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A Note from the Editor

As many of you may have heard, the National Association for Interpretation (NAI) is undergoing reorganization and restructuring. This is a difficult and important process, and the ramifications could have ripple impacts for years to come. Because the process and impacts from it are so important, it has as its basis, research.

There were over 25 surveys and 15 focus groups conducted to ensure that decisions are made accurately and thoughtfully, and will result in the desired outcomes. According to the fact sheet put out by NAI, in addition to the data collected through the various methods, “The Board has held extensive discussions and appointed a task force to address the issues with the present organizational structure.” This process has taken well over a year and is not yet complete. From this process, some preliminary results have been put forth, including the goals for the organization and some basic tenants for moving forward. This draft document has been widely circulated and additional feedback and comments are being solicited to further refine the reorganization.

For the National Association for Interpretation, these changes and the impacts from them are critically important to the organization, its members, and the profession itself—and “getting it right” is not an option, it is a must. Because it is so critical to “get it right,” all of this work is a prime example of the importance and value of research. These changes were not suggested because someone wanted to do it, or because someone liked the idea, or because someone thought it would be successful. They are suggested as the result of careful data collection and analysis.

On the whole, why do we treat the practice of the profession of interpretation any differently? Are the goals we have for our individual parks and programs any less important? Are the training programs we use for new interpreters any less critical? Decisions such as how a program should be developed and delivered are often made based on individual preferences, agency requirements or status quo standards. The survival of interpretation depends on the critical examination of what is done, how it is done, and what results from it. Research is the foundation of the practice of the science of interpretation, and it is the only way that we will advance the profession.

I look forward to the future developments of our field through your quality submissions to JIR.

—C
RESEARCH
Improvisational Theater Games for Children in Park Interpretation

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Abstract
With children increasingly disconnected from nature and much interpretation geared toward adults, agencies need age-appropriate techniques for children. Improvisational theater games use group-based role-playing to solve problems through dialogue and activity in a creative, spontaneous, supportive, and interactive atmosphere. This paper highlights children’s enjoyment and perceived learning resulting from a new improvisation program in Banff National Park, Canada.

We thematically analyzed open-ended evaluations of an improvisation-dominated program. The activities enjoyed most included improvisation, because they involved fun, physical activity, creativity, challenge, and novelty. The least-enjoyed activities were physical activity games and an interpretive talk. Perceived learning was highest
from an interpretive talk and nature walk and least from games focused on physical or group activities. Most perceived and desired learning related to natural history and park management topics. Despite being nontraditional and non-thematic, improvisation can contribute to children’s enjoyment and perceived learning in park interpretive programs.

**Keywords**
improvisational theater games, children, national parks, evaluation, enjoyment, perceived learning

**Introduction**
Children are increasingly disconnected from the natural world due to urbanization, declining natural spaces, fear of the outdoors, and alternative access to the natural world through electronic media (Beck & Cable, 2002; Louv, 2005). Moreover, interpretation in many protected areas is geared toward adults (Parks Canada Agency, 2000), which is not necessarily effective for children (Beck & Cable, 2002). In order to effectively reach children, interpretive techniques and messages must be age-appropriate and relevant (Adamson, 2004; Wells & Lekies, 2006; Hvenegaard, Shultis, & Butler, 2009).

For Tilden (1977, p. 47), interpretation for children “should not be a dilution of the presentation to adults, but should follow a fundamentally different approach.” Two frameworks explaining the cognitive development of children can help design such an approach. For Vygotsky (1997), children’s cognitive development is socio-cultural in nature and continues throughout life. Thus, partners with similar levels of competence collaborate and interact with themselves, authoritative figures, and the environment to create new knowledge (Vasta, Miller, & Ellis, 2004). For Piaget, children’s cognitive development is universal and passes through several predictable stages (Singer & Revenson, 1996). For example, children aged 6–12 years (the concrete operational period) can deal with things that are tangible and real (Vasta et al., 2004). Piaget believes that children increase their learning when they are active participants and when a cognitive conflict is resolved through accommodation or assimilation (Forestell, 1992).

Improvisational theater games offer a new interpretive approach for children. These activities involve loosely structured role-playing games in which groups solve problems through dialogue and activity in a creative, spontaneous, and interactive manner (Spolin, 1983). Improvisation addresses many of the learning issues described above. First, objects and activities can help children understand higher-order concepts. Second, improvisation allows children to learn in a natural manner about relationships with oneself, others, and the environment, especially when pretend play is involved (Mearns 1977). Third, children, who normally lack abstract thought, are capable of it when they understand that they are pretending (Vasta et al., 2004). Fourth, improvisation promotes learning in a cooperative and interactive atmosphere to achieve group goals (Dickinson, Neelands, & Shenton Primary School, 2006). Last, improvisation provides challenge through group problem solving and provides support through guided interaction by qualified leaders (Peterson & O’Connor, 2006). Given the interpretive possibilities of improvisation in parks, the goal of this study was to examine the dynamics, enjoyment, and perceived learning of improvisation for children.
Methods
In 2006, Banff National Park offered a new interpretive program for children, called *Fostering the Future*. The program consisted of mostly improvisation games (see Spolin, 1983 and Hvenegaard, Johnson, & Macklin, 2008 for names and descriptions) along with group activity games, nature walk, and interpretive talk (called *Structured Story*). Three interpreters received equal training to deliver the program. The program was offered Wednesday through Sunday (1:00–3:00 pm) from June 30 to August 20 at the Tunnel Mountain Campground Amphitheater. Advertising was concentrated in the campground, but extended to Banff townsite and the entire park. Each day, the interpreters modified the program to account for weather and the group’s age and size.

After each program, all participants were invited to fill out a voluntary evaluation form. For children who were unable to write, their parents helped transcribe answers. The evaluation form, as prescribed by the park administration, asked the following questions:

- Which of today’s activities did you enjoy the most (and the least)? Why?
- From which of today’s activities did you learn the most (and the least)?
- What was the most important thing that you learned from today’s activities?
- If you had one question to ask Banff National Park, what would it be?

We categorized responses into thematic groups. Interpreters also recorded relevant observations of children during the games and conversations after the games.

Results
The program ran on 29 of a possible 38 days. Each program involved an average of 7.9 activities, of which 6.2 were improvisation games. The program attracted 159 children (average of 5.5 children per program, range: 1–13), with 133 involved in completing evaluations. Of the respondent families, 91% were from Canada and 9% from the United States. Most Canadian families came from Alberta (61%), British Columbia (10%), and Saskatchewan (9%). The average age of participants was 7.5 years (range: 4–14).

When asked about the activities they enjoyed the most, children gave 93 responses, 14% of which were “everything.” The most common responses involved improvisation: *Telephone* (16%), *Camouflage* (15%), *Gibberish* (13%), *Lemonade* (13%), *Build-A-Story* (11%), and *Trees and Squirrels* (11%). When asked why these activities were enjoyed, the most frequent responses provided were having fun, running around, being silly, being creative, undertaking challenges, entertaining each other, and taking part in something new.

We asked children which activities they enjoyed the least and why. Of the 65 responses received, 49% said “nothing.” The activities most commonly listed (*Tag*, 14% and *Structured Story*, 11%) did not involve improvisation. The common reasons for activities being enjoyed least related to getting hurt, lasting too long, providing too much challenge, and being boring.

We asked children which activities helped them learn the most (perceived learning). We received 59 responses, 3% of which were “everything.” The most common activities mentioned were *Structured Story* (26%), *Nature Walk* (15%), *Micro-Hike* (13%), and *Three-Way Drawing* (10%). The first two did not involve improvisation. We received 34 responses about activities from which children learned the least, the most common of which were *Telephone* (16%) and *Tag* (14%), with the former involving improvisation.
In terms of the most important thing they learned, children provided 63 responses, of which 51% were about natural history (e.g., ecosystems, mountain formation), 16% about individual development (e.g., having fun), 10% about group dynamics (e.g., teamwork), 10% about management and conservation (e.g., harming plants or animals), and 8% about safety (e.g., bears).

Finally, in terms of questions for the park, children provided 49 responses, of which 37% were about natural history (e.g., mountains, wildlife), 29% about management issues (e.g., bears, fires), 16% about future interpretive events (e.g., child-focused programs), 12% about safety (e.g., bears, getting lost), and 6% about miscellaneous details.

Discussion
This study examined children’s enjoyment and perceived learning from an improvisation-dominated interpretive program. Children generally enjoyed the entire program, but especially the improvisation activities because they offered fun, physical activity, creativity, challenges, positive group dynamics, and novelty. These characteristics are consistent with other analyses of interpretation for children (Cessford, 1989; Hansen-Møller & Taylor, 1991; Beck & Cable, 2002). Enjoyment may have resulted from healthy social interactions, group energy, and a sense of accomplishment (Spolin, 1983; Beck & Cable, 2002; Caine et al., 2005). Some activities were enjoyed less because of difficult logistics or an incorrect matching of challenge and ability.

In terms of perceived learning, the activities rated highest by children were not improvisation games, but a traditional nature walk and interpretive talk. These activities involved sensory awareness, physical involvement, and guided interaction. According to the interpreters, children seemed to learn well from activities in which there was effective collaboration with peers (e.g., Pictionary), interaction with the interpreters, and simple messages (see Singer & Revenson, 1996; Vasta et al., 2004). For example, animals and plants on the nature walk stimulated many questions about ecology and human impact, resulting in discussions about proper behavior that minimizes impacts on the environment and ensures the safety of people and wild animals. The activities rated low for perceived learning primarily focused on increasing group cohesion and energy levels, and did not have specific learning goals.

In terms of specific perceived learning topics, children most often mentioned concepts of natural history, which is consistent with most parks’ interpretive goals (e.g., understand the natural environment, maintain ecological integrity, and increase meaningful visitor experiences) (Tilden, 1977; Cessford, 1989; Beck & Cable, 2004). Park managers would also be pleased to know that children learned about management, conservation, and safety issues (Government of Canada, 2007).

Other researchers promote the use of thematic interpretation, which increases children’s ability to recall and apply information (Tarlton & Ward, 2006). However, interpretation involving improvisation has less thematic structure; nevertheless, children in our study stated that they learned information relevant to the park and to their experiences. Furthermore, children wanted to learn more about natural history concepts, park management, and future interpretive events.
Conclusion
These results suggest that incorporating improvisation games into interpretive programs can contribute to enjoyment and perceived learning of children. Sensory awareness, physical involvement, collaboration, creativity, and guided interaction helped increase enjoyment and perceived learning. These characteristics support the models proposed by learning theorists. In particular, Piaget argues that play is critical to a child’s cognitive, social, and emotional development (Singer & Revenson, 1996). The act of playing enables children to determine their role in their environment (Mearns, 1977) and helps to communicate complex ideas (Edgar, 2006). Furthermore, children up to the age of 12 can learn about abstract concepts by interacting with tangible objects, using all of their senses (Vasta et al., 2004). Moreover, the activities resulted in appropriate insights and curiosity about Banff National Park. These new interpretive approaches are critical today when many children have fewer opportunities to connect to nature.

Further study on the use of improvisation activities, and their ability to reconnect children to nature, will be helpful. First, research should evaluate knowledge retention from these activities over time. Second, research should explore the influence of spontaneous content inherent in these theater games, compared to the goal of thematic interpretation (Tarlton & Ward, 2006). Third, research should compare evaluation responses among children with different ages and levels of cognitive development (Kellert & Westervelt, 1984). Last, research should compare the effectiveness of different types of creative dramatics in enabling children to learn about themselves and their role in their environment (Mearns, 1977).

In terms of limitations, we had with little control over the number of participants each day, so it was difficult to play every game regularly. Second, parents may have influenced responses from younger children. Third, the program variability and small sample size did not allow for statistical comparisons among activities.

In the future, the age range of participants should be restricted to enhance the potential learning among ages within similar cognitive development stages. As well, pre-registration would help improve program planning. In general, improvisation can contribute to the enjoyment and perceived learning for children in interpretive programs, but it is important to consider group dynamics and individual preferences, since these factors may influence a child’s enjoyment or learning potential of any activity (Caine et al., 2005).

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References


Comparative Evaluation of the Attention Capture and Holding Power of Novel Signs Aimed at Park Visitors

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Abstract  
Communication theories guided the development of messages to increase attention paid to signs in Yosemite National Park regarding food storage in bear country. Four experimental signs (moral appeal, humorous appeal, narrative story, and telegraphic title) were tested against a standard park message at three locations in the park. Hypotheses that the experimental signs would outperform the standard sign were only partially supported. In most cases, more than 50% of visitors at least glanced at the signs, although few paid sufficient attention to fully process the message. The most effective sign overall was the narrative format. However, observations of 963 people indicated that the effect of signs on reading behavior is highly variable and depends often on the location of the sign. Interviews with 163 visitors in two locations showed that visitors recognized certain signs as highly familiar and tended not to like traditional formats as much as the novel designs. The empathetic and narrative messages received the most positive response. The highly variable attracting power and holding times for the different messages across locations suggests park managers need to attend closely to audience and site characteristics if they expect to communicate effectively with signs. Implications for understanding message vividness are developed.
Introduction
For decades, land managers have relied on interpretation to inform park visitors about regulations, teach them about resource issues, or encourage appropriate behaviors (Ham, 1992; Petty, McMichael, & Brannon, 1992). On-site signs, in particular, have emerged as a strategically important communication medium because of their ability to reach visitors at times and in locations where the constant presence of park staff is impractical or impossible. This versatility is especially advantageous when resource protection and visitor safety are at stake (Ham, Weiler, Hughes, Brown, Curtis, & Poll, 2008; Wiles & Hall, 2003).

However, interpretive signs are often developed to conform to institutional formats or styles, or on the basis of staff intuition about what will “work.” Consequently, the impact of signs in natural resource settings varies substantially, and in some cases little is achieved. In the study presented here, we reviewed several communication theories to develop different messages regarding the topic of proper food storage by campers in Yosemite National Park. Between 1999 and 2008, an average of 521 human-bear incidents occurred annually in the park, resulting in approximately $107,000 in property damage each year (Madison, 2008). Although these figures signify an improvement from pre-1999 levels, park staff continue to consider human-bear conflicts a significant issue and they remain concerned that existing signs encouraging campers to store food properly may not be as effective as they might be.

Attention – A Limiting Factor
Our focus is specifically on attention to signs. Although a number of things must occur for a persuasive message to affect behavior, it is obvious that capturing visitors’ attention is the critical first step. Simply put, if visitors do not notice and attend to a message it cannot be effective in influencing their behavior (Moscardo, Ballantyne, & Hughes, 2007; Serrell, 1997). Observational studies in various free-choice learning environments (e.g., zoos and museums) have shown that some signs or exhibits are viewed by very few people, while others are viewed by most visitors (Korn & Jones, 2000; Sandifer, 1997; Tubb, 2003). At Yosemite, previous research by Lackey and Ham (2004) demonstrated that few people actually attend to signs pertaining to bears and food storage, despite the widespread use of such signs in the park.

There are several possible explanations for visitors’ lack of attention to signs. One, of course, is that signs may be inconveniently placed, so that visitors simply overlook them. While this is undoubtedly a concern in Yosemite, it is not the focus of the study presented here. Indeed, even signs that are placed directly in line-of-site are often ignored (Thompson & Bitgood, 1988), and overcoming this problem is our goal.

Another reason signs may fail to capture attention is that visitor behavior in some environments is highly scripted (Werner, Rhodes, & Partain, 1998). For instance, park visitors in campgrounds, many of whom have been camping dozens of times, may go through the routines of camp chores largely automatically. A stimulus (sign) that does not interrupt such schematic behavior has little chance of success (Moscardo, 1996). An example of this was reported in a study by Liu and Sibley (2004). In their investigation
of littering in a university quad, a banner with a mundane message (“Be clean and green. Please throw it in the bin.”) failed to decrease littering, whereas a banner with an unusual message (“Yesterday, x% of males littered and x% of females littered. You know the odds. Now beat them!”) caused a drop of more than 50% in the rate of littering.

A third major limiting factor with respect to signs is visitors’ feelings of familiarity with the topics addressed. Such feelings can minimize message processing because a person “already knows the message” and therefore fails to attend to a message enough to process it (Garcia-Marques & Mackie, 2001; Rogers, Lamson, & Rousseau, 2000). For example, a park visitor may glance at an interpretive sign about food storage, classify it (“a typical park sign”) or make a judgment about the content (“I know the rules; I don’t need to read it”), and end up paying no attention to the actual content. In their research related to standard National Park Service signs in Yosemite, Hall, Hockett, and Smith-Jackson (2001) reported that visitors interviewed about their reactions to signs often considered them to be familiar and not worth reading. In another study, Lackey, Ham, and Quigley (2002) determined that, at any given moment, hundreds of messages about bears were simultaneously vying for the attention of Yosemite visitors.

It makes sense, then, that visitors may direct their attention to other things than a sign or they may be functioning in a mindless, inattentive state. Human attention systems evolved to notice unusual or emotional things, contrast, certain colors, or movement (Sylwester & Cho, 1992/3). Typically signs (including those in national parks) do not contain any of these elements that engage the automatic orienting response (Lang, 2000). Hence, park signs may lose in the competition with stimuli from the natural or social environment that are comparatively more novel to visitors.

Study Purpose
Our initial research, together with that of others, suggested that capturing visitor attention with signs was a major limiting factor at Yosemite. More than 75% of visitors are repeat visitors, and it was clear that many do not attend to signs as a matter of routine. Therefore, our study was undertaken to explore alternative approaches to designing signs with bear messages that might better capture the attention of visitors. Our objectives were (1) to determine how well newly designed theoretically based test messages attracted the attention of visitors and how long people read them; (2) to understand, in visitors’ own words, how they responded to and evaluated the signs; and (3) to compare five different versions of message content in three locations, each based on a different theoretical approach to communication.

Theoretical Approaches to Capturing and Holding Attention
In park settings, visitors’ feelings of familiarity and pre-established behavioral schemas can work against interpreters. In response to this challenge, interpreters must develop communication approaches that succeed in stimulating enough attention to media (such as signs) that their messages are, in fact, processed and encoded by visitors (Moscardo, 1996). Two techniques for doing this have shown promise: novel designs and use of vivid information. Change is intrinsically interesting to people (Sylwester & Cho, 1992/3), including visitors in free-choice learning environments (Falk & Dierking, 1992; Falk & Storksdieck, 2005; Ham, 1992). Designs that are novel are thought to interrupt scripted behaviors and arouse focused attention (Werner et al., 1998). Novelty can be introduced via placement of a sign in a new or unexpected location as well as through elements of
artistic design and textual content (Arndt, Screven, Benusa, & Bishop, 1993; Moscardo et al., 2007).

Vivid messages—which are by definition distinct, graphic, and striking—also attract attention (Block & Keller, 1997). Vividness encapsulates both the visual appearance of a sign (which would be involved in initial attention capture) as well as the content of the text-based message (which is involved in sustaining attention and increasing retention). Vivid text stands out and holds attention because it creates suspense, surprise, or other emotional engagement (Schraw & Lehman, 2001; Stapel & Velthuijsen, 1996). Text that is imagistic or concrete is especially memorable (David, 1998).

We developed messages that would have personally relevant content and be novel and vivid. Several theoretical orientations suggested different ways to accomplish these goals. Ultimately, message designs were based on studies that utilized perspective taking to promote empathy, narrative anecdotes or story type of evidence, humor, and declarative titles, as explained below.

**Empathetic appeals and perspective taking.** Many environmental behaviors are motivated by altruism (Eagly & Kulesa, 1997; Widegren, 1998), and an appeal to consider animal welfare could therefore be an effective approach to encourage proper food storage at Yosemite. For instance, Shelton and Rogers (1981) found that people responded more strongly to an anti-whaling message that showed whales suffering than one that did not, and Ham and Weiler (2005) reported that a personal norm-based sign was superior to most other experimental treatments they employed to persuade national park visitors to stay on a designated trail. Similar results were reported by Ham et al. (2008) in a study of litter pick-up by national park trail users. A particularly effective way to increase empathetic response is to encourage message recipients to adopt the perspective of the “victim” (Schultz, 2000). Empathy can increase arousal, which may then increase attention and processing (Campbell & Babrow, 2004).

**Narrative personal anecdotes.** 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 & Monroe, 1996). Communications that use concrete exemplars (e.g., personal case history or testimony) have substantially more persuasive effect than abstract statements or statistical data (Brosius & Bathelt, 1994; Rook, 1987; Stapel & Velthuijsen, 1996). Block and Keller (1997) argued that vivid anecdotes are most effective when personally relevant and emotional, while Stapel and Velthuijsen (1996) suggested that information that involves persons who are similar to the subjects may be just as impactful as a direct experience. In their study of persuasive communication aimed at national park trail users, Ham and Weiler (2005) found that a sign relating the personal story of a photographer had the most impact of five experimental conditions on users’ attitudes toward staying on the trail.

**Humor.** Using humorous appeals in a persuasive context of changing attitudes has generated mixed results in the literature. Humor does appear to be a good way to capture attention, especially in low-involvement contexts, and it can create a positive mood that translates into compliance (Lee & Mason, 1999; Weinberger & Gulas, 1992). However, in general humor may be no more persuasive than messages that do not include humor. In their comparison of different signs to deter off-trail hiking, Johnson and Swearingen (1992) found that a humorous message was slightly more effective than a standard NPS sign but less effective than a message emphasizing sanctions.
Telegraphic titles. Attention is highly selective (Bitgood, 2000). According to Ham (1992), most people read the title of a written message before they read anything else, and many people read only the title. Ham argues that the message theme should, therefore, be incorporated into the title. Because they convey a complete idea, thematic titles (“bears are curious creatures”) can be more attention grabbing than topic titles (“the bears”). An advantage to such titles is that visitors are not required to read beyond the title to grasp the primary message. The benefit of this was demonstrated by Falk (1997), who showed that placing explicit thematic labels on science exhibits significantly increased visitors’ knowledge of the central messages.

Methods

Study Area
The study focused on sign-viewing patterns of Yosemite National Park visitors who camped at the Upper Pines Campground, stayed at Curry Village, or hiked from the Wilderness Trailhead between August 1 and September 30, 2002. Three study locations were chosen where we could unobtrusively observe these visitors’ attention-paying behavior and conduct oral interviews, as well as to represent different types of park visitors.

At Upper Pines, signs containing test messages were placed at each of the ten restroom facilities in the campground where visitors could view the message either entering or exiting the restroom, yet where behavior could be visible to the researcher. On treatment days at the Wilderness Trailhead, a 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. Curry Village was chosen as a site representative of more developed accommodations. Test messages were placed near the campground registration area, 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. All signs were 11 inches by 17 inches, yellow in color and laminated. Each included a line drawing of a black bear, used 24-point fonts, and had similar text length (94 to 108 words). Only the typeface differed between signs. Using 10 independent readers, we determined that the holding time (the time required for a visitor to read an entire message at a natural pace) ranged from 18 to 23 seconds, depending on treatment. Figure 1 illustrates the sign design and layout.
Treatment 1: Moral, Empathetic Appeal

**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

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Treatment 2: Narrative

**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 & Salient Beliefs

**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

**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!

Control: Existing Park Message

**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!

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Figure 2. Text of five experimental signs
Message Content

Empathetic appeal with perspective taking (“Attention Humans!”). Prior research (Lackey & Ham, 2003; Lackey & Ham, 2004) indicated visitors have positive attitudes towards bears in Yosemite. This message targeted people’s values with an appeal intended to arouse empathy via perspective-taking (Figure 2). The use of first person and the appeal to saving the lives of bears were message elements used to increase persuasiveness via creating empathy for the bears. The title did not mention bears (although the graphic probably communicated this topic), but instead was a novel command.

Narrative personal anecdote (“My Bear Story”). The second sign conveyed a personal story of failure to store food properly as told by a child. Narratives capture and sustain attention (Knobloch, Patzig, Mende, & Hastell, 2004), and therefore we expected this sign to be more effective than standard park messages. The title conveyed the topic of the message directly.

Humor targeting salient beliefs (“Top 10 Reasons to Put Your Stuff in the Locker”). Our humorous message was based on the assumption that people would recognize the allusion to a popular television comedy sketch. We reasoned that humor would be more likely to capture attention than standard park messages, due to its novel tone. The content was based on visitors’ salient beliefs that emerged in previous research (Lackey & Ham, 2003). These include behavioral, normative, and control beliefs regarding proper food storage in Yosemite Valley. This sign was expected to appear quite unusual to visitors because of its dissimilarity in title and tone to other signs in the park, and its title clearly indicated appropriate behavior.

Telegraphic title (“Leave it in the Locker – Not in Your Car!”). This sign’s title conveyed a clear instruction to visitors that could be grasped without reading the body of the message. Exclamation points reinforced the importance of the message. Only this sign and the humorous sign conveyed the primary message in the title. However, this sign should have seemed similar to many types of park signs given its straightforward factual approach.

Control: existing park message text (“Black Bears and Human Food”). This message was constructed from existing park message texts. Unlike the telegraphic title sign, this sign’s title did not convey a specific instruction, although the topic was clear. The design should have appeared like many other typical park signs given its straightforward factual approach and authoritative tone. The message did not incorporate novelty, narrative, humor, or emotion.

Study Hypotheses

Since the primary goal of the research was to explore the comparative effectiveness of four different approaches to message vividness, the central hypothesis was that each of the experimental treatments would be superior to the control (existing park message) in terms of attention capture and holding power. While a secondary interest was to compare attention capture and holding power among the four treatments, previous research provided no evidence to suggest that any one of them ought to be superior or inferior to the others. For this reason, directional a priori hypotheses for these comparisons could not be formulated in advance of the research. Thus, four hypotheses guided the data analysis:

H1: Treatment 1 (Moral, Empathetic Appeal) attention capture and holding power > Control (Existing Park Message).
H2: Treatment 2 (Narrative) attention capture and holding power > Control (Existing Park Message).

H3: Treatment 3 (Humor & Salient Beliefs) attention capture and holding power > Control (Existing Park Message).

H4: Treatment 4 (Telegraphic Title) attention capture and holding power > Control (Existing Park Message).

Sampling
Sampling was carried out over four weekend and three weekday periods at the three locations across the nine-week study period, as follows. We conducted four two-hour sessions per treatment at Upper Pines and Wilderness Trailhead, and three sessions per treatment at Curry Village. More sessions occurred at Upper Pines and Wilderness Trailhead than at Curry Village due to lower visitation. Campground and trailhead sessions were conducted in the morning when most visitors were preparing to leave the campground and hikers were just starting on the trail. Curry Village subjects were sampled during the afternoon when many visitors were registering for their stay.

Observational data – Attention to signs. Observational data were collected for more than 100 hours at each location. 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 (closer than five feet) was recorded. If groups approached the sign, one member was randomly selected for observation. 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. For each individual observed, gender, group size, and the presence or absence of children was documented to determine if these variables impacted attention-paying behavior. Attention to the sign was monitored and recorded either as “ignored” the message (no overt attention directed at the sign), “glanced” at the message (physically oriented toward the sign, but for two seconds or less), or “extended viewing” (stopped to read the message for more than two seconds). Those who viewed for extended periods were timed until they ceased looking at the sign.

Interviews. Interspersed with observation sessions, semi-structured oral interviews were conducted with campground and trail visitors to obtain in-depth information about reactions to signs. The intent was to achieve balanced sampling between people who stopped for extended viewing and people who did not stop. Of the 163 visitors interviewed, about 50% stopped to read the message beyond two seconds, and the remaining half glanced at or ignored the message. 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.

The interviews began with questions asking visitors about their immediate reactions to the sign. Then visitors were asked whether the signs and their content seemed familiar or new. Further questions asked what visitors liked and disliked about the signs. The interview concluded with questions about how long visitors had been in the park and prior visits they had made, to ascertain whether familiarity affected visitor response to signs.

Interviews were tape-recorded and transcribed verbatim. Using standard content
### Table 1. Manipulation Checks on Treatment Variables

<table>
<thead>
<tr>
<th></th>
<th>Attn</th>
<th>My Bear</th>
<th>Top10</th>
<th>Leave</th>
<th>Park</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humans</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Message evokes sympathy</td>
<td>7.35</td>
<td>7.16</td>
<td>4.34</td>
<td>6.36</td>
<td>6.04</td>
</tr>
<tr>
<td>for bears</td>
<td>b</td>
<td>b</td>
<td>a</td>
<td>b</td>
<td>ab</td>
</tr>
<tr>
<td>Title told me what I needed to know</td>
<td>6.16</td>
<td>5.10</td>
<td>6.64</td>
<td>7.96</td>
<td>6.46</td>
</tr>
<tr>
<td>Mental picture came to mind</td>
<td>6.66</td>
<td>8.30</td>
<td>7.08</td>
<td>7.02</td>
<td>6.96</td>
</tr>
<tr>
<td>Text seems like other messages I’ve seen in the park</td>
<td>5.55</td>
<td>5.62</td>
<td>4.12</td>
<td>6.70</td>
<td>6.42</td>
</tr>
<tr>
<td>Text catches my attention</td>
<td>6.78</td>
<td>6.96</td>
<td>7.42</td>
<td>8.20</td>
<td>7.86</td>
</tr>
<tr>
<td>Emotional vs. Factual</td>
<td>7.14</td>
<td>6.02</td>
<td>5.73</td>
<td>8.25</td>
<td>8.65</td>
</tr>
<tr>
<td>Unusual vs. Typical</td>
<td>5.90</td>
<td>6.84</td>
<td>5.16</td>
<td>7.45</td>
<td>7.67</td>
</tr>
<tr>
<td>Funny vs. Not Funny</td>
<td>6.88</td>
<td>7.34</td>
<td>5.04</td>
<td>7.40</td>
<td>9.27</td>
</tr>
<tr>
<td>Believable vs. Not Believable</td>
<td>2.98</td>
<td>3.58</td>
<td>4.29</td>
<td>3.02</td>
<td>2.19</td>
</tr>
<tr>
<td>Unique vs. Ordinary</td>
<td>5.14</td>
<td>5.44</td>
<td>4.49</td>
<td>6.37</td>
<td>6.63</td>
</tr>
<tr>
<td>Abstract vs. Concrete</td>
<td>7.82</td>
<td>7.12</td>
<td>6.51</td>
<td>8.08</td>
<td>8.50</td>
</tr>
<tr>
<td>Boring vs. Interesting</td>
<td>7.88</td>
<td>7.18</td>
<td>7.04</td>
<td>6.94</td>
<td>7.61</td>
</tr>
<tr>
<td>Vivid vs. Not Vivid</td>
<td>4.39</td>
<td>4.82</td>
<td>4.63</td>
<td>4.33</td>
<td>5.36</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>8.55</td>
<td>6.89</td>
<td>6.42</td>
<td>6.29</td>
<td>6.42</td>
</tr>
<tr>
<td>p</td>
<td>&lt;.0005</td>
<td>&lt;.0005</td>
<td>&lt;.0005</td>
<td>&lt;.0005</td>
<td>&lt;.0005</td>
</tr>
</tbody>
</table>

1 Scale: 1=Strongly disagree; 10=Strongly agree
2 Scale: 1 to 10, semantic differential

---

Message evokes sympathy for bears
Title told me what I needed to know
Mental picture came to mind
Text seems like other messages I’ve seen in the park
Text catches my attention
Emotional vs. Factual
Unusual vs. Typical
Funny vs. Not Funny
Believable vs. Not Believable
Unique vs. Ordinary
Abstract vs. Concrete
Boring vs. Interesting
Vivid vs. Not Vivid

Table 1. Manipulation Checks on Treatment Variables
analytic procedures, one 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 people not involved with the study independently coded a random sample of 10% of the interviews. The two independent coders both coded only two statements (1%) differently than the first author. Eighty-seven percent of 179 individual statements were coded identically by the three coders, and 12% of the statements were agreed upon between two of the three coders, indicating high reliability.

**Manipulation Checks**

In order to be confident that each of the experimental signs was actually perceived by visitors in the way it was intended by researchers, a series of manipulation checks was conducted. Manipulation checks are an essential part of this type of evaluation since in order to assess the effectiveness of a given communication product, researchers must be sure that the product actually possesses the qualities it was designed to have. Speaking directly to the case of research on vivid message design, O’Keefe (2003) makes a convincing argument that “in order to be vivid, a message must be perceived as being vivid” (p. 243). And more specifically in the present study, given that four different messages were theorized to be vivid or novel in different ways, it was important to ascertain not only whether each of the messages was perceived by visitors to be vivid, but whether it was perceived to have the qualities intended by researchers to give it its vividness. In other words, was each of the messages reasonably consistent with the theoretical basis behind its design?

To this end, a series of statements (e.g., “the text catches my attention,” “the message makes me sympathize with bears”) was developed to determine if the variables we were intending to manipulate with each individual treatment (e.g., emotion, novelty, vividness) were perceived as such by respondents. Approximately 250 manipulation checks (50 per treatment) were administered to randomly chosen campers and hikers on days between observations and interviews. Respondents were asked to read the test message and then respond to the statements using five 10-point agree/disagree scales (1=strongly disagree, 10=strongly agree) and eight 10-point semantic differential items.

**Results**

**Manipulation Checks**

We anticipated the treatments would differ in the way they were perceived by respondents, and significant differences were indeed found for 10 measures (Table 1). Respondents agreed fairly strongly that all five treatments caught their attention. 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. In sum, each of the five messages was found to possess its intended distinguishing quality more so than the same quality was possessed by the other messages. However, the four treatments manipulated for vividness were not considered significantly more vivid than the control (Park Message). It is possible that the physical characteristics (yellow sign) shared by all five signs led to the similarity in “vividness” ratings.
### Table 2. Percentage of Visitors Attending to Signs by Location and Treatment

<table>
<thead>
<tr>
<th>Location</th>
<th>Attention</th>
<th>My Bear</th>
<th>Top 10</th>
<th>Leave it</th>
<th>Park</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Humans</td>
<td>Story</td>
<td>Reasons</td>
<td>in Locker</td>
<td>Message</td>
</tr>
<tr>
<td>Upper Pines</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ignored</td>
<td>65</td>
<td>42</td>
<td>58</td>
<td>51</td>
<td>57</td>
</tr>
<tr>
<td>Glanced</td>
<td>12</td>
<td>21</td>
<td>13</td>
<td>20</td>
<td>23</td>
</tr>
<tr>
<td>Extended View</td>
<td>23</td>
<td>38</td>
<td>29</td>
<td>30</td>
<td>19</td>
</tr>
<tr>
<td>Wilderness Trailhead</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ignored</td>
<td>25</td>
<td>20</td>
<td>43</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>Glanced</td>
<td>45</td>
<td>32</td>
<td>35</td>
<td>69</td>
<td>55</td>
</tr>
<tr>
<td>Extended View</td>
<td>30</td>
<td>48</td>
<td>22</td>
<td>13</td>
<td>23</td>
</tr>
<tr>
<td>Curry Village</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ignored</td>
<td>56</td>
<td>24</td>
<td>55</td>
<td>69</td>
<td>51</td>
</tr>
<tr>
<td>Glanced</td>
<td>29</td>
<td>35</td>
<td>30</td>
<td>23</td>
<td>32</td>
</tr>
<tr>
<td>Extended View</td>
<td>15</td>
<td>41</td>
<td>15</td>
<td>8</td>
<td>17</td>
</tr>
</tbody>
</table>

Note: Extended viewing = reading for more than 2 sec.

**Attention Capture and Holding Power**

The four hypotheses received partial support. Consistent with the results of the manipulation checks, the existing park message was not as inferior to the four treatments in attention capture and holding power as we anticipated it would be. It ranked third or fourth, depending on location, in the percentage of people who ignored it, and it ranked second to fifth in generating extended viewing. There were no differences in the percentage of visitors who ignored, glanced at, or read signs based on gender ($\chi^2 = 0.18$, $p = .91$). No differences emerged between people in groups with or without children ($\chi^2 = 3.61$, $p = .17$). However, there were significant differences in attention paying based on group size ($\chi^2 = 59.80$, $p < .0005$). People who were alone were more likely to ignore signs (53%) than those who were with others (less than 39%, depending on group size). On
the other hand, the percentage who viewed signs for an extended period (>2 seconds) was relatively constant across group sizes (approximately 20%).

Few visitors (less than 50% in all cases) viewed signs for extended periods (Table 2). The percentage that ignored signs varied greatly both across experimental conditions and locations, from a low of 19% for the Telegraphic Title sign at the Wilderness Trailhead to a high of 69% for the same sign at Curry Village. The five signs did not differ in their ability to capture attention at the campground ($\chi^2 = 11.96; p = .15$), but differences were substantial at the Wilderness Trailhead ($\chi^2 = 36.67, p < .0005$) and at Curry Village ($\chi^2 = 33.3, p < .0005$). The complexity of these results is due mainly to the conspicuous influence of the sign’s location at the time it was viewed by respondents. My Bear Story was the least likely to be ignored and the most likely to elicit extended viewing in all three locations, but the second most “viewed” sign varied depending on where it was placed. Additionally, the most ignored sign varied across locations. Attention Humans was ignored by 65% of campers but only 21% of hikers. At the Wilderness Trailhead, Top 10 Reasons was most ignored, while at Curry Village Leave it in the Locker was most ignored.

Although few visitors looked at any sign for an extended period, there were some differences in mean viewing time among the message treatments and locations (Table 3). Based on ANOVAs contrasting signs within each location, the different signs elicited significantly different viewing times at Curry Village, $F(4,53) = 2.96, p = .028$, but not...
### Table 4. Interview Responses Regarding Aspects of Signs

<table>
<thead>
<tr>
<th></th>
<th>Attention</th>
<th>My Bear</th>
<th>Top 10</th>
<th>Leave it in Locker</th>
<th>Park Message</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Immediate response</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Familiar topic</td>
<td>50</td>
<td>21</td>
<td>19</td>
<td>44</td>
<td>13</td>
</tr>
<tr>
<td>Relate own story</td>
<td>0</td>
<td>32</td>
<td>3</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Informative</td>
<td>7</td>
<td>5</td>
<td>6</td>
<td>13</td>
<td>17</td>
</tr>
<tr>
<td>Humorous</td>
<td>0</td>
<td>0</td>
<td>50</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ignored – knew already</td>
<td>20</td>
<td>0</td>
<td>16</td>
<td>19</td>
<td>13</td>
</tr>
<tr>
<td>Thought about compliance</td>
<td>10</td>
<td>11</td>
<td>0</td>
<td>13</td>
<td>30</td>
</tr>
<tr>
<td><strong>Comparison to other information</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information familiar</td>
<td>87</td>
<td>89</td>
<td>84</td>
<td>91</td>
<td>80</td>
</tr>
<tr>
<td>Different information</td>
<td>3</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>23</td>
</tr>
<tr>
<td>Different tone/style</td>
<td>43</td>
<td>61</td>
<td>78</td>
<td>13</td>
<td>23</td>
</tr>
<tr>
<td><strong>Evaluative reaction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>55</td>
<td>53</td>
<td>50</td>
<td>24</td>
<td>22</td>
</tr>
<tr>
<td>Negative</td>
<td>10</td>
<td>13</td>
<td>19</td>
<td>17</td>
<td>11</td>
</tr>
<tr>
<td>Mixed</td>
<td>10</td>
<td>8</td>
<td>22</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Non-committal, neutral</td>
<td>26</td>
<td>26</td>
<td>9</td>
<td>59</td>
<td>63</td>
</tr>
</tbody>
</table>
at the other two locations. In other words, at Upper Pines and the Wilderness Trailhead, if people read a sign, they read for about the same amount of time, regardless of the sign. At Curry Village, though, *Attention Humans* generated longer reading times than all others, and *Leave it in the Locker* generated the least. It is important to note that the means shown in Table 3 are based on small samples of viewers, and larger numbers would have greater power to discern differences among signs.

**Visitors’ Opinions of Signs**

Among those asked to participate in an interview, the response rate was 96%. Sixty-eight interviews were conducted in Upper Pines Campground. Nearly half of these respondents had camped in Upper Pines previously, and only 23% were first-time visitors to Yosemite. Possibly their high degree of familiarity and experience with Yosemite accounts for why the viewing rates were so low at this site. Interviewees who had read the signs repeatedly commented that they read the sign because it looked new or that they had not seen it at the restroom before.

Unlike Upper Pines interviews, nearly half of the 95 trail interviews occurred with first-time visitors to the park. First-time visitors stopped to read the signs the 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 across locations, it could be the result of differences in the populations of visitors. Alternatively, there may be something about placing signs in different locations that influences attention paying, even within a single population.

Nearly one-third of respondents, regardless of which sign they viewed, said their first reaction to the sign was a feeling of familiarity (Table 4). This led a sizable number to opt not to read it. For example, one visitor said, “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.” However, other initial reactions varied across signs. As expected, many found the *Top 10 Reasons* sign to be humorous. *The Park Message* was the most effective in prompting people to think about whether they had stored all their belongings properly, and—along with the *Telegraphic Title*—it was also rated as somewhat more informative than the three novel designs.

Other differences among the signs were intriguing, most notably that 32% of those seeing *My Bear Story* said it made them think about their own experiences or the experiences of others, either at Yosemite or elsewhere. Interestingly, several people conveyed their frustration with the story of Troy in *My Bear Story* 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 whether the material seemed familiar or different, many people said it was the same message they had received elsewhere in the park. However, the three novel formats were described as having a new or different tone by substantially larger numbers of people than the two more traditional formats. Interestingly, 23% of those who saw the *Park Message* said it contained new information (generally related to storing toothpaste, lotion, or other sundries)—more so than the other four signs. This point is intriguing, as *Attention Humans* and *Leave it in the Locker* also included this new information.
Finally, visitors’ reactions to the signs were classified into mutually exclusive categories of overall positive, overall negative, a mix of positive and negative, and non-committal or neutral. Whereas about half of people had unambiguously positive reactions to the three novel formats, about half were non-committal about the two traditional formats. While most people did not have negative reactions to Attention Humans and My Bear Story, the Top 10 Reasons elicited negative responses from more than 40% of people who viewed it. For instance, one person remarked, “There were cute things in it, but it was almost too cute. I think it would be better to have a little bit more education and a few more serious, possibly even dramatic, reasons for people to keep their cars clean.”

**Discussion**

The four new treatments were designed to incorporate different forms of vividness (e.g., imagery, story format), and three included novel elements to increase attention paying. Findings were complex, and interpretation of success depends on whether simply capturing versus sustaining attention is important to the communicator. If information is new, it may be important that visitors process all of it, and sustaining attention is therefore critical. The appropriate measure, in most cases, would be extended viewing. However, if people have previously learned the relevant information, a mere reminder may be all that is necessary. In this case, a glance may be all that is needed to activate appropriate cognitions and stimulate behavior. These issues should be borne in mind in our discussion of different formats below.

**Attention Humans.** Based on the manipulation checks, respondents validated that this message appealed to emotions and generated a sense of empathy for the bears more than other test messages, i.e., it evoked the emotional appeal that we expected. However, this sign had the highest or second-highest rate of ignoring, depending on location, and relative to other signs it varied in ability to sustain attention for extended viewing. Only 15% to 30% of people spent more than two seconds reading the sign. However, among those who read the sign, this message elicited the longest mean viewing times at each site.

**My Bear Story.** Manipulation checks showed this message to be 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 was more engaging, which is what we had anticipated. Overall, more visitors stopped to view this message for an extended period than the other messages, and it was least likely to be ignored altogether. No one said that they ignored the sign because they already knew what it had to say. Based on the time observed stopping to read this message, most of the visitors who stopped (67%) viewed this message between six and nine 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. Thus, the message appears to have caused visitors to process and elaborate upon the story.

**Top 10 Reasons.** Compared to the other treatments, visitors claimed this message to be least similar to other messages they had seen in the park. Despite these assessments, this message was ignored more than any other message. Apparently the humorous message design served the intended purpose of being funnier than the other message
treatments. Nevertheless, it was least effective in sustaining attention, suggesting that humor alone may not be an effective appeal in a national park setting. Additionally, it elicited many critical or confused remarks, much more than any other sign. A possible conclusion to be drawn from these findings is that while message vividness might in some situations serve the useful purpose of initial attention capture, it is the visitor’s evaluation of message content that will most influence holding power.

Leave It in the Locker. According to the manipulation check, this message was rated as most likely to catch attention. However, it did not actually capture attention more than the others when erected in locations throughout the park. Based on observations, about 17% of the subjects actually viewed this message for an extended time period, and the percentage who viewed for more than two seconds was always the lowest in each location. Interviews revealed that this sign seemed highly familiar to respondents, and most campers (51%) and Curry Village subjects (69%) ignored this message. However, 69% of hikers glanced at it. Given that the appropriate behavior (leaving food in the locker) was very clear in the title alone, it is possible visitors saw little need to continue reading.

Park Message. As expected, this message was considered the most factual, typical, ordinary, and least unique in manipulation checks and interviews. Generally, then, it served as an adequate control. Contrary to our expectations that this sign would be least likely to capture and hold attention, it was quite comparable to some of our more novel messages. It ranked third or fourth, depending on location, in the percentage of people who ignored it, and it ranked second to fifth in generating extended viewing. Thirty percent of people said it made them think about whether they had complied with park instructions, which is a highly desirable outcome from the perspective of park managers.

Overall Assessment of Communication Effectiveness
All our signs, with the exception of the Park Message, were designed to interrupt visitors’ likely mindless behavior and capture their attention. My Bear Story performed the best in this regard, and it is instructive to compare it to Attention Humans and Top 10 Reasons, which were not so effective. Attention Humans and Top 10 Reasons both employed humor, although of different sorts (sentimental versus comic wit). Humor has been shown to be highly variable in its effects (Weinberger & Gulas, 1992). In this case, we suspect that, although humor increased liking of the message (as predicted by Weinberger and Gulas), it did not sustain attention as well. An obvious difference between these two signs and My Bear Story is the title. In the two humorous messages, the title is ambiguous about the topic, but My Bear Story clearly tells the viewer that the topic is bears. Additionally, we believe that the obvious narrative structure draws readers into the story line. Story structures have been shown to generate suspense or curiosity, and this sign clearly tells the reader that there is a potentially intriguing story to be heard (Knobloch, Patzig, Mende, & Hastall, 2004). Emotion and elaboration—causing people to think about the message and link it to themselves—are outcomes message designers often desire. 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. My Bear Story was effective in creating a mental image in the minds of respondents and seemed to prompt the most elaboration. By several criteria, then, it was most effective.

The success of communication must be judged relative to what can reasonably be expected in any given situation. Clearly, none of the signs caused many people to read for as long as we judged necessary to read each message completely. That is, they had
relatively low holding power. Furthermore, the standard park message fared nearly as well as some of the newer signs, although this could be due to the attention-grabbing bright yellow color used on all treatments. However, in Yosemite, where high repeat visitation produces an audience that is highly familiar with the bear issue, it is unclear just how much can and should be expected of signs.

Importance of Location

It is rare for studies to test the same messages in different locations. If we had tested our signs in only one location, we would have been misled about the ability of most of the signs to attract and hold attention. Although My Bear Story and Attention Humans performed similarly, relative to the other signs, in each location, Leave it in the Locker and the Park Message generated quite variable responses across locations. While there are probably many reasons for the differences in performance, the different types and motivations of visitors at different locations are likely to be important. Our results suggest that the influence of message vividness on visitor attention-paying is likely to be mediated by sign location. A sign that is relatively attention grabbing in one location might well be largely ignored in another.

For instance, Leave it in the Locker was ignored by 57% of campers and 69% of Curry Village respondents, but only 18% of hikers. Campers were more familiar with the park and had seen many such messages around the campground (information is distributed at the campground entrance). Indeed, campers were most likely to ignore all of the signs. At Curry Village, this sign was placed in a location where visitors would encounter it after having just gone through registration and check-in where they were exposed to many bear-related messages, and they may have been in a state of mind that they were adequately prepared. Furthermore, the need for lockers is largely irrelevant to those staying in developed accommodations. Hikers, on the other hand, would have been less likely to have seen this particular message, and the idea of a “locker” at the trailhead might have been novel to many of them. Moreover, hikers are probably accustomed to think that a sign placed 100 yards up the trail contains information of importance to hikers, whereas the types of information posted around campgrounds and lodging could be expected to address many different topics and audiences.

Not only did the signs vary in attention capture across locations, but the percentage of people who noticed the signs and spent time reading varied as well. Although campers tended to ignore signs, among those who did not ignore them, 62% read for more than two seconds. On the other hand, at the Wilderness Trailhead and Curry Village, the percentage of those noticing the signs that spent more than two seconds was only 32% and 38%, respectively. Thus, in the campground the difficulty is capturing attention in the first place, but people who are loitering are willing to spend the time to read. On the other hand, in the other locations people may be in more of a hurry, and the difficulty is sustaining attention. Very brief, clear messages are needed in those locations. The highly variable attracting power and holding times for the different messages across locations suggests resource managers need to attend closely to audience and site characteristics if they expect to communicate effectively with signs.

Conclusion and Implications

An overarching conclusion from this study is that our understanding of what constitutes “vividness” in communication needs sharpening. A straightforward factual message
resembling a traditional park regulatory sign was seen by visitors as no less vivid than four experimental messages, each specifically designed to be vivid or novel in a different way. While further research would be needed to fully understand the reasons for this finding, an obvious possibility is that the same bright yellow background used in all the signs was just as responsible for visitors’ assessments of “vividness” as the actual content and tone of the messages the signs presented. It is possible that a construct such as “message vividness” is incomplete since it assumes the character of a message is somehow isolated in the visitor’s mind from the communication medium or delivery system used to convey the message. Thus, the background color of a sign (or the fonts it uses, the types of illustrations, etc.) can influence audience perceptions of vividness on an equal par with the communication appeal of the message and the words used to convey it. While researchers might attempt to partition out these elements of vividness for the sake of empirical clarity, the same elements might nevertheless remain an inseparable integrated whole in the mind of the visitor.

Alternatively, communication researchers might consider whether the conventional concept of “message” as consisting solely of the words in a sign text is adequate. The results of this study suggest the possibility that, from the visitor’s side of things, the “message” is actually the sum total of the words and the delivery system used to convey them. In fact, this is not a new way of looking at things. The famed Canadian philosopher of the 1960s, Marshall McLuhan (1967), felt that the medium and the message were an inextricable whole and that to understand the influence of a message on an audience required consideration of the way the medium and the message interacted. Thus, the quality or power of a message would derive not just from the words used to express it, but from the totality of these things plus the medium used to convey or deliver the message.

A fruitful area for future research is the influence of sign location both on attention capture and holding power as well as on the persuasive effects of messages. This study found that the message vividness provided by a personal narrative was relatively effective in attracting and holding attention regardless of where the sign was located. However, the effectiveness of other types of messages varied widely according to a sign’s location. It is likely that the location effect has something to do with the schemas visitors bring with them to certain locations. Whatever is on visitors’ minds in a particular place, and what is most centrally relevant to them at the time (e.g., what they most need, want, fear, etc.) is likely to shape their attention-paying behavior. While the immediate interests of campers in a large campground such as Yosemite Valley would probably be quite varied, visitors in settings that are more specifically defined by a certain type of use (hiking, climbing, etc.) might have more homogeneous interests. A deeper understanding of how such factors influence attention paying to signs represents a potentially important focus for additional work.

References


IN SHORT
An Evaluation of the Impact of River Guide Interpretation Training on the Client’s Knowledge and Interest Regarding the Environment

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Abstract  
This study assesses the impact of a Headwaters Institute seminar interpretation training on a river guide’s client knowledge and interest regarding the environment. The experiences of clients of river guides who had participated in the training were compared to experiences of clients of river guides who had not participated in the
training. Experience in this case was measured by increase in interest in and knowledge of the river environment pre- and post-rafting trip. Regardless of guide training, all clients’ interest in and knowledge of the environment showed significant increase after the rafting experience. However, clients of guides who had participated in the training had significantly higher increases than clients of guides who did not participate in the training. This study indicates that river guide participation in interpretation training can influence the client’s knowledge and interest regarding the environment. This study indicates that the embedding of interpretive messages in settings that are not traditionally interpretation platforms can encourage interest in the natural environment in a wider population.

Context
This study assesses the impact of interpretation training on a river guide’s client knowledge of and interest in the river environment. River guide interpretation training, in this instance, was through a Headwaters Institute (HWI) seminar. The Headwaters Institute is a nonprofit organization with a mission “to provide education that inspires individuals and communities to care for and connect with their watershed” (Hicks, 2006). The institute provides support to educators that host environmental education/interpretation seminars across North America. These seminars are largely targeted towards whitewater raft guides, but fishing guides and environmental educators are also encouraged to be seminar participants. The two main objectives of a HWI seminar are (1) to educate and inform participants about the natural history and ecosystem in which they work and (2) to give them support to act as interpreters of this information. The ultimate intent is that they will then pass this information and ideally pass a better appreciation of the river environment on to their clients.

Previous research (Harrison & Banks, 2008) indicates that participants in a Headwaters Institute seminar show a significant (p< .005) increase in their perceptions of self-efficacy regarding both their ability to teach specific environmental information as well as their ability to motivate their clients to learn about the river environment. This research investigates the validity of those efficacy perceptions.

Study Purpose
The purpose of this study was to evaluate the effectiveness of river guide participation in a Headwater’s Institute Seminar in increasing client’s knowledge of and interest in the river environment.

Specifically, the following hypotheses were examined:

Ho1: There is no difference in pre- and post-rafting experience test scores of river guide client knowledge of and interest in the river environment.

Ho2: There is no difference in scores of river guide client knowledge of and interest in the river environment between groups who rafted with HWI trained guides when compared to non-HWI trained guides.

Background
Tourism is one of the largest and fastest-growing industries in the world, particularly nature-based tourism. One unfortunate by-product with this increase interest in nature-based tourism is environmental impact. The management and protection of
these natural resources depends on how they are perceived and experienced by tourists (Daily, 1997; Vygotsky, 1978). Impacts to the natural environment are intensified by an individual’s behavior, either knowingly or unknowingly. These behaviors are largely dependent on one’s perceptions of and experiences in the environment (Petrosillo, Zurlini, Corliano, Zaccarelli, & Dadamo, 2007). Feelings or affective attachments for the environment can be determined through participation in outdoor recreation activities (Vygotsky, 1978; Novak, 1998). Nature-based interpretive programs offer tourists the opportunity to participate and learn more about an area.

Interpretation has a long history of educating tourists regarding a natural area’s conservation objectives, and has been used as a tool to enhance the tourist experience (Sharpe, 1982; Orams, 1996; Ham & Krumpe, 1996). Ecotourism with an emphasis on environmental interpretation can prevent or reduce the inherent negative impacts with which it is associated (Kimmel, 1999). Previous research has also indicated that river guides may be an important and potentially underused source through which environmental interpretation can take place (Bange, 1984; Roggenbuck, Williams, & Bobinski, 1992; Harrison & Banks, 2008).

Methods
The study was conducted at a satellite site of the Nantahala Outdoor Center located on the French Broad River in western North Carolina, near Hot Springs. This particular site was chosen because of the relatively large number of guide employees (ten) who had participated in the HWI. The data was gathered in a convenience sample over the course of three high-use days in August 2007. Over the three-day period, the two authors gave an “interest and knowledge scale”—pre- and post-rafting experience—to all NOC river raft guide clients who agreed to participate. The questionnaires consisted of 18 Likert scale questions. The questions gauged both “interest in the environment” and “knowledge of the environment.” Some sample questions include: “How much are you interested in protecting the river area?” and “How much do you know about the water quality of this area?” This resulted in 97 useable questionnaires. Group 1 (n=39) consisted of those clients whose guides went to the HWI seminar and Group 2 (n=58) were those clients whose guides did not attend.

The “interest and knowledge scale” was totaled and statistical analysis consisted of paired sample t-tests to determine change in client environmental knowledge and interest between pre- and post-rafting experience. Additionally, an ANOVA was conducted to determine if there was a difference between interest and knowledge scale score change with respect to groups (Group 1 = clients whose guides attended HWI seminar, Group 2 = clients whose guides did not attend the HWI seminar).

Results
Results showed that overall post scores were statistically significantly higher (p< .000) on the interest and knowledge scale for all clients following their river rafting experience, regardless of whether their guide had participated in the HWI seminar. Analysis indicated no significant difference between groups 1 and 2 regarding pre-test scores. However, differences between pre and post scores for clients whose guide attended the HWI seminar (Group 1) were statistically significantly higher (p< .005) than those of clients whose guide did not attend (Group 2).
Conclusions
All participants increased their interest in and knowledge of the river environment after the river rafting experience, whether or not their guides participated in the HWI seminar. This may indicate that just being exposed to the river environment can begin the process of influencing recreationists to become more aware and interested in the environment. However, increases in knowledge and interest in the environment were significantly higher for the group whose guides had participated in a Headwaters Institute seminar.

Implications
This study is limited by the small number of participants, as well as the fact that only one rafting company was involved. Additionally, it is also true that HWI participants may self-select, and so may have more enthusiasm regarding educating clients about the environment. However, even in this context, it is significant that the results of this study indicate that guide participation in the HWI seminar can influence clients’ knowledge of and interest in the environment. There is tremendous potential to influence a “captured” audience through the training of guides in basic environmental knowledge and interpretive methods. This study indicates that the use of interpretive messages in settings that are not traditionally interpretation platforms can encourage interest in the natural environment in a wider population.

Past research has confirmed the value of interpretive messages in influencing people’s attitudes regarding the environment (Ballantyne, Packer, & Beckmann, 1998; Madin & Fenton, 2004; Hughes & Saunders, 2005; Zeppel & Muloin, 2008). What makes the Headwaters Institute seminar unique is the focus beyond traditional raft guide training of reading the water, paddling skills, and safety of the client to a more robust educational experience. The results of this study suggest that other ecotourism and outdoor recreation providers should consider including specific area natural history, environmental information, and interpretive skills in their staff trainings, thus encouraging the embedding of interpretive messages within the recreational activity that they provide.

References


Much has been written about accessible text, regarding word counts, active rather than passive tense, straightening out sub-clauses and so on. This is now becoming embedded in good museum writing practice. At the British Museum, our aim is to maximize visitors’ engagement with our collections. Beyond the basic guidelines outlined above and in the light of the results of recent visitor research and evaluation we have begun to look again at the way in which we write interpretive text.

This article focuses on writing text for permanent galleries, rather than temporary exhibitions, and uses the recent Japan Gallery as a case study. The article also aims to provide some practical tips for writing and the interpretation process.

**Role of the Interpretation Officer**
The interpretation officer is a key member of the core project team for all exhibition and gallery projects. He/she works with the curator in the initial stages to scope the key messages and narrative of the gallery or exhibition. Formative evaluation will then be carried out to gauge visitors’ interests and levels of understanding of the subject. The results of this evaluation inform our decisions about what texts should be written and enables the interpretation officer to brief the curator before they begin text writing. He/she then edits the texts to ensure they support the agreed key messages and themes and are intellectually accessible to visitors. The interpretation officer also works closely with the graphic and three-dimensional designers to ensure that the location of objects and panel texts and design encourages visitor engagement with the objects.

**Permanent galleries and paying exhibitions**
The results of our visitor evaluations have shown that visitor behavior is significantly different in permanent galleries to paid exhibitions, above all in terms of the amount of time spent. In paid exhibitions visitors will follow the exhibition narrative, read the subject panels and labels and engage with other interpretive media. Visitors tend to spend between 30 to 90 minutes in paid exhibitions. By contrast, visitor dwell time in
the permanent galleries is considerably lower, usually under four minutes for a whole gallery. Fewer visitors are prepared to follow the narrative of the gallery. Instead 70% of visitors “browse” the gallery, stopping at two or three objects, at which point they may engage and look closely at the object and read its associated label. Less than 10% of visitors read the panels which provide vital contextual information about the objects.

In response to these findings we have made some changes in our new galleries that we believe will help visitors engage more deeply with the objects and at the same time deliver more key messages:

**Panels**
Evaluation showed that while few visitors read gallery or subject panels in galleries, they do nevertheless expect them in a display. Visitors are drawn to objects rather than panels. The strength of panels seems to be the sense of visual and intellectual structure that they give. For this reason we retained panels but used them more as signage with limited word counts.

**Gateway objects**
These are carefully selected objects throughout recently redisplayed galleries that act as “gateways” to a particular section or theme. The Japan gallery is a good example of this new technique. The aim is that visitors will engage with these gateway objects and the texts immediately next to them and then be drawn to other nearby objects. Through careful positioning, display, lighting, images and text we have tried to make the gateway objects attractive to visitors, enticing them to engage. This is a direct response to our research showing that visitors read more labels than panels in permanent galleries. We have placed some essential contextual information with the objects to encourage visitors to read more. The results are heartening, the dwell time in the Japan gallery is around 11 minutes, and visitors on average stop at 12 gateway objects (27% of the objects in the gallery), which is significantly higher than most other galleries.

**Evaluation**
We undertake different forms of evaluation in order to have a better understanding of visitors’ interests and needs.

*Terminology Testing*
We use terminology testing and personal meaning maps to get a good sense of what visitors understand by certain key terms. This means that when drafting interpretive text we know what preconceptions visitors have about certain words. We have also carried out formative evaluation on potential gateway objects. This gives us a valuable insight into what type of questions visitors ask about an object and we can endeavor to answer them in the label texts.
A general view of the Japan gallery.

The portrait of a retired townsman’s object label on the left, with contextual information on the right.
Testing Length and Tone
We have researched visitor responses to different styles and lengths of text. Visitors tend to prefer text that includes dates and facts, but that is presented in an easily readable style. We want interpretive texts to have a distinctive voice, often the curator’s voice, so that each gallery or exhibition has a different feel. This variety in style of the text, combined with the use of contemporary quotes and other media gives visitors variety and can enable them to engage more with objects.

We may, for instance, include language that helps visitors gain an emotional response to the objects. We have found that when visitors have had an emotional response to a display it often makes it more memorable. This example of a label from the Japan gallery shows the use of emotive language to create a connection between the visitor and the object:

*Portrait of a retired townsman*

The figure gazes out at us with an air of calm. His crystal eyes give him a gently human expression. Many successful townsmen, as they grew older, took Buddhist vows. Like monks they often had their heads shaved, abandoning vanity. Some continued to live busy secular lives, others went into semi-retirement to prepare spiritually for death.

Townspeople believed that by making portraits such as this one, often as a memorial after death, they would preserve the success of their family. In effect the head of the household was still watching over them.

Interpretive media
Diversity of information and media can help visitors to engage with objects. In any project there are a range of interpretive devices offering different modes of engagement and catering for varied learning styles. For the Japan gallery high-level texts, panels, labels, images, a gallery guide, the museum multimedia guide, the museum map, gallery talks, and other events provide visitors with variety of entry points. There must be a clear hierarchy between these distinct media. Furthermore, various writing styles and voices will be appropriate for each of the different media. This article focuses on the more traditional forms of interpretive writing such as panels and labels, but these should be considered alongside other interpretive devices and not in isolation.

Interpretive writing process
Our evaluation research has enabled us to develop some guidelines for writing interpretive text at the British Museum. We have a constantly evolving house style, as well as guidance on word lengths for panels and labels. We always consider our audience, visitors to the museum itself, but also specific target audiences identified for different exhibitions. All our object-specific texts start with what the visitor can see to help them look at the objects more closely. This enables visitors to engage more deeply with our collections.

We have developed a text sign-off process: once the interpretation officer and the curator have agreed the text, it is circulated to all other stakeholders for their comments. We also ensure that for major projects at proof stage a second interpretation officer, who has not been involved in the project, reads all the texts as a final check for proofing, consistency and sense.
Conclusion
Visitors are motivated to visit the museum for many different reasons and seek a variety of ways to engage with objects at an intellectual, emotional, social, or spiritual level. Visitors’ needs change according to the motivation for their visit. Our next challenge will be to develop further interpretation techniques so that we can provide more for every visitor, including those who do not yet come to the British Museum. Our biggest challenge is to enable visitors to engage more deeply with our permanent galleries and display collections. Providing interesting, informative, and accessible text is just the first step.

Resources


APPENDIX
Manuscript Submission

Instructions to Authors

Purpose
The purposes of the *Journal of Interpretation Research* are to communicate original empirical research dealing with heritage interpretation and to provide a forum for scholarly discourse about issues facing the profession of interpretation. The *Journal* strives to link research with practice. The *Journal of Interpretation Research* is published by the National Association for Interpretation, the preeminent professional association representing the heritage interpretation profession.

General Information
The primary function of the *Journal* is to disseminate original empirical research regarding interpretation. However, the *Journal of Interpretation Research* takes a broad view of the field of interpretation and publishes manuscripts from a wide-range of academic disciplines. The primary criteria for deeming a manuscript appropriate for the *Journal* are whether it adds to the current state-of-knowledge for practitioners, researchers, academics, or administrators who work in the field of interpretation.

In recognition of how diverse the relevant literature is, the *Journal* will also publish reviews of recent books, government publications, original literature reviews, and bibliographies dealing with interpretation. Abstracts from dissertations, private consultant materials, and reports from public agencies will be published in the *Journal* in a section called “In Short: Reports and Reviews.” This section will also provide an outlet for summaries of research studies with limited scope. Interpretation research often consists of small “in-house” program evaluations and basic visitor studies. The purpose of this section is to communicate current research activities, allow readers to identify colleagues with similar interests, and provide practitioners and administrators with useful information and direction for conducting their own mini-research projects. Submissions for the “In Short: Reports and Reviews” section should be limited to 800 to 1,000 words and will be reviewed by the editor and two associate editors.

Additionally, the *Journal* will publish thought pieces that exhibit excellence and offer original or relevant philosophical discourse on the state of heritage interpretation. The “In My Opinion” section of the *Journal* encourages the development of the profession and the practice of interpretation by fostering
discussion and debate. Submissions for the “In My Opinion” section should be limited to 1,000 to 1,200 words and will be reviewed by the editor and two associate editors.

**Research Manuscript Submission Guidelines**

All research manuscripts will be reviewed anonymously by an associate editor and by at least two other reviewers. Based on the nature of the manuscript, special efforts will be made to identify well-qualified associate editors and reviewers to evaluate the manuscripts. From the recommendations of the associate editor, the editor will make the final decision of the manuscript’s disposition and communicate this information to the author.

**Manuscripts**

Manuscripts will be accepted with the understanding that their content is unpublished and not being submitted elsewhere for publication.

- All parts of the manuscript, including title page, abstract, tables, and legends, should be typed in 12-point font, and double-spaced on one side of 8.5” x 11” or A4 white paper.
- Margins should be 1” on all sides.
- Manuscript pages should be numbered consecutively in the top right corner.
- All papers must be submitted in English. Translations of papers previously published in other languages will be considered for publication, but the author must supply this information when the manuscript is submitted.
- Maximum length of manuscripts shall be 30 double-spaced pages (including all text, figures, tables, and citations). The editor will consider longer manuscripts on an individual basis.

**Titles**

Must be as brief as possible (six to 12 words). Authors should also supply a shortened version of the title, suitable for the running head, not exceeding 50 character spaces.

**Affiliation**

On the title page include full names of authors, academic, and/or other professional affiliations, and the complete mailing address of the author to whom proofs and correspondence should be sent. An e-mail address and phone and fax numbers should also be included. As all manuscripts will be reviewed anonymously; the name(s) of the author(s) should only appear on the title page.

**Abstract**

Each paper should be summarized in an abstract of no more than 150 words. The abstract will preface the paper and should be a comprehensive summary of the paper’s content, including the purpose or problem, methods, findings, and implications or applications. It should enable the reader to determine exactly what the paper is about and make an informed decision about whether to read the entire paper. Abbreviations and references to the text should be avoided. All abstracts shall be listed on the *Journal of Interpretation Research* Web site (www.interpnet.com/JIR).
Keywords
Authors must supply five to 10 key words or phrases that identify the most important subjects covered by the paper.

References and Citations
Include only references to books, articles, and bulletins actually cited in the text. All references must follow the Publication Manual of the American Psychological Association (APA), version 6.2. References in the text should cite the author’s last name, year of publication, and page (if appropriate). All references used in the text should appear at the end of the typed script in alphabetical order using APA version 6.2 style.

Examples of references:


Figures
All figures must be discussed in the text and numbered in order of mention. Each figure must be submitted as a print-ready digital file. Label each figure with article title, author’s name, and figure number by attaching a separate sheet of white paper to the back of each figure. Each figure should be provided with a brief, descriptive legend. All legends should be typed on a separate page at the end of the manuscript.

Tables
All tables must be discussed in the text and numbered in order of mention. Each table should have a brief descriptive title. Do not include explanatory material in the title: use footnotes keyed to the table with superscript lowercase letters. Place all footnotes to a table at the end of the table. Define all data in the column heads. Every table should be fully understandable without reference to the text. Type all tables on separate sheets; do not include them within the text.

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Submission
Please submit an original and three copies of your manuscript to the address below. Authors whose manuscripts are accepted for publication must submit final manuscripts electronically or on computer disk.

Contact
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