visitors.

- Do not focus communication efforts solely on signs. If the park does focus on signs, the information must look new or else it may be ignored.

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Appendix A

Manipulation Check Forms

Attention Humans!

This is our home, and we've been here for a long time, living off natural food. But we're really tempted by your human food. Did you know that we can smell anything with an odor, including canned food, drinks, toiletries (like sunscreen, soap, toothpaste), and trash? When you don't store these things properly, we might break into your car, a backpack, or an ice chest that's left out. Sometimes we get hurt or killed just for liking your food. Don't help a good bear go bad.

Please do us both a favor and store your food and scented items the right way!

The Bears

Please indicate how much you agree or disagree with the following statements about the message you just read: *(please circle one response for each statement).*

	Strongly Disagree									Strongly Agree
The text catches my attention.	1	2	3	4	5	6	7	8	9	10
The park should have more messages like this one.	1	2	3	4	5	6	7	8	9	10
This message tells me something new.	1	2	3	4	5	6	7	8	9	10
The message makes me sympathize with bears.	1	2	3	4	5	6	7	8	9	10
The title of the message tells me what I need to know.	1	2	3	4	5	6	7	8	9	10
A mental picture came to mind when reading this message.	1	2	3	4	5	6	7	8	9	10
The text in this message seems like most other park signs I've seen in Yosemite.	1	2	3	4	5	6	7	8	9	10

I would rate this message as: *(please circle one response for each pair of words)*

Emotional	1	2	3	4	5	6	7	8	9	10	Factual
Unusual	1	2	3	4	5	6	7	8	9	10	Typical
Too Long	1	2	3	4	5	6	7	8	9	10	Too Short
Funny	1	2	3	4	5	6	7	8	9	10	Not Funny
Believable	1	2	3	4	5	6	7	8	9	10	Not Believable
Boring	1	2	3	4	5	6	7	8	9	10	Interesting
Unique	1	2	3	4	5	6	7	8	9	10	Ordinary
Abstract	1	2	3	4	5	6	7	8	9	10	Concrete
Vivid	1	2	3	4	5	6	7	8	9	10	Not Vivid
Convincing	1	2	3	4	5	6	7	8	9	10	Not Convincing

Finally, a couple of questions about you:

Are you male _____ or female _____?

How many visits have you ever made to Yosemite Valley? *(Please check one box).*

- ❑ This is my first visit
- ❑ 2-3 times, including this visit
- ❑ 4-10 times, including this visit
- ❑ 11-20 times, including this visit
- ❑ 20+ visits, including this visit

My Bear Story

A bear broke into my family's car last night. I was real scared. We accidentally left some cans of food, drinks, and trash in the car trunk. The bear made a huge mess of our car. It broke the back window and ripped up the backseat. Bears can sure smell things better than I can. Last we heard, they were tracking him down. It's too bad bears get hurt or killed just for liking our food.

Please be sure to put all of your food and smelly things in a locker!

Troy

Please indicate how much you agree or disagree with the following statements about the message you just read: *(please circle one response for each statement).*

	Strongly Disagree									Strongly Agree
The text catches my attention.	1	2	3	4	5	6	7	8	9	10
The park should have more messages like this one.	1	2	3	4	5	6	7	8	9	10
This message tells me something new.	1	2	3	4	5	6	7	8	9	10
The message makes me sympathize with bears.	1	2	3	4	5	6	7	8	9	10
The title of the message tells me what I need to know.	1	2	3	4	5	6	7	8	9	10
A mental picture came to mind when reading this message.	1	2	3	4	5	6	7	8	9	10
The text in this message seems like most other park signs I've seen in Yosemite.	1	2	3	4	5	6	7	8	9	10

I would rate this message as: *(please circle one response for each pair of words)*

Emotional	1	2	3	4	5	6	7	8	9	10	Factual
Unusual	1	2	3	4	5	6	7	8	9	10	Typical
Too Long	1	2	3	4	5	6	7	8	9	10	Too Short
Funny	1	2	3	4	5	6	7	8	9	10	Not Funny
Believable	1	2	3	4	5	6	7	8	9	10	Not Believable
Boring	1	2	3	4	5	6	7	8	9	10	Interesting
Unique	1	2	3	4	5	6	7	8	9	10	Ordinary
Abstract	1	2	3	4	5	6	7	8	9	10	Concrete
Vivid	1	2	3	4	5	6	7	8	9	10	Not Vivid
Convincing	1	2	3	4	5	6	7	8	9	10	Not Convincing

Finally, a couple of questions about you:

Are you male _____ or female _____?

How many visits have you ever made to Yosemite Valley? *(Please check one box).*

- ❑ This is my first visit
- ❑ 2-3 times, including this visit
- ❑ 4-10 times, including this visit
- ❑ 11-20 times, including this visit
- ❑ 20+ visits, including this visit

Top 10 Reasons to Put Your Stuff in the Locker

10. The rangers will like you a lot.
9. Avoid being dubbed the "park dunce" by your fellow visitors.
8. No forking out 500 bucks for the window that a bear busted out of your car.
7. Keep bears wild.
6. Have food left for breakfast in the morning.
5. Make your fellow campers way happy.
4. Avoid getting a ticket from a ranger.
3. Keep bears, squirrels, and raccoons away from camp.
2. Avoid the "aromas" that bears can leave behind in your car.
1. Keep bears from drinking all the beer in your cooler.

Please indicate how much you agree or disagree with the following statements about the message you just read: *(please circle one response for each statement).*

	Strongly Disagree									Strongly Agree
The text catches my attention.	1	2	3	4	5	6	7	8	9	10
The park should have more messages like this one.	1	2	3	4	5	6	7	8	9	10
This message tells me something new.	1	2	3	4	5	6	7	8	9	10
The message makes me sympathize with bears.	1	2	3	4	5	6	7	8	9	10
The title of the message tells me what I need to know.	1	2	3	4	5	6	7	8	9	10
A mental picture came to mind when reading this message.	1	2	3	4	5	6	7	8	9	10
The text in this message seems like most other park signs I've seen in Yosemite.	1	2	3	4	5	6	7	8	9	10

I would rate this message as: *(please circle one response for each pair of words)*

Emotional	1	2	3	4	5	6	7	8	9	10	Factual
Unusual	1	2	3	4	5	6	7	8	9	10	Typical
Too Long	1	2	3	4	5	6	7	8	9	10	Too Short
Funny	1	2	3	4	5	6	7	8	9	10	Not Funny
Believable	1	2	3	4	5	6	7	8	9	10	Not Believable
Boring	1	2	3	4	5	6	7	8	9	10	Interesting
Unique	1	2	3	4	5	6	7	8	9	10	Ordinary
Abstract	1	2	3	4	5	6	7	8	9	10	Concrete
Vivid	1	2	3	4	5	6	7	8	9	10	Not Vivid
Convincing	1	2	3	4	5	6	7	8	9	10	Not Convincing

Finally, a couple of questions about you:

Are you male _____ or female _____?

How many visits have you ever made to Yosemite Valley? *(Please check one box).*

- ❑ This is my first visit
- ❑ 2-3 times, including this visit
- ❑ 4-10 times, including this visit
- ❑ 11-20 times, including this visit
- ❑ 20+ visits, including this visit

Leave it in the Locker – Not in Your Car!

How do you keep your car, truck or van from being mangled by a bear?

- Don't leave food or scented things in autos.
  Bears break into cars for canned foods, drinks, toiletries (like sunscreen, soap, toothpaste), or trash. So thoroughly search your car!

- Store all food and scented things in the bear-proof storage lockers.
  Lockers are provided for your use and should be kept closed and latched at all times (not just at night)!

Protect your property and the lives of Yosemite bears!

Please indicate how much you agree or disagree with the following statements about the message you just read: *(please circle one response for each statement).*

	Strongly Disagree									Strongly Agree
The text catches my attention.	1	2	3	4	5	6	7	8	9	10
The park should have more messages like this one.	1	2	3	4	5	6	7	8	9	10
This message tells me something new.	1	2	3	4	5	6	7	8	9	10
The message makes me sympathize with bears.	1	2	3	4	5	6	7	8	9	10
The title of the message tells me what I need to know.	1	2	3	4	5	6	7	8	9	10
A mental picture came to mind when reading this message.	1	2	3	4	5	6	7	8	9	10
The text in this message seems like most other park signs I've seen in Yosemite.	1	2	3	4	5	6	7	8	9	10

I would rate this message as: *(please circle one response for each pair of words)*

Emotional	1	2	3	4	5	6	7	8	9	10	Factual
Unusual	1	2	3	4	5	6	7	8	9	10	Typical
Too Long	1	2	3	4	5	6	7	8	9	10	Too Short
Funny	1	2	3	4	5	6	7	8	9	10	Not Funny
Believable	1	2	3	4	5	6	7	8	9	10	Not Believable
Boring	1	2	3	4	5	6	7	8	9	10	Interesting
Unique	1	2	3	4	5	6	7	8	9	10	Ordinary
Abstract	1	2	3	4	5	6	7	8	9	10	Concrete
Vivid	1	2	3	4	5	6	7	8	9	10	Not Vivid
Convincing	1	2	3	4	5	6	7	8	9	10	Not Convincing

Finally, a couple of questions about you:

Are you male _____ or female _____?

How many visits have you ever made to Yosemite Valley? *(Please check one box).*

- ❑ This is my first visit
- ❑ 2-3 times, including this visit
- ❑ 4-10 times, including this visit
- ❑ 11-20 times, including this visit
- ❑ 20+ visits, including this visit

Black Bears and Human Food

Bears are active day and night. Proper food storage is required by federal law. Help protect your property and yourself. Do not leave food (even canned food), drinks, toiletries (like sunscreen, soap, toothpaste), and trash, or other items with an odor, in vehicles. When bears obtain human food, they lose their natural fear of people. Some bears with histories of threatening behavior must be killed.

Please be a responsible park visitor and store your food properly!

Please indicate how much you agree or disagree with the following statements about the message you just read: *(please circle one response for each statement).*

	Strongly Disagree									Strongly Agree
The text catches my attention.	1	2	3	4	5	6	7	8	9	10
The park should have more messages like this one.	1	2	3	4	5	6	7	8	9	10
This message tells me something new.	1	2	3	4	5	6	7	8	9	10
The message makes me sympathize with bears.	1	2	3	4	5	6	7	8	9	10
The title of the message tells me what I need to know.	1	2	3	4	5	6	7	8	9	10
A mental picture came to mind when reading this message.	1	2	3	4	5	6	7	8	9	10
The text in this message seems like most other park signs I've seen in Yosemite.	1	2	3	4	5	6	7	8	9	10

I would rate this message as: *(please circle one response for each pair of words)*

Emotional	1	2	3	4	5	6	7	8	9	10	Factual
Unusual	1	2	3	4	5	6	7	8	9	10	Typical
Too Long	1	2	3	4	5	6	7	8	9	10	Too Short
Funny	1	2	3	4	5	6	7	8	9	10	Not Funny
Believable	1	2	3	4	5	6	7	8	9	10	Not Believable
Boring	1	2	3	4	5	6	7	8	9	10	Interesting
Unique	1	2	3	4	5	6	7	8	9	10	Ordinary
Abstract	1	2	3	4	5	6	7	8	9	10	Concrete
Vivid	1	2	3	4	5	6	7	8	9	10	Not Vivid
Convincing	1	2	3	4	5	6	7	8	9	10	Not Convincing

Finally, a couple of questions about you:

Are you male _____ or female _____?

How many visits have you ever made to Yosemite Valley? *(Please check one box).*

- ❑ This is my first visit
- ❑ 2-3 times, including this visit
- ❑ 4-10 times, including this visit
- ❑ 11-20 times, including this visit
- ❑ 20+ visits, including this visit

ACTIVE BEAR AREA: AVOID DAMAGE & EMBARRASSMENT

Did You Know:

- In 2000, a total of 431 bear incidents were reported in Yosemite Valley. Many more were never reported. Don't become a statistic yourself.
- Yosemite visitors suffered more than $500,000 in property damage by leaving things like baby seats and empty ice chests in their locked cars.
- In 2001, visitors' reduced bear-caused property damage by 85% just by using their food storage lockers 24 hours a day.
- Using storage lockers is easy and it only takes 2-3 minutes of your time.

Avoid property damage and an embarrassing moment!

Please indicate how much you agree or disagree with the following statements about the message you just read: *(please circle one response for each statement).*

	Strongly Disagree									Strongly Agree
This message says how likely visitors are to have a bear incident while visiting Yosemite.	1	2	3	4	5	6	7	8	9	10
The park should have more messages like this one.	1	2	3	4	5	6	7	8	9	10
When I read this message, an image of a car came immediately to mind.	1	2	3	4	5	6	7	8	9	10
This message tells me how severe the consequences are if visitors don't store food and scented items properly.	1	2	3	4	5	6	7	8	9	10
The message explains how a visitor can reduce the chance of bear damage.	1	2	3	4	5	6	7	8	9	10
It will make most visitors worry about bear incidents.	1	2	3	4	5	6	7	8	9	10
This message will convince visitors to do the right thing.	1	2	3	4	5	6	7	8	9	10
The message addresses how much effort it takes visitors to store their food and scented items properly.	1	2	3	4	5	6	7	8	9	10

This message text is: *(please circle one response for each set of words)*

Unusual	1	2	3	4	5	6	7	8	9	10	Typical
Abstract	1	2	3	4	5	6	7	8	9	10	Concrete
Too Long	1	2	3	4	5	6	7	8	9	10	Too Short
Familiar	1	2	3	4	5	6	7	8	9	10	Not Familiar
Believable	1	2	3	4	5	6	7	8	9	10	Not Believable
Boring	1	2	3	4	5	6	7	8	9	10	Interesting
Emotional	1	2	3	4	5	6	7	8	9	10	Factual

Finally, a couple of questions about you:

Are you male _____ or female _____?

How many visits have you ever made to Yosemite Valley? *(Please check one box).*

- ❑ This is my first visit
- ❑ 2-3 times, including this visit
- ❑ 4-10 times, including this visit
- ❑ 11-20 times, including this visit
- ❑ 20+ visits, including this visit

ACTIVE BEAR AREA: AVOID DAMAGE & EMBARRASSMENT

Consider the case of Pat:

- Pat's been coming to Yosemite for years.
- Pat knows that bears damage cars and she often uses park storage lockers, even for canned goods, toothpaste, soap, and trash.
- On a recent visit, Pat was lazy one evening. She left a baby seat and empty ice chest in her locked car. At 2:00 a.m., a bear crushed her car window looking for food.
- After paying a fine and replacing the car window, Pat was upset with herself. It would have been so easy to use the locker. All of the other campers near Pat used lockers and had no problem!

Please indicate how much you agree or disagree with the following statements about the message you just read: *(please circle one response for each statement).*

	Strongly Disagree									Strongly Agree
This message says how likely visitors are to have a bear incident while visiting Yosemite.	1	2	3	4	5	6	7	8	9	10
The park should have more messages like this one.	1	2	3	4	5	6	7	8	9	10
When I read this message, an image of a car came immediately to mind.	1	2	3	4	5	6	7	8	9	10
This message tells me how severe the consequences are if visitors don't store food and scented items properly.	1	2	3	4	5	6	7	8	9	10
The message explains how a visitor can reduce the chance of bear damage.	1	2	3	4	5	6	7	8	9	10
It will make most visitors worry about bear incidents.	1	2	3	4	5	6	7	8	9	10
This message will convince visitors to do the right thing.	1	2	3	4	5	6	7	8	9	10
The message addresses how much effort it takes visitors to store their food and scented items properly.	1	2	3	4	5	6	7	8	9	10

This message text is: *(please circle one response for each set of words)*

Unusual	1	2	3	4	5	6	7	8	9	10	Typical
Abstract	1	2	3	4	5	6	7	8	9	10	Concrete
Too Long	1	2	3	4	5	6	7	8	9	10	Too Short
Familiar	1	2	3	4	5	6	7	8	9	10	Not Familiar
Believable	1	2	3	4	5	6	7	8	9	10	Not Believable
Boring	1	2	3	4	5	6	7	8	9	10	Interesting
Emotional	1	2	3	4	5	6	7	8	9	10	Factual

Finally, a couple of questions about you:

Are you male _____ or female _____?

How many visits have you ever made to Yosemite Valley? *(Please check one box).*

- ❑ This is my first visit
- ❑ 2-3 times, including this visit
- ❑ 4-10 times, including this visit
- ❑ 11-20 times, including this visit
- ❑ 20+ visits, including this visit

Appendix B

Study 1: Interview Protocol

Interview Form

"Hello. My name is _____. I'm from the University of Idaho, working on a project about your visit to Yosemite. May I take a few minutes to ask you a few questions? Your participation is voluntary and responses are confidential. Here is a card that describes the study." [Hand respondent the card.]

If no, "Thanks, enjoy your visit to Yosemite."

If yes, "Have you been contacted to participate in a study already during this trip?"

If yes, "Thank you for your time. We are only talking to people who have not already participated in a study."

If no, "I'd like to tape-record our conversation. This will make it go a little quicker than me writing down your answers. Is that ok?" [If they refuse to be tape-recorded, researcher will write down answers.]

If respondents are not in a place where they can see the sign, ask "May we step over here to look at this sign?"

1. What attracted your attention to this message?
2. What was your immediate reaction?
3. Does this message seem relevant or important to you?
4. Do you like it more or less than other messages you've seen in Yosemite?
5. Would you describe the information in this message as new or familiar to you?
6. For you personally, is this information unexpected or similar to what you've seen before?
7. Are there any things you particularly like about this message?
8. Are there any things you particularly dislike about this message?
9. Are you interested or disinterested in information about bears in Yosemite?
10. How much information have you seen about bears in Yosemite during this visit?
11. How long have you been in Yosemite Park so far on this trip?
12. Have you been to Yosemite before?
13. Have you been to this campground/trail before? How many times?

"Thank you for your help. Have a good visit to Yosemite."

Appendix C

Study 2: Survey Instrument

Yosemite Camper Survey

Your participation in this study will help the National Park Service provide a safe and enjoyable visit for park visitors. Thank you for participating in this study about your visit to Yosemite. Your participation is voluntary and any information collected will remain confidential.

OMB #1024-0224
NPS ID #02-018
Exp. Date: 03/31/2003

PRIVACY ACT and PAPERWORK REDUCTION ACT statement: 16 U.S.C. 1a-7 authorizes collection of this information. This information will be used by park managers to better serve the public. Response to this request is voluntary. No action may be taken against you for refusing to supply the information requested. Permanent data will be anonymous. Data collected through visitor surveys may be disclosed to the Department of Justice when relevant to litigation or anticipated litigation, or to appropriate Federal, State, local or foreign agencies responsible for investigating or prosecuting a violation of law. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

Burden estimate statement: Public reporting for this form is estimated to average 11 minutes per response. Direct comments regarding the burden estimate or any other aspect of this form to the Office of Information and Regulatory Affairs of OMB, Attention Desk Officer for the Interior Department, Office of Management and Budget, Washington, D.C. 20503; and to the Information Collection Clearance Officer, WASO Administrative Program Center, National Park Service, 1849 C Street, N.W., Washington, D.C. 20240.

I.D. # _____

Date _____

Location _____

Yosemite Visitor Survey

This section asks questions about your trip to Yosemite National Park.

1. How many visits (including this visit) have you ever made to Yosemite Valley?
(Please check one box).

- ❑ This is my first visit
- ❑ 2-3 times, including this visit
- ❑ 4-10 times, including this visit
- ❑ 11-20 times, including this visit
- ❑ More than 20 visits, including this visit

2. How many nights will you be staying in Yosemite Valley during this visit?

_____ Nights

This section asks about your perceptions of recreational activities while at Yosemite.

3. Please indicate how risky to you personally you would consider each of the following situations **if** you were involved in them during your visit to Yosemite Valley. *(Please circle one response).*

	Not risky At all			Neutral			Very Risky
a. Hiking up Half Dome	-3	-2	-1	0	+1	+2	+3
b. Feeding the squirrels	-3	-2	-1	0	+1	+2	+3
c. Taking a float trip down the Merced River	-3	-2	-1	0	+1	+2	+3
d. Going on a guided nature walk	-3	-2	-1	0	+1	+2	+3
e. Encountering a bear in your campsite looking for food	-3	-2	-1	0	+1	+2	+3
f. Wading in the river above Yosemite Falls	-3	-2	-1	0	+1	+2	+3
g. Feeding the deer	-3	-2	-1	0	+1	+2	+3
h. Bicycling along the valley bike path	-3	-2	-1	0	+1	+2	+3
i. Hang gliding off Glacier Point	-3	-2	-1	0	+1	+2	+3

This section asks about how familiar you are with Yosemite, and the activities you will be doing during your visit.

4. Please rate how familiar or unfamiliar you personally are with the following aspects of Yosemite Valley. *(Please circle one response).*

	Not at all Familiar			Neutral			Very Familiar
a. Where to purchase food in the valley	1	2	3	4	5	6	7
b. The Yosemite Valley Plan	1	2	3	4	5	6	7
c. Things to see and do in the valley	1	2	3	4	5	6	7
d. Dangerous wildlife in the park	1	2	3	4	5	6	7
e. How to use food storage lockers	1	2	3	4	5	6	7
f. Shuttle bus schedule in the valley	1	2	3	4	5	6	7
g. What items need to be kept in food storage lockers	1	2	3	4	5	6	7

5. Please indicate how much you personally plan to do the following activities during your visit to Yosemite Valley. *(Please circle one response).*

	I definately won't			Not sure			I definately will
a. Have a campfire during my visit.	-3	-2	-1	0	+1	+2	+3
b. Attend an evening campfire program during my visit.	-3	-2	-1	0	+1	+2	+3
c. Go the visitor center during my visit.	-3	-2	-1	0	+1	+2	+3
d. Lock my cooler in my vehicle at night.	-3	-2	-1	0	+1	+2	+3
e. Use my dishwater to put out my campfire.	-3	-2	-1	0	+1	+2	+3
f. Drive at safe speeds in the park.	-3	-2	-1	0	+1	+2	+3
g. Put my dishes in the storage locker when not using them.	-3	-2	-1	0	+1	+2	+3
h. Recycle glass and cans.	-3	-2	-1	0	+1	+2	+3

These questions ask about the amount of information you have received about various topics from Yosemite.

6. We would like you to evaluate the amount of information you have seen while visiting Yosemite. If you don't recall seeing or reading information about a topic, mark "I don't know."

	Not enough information		Just right for me		Too much information	I don't know
Topic						
Yosemite Valley Plan	-2	-1	0	+1	+2	❑
What to do if I encounter a deer	-2	-1	0	+1	+2	❑
Activities to do during my visit	-2	-1	0	+1	+2	❑
What to do if I encounter a bear	-2	-1	0	+1	+2	❑
Directions on how to get around	-2	-1	0	+1	+2	❑
How to store my food properly	-2	-1	0	+1	+2	❑
Pets in Yosemite	-2	-1	0	+1	+2	❑
History of Yosemite	-2	-1	0	+1	+2	❑
Meadow restoration	-2	-1	0	+1	+2	❑
What to do if I encounter a mountain lion	-2	-1	0	+1	+2	❑
What items to store in lockers other than food	-2	-1	0	+1	+2	❑
Campground rules and regulations	-2	-1	0	+1	+2	❑

This next series of several questions asks you specifically about black bears and your safety while visiting Yosemite.

7. As far as you know, have the number of problems with bears and visitors increased or decreased from recent years in Yosemite Valley? *(Please check one)*

❑ Increased ❑ Decreased ❑ Same ❑ I don't know

8. Please rate how likely or unlikely you think it is that the following will occur during your camping trip to Yosemite Valley. *(Please circle one response).*

	Not Likely At All						Very Likely
a. My tent or camper is damaged by a bear looking for food.	1	2	3	4	5	6	7
b. I see a ranger during my visit.	1	2	3	4	5	6	7
c. A bear wanders through my campsite.	1	2	3	4	5	6	7

	Not Likely At All						Very Likely
d. The window of my vehicle is broken by a bear.	1	2	3	4	5	6	7
e. A bear gets food from my cooler.	1	2	3	4	5	6	7
f. A bear is seen in the campground.	1	2	3	4	5	6	7
g. A member of my group gets injured by a bear.	1	2	3	4	5	6	7
h. My vehicle hits a bear along the roadway.	1	2	3	4	5	6	7
i. A ranger gives me a citation for not storing my food the right way.	1	2	3	4	5	6	7

9. Please indicate how good or bad you think the following situations would be for you if they happened to you during this visit. *(Please circle one response).*

	Not at all serious						Very serious
a. Seeing a bear wandering around on the other side of the campground.	1	2	3	4	5	6	7
b. A bear breaks a window of my vehicle.	1	2	3	4	5	6	7
c. Being issued a fine by a ranger for not using my food locker.	1	2	3	4	5	6	7
d. Having a face to face encounter with a bear at my campsite.	1	2	3	4	5	6	7
e. A bear injures someone in my group.	1	2	3	4	5	6	7
f. My vehicle hits a bear while driving in the park.	1	2	3	4	5	6	7
g. My ice chest is damaged by a bear.	1	2	3	4	5	6	7
h. A bear eats food scraps it finds in my campsite.	1	2	3	4	5	6	7

10. Please indicate how much you agree or disagree with these statements about bears and your safety. *(Please circle one response).*

	Strongly Disagree			Neutral			Strongly Agree
a. It's quite easy to scare bears away.	-3	-2	-1	0	+1	+2	+3
b. Leaving my dishes out during the day has little effect on what bears do.	-3	-2	-1	0	+1	+2	+3
c. Bears will come through the campground no matter what I do to store my food.	-3	-2	-1	0	+1	+2	+3
d. If I remove every scrap of food and other items with odors from my locked vehicle, the bears won't be interested in breaking into it.	-3	-2	-1	0	+1	+2	+3
e. At night I may be too tired to check that all my food, toothpaste, and other items are stored in the locker.	-3	-2	-1	0	+1	+2	+3
f. Making noise, yelling, and clapping if a bear comes around will better assure that nobody in my group is injured by a bear.	-3	-2	-1	0	+1	+2	+3
g. For me it is a hassle to empty my vehicle of food and other scented items and place them in a storage locker.	-3	-2	-1	0	+1	+2	+3
h. It's no trouble for me to put my food and scented items in a storage locker.	-3	-2	-1	0	+1	+2	+3
i. I know that I can fit everything into the storage locker, including my cooler, canned goods, and other scented items.	-3	-2	-1	0	+1	+2	+3
j. It's inconvenient to have to put things away every time I leave my campsite unattended.	-3	-2	-1	0	+1	+2	+3

11. We would like to know what you know about bears and your safety in Yosemite. *(Please place one **X** for each response).* If you don't know the answer, please mark "I don't know," instead of guessing.

	True	False	I don't know
Bears are attracted to toothpaste and soap.			
If a bear approaches, your group should spread out.			
The less equipment you keep in your vehicle, the less likely a bear will break into it to investigate.			
I need to store my food, scented items and trash in my vehicle after dark only, not during the day.			
It is OK to lock my canned goods, bottles and drinks in my vehicle if they're covered and unopened.			
Campers should store baby seats in their locked vehicle.			
Leaving an empty ice chest in my locked vehicle is a temptation to a bear.			
A bear may check storage lockers to see if they're secured.			
It's OK to leave a sleeping bag in my vehicle.			
It's OK to leave pots and pans out over night if they're clean.			

12. The current fine for improper food storage is: *(please check one response)*

❑ $25	❑ $45	❑ $90	❑ $300	❑ don't know

Finally, we would like some information about you. This will be used only for comparison purposes, to describe the type of people who visit Yosemite.
(Please mark one response for each question).

13. Are you male ___ or female ___?

14. What is your age? _____ years.

15. What is the highest level of education you have completed?

- ❑ Some high school
- ❑ High school graduate
- ❑ Some college or technical school
- ❑ Bachelor's degree or equivalent
- ❑ Master's degree or equivalent
- ❑ Ph.D., J.D., M.D.

16. Please mark the category that represents your total household income before taxes.

- ❑ Less than $20,000
- ❑ $20,000-$39,999
- ❑ $40,000-$59,999
- ❑ $60,000-$79,999
- ❑ $80,000-$99,999
- ❑ $100,000-$119,999
- ❑ $120,000 or more

17. Did you read the bear-related message left on your windshield?

❑ Yes ❑ No ❑ I don't know

Thank you for your time and effort to help us better understand how the National Park Service can help improve the quality and safety of your visit!

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