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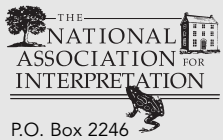

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A Note from the Editor

This issue of *JIR* includes two research articles that revisit and update some traditional and time-honored approaches and theories used in the field. Both articles serve to remind us of the importance of research to ask and answer even some of our most basic assumptions in the field. In addition, this issue also contains a special "In Short" report from Steve Hill and Ted Cable examining the concept of authenticity and the associated impacts on interpretation.

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

—*C*

RESEARCH

The Effect of Thematic Interpretation on a Child's Knowledge of an Interpretive Program

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Dr. Ted Cable served as the guest editor for this article.

Abstract
In the field of interpretation, thematic interpretation is a widely accepted technique used to increase knowledge gain from interpretive programs with educational goals and objectives. Although the approach has theoretical grounding in cognitive psychology, social psychology, and persuasive communication, it has not been formally tested in a field interpretive setting. This study addressed this lack of empirical evidence by comparing children's knowledge gained from a thematic versus a non-thematic interpretive program. It also compared type of knowledge gained by evaluating three different levels of learning: recognition, recall, and application.

The results supported the use of thematic interpretation and program construction. The thematic group not only showed a significant increase in ability to recall and apply information, but was also three times more likely to identify the theme and main points of the program, when compared with the non-thematic group. No differences between groups were found for the recognition measure. This indicated that thematic interpretation is effective at encouraging higher levels of thinking and learning and highlights the importance of matching correct evaluation measures with learning objectives. Further management and research implications are discussed.

Keywords
thematic interpretation, schema, advance organizers, signaling, evaluation, recognition, recall, application, knowledge acquisition

Introduction

The use of thematic interpretation is thought to be one of the most crucial elements for success in interpretive programs (Ham, 1992; Ham, 2003; Ham & Weiler, 2003, Larsen, 2003). This is based in part on Ham's (1992) assertion that presentations organized around a theme are easier to understand. Drawing on research in cognitive and social psychology, Ham (1992) suggests that a theme is the central message of a presentation and is the single most important idea the interpreter seeks to convey (Ham, 2002; Ham, 2003). In a thematic program, the main points and supporting information in a presentation must link back to the theme. This is made explicit by incorporating advanced organizers, cognitive maps, transition sentences, and a conclusion into a presentation (Knopf, 1981; Ham, 1992). According to Ham (2003), thematic interpretation makes it easy for the audience to sort through the information and attenuate to the important ideas, namely the theme and main points of the presentation.

Considering the important role thematic interpretation has in the development and delivery of programs, it is surprising the lack of empirical evidence supporting its use. Further, there is not a single study supporting the use of thematic interpretation in school-based interpretive programs.

To gain insight on the effectiveness of thematic interpretation as a tool to increase a child's knowledge gained from an interpretive program, the fields of cognitive and educational psychology offer the constructs of schema, advance organizers, and signaling, which closely relate to thematic interpretation. Empirical evidence resulting from studies on these constructs suggests that the use of thematic interpretation will significantly increase knowledge gain from an interpretive program (Alba & Hasher, 1983; Snapp & Glover 1990; Lorch & Lorch, 1995; Mautone & Mayer, 2001). The primary purpose of this study was to assess whether there is a significant increase in a child's knowledge gained from a thematic interpretive program compared to a non-thematic interpretive program.

Interestingly, the results of schema, advance organizer, and signaling studies reveal a different pattern of results depending on the type of evaluation measure used and the level of learning assessed. For example, studies using recognition measures generally find non-significant results (Kardash, Royer, & Greene, 1988; Siebold, 1989), while the results of recall measures lead to inconclusive findings (Brooks, Dansereau, Spurlin, & Holley, 1983; Lorch et al., 1993). Application measures, on the other hand, consistently generate significant results (Lorch & Lorch, 1996; Mautone & Mayer, 2001). This pattern of results can be attributed to the different levels of knowledge that recognition, recall, and application questions are evaluating. Matching the correct evaluation measure to the type of knowledge evaluated is potentially a crucial element in the establishment of defensible results for the field of interpretation. Therefore, the secondary purpose of this study was to assess whether measuring different levels of learning using recognition, recall, and application questions significantly affects the results.

Literature Review

What is known about effective thematic interpretation?

Within the field of interpretation, there have been several recent studies examining the effectiveness of interpretive services (Goldman, Wei-Li, & Larsen, 2001; Knapp & Li-Lang, 2002; Porter & Howard, 2002; Lackey & Ham, 2003; Ward & Roggenbuck, 2003; Knapp & Benton,

2004). In addition, individual assessments are increasingly being tied to specific goals and objectives (Knapp, 1994; Knapp, & Yang, 2002; Ham, 2003), the target audiences (Silverman & Masberg, 2001; Ham & Weiler, 2002; O' Brien & Pease, 2004) and the methods of communication used (Moscardo, 1999; Bitgood, 2000; Athman & Monroe, 2004). However, there does not appear to be empirical evidence supporting the use of a "thematic" approach to interpretation versus a non-thematic approach.

Ham (2003) describes the theme of a presentation as "the heart and soul of the learning objective" (p. 11). Larsen (2003) describes the theme as "perhaps the most powerful interpretive tool" (p. 1). The theme captures the main belief put forth in the communication that the interpreter is attempting to convey to the audience (Ham, 2003; Ham, 2003). Although the use of themes and thematic interpretation has long been touted as a basic building block of successful interpretation, there has been little evidence testing the impact of themes or thematic interpretation on achieving any particular objective (Thorndike, 1977; Ham, 1992; Ham, 2003).

Thematic interpretation, however, includes much more than just the theme. It also includes the organizational structure of the program built around the theme (1992). Ham (1992) refers to "thinking thematically" as a much larger concept than just the main message being conveyed in the program. Advanced organizers, cognitive maps, transition sentences, and conclusions are all key components of a thematic program (Knopf, 1981; Ham, 1992). The cognitive map generally consists of several sentences with the purpose of orienting the audience to the organization of the presentation (Knopf, 1981). A cognitive map is usually stated after the theme and serves as the transition from the introduction into the body of the presentation. Transition sentences cue the visitor that the discussion of one main point is finished and the presentation is moving into a discussion of the next main point. Transition sentences also link each main point back to the main theme, which connects the entire presentation to the central message. The conclusion occurs at the end of the presentation and includes a restatement of the theme, the main points, and how the main points relate back to the theme (Ham, 1992).

By examining the literature, this review provides insight on the use of thematic interpretation and its potential impact on achieving targeted goals and objectives. Whether making-meaning, increasing knowledge, controlling a depreciative behavior, or connecting a visitor to a resource, the specific objectives of any interpretive endeavor are based upon management goals and objectives, resource needs, target audiences, and the interpreter (Goldman, Wei-Li, & Larsen, 2001; Brochu & Merriman, 2002; Ham, 2003). Although there are numerous goals and objectives of interpretation ranging from knowledge gain to behavioral modification, the key for any successful evaluation is to build assessment mechanisms that allow for measurement of the targeted objective (Webb, 2000; Ham, 2003; Ham, 2004).

The focus of this study was providing an interpretive program to a school group with the goal of knowledge gain. Working with a school group allowed for relative control of many variables and promoted a quasi-field experiment. Assessing knowledge gain has been widely recognized as an important and measurable objective of interpretation (Fishbein & Ajzen, 1975; Ajzen 1991; Ballantyne & Uzzell, 1999; Beckman, 1999; Knapp, 2000; Morgan, Absher & Whipple; 2003; Ham, 2003; Ham & Weiler; 2002).

Theories supporting the use of thematic interpretation.
Consideration must also be given to supporting theory as well as to empirical evidence. Schema, advance organizers, and signaling theories from the fields of cognitive and educational psychology all relate to the use of thematic interpretation and provide empirical evidence suggesting the use of thematic interpretation will improve a child's knowledge gain from an interpretive program.

Schema
One source of empirical support regarding the effectiveness of thematic interpretation comes from studies of a well-developed construct of memory called schema. A broad definition of schema suggests that it is the underlying structure of memory for a given context. It is essentially the knowledge an individual has about a particular domain (Alba & Hasher, 1983).

According to Alba and Hasher's (1983) analysis of schema theories, the selection process is the cognitive operation that determines what information is initially encoded into memory. This process is influenced by three factors: prior knowledge, activation of an existing schema, and the importance of the incoming information to the schema (Alba & Hasher, 1983; Schneider; 1993; Knapp & Li-Lang, 2002).

Support for the important role that the selection process has on encoding new information is well-documented in the literature (Dooling & Lachman, 1971; Bradford & Johnson, 1972; Pichart & Anderson, 1977; Thorndyke, 1977; Alba & Hasher, 1983; Schneider, 1993; Alexander, Kulikowich & Schulze, 1994). It has been shown that there must be an existing schema, that the schema must be activated, and that only relevant information will be encoded within the schema. This in turn can be directly applied to the use of thematic interpretation in a presentation. A theme must be linked to prior knowledge, be stated at the beginning of the presentation in order to activate the schema, and finally, the information in the presentation must relate back to the theme.

Advance Organizers
A second source of empirical support regarding the effect that thematic interpretation has on knowledge gain comes from research on advance organizers. Mayer and Bromage (1980) define an advance organizer as "a stimulus that is presented prior to learning and contains a system for logically organizing the incoming information into a unified structure" (p. 211). While advance organizers are more inclusive than the combination of a theme and cognitive map, they serve a similar purpose in providing a means for individuals to logically organize incoming information and store it in memory.

The use of advance organizers is based on assimilation theory. This theory suggests that learners remember information in a hierarchical fashion (Ausubel, Robbins, & Blake, 1957). The more general or inclusive concepts are at the top of the hierarchy and serve as the categories under which more specific sub-concepts and informational data are stored (Ausubel et al., 1957). This is similar to the constructivist learning approach used in much of the educational literature where learners actively build their own unique knowledge structures (Silverman, 1997; Goldman, Wei-Li, & Larsen, 2001; Knudson, Cable and Beck, 2003). Advance organizers are effective at improving understanding because they function at the top of the hierarchy and help the learner build organized structures of knowledge. In addition, Mayer (1975) suggests that advance organizers are successful because they fulfill two

important criteria of assimilation theory. They provide an assimilative context by presenting background information that is linked to prior knowledge. Advance organizers are also presented before the learning material, allowing the learner to utilize this context as an aid in understanding new information (Mayer, 1975). Studies of advance organizers demonstrate that introducing an advance organizer prior to the learning material increases students' performance on post-tests compared to students who did not receive an advance organizer (Corkill, Glover, Bruning & Krug, 1988; Siebold, 1989; Snapp & Glover 1990).

Signaling

While advance organizers address the use of a theme and cognitive map, they fall short of explaining the effectiveness of transitions and conclusions in thematic interpretive programs. A third source of support for the use of thematic interpretation to improve knowledge addresses all four elements of thematic communication. Known collectively as signaling studies, this line of research focuses on the effect of topic cues that reveal the structural organization of a passage or presentation as a technique to increase comprehension (Lorch, 1989).

Signaling is referred to as the addition of non-content words in presented material that emphasize the topic structure and the relationship between main ideas (Spyridakis & Standal, 1987). They can be added or subtracted without changing the semantic meaning of the text (Lorch, 1989). The four categories of signals include overviews, headers, pointer words, and summaries (Meyer, 1975; Lorch, 1989).

According to Meyer (1975), overviews are provided before the presentation and serve as a brief description of the main ideas. Headings specify the structure of relations between the main points of the presentation. They may include words such as "first," "second" (Loman and Mayer, 1983), or may be an explicit statement of the main idea (Lorch & Lorch, 1995). Pointer words bring attention to the important information in the body of the presentation (Meyer, 1975). Finally, summaries are similar to overviews in that they paraphrase the main ideas, but occur at the end of the presentation (Meyer, 1975).

Signaling is closely related to thematic interpretation. Overviews can be thought of as a combination of a theme and cognitive map. All three provide a brief synopsis that previews the relevant learning material. Headings and pointer words are similar to transition sentences in that they focus attention on the shift from one main idea to the next. The summary and the conclusion are identical in that they both restate the main ideas and signal the end of the learning material.

There are multiple theories that attempt to explain the effectiveness of signaling on understanding. The meaningful reading strategy (Loman & Mayer, 1983), the strategy switch hypothesis (Lorch & Lorch, 1995), the structure strategy hypothesis (Spyridakis & Standal, 1987), the mental model strategy hypothesis (Mayer, Dyck, & Cook, 1984), and the knowledge construction hypothesis (Mautone & Mayer, 2001) are remarkably similar in their explanations. The basic premise is that signaling causes an individual to focus on the conceptual organization of the passage (Loman & Mayer, 1983). This means that attention is directed to the hierarchical organization of the passage allowing the reader to identify the relative importance of the various ideas presented (Lorch & Lorch, 1995; Spyridakis, 1987; Mayer et al., 1984).

Mautone and Mayer (2001) suggest that signals meet the three proposed requirements needed to build a coherent mental representation. First, signals make the important infor-

mation explicit, allowing the individual to discriminate between relevant and irrelevant points. Second, signals help the individual identify the local and global organization of the learning material. They do this by emphasizing the interrelationship of ideas in the text that may not have been inferred by the individual. Lastly, signals reduce the cognitive load of identifying important information, which allows resources to be spent on integrating new knowledge with prior knowledge. Overall, the results of signaling studies point to the conclusion that the use of signaling techniques can be generalized across different types of instruction and that signaling has a consistent positive effect on the ability to transfer knowledge to new situations (Loman & Mayer, 1983; Mayer et al., 1984; Lorch & Lorch, 1996; Mautone & Mayer, 2001).

Importance of Evaluation

Research on schema, advance organizers, and signaling, provide support for the effectiveness of thematic interpretation as a tool to increase knowledge acquisition (Loman & Mayer, 1983; Mayer et al., 1984; Lorch & Lorch, 1996; Mautone & Mayer, 2001). However, there have been various studies conducted on these constructs that have not found significant findings (Sowder, Musser, Flora & Bright, 1971; Alba, Alexander, Hasher & Caniglia, 1981; Brooks, Dansereau, Spurlin & Holley, 1983; Lorch, Lorch & Inman, 1993). A closer look at the evaluation methods used in these studies and the level of learning assessed reveals a different pattern of results depending on whether recognition, recall, or application questions were used.

Evaluations that assess recognition often include either multiple-choice or sentence-recognition questions, which require participants to identify one of two sentences that were present in the learning material (Diamond, 1999). Recall assessments consist of fill-in-the-blank or short-answer questions. Perhaps the most common recall measure is the use of free recall. Participants are asked to write down everything they remember from the presented material. Application assessments primarily include problem-solving questions, which assess the ability to transfer new information.

Studies on schema, advance organizers, and signaling that use recognition questions generally find non-significant results (Alba et al., 1981; Brooks et al., 1983; Kardash, Royer, & Greene, 1988; Siebold, 1989). The results of studies using recall questions differ depending on the construct being evaluated. For example, Alba and Hasher (1983), in their review of schema studies, note the use of recall questions typically led to significant results. Conversely, several studies conducted on advance organizers and signaling that used recall questions failed to find a significant effect (Sowder et al., 1971; Meyer & Rice, 1982; Brooks et al., 1983; Lorch et al., 1993).

Research using application questions, which evaluate the ability to transfer new information in related but different domains, consistently find significant results. For example, Loman and Mayer (1983) gave participants a recognition-and-recall test designed to measure the quantity of factual information remembered. Participants were also given a problem-solving measure that served to differentiate between types of information remembered. Consistent with the previous discussion of recognition and recall questions, they found that signaling does not affect the quantity of information recognized or recalled, but that it does effect the distribution of recall in that the signaled group remembered more of the relevant ideas than the non-signaled group. This was evident from participants' answers on the problem-solving questions (Loman & Mayer, 1983). Several other advance organizer and signal-

ing studies consistently find significant results when participants were asked to apply the knowledge (Mayer, 1976; Mayer, 1977; Mayer & Bromage, 1980; Loman & Mayer, 1983; Mayer et al., 1984; Lorch & Lorch, 1996; Mautone & Mayer, 2001).

A review of the evaluation measures used in schema, advance organizer, and signaling studies leads to the conclusion that the type of evaluation questions used influences the results. For example, recognition questions generally find no significant differences between groups. Studies using recall questions are mixed as to whether they find significant or non-significant results, and application questions consistently result in significant findings.

Hypotheses

The present study was guided by four hypotheses: (1) Knowledge, as assessed by the combination of recognition, recall, and application questions, will increase regardless of whether a child hears a thematic or a non-thematic program; (2) There will be no difference in a child's ability to recognize information presented in a thematic program compared to a non-thematic program; (3) A child will be more able to recall and apply the information presented in a thematic program compared to a non-thematic program; (4) A child will be more likely to identify the main message and main points of a thematic program compared to a non-thematic program as assessed by the combination of recognition, recall, and application measures.

Materials and Methods

Design

A quasi-experimental pretest-posttest design was used for this study. Classes were randomly exposed to one of two versions of a 45-minute interpretive presentation on bats. The thematic version of the interpretive program included a theme (Bats are the most misunderstood creatures of the night.), a cognitive map, transition sentences, and a conclusion. The non-thematic interpretive program contained the same content as the thematic program, but was presented in a slightly different order and did not include a theme, a cognitive map, transition sentences, or a conclusion (See appendix A).

The study was conducted in 2002 and included a sample of 240 students from eight third-grade classes from schools located in Humboldt County in northern California. The selection of classes was based on teacher interest. The sample consisted of roughly an equal number of female and male participants ranging in age from seven to nine years old.

As is often the case in educational research, random assignment of subjects was not feasible. Intact classes were used and randomly assigned to either the thematic or non-thematic groups. The individual student served as the unit of analysis.

Each teacher was contacted individually to set a time and date for the interpretive program. At that time, the teacher received the consent forms, the pretest, the posttest, and the questionnaire delivery instructions. The teacher was responsible for distributing and collecting the consent forms from the parents. Five days before the scheduled program, the teacher conducted the first phase of the experiment by administering the pretest to the class. The teacher read from the questionnaire delivery instructions and then handed out the test. Each question was read aloud by the teacher and ample time was given for the student's written response. The teacher provided no further direction. If a student had a question, the teacher re-read the question and encouraged the students to answer it to the best of their ability.

The second phase of the experiment was conducted by the researcher. Five days after the teacher administered the pretest, the researcher presented a 45-minute thematic or non-thematic interpretive program to the class. At the conclusion of the program, participants and non-participants received a token of appreciation.

Phase three of the experiment occurred five days after the presentation of the program. The teacher administered the posttest in the same format as described in phase one. Within one week, the researcher collected the consent forms, pretests, and posttests.

Questionnaires and Forms

A questionnaire was developed to measure knowledge gain (Appendix B). The questionnaire served as a pretest and a posttest and was given to all participants regardless of experimental condition. This format was chosen as an appropriate evaluation measure because of its standard use in school settings. The questionnaire consisted of three types of questions: recognition, recall, and application. Each type of question served independently as a measure of knowledge gain.

The use of recognition, recall, and application questions was based on established guidelines (Bloom, Englehart, Furst, Hill, and Krathwohl,1957; Diamond, 1999). Multiple-choice and fill-in-the-blank questions are appropriate measures of recognition and recall respectively. Not only are these types of questions frequently used as a test of knowledge, but they are also considered the most efficient due to the ability to use a small sample of questions to generate a comprehensive test. For these reasons, the present study used five multiple-choice questions as a measure of recognition and five fill-in-the-blank questions as a measure of recall.

As a measure of application, problem-solving questions are an appropriate measure of the ability to transfer information to new situations (Bloom, et al., 1957; Diamond, 1999). Six problem-solving questions were developed and included in the questionnaire. In addition, the posttest included two additional questions designed to evaluate whether students could identify the thematic message and main points of the interpretive program.

To effectively evaluate differences in the recognition, recall, and application questions themselves, one of each type of question was developed to assess variations of the same content. For example, a recognition, recall, and application question was developed to assess students' knowledge of echolocation (See Appendix B, Questions 1, 10, and 11). In addition, there were three questions—a recognition, recall, and application question—representing content for each of the five main points (see Appendix B).

Pilot Study

To evaluate the reliability and validity of the questionnaire, an initial pilot study was conducted in a combination fourth- and fifth-grade class at St. Mary's School located in Humboldt County, California. Fifteen students participated in the pilot study.

As a measure of reliability, the teacher administered the pretest on two different occasions. The first pretest was administered two weeks before and the second pretest was administered one week before the scheduled delivery date of the bat program. The teacher read from the scripted instructions and then read each pretest question aloud to the students. The researcher was present on both occasions to make observations and answer questions.

Pearson correlations were conducted between the first and second pretest for each of

the four selected variables to evaluate their test-retest reliability. The variables consisted of total score for recognition questions, total score for recall questions, total score for application questions, and total combined score for recognition, recall, and application questions. Results indicate significant correlations between the first and second pretest for total recognition score, $r(11) = .720$, $p < 0.01$, and total application score, $r(11) = .896$, $p < 0 .001$. The correlation between the first and second pretest for the total recall score, $r(11) = 0.370$, was not statistically different from zero at $p > 0.05$. The results of the paired sample t-tests indicated that there were no significant differences between the first and second pretest for any of the four variables. This suggests good stability of the instrument.

The internal and external validity of the instrument was also established using two methods. The first included the use of a panel of experts consisting of two university professors and three third-grade teachers who provided feedback on the construction and content of the instrument. Changes were made to the instrument based on the panel's feedback to ensure the instrument measured what it intended to measure.

A second method using feedback from pretest participants was incorporated to establish the validity of the instrument. The 45-minute pilot bat program was presented to the students. Three days after the program, the teacher administered the pilot posttest, again using the scripted instructions. The researcher was present on all occasions to make observations and answer questions. After the pilot posttest, the teacher selected two students differing in academic ability to be interviewed by the researcher. The researcher read each question to the students and asked about the reasoning behind their answers. Again, changes were made to the instrument based on the students' feedback.

While responses to the recognition and recall questions provided strictly quantitative data, the application questions required that students respond by writing short answers. A rubric was used to code students' responses on the application questions. Inter-rater reliability was assessed to establish the reliability of the rubric. Two raters used the rubric to code data from the application questions on the first and second pilot pretest and the pilot posttest. Pearson correlations were conducted between the two raters on each of three selected variables. The variables consisted of the total application score for the first pilot pretest, the total application score for the second pilot pretest, and the total application score for the pilot posttest. Significant correlations between Rater 1 and Rater 2 were found for the total application score on the first pilot pretest, $r(11) = .951$, $p < .001$, the total application score on the second pilot pretest, $r(12) = .969$, $p < .001$, and the total application score for the pilot posttest, $r(10) = .923$, $p < .001$. The results of paired sample t-tests indicate no significant differences between the two raters.

The significant correlations between the first and second pretest indicates that the instrument is a reliable measure. The panel review and interviews with students, resulting in appropriate changes to the instrument, indicates the measure is valid. In addition, the significant correlations between the two raters indicates inter-rater reliability, which establishes the reliability of the scoring procedure.

Results

Knowledge Change Between Pretest and Posttest

A paired sample t-test was conducted to evaluate knowledge change from pretest to posttest for the thematic group and the non-thematic group. The pretest and posttest scores were

	Recognition (n=80)	Recall (n=80)	Application (n=80)
Pretest	1.83 (1.09)	1.01 (.83)	4.56 (2.89)
Posttest	3.93 (1.00)	3.99 (1.28)	10.58 (4.25)
Change Score	+2.10 (1.10) p<.001	+2.98 (1.24) p<.001	+6.01 (3.66) p<.001

(Means, standard deviations (in parentheses) and p values).

Table 1. Paired Sample t-tests for Knowledge Change Between Pretest and Posttest for the Thematic Group

	Recognition (n=75)	Recall (n=75)	Application (n=75)
Pretest	2.08 (1.04)	1.77 (.98)	6.63 (3.34)
Posttest	3.99 (1.02)	4.24 (.84)	11.23 (3.44)
Change Score	+1.91 (1.07) p<.001	+2.47 (1.07) p<.001	+4.60 (3.41) p<.001

(Means, standard deviations (in parentheses) and p values).

Table 2. Paired Sample t-test for Knowledge Change Between Pretest and Posttest for the Non-Thematic Group

divided into three variables consisting of total recognition score, total recall score, and total application score. Participants were given a higher score for correct responses.

Table 1 shows the mean change in knowledge scores between the pretest and posttest for the thematic group. The results indicate significant increases from pretest to the posttest on total recognition score, $t = 17.110$, $df = 79$, $p < 0.001$, total recall score, $t = 21.417$, $df = 79$, $p < 0.001$, and total application score, $t = 14.688$, $df = 79$, $p < 0.001$. Table 2 shows the mean change in knowledge scores between the pretest and posttest for the non-thematic group. The results indicate significant increases from the pretest to the posttest on total recognition score, $t = 15.466$, $df = 74$, $p < 0.001$, total recall score, $t = 19.971$, $df = 74$, $p < 0.001$, and total application score, $t = 11.699$, $df = 74$, $p < 0.001$.

The results of the paired sample t-tests indicate that knowledge, as assessed by total recognition score, total recall score, and total application score increased regardless of whether a child heard a thematic or non-thematic interpretive program.

Knowledge Change Between Thematic and Non-Thematic Groups

A one-way ANOVA was conducted to evaluate whether there were significant differences in

Measures	Thematic Group (n=80)	Non-Thematic Group (n=75)	Significance of Group Differences
Recognition Pretest	1.83 (1.09)	2.08 (1.04)	p>.05
Recognition Posttest	3.93 (1.28)	3.99 (1.02)	p>.05
Recognition Change	+2.10 (1.10)	+1.91 (1.07)	p>.05
Recall Pretest	1.01 (.83)	1.77 (.98)	p<.01
Recall Posttest	3.99 (1.00)	4.24 (.84)	p>.05
Recall Change	+2.97 (1.24)	+2.47 (1.07)	p<.01
Application Pretest	4.56 (2.89)	6.63 (3.34)	p<.001
Application Posttest	10.58 (4.25)	11.23 (3.44)	p>.05
Application Change	+6.01 (3.66)	+4.60 (3.41)	p<.05

Table 3. One Way ANOVA for Knowledge Change Between the Thematic and Non-Thematic Groups: Means, standard deviations (in parentheses), and p value.

pretest scores, posttest scores, and change scores between the thematic and non-thematic groups. Change scores were calculated by subtracting individuals' pretest scores from their posttest scores. The pretest scores, posttest scores, and change scores were divided into three variables consisting of total score for recognition questions, total score for recall questions, and total score for application questions.

For the pretest, the results indicate significant differences between the thematic and non-thematic groups on total recall score, $F(1, 153) = 27.180$, $p < .001$ and total application score, $F(1, 153) = 16.945$, $p < .001$, with the thematic group scoring lower than the non-thematic group on each of these measures initially at pretest. The thematic and non-thematic group did not differ significantly on total recognition score, $F(1, 153) = 2.225$, $p > .05$ (See Table 3).

For the posttest, the results indicate there were no significant differences between the thematic and non-thematic groups for any of the selected variables: total recognition score, $F(1, 153) = 0.144$, $p > .05$, total recall score, $F(1, 153) = 2.090$, $p > .05$, or total application score, $F(1, 153) = 1.093$, $p > .05$ (See Table 3). This indicates that at posttest, the thematic group had risen to a similar level as the non-thematic group.

Category	Thematic Group (n=70)	Non-thematic Group (n=74)
Provided subordinate information	43 (61%)	62 (84%)
Provided a main point	4 (6%)	3 (4%)
Demonstrated knowledge of the main message	7 (10%)	8 (11%)
Explicitly stated the main message	16 (23%)	1 (1%)

Table 4: Frequency Distribution (percents in parentheses) for Identifying the Main Message for Thematic and Non-Thematic Groups

For the change scores, the results indicate a significant difference between the thematic and non-thematic groups on the total recall change, $F(1, 153) = 7.407$, $p < .01$ and total application change, $F(1, 153) = 6.164$, $p < .05$, with the thematic group showing greater improvement than the non-thematic group. No significant differences were found between groups for the total recognition change, $F(1, 153) = 11.233$, $p > .05$ (See Table 3).

Differences Between Thematic and Non-Thematic Groups on Identifying the Conceptual Framework of the Interpretive Program

Two posttest questions were analyzed to determine students' knowledge of the main message and main points in the interpretive program. Specifically, students were asked to respond to the following, *"In one sentence, what do you think the program was mostly about?"* The purpose of this question was to identify if students could describe the theme of the interpretive program. Individual responses were categorized and then numerically coded on a scale of 1 through 4, with a high score indicating the student could state the theme of the interpretive program. The categories included: 1 = "providing subordinate information", 2 = "providing a main point", 3 = "understanding the main message" and 4 = "providing the main message."

A Mann-Whitney U test was conducted to evaluate the difference in scores between the thematic and non-thematic groups in terms of their ability to identify the main message. The results indicate that the thematic group scored significantly higher than the non-thematic group, with a z value of -3.359 at a significance level of $p = .001$. This signifies that the thematic group was more likely to identify the main message of the interpretive program. Although there were significant differences between groups, Table 4 reveals that 33% of the thematic group identified the main message, compared to 12% of the non-thematic group.

Students were also asked to respond to the following, *"If you were to tell your friend one thing about the bat program, what would it be?"* The purpose of this question was to analyze whether students would identify a main point of the interpretive program. Each student's response was categorized and then coded on a scale of 1 to 4, with a higher score indicating that a student described a main point. The categories included: 1 = "provided information unrelated to the program", 2 = "provided an incomplete thought", 3 = "provided related

Category	Thematic Group (n=75)	Non-thematic Group (n=75)
Provided information unrelated to the program	9 (12%)	11 (15%)
Provided an incomplete thought	2 (3%)	0 (0%)
Provided related information, but not specifically a main point	32 (43%)	52 (69%)
Explicitly stated a main point	32 (43%)	12 (16%)

Table 5: Frequency Distribution (percents in parentheses) for Identifying a Main Point for Thematic and Non-Thematic Groups

information, but not specifically one of the five main points", and 4 = "explicitly stated one of the five main points."

A Mann-Whitney U test was conducted to compare differences in scores between the thematic and non-thematic groups. The results indicate that the thematic group scored significantly higher than the non-thematic group, with a z value of -2.741 at a significance level of p = .003. Descriptive statistics revealed that 43% of the thematic group identified a main point compared to 16% of the non-thematic group (see Table 5). Taken together, these results support the fourth hypothesis, that a child will be more likely to identify the main message and main ideas of a thematic program compared to a non-thematic program.

Limitations

The current study reflects some of the common challenges of conducting research in classroom settings where random assignment of subjects to control and experimental groups is unfeasible. The need to use intact groups introduces some uncertainty as to the comparability of the two groups because the possibility of some unknown bias within one of the groups could affect the results. In the case of the current study, there were significant differences between groups on the pretest, with the non-thematic group performing better than the thematic group. While there may be some unknown bias within the groups, the analysis suggests a significant difference between the thematic and non-thematic groups in how much the students learned through the intervention. Where feasible, future research can build on and strengthen the current study by randomly assigning participants to the two groups and then randomly assigning the groups to the two conditions.

Another difficulty in interpreting the results of this study is the threat to validity posed by "regression to the mean." This occurs when extreme scores represent measurement error rather than a true difference between groups. In retesting, extreme scores tend to move back toward the mean. In the current study the thematic group scored significantly lower on the pretest than the non-thematic group. In retesting, the thematic group may have improved simply as a matter of natural variation. However, the results of the analysis are quite strong and the level of significance is quite high, suggesting that the difference between thematic and non-thematic groups represent true gains rather than measurement error.

Discussion

Three primary findings stem from this research. The first suggests that participation in an interpretive program increased knowledge from pretest to posttest for both the thematic and non-thematic program. A second primary finding indicates that the thematic group improved significantly more than the non-thematic group from pretest to posttest on the recall and application measures, but not on the recognition measure. Thirdly, the thematic group was significantly more likely than the non-thematic group to identify the main message and main points of the program.

Research Implications

There are several questions of both a practical and theoretical nature that stem from this study. On a practical level, did the type of participant and type of setting influence the outcome? For example, Piaget (1952) suggests that individuals learn differently at different stages of life. The participants in this study consisted solely of children. Children are especially rapid learners and are able to retain large quantities of information (Piaget, 1952; Knudson, Cable and Beck, 2003). Perhaps because adults are not rapid learners like children, presenting a thematic interpretive program that highlights the organizational structure of information would be even more effective in terms of knowledge gain for an adult audience.

Another question relating to the practical nature of the study involves the setting. Ham (1992) originally suggested that people act differently depending on the environment or the situation (captive versus non-captive audiences). In this study, the children were a captive audience in a classroom setting. Looking at the differences between a captive and non-captive audience, Ham (1992) asserts that captive audiences tend to be more attentive because they are motivated by external rewards such at success and advancement. Koran, Willems & Camp (2000) discuss situated cognition and the role the environment plays in the level of learning achieved. They conclude that, "how tightly learning will be bound to context depends on the kind of knowledge being taught and on the way the material is studied" (p.11). They recommend within and between group variations on setting in order to tease apart the settings impact on learning. To better understand the benefits of thematic interpretation, future research should address variables involving the setting. For example, what effect would a thematic program have on a non-captive audience in a park setting?

There are also several research implications involving the theoretical approach used in this study. For example, does a thematic program need to include a theme, cognitive map, transition sentences, and a conclusion or is just one or a combination of these components as effective at increasing knowledge acquisition? The definition of advance organizers suggests that they work in the same way as a theme and cognitive map. Since research has demonstrated the effectiveness of advance organizers, perhaps it is also only the theme and cognitive map that support knowledge gain. Teasing apart the effectiveness of each of the four components of thematic interpretation is a necessary step in understanding the benefits that themes, cognitive maps, transition sentences, and conclusions have on knowledge acquisition.

A second research implication involves evaluation methods. Bloom et al. (1957) suggests there are six levels in a hierarchy of learning and that evaluation methods differ depending on which level is being evaluated. Within this hierarchy, an individual moves from lower levels of thinking in the order of rote memorization (recognition), comprehension, and application. Then the individual can move into higher levels of thinking such as

analysis, synthesis, and evaluation. Based on the results of this study, both the thematic and non-thematic groups were successful at recognition, but only the thematic group saw significant increases in knowledge gain at the application level of the hierarchy. Would there also be significant differences between groups at higher levels in the hierarchy? Future research should focus on utilizing evaluation methods that can identify the ability to analyze, synthesize, and evaluate the information presented in an interpretive program.

Management Implications

There are a few important management implications from this research. One is that managers can increase children's knowledge of a resource through school-based interpretive programs. The finding that the thematic and non-thematic groups both showed significant increases in knowledge from pretest to posttest may be an indication that interpretation, regardless of the presence or absence of a thematic structure, is an effective communication technique for conveying an educational message to children. Accurate knowledge about the environment may be an important component in the development of beliefs and thus meaning-making about the natural world (Ham & Weiler, 2002; O' Brien & Pease, 2004). Because children make up tomorrow's constituency, they are an important population in terms of future resource protection and agency support. This study indicates that a one-time exposure to an interpretive program can increase knowledge and understanding in a very specific desired direction.

Managers must also consider the limited amount of time interpreters have to share their knowledge and inspiration with an audience. Unlike traditional environmental education programs that may have repeated exposures, most interpretive programs are a one-time, limited exposure (typically one hour or less) (Knudson, Cable and Beck, 2003). This short amount of time means that interpreters must focus on presenting quality programs that facilitate meeting the objectives of the programs (Ham, 2003). Based on this study, presenting a thematic interpretive program is one way to increase knowledge during a limited time span.

This supports Ham's (1992) assertion that thematic interpretation promotes knowledge gain and is consistent with prior research into schemata, advance organizer, and signaling theories (Alba & Hasher, 1983; Snapp & Glover 1990; Lorch & Lorch, 1995; Mautone & Mayer, 2001). In addition, the knowledge gained in this study represents a higher-level knowledge since differences between groups were found on recall and application measures, but not on the recognition measure (Bloom's et al.,1957; Diamond,1999). Thematic interpretation led to an increase in the participants' ability to recall and apply knowledge and thus promoted understanding at a deeper more meaningful level than a program without a thematic structure.

According to the theory of schemata, the three factors that determine what is initially encoded into memory are prior knowledge, schema activation, and the relative importance of new information to the activated schema (Alba & Hasher, 1983; Schneider, 1993; Alexander, Kulikowich & Schulze, 1994). While in both the thematic and non-thematic programs prior knowledge of bats was established in the introduction, the programs differed in the extent of schema activation and the relative importance of new information to the activated schema. For example, the non-thematic program stated that the topic of the program was bats. In the thematic program, the topic was narrowed down to a theme that stated, "Bats are the most misunderstood creatures of the night." According to schema theory, pro-

viding just a topic would potentially activate various schemas related to bats, such as Halloween, caves, echolocation, or nocturnal creatures. Providing a theme, however, would serve as a cue as to which schema is the most appropriate to activate. A theme may therefore be an important element in activating the correct schema so that information can be encoded into memory.

In addition to activating the correct schema, the relative importance of new information to the activated schema must be identified (Alba & Hasher, 1983; Schneider, 1993; Alexander, Kulikowich & Schulze, 1994). If this relationship is not obvious then potentially important information will be either lost or stored outside the schemata. Only the thematic program contained a cognitive map, transition sentences, and thematic conclusion. These elements may be crucial in supporting knowledge gain because they help participants select and encode relevant information into the correct schema.

The finding that the thematic group performed better than the non-thematic group on recall and application measures is also supported by theory and research into advance organizers. Because advanced organizers occur in the introduction to reveal the organizational structure of the learning material, they relate well to themes and cognitive maps. Assimilation theory suggests learners remember information in a hierarchical fashion (Ausubel et al., 1957). According to this theory the theme functions at the top of the hierarchy, which allowed participants to focus on the main message of the program. Participants' attention would then be drawn to the main points of the program, which were identified in the cognitive map and served as the second layer in the hierarchy. All other information would be logically stored beneath these main point categories. Therefore, the addition of a theme and cognitive map, whose purpose is to identify the structure of the thematic program, may have contributed to the increased in knowledge gain for the thematic group compared to the non-thematic group.

Like assimilation theory of advance organizers, signaling theory suggests that signals make important information explicit, allowing the individual to identify the organization of the material and to discriminate between relevant and irrelevant points. However, signaling theory adds one more possibility as to why the thematic program was more effective than the non-thematic program. It may be that the addition of a theme, cognitive map, transition sentences, and a conclusion reduces the cognitive load of identifying important information. This would allow limited resources to be spent on integrating new knowledge with prior knowledge instead of identifying the structure of information presented. This more efficient use of resources could have been one reason for the increase in knowledge gain for the thematic group.

Increasing *overall* knowledge about a resource is a significant goal, but often managers would like interpreters to achieve *specific* knowledge-based objectives. Thematic interpretation can help achieve these objectives as well. The thematic program used in this study allowed the audience to focus on the messages that the interpreter wanted to highlight. Although there may be multiple meanings associated with any given theme (Goldman, Wei-Li, & Larsen, 2001), the ability of an audience to *identify*, remember, and retain the intended message is of great value to managers. Children participating in the thematic program were three times more likely to restate the main message and four times more likely to identify one of more main points of the program demonstrating that the specific learning objectives of the program were achieved. A thematic program is more likely to result in intended message reception. This is perhaps the most exciting finding of all. Remembering factual infor-

mation is not what concerns most interpreters and managers. It is conveying a message, a central idea that is supported by the information. Based on the discussion of schema, advance organizer, and signaling theories above, the four components of thematic interpretation enable participants to identify important information as well as the structure of the program. Information is then stored in a logical and organized manner within the correct schema. This may allow greater ease in later identifying the main message and main points of an interpretive program.

Another implication from this study involves the measures used to assess interpretation. This study suggests that the results of evaluation may not necessarily reflect actual success of message communication but instead may be the result of the type of assessment implemented. Results from the current study demonstrate that the use of a recognition measure did not discern differences between the thematic and non-thematic groups. However, alternate measures, such as recall and application questions, did reveal significant differences between groups. This suggests that if managers wish to demonstrate the effectiveness of interpretation, they should consider utilizing multiple types of evaluation.

While there were no differences between the thematic and non-thematic groups on the recognition measure, this may indicate that both groups were successful at learning at this level. Recognition questions are limited in that they identify learning at the lowest level of the knowledge hierarchy. This variability to results depending on the type of questions used and the associated levels of learning assessed can be explained by Bloom's et al. (1957) taxonomy of educational objectives, in which knowledge is hierarchically defined. According to this hierarchy, the recognition questions used in this study identify the first level of knowledge retention. At this level, knowledge is measured by the extent that participants can retrieve information without any significant changes to what was originally presented. The finding that both the thematic and non-thematic groups were successful in retrieving information at this level supports the assertion by Klein (1981) that recognition questions are a more perceptive measure of knowledge retention. Participants may have used what Miles, Roger, Alt, Gosling, Lewis, and Tout (1988) called a cued retrieval strategy. Each multiple-choice question used in this study provided participants with one correct and three incorrect answers. These answers served as cues that aided participants in searching memory for the correct response. One reason that the thematic and non-thematic groups both increased knowledge from pretest to posttest may be that the cues were sufficient in helping participants identify where they had stored the information in memory. This indicates that both groups retained knowledge from the program at the lowest level of the hierarchy and that the recognition questions were successful at identifying knowledge gain at this fundamental level.

While Bloom et al. (1957) also included recall measures into the first level of knowledge, Diamond (1999) argued that recognition and recall measures test different types of knowledge. The recall measure used in this study consisted of fill-in-the-blank questions. Because participants are not given specific cues to help them search memory for the correct answer, they must identify the information from their own retrieval strategy (Diamond, 1999). Those participating in the thematic program may have been more successful at recalling the correct response because the information was stored in memory in a logical and organized manner. In other words, the thematic program may have aided the student in constructing an organized structure of information. This aided their retrieval strategy because the information was easily accessible rather than scattered throughout the memory

structures. The recall measure was able to discriminate differences in knowledge gain between the thematic and non-thematic groups because it requires participants to do a more thorough memory search and select their own search strategy based on their own generated cues. They must "recall" the information, not just "recognize" it.

The third category in Bloom's et al. (1957) hierarchy of understanding is application. This involves the ability to use knowledge gained from the interpretive program and apply it to a similar but new context. According to Bloom et al. (1957), this ability indicates that the information has been processed at a deeper level and involves the ability to comprehend. The short answer questions used in this study required participants to not only find the information in memory, but demonstrate that they could use the information to solve new problems.

The idea that a thematic interpretive program encourages individuals to process information at a deeper level is consistent with theory in the field of interpretation. For example, Knopf (1981) asserts that knowing the structure of the program helps individuals generate a holistic view of the interpretive presentation. This is because participants can focus on the message and fill in the pieces that were not made explicit. Knopf (1981) suggests that generating a holistic view of the interpretive program results in increased comprehension. The findings of this study also support signaling theory, which suggests knowing the structure of a program allows for information to be processed at a deeper level. When the structure is made explicit, it reduces the cognitive load placed on the individual. Instead, these limited cognitive resources can be allocated to processing new information and integrating it into memory (Mautone & Mayer, 2001). This deeper level of processing may have led to an increase in the ability to apply new information and contributed to the significant increase in knowledge for the thematic group compared to the non-thematic group. It appears that the application measure was successful at discriminating differences in knowledge gain at this higher level in the knowledge hierarchy.

This is important as most managers probably set their knowledge objectives above rote memorization. They may want audience members to come away at least comprehending the main message of the program. Some probably set loftier goals such as wanting audience members to be able to apply information to new problems, analyze a problem from different angles, and evaluate the merits of possible management solutions. If managers want to know if interpretive programs are meeting these objectives then they need to use the most appropriate evaluation techniques. Matching the correct type of evaluation for each knowledge-based objective is a crucial element in establishing defensible results for the field of interpretation.

Touted as the "heart and soul of the learning objective" (Ham, 2003, p.11) and the "most powerful interpretive tool" (Larsen, 2003, p.1), this study provides one of the first field tests of the long-held practice of using themes and thematic interpretation. It provides initial evidence supporting the use of thematic interpretation to increase knowledge gain from an interpretive program. In addition, results also indicate that the use of thematic interpretation may serve to promote higher levels of learning beyond that of mere rote memorization. Thematic interpretation not only resulted in more learning, but learning at a more meaningful level.

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Appendix A

Outline of Bat Program
The thematic and non-thematic bat programs were identical in content, with the exception of the inclusion of a theme, a cognitive map, transition sentences, and a conclusion in the thematic program *(see italics below)*. The programs also differed slightly in the order of the content within each main point.

I. Introduction
   a. Introduction of interpreter and topic (bats)

   b. Theme:
   Bats are the most misunderstood creatures of the night.

   c. Cognitive Map:
   Today we are going to explore how bats are the most misunderstood creatures of the night. During the next hour we're going to shed some light on five common misunderstanding that people have about bats. We'll discover how each misunderstanding occurred and then uncover the truth behind bat's batty behavior.

   We'll start with a slide show that will shed some light on three of the misunderstandings that people have about bats. Then we'll explore a fourth misunderstanding by doing a fun activity. Finally, we'll finish with the fifth misunderstanding by have a little fun with some costumes.

   d. Transition from intro to slide show:
   During the slide show we are going to shed some light on three of the five misunderstandings that people have about bats. We'll explore the misunderstandings that bats are blind, that they suck your blood, and that they are harmful creatures that carry diseases.

II. Main Point 1: Bats are not blind
   a. Slide show—use of analogies, examples, and interactive questions.
   Focus on how all bats can see. Some can see better than others. Differences between insect-eating bats that use echolocation and fruit eating bats that rely on their excellent night vision are discussed.

   b. Transition from first main point to second main point
   Now that we have discovered that bats are not blind and that fruit eating bats need good eyesight to find their dinner in the dark, let's take a look at a second misunderstanding the people have about bats: that they suck human blood.

III. Main Point 2: Bats will not suck your blood
   a. Slide show—use of analogies, examples, and interactive questions.
   Focus on the number of vampire bat species, where they live, and their taste preferences.

b. Transition from second main point to third main point
Now that we know vampire bats would rarely waste their time eating your human tasting blood, let's explore a third misunderstanding that people have about bats: that they are harmful creatures carrying dangerous diseases.

IV. Main Point 3: Most bats do not carry rabies
a. Slide show—use of analogies, examples, and interactive questions
Focus on the general health of bats, the slim chance of getting rabies from a bat, and how to prevent getting rabies from a bat.

b. Transition from third main point
Now that we have explored how most bats are gentle creatures and that you're not likely to ever get rabies from a bat, it is time to end our slideshow.

c. Transition from slide show to fourth main point
During this slide show we have discovered how bats are the most misunderstood creatures of the night. We have explored three of the misunderstandings that people have about bats. We now know that bats are not blind and that fruit eating bats have excellent vision. We also know there are only three types of vampire bats and that they will rarely waste their time with your human tasting blood. Finally, we found out that you're not likely to get rabies from a bat, especially it you never pick one up. Now we are going to shed some light on a fourth misunderstanding that people have about bats: that they fly into your hair.

V. Main Point 4: Bats will not fly into your hair
a. Interactive activity
Focus on the precision of echolocation
1. Listen to a recording of three different bat calls.
2. Timed activity of vocalizing bat calls.
3. View blown up pictures of a variety of bat ears.

b. Transition from fourth main point to fifth main point
Now that we know bats won't fly into your hair, let's shed some light on the fifth misunderstanding that people have about bats: that they are flying mice.

VI. Main Point 5: Bats are not flying mice
a. Costume activity—two volunteers dress up as a bat and mouse
Focus on differences between hands, ears, tails, toenails, reproductive abilities, and lifespan of the two creatures. Interactive discussion.

b. Transition from end of fifth main point
Now that we know bats and mice are very different creatures, we have cleared up the fifth and final misunderstanding that people have about bats.

V. Conclusion
   a. Answer questions—limit to five

   b. Thematic conclusion
      Today we discovered that bats are the most misunderstood creatures of the night. We shed some light on five common misunderstandings that people have about bats. The first misunderstanding we explored was that bats are blind. We discovered that all bats can see and that fruit eating bats have excellent night vision. The second misunderstanding was that bats eat human blood. We now know bats rarely waste their time with your human-tasting blood because they prefer the blood of livestock or birds. The third misunderstanding we explored was that bats are dangerous creatures that can give you diseases. Today we discovered that you're not likely to get rabies from a bat especially if you're careful never to pick one up. The fourth misunderstanding was that bats will fly into your hair. We now know that local bats use echolocation to get around and can easily dodge your head. The last misunderstanding that we explored today was that bats are flying mice. We discovered that bats and mice are very different creatures. As more and more people just like you discover that the rumors they hear about bats are just not true, perhaps someday bats will no longer be the most misunderstood creatures of the night.

   c. Thank the class

Appendix B

Questionnaire (Pre and Posttest)

Name _____

1. The process of locating food using sound is called _____.

2. Out of 1000 types of bats, there are only _____ (how many) that rely on blood as a food source.

3. You should never pick up a bat because it could be sick with a disease called _____.

4. The flying fox bat has large _____ to help it find fruit.

5. A bat catches an insect by flipping up its _____ to toss the insect into its mouth.

6. Vampire bats live in: (Circle one)
   (A) Central America
   (B) Europe
   (C) United States
   (D) Australia

7. If you see a bat during the day it might be: (Circle one)
   (A) confused about its bedtime
   (B) extra hungry
   (C) a bat that prefers the daylight
   (D) sick

8. To find its favorite food, a fruit-eating bat uses its sense of: (Circle one)
   (A) hearing
   (B) smell
   (C) sight
   (D) taste

9. How many babies do bats have per year? (Circle one)
   (A) 1
   (B) 2
   (C) 5
   (D) 10

10. Bats that use echolocation tend to have: (Circle one)
    (A) a special antenna
    (B) large ears
    (C) x-ray vision
    (D) a radar sensor

11. Imagine someone put a blindfold on a bat that eats insects. Could it still fly without bumping into things? Why or why not?

    _____
    _____

12. Why are you more likely to get rabies from a dog than from a bat?

    _____
    _____

13. Why would it be hard for a bat to catch insects if it had a tail like a mouse?

    _____
    _____

14. Imagine that you live in Central America where there are vampire bats. Would you have to worry that these bats would suck your blood? Why or why not?

    _____
    _____

15. Why do some bats, like the flying fox, have huge eyes while other bats have really small eyes?

    _____
    _____

16. Why would you get fewer mosquito bites if there are bats around?

    _____
    _____

17. In one sentence, what do you think the bat program was mostly about? *(Posttest only)*

    _____
    _____

18. If you were to tell your friend one thing that you learned in the bat program, what would it be? *(Posttest only)*

    _____
    _____

Thank you!

The Impact of Normative Message Types on Off-Trail Hiking

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Abstract
Depreciative activities and high annual visitation levels threaten the health and sustainability of the giant Sequoia. Signage is one route to managing visitor behavior. Research suggests a two-by-two conceptualization of normative messages in signs. Messages may present the "ought" (injunctive) or the "is" (descriptive) of behavior and may be stated positively (prescriptive) or negatively (proscriptive). This paper summarizes findings from an experiment testing normative messages and presents evidence for injunctive-proscriptive messages as the most effective route in gaining desired behavior. Under this condition off-trail hiking was less likely to occur, compared to the incidence of off-trail hiking under four other conditions (including a control under which no additional sign was posted). In contrast, the incidence of off-trail hiking was greatest when the descriptive-proscriptive message was used (when compared to three other message types). The injunctive-proscriptive message is most appropriate when a behavior is desired shortly after exposure to a message and may not be most effective when longer-term maintenance of actions is desired.

Keywords
normative message framing, depreciative behaviors, off-trail hiking, natural resource management, signage

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The Impact of Normative Message Types on Off-Trail Hiking

Depreciative behavior, such as littering, graffiti, and off-trail use poses a threat to the health and sustainability of the Giant Sequoia and its surrounding habitat. Human impacts are not a new threat. However, designation of the home to many of the Giant Sequoia as Sequoia and Kings Canyon National Parks helped to reduce that threat (Dilsaver & Tweed, 1990). Annual visitation to the two parks exceeds 1.5 million, with peak visitation during summer and fall (Stynes & Sun, 2003). Efforts to mitigate the extensive impacts of being a popular visitation area have been employed. Examples of these efforts include hardening of trails, posting signs, and erecting split rail fencing or other barriers to preclude off-trail hiking near the Sequoias. Visits by ranger patrols and interpretive staff, and educational programs at the visitor centers are further measures. Mitigation efforts vary by site and are reflective of typical use levels as well as the intended visitor experience at each location (Dilsaver & Tweed, 1990). Limitations on visitation (for example through limited parking and other forms of development) have also worked to limit impacts (Dilsaver & Tweed, 1990). Some off-trail use is tolerated by the ecosystem; however, the amount of soil compaction and erosion that is acceptable is weighed against the level of visitation at each site. Agencies need to manage sites in a way that provides for an enjoyable visitor experience and at the same time protects the natural resource (Kuo, 2002).

Indirect methods of visitor management (such as signage, brochures, and bulletin boards) are frequently relied on in natural resource settings (Chavez, 1996; Johnson, Vande Kamp, & Swearingen, 1994; Tynon, Chavez, & Harding, 1997). Recreationists and the general public tend to approve of signs in recreation settings to address a variety of issues (Chavez, 2001; Cvektovich & Winter, 1998; 2002; Wirsching, Leung, & Attarian, 2003) though how effective signs are expected to be in gaining desired behaviors and protecting settings varies (Cvetkovich & Winter, 1998; 2002; Winter & Cvetkovich, 2003). Recent studies of the effectiveness of signage, in light of their frequent usage in natural resource management, are rare (Gramann, 2000).

Signs vary in effectiveness based on placement of the sign, length of the message contained, importance to the visitor, language of the message vs. language of the visitor, and normative message content and presentation. Poorly constructed signs may work against the intent of the managing agency, either by failing to be noticed, or by actually increasing the likelihood of undesirable activities. For example, work by Marin (1994) showed that individuals whose primary language is Spanish might not notice strategically placed signs and messages unless they are in Spanish. Poorly translated signs, such as those discussed by Chavez (2001) may be noticed but due to poor translation may still be ineffective. Other work suggests that signs should meet a particular need or interest of the visitor in order to be noticed (McCool & Cole, 2000; Nickerson, 2003). Interest may be driven in part by message content and style of presentation (Lackey & Ham, 2003; Ward et al., 2003), with questions, activities, or other thought-provoking content deemed to be of greater interest to visitors.

A distinction should be made between interpretation and communication regarding judgment of effective content. Where the purpose of interpretation may be to engage and

provoke, rather than instruct (Kuo, 2002), the interest of this paper is on visitor information and communication directed at gaining behavioral compliance. Recommendations for effectiveness may be quite different for interpretive purposes.

Signs are not always the most effective intervention in cases where depreciative activities are taking place. Effectiveness of signage varies based on the problem being targeted. Manning (2003) distinguished between depreciative activities that are intentionally illegal or that are unavoidable, versus those that are due to carelessness, a lack of skill, or a lack of knowledge. The latter are viewed as more amenable to indirect management approaches than illegal or unavoidable behaviors (Manning, 2003). However, limited resources, vast areas managed, and the value in having a salient reminder of expected conduct, all make signs an important aspect of managing our nation's resources. A recent study suggested that signage, when the message was properly constructed, was equal in effectiveness to a written pledge and a uniformed volunteer in deterring theft of petrified wood (Widner & Roggenbuck, 2000).

Signs can be particularly valuable in evoking desired actions when properly worded with the understanding that some messages are simply more persuasive than others (Kuo, 2002). Research points to a two-by-two conceptualization of messages in signs that might influence visitor behavior (Cialdini, 1996; Cialdini, Reno, & Kallgren, 1990; Cialdini, Kallgren, & Reno, 1991; Reno, Cialdini, & Kallgren, 1993). Signs may have an injunctive focus (tell visitors what they should do), or a descriptive focus (tell visitors what other visitors do). Further they may be framed proscriptively (focus on discouraging negative behavior), or prescriptively (focus on encouraging positive behavior).

In an onsite evaluation of messages in signs at natural resource settings a preponderance of injunctive-proscriptive messages was revealed (Winter et al., 1998). The preponderance of these messages demonstrated the reliance on negatively worded admonitions within messages on signs in natural resource settings. In a follow-up study, a random sample of interpretation professionals compared the effectiveness of "encouraging" and "discouraging" injunctive messages (descriptive messages were not tested since they were quite rare in the onsite evaluations of signs). The respondents rated the encouraging messages as much more effective than the discouraging ones (Winter et al., 2000). In fact, years of experience in interpretation had a significant, positive relationship with tendency to rate the encouraging messages as more effective. Comparing the findings from these two studies, the evaluation of the environmental professionals ran counter to what was found to be the main practice on actual signs.

An onsite experiment was run at the Petrified Forest National Park (Cialdini et al., 2006). An examination of signage was conducted, comparing the four types of normative messages and the impact on theft of petrified wood. The injunctive-proscriptive message (describing that negative behavior is discouraged) was most effective, as park visitors removed the fewest pieces of wood when this type of sign was posted. In contrast, the descriptive-proscriptive condition (describing that negative behavior is often performed) showed the greatest amount of theft of petrified wood. In fact, theft was higher than in the control condition (no additional signage) demonstrating the potential for messages to backfire. It is quite likely that the counter-productive effect had to do with the normative information (via the descriptive-proscriptive message) that was presented. If a message contains the idea that others are stealing petrified wood and that this is occurring frequently in the setting (presenting theft of wood as the norm, see for example Cialdini,

Kallgren, & Reno, 1991; Schultz, 1998), we would expect that others would be more likely to steal the wood as well.

An extension of previous work on normative messages in signs (Cialdini et al., 2006) was implemented at Sequoia and Kings Canyon National Parks in the summer of 2004. This study compared the level of off-trail recreation use under each of five conditions based on the four normative message approaches and one control condition. The control involved no additional sign posted beyond that already present in the park. While the same four message types and the control are a replication of those tested by Cialdini et al. (2006) the current study's signs did not include a graphic (the Cialdini et al. study did). Second, the theft of petrified wood seemed to be a clearer violation of acceptable conduct (stealing of park property) than off-trail hiking might be (for example, Roggenbuck, Widner, and Stratton's 1997 report found that visitors do not approve of theft of petrified wood). Finally, it was expected that off-trail hiking would occur more often than theft of petrified wood, which Cialdini et al. (2006) found to be rare. (Roggenbuck et al. 1997 also reported removal of petrified wood as a rare event. However, in spite of the reported rarity, removal has a significant, permanent impact on the sustainability of the park.) Findings are instructive towards managing off-trail use; and can be extended to other visitor behaviors that might also be influenced through signage. The approach is simple and practical, modeled after the behavioral analysis tradition wherein an overt behavior (as the dependent variable) is targeted and environmental stimuli (the independent variables) are manipulated to gain the desired behavior change (Geller, 1992).

Method

Development of Signs

Signs were developed with each of the four message types and posting methods were selected in consultation with park staff. Each sign complied with the parks' layout guidelines. The sign maker for the two parks provided the layout. Four sign messages were developed and eight signs were made (two of each) as follows:

Condition I – Injunctive - Proscriptive
Please don't go off the established paths and trails, in order to protect the Sequoias and natural vegetation in this park.

Condition II – Descriptive - Proscriptive
Many past visitors have gone off the established paths and trails, changing the natural state of the Sequoias and vegetation in this park.

Condition III – Injunctive - Prescriptive
Please stay on the established paths and trails, in order to protect the Sequoias and natural vegetation in this park.

Condition IV – Descriptive - Prescriptive
The vast majority of past visitors have stayed on the established paths and trails, helping to preserve the natural state of the Sequoias and vegetation in this park.

Figure 1. Descriptive-Prescriptive Sign at Big Trees Trail

Condition V - Control
No sign other than those already in use was added to the setting.

The signs were constructed of lightweight aluminum and each was the same size and shape (rectangular, 12" by 16"). A dark brown background with white lettering was used in order to match the majority of information signs used by the National Park Service (fig. 1). The signs had drilled holes in the top and bottom center so that bolts could be run through the sign, allowing attachment to an iron signpost. The signposts were on loan from the park and had been used in a previous study on air quality.

Sites of Observation/Experimentation
The sites where the experiment was conducted included Congress Trail, Big Trees Trail, Crescent Meadow, and Grant Grove. The observations were made from the same point at the selected sites across all experimental sessions. Each of the sites has unique features in terms of trails and presence or absence of barriers. Congress Trail has a paved path for visitors to walk along through the big trees; however there is no barrier along the section of trail chosen for observation. Slightly northeast is the pathway to the General Sherman tree, with wooden railings. The selected point of observation looked down the trail from its entrance towards the "Leaning Tree" and a bridge across a small creek.

	Location							
Condition	Congress Trail		Big Trees Trail		Crescent Meadow		Grant Grove	
Injunctive-Proscriptive	Sat[1]	Sun	Sat	Sun	Sat	Sun	Sat	Sun
	1	81	***5***	85	9	***89***	13	93
	2[2]	82	6	86	10	90	14	94
	3	83	7	87	11	91	15	***95***
	4	84	8	88	12	92	16	96
Descriptive-Proscriptive	Sat	Sun	Sat	Sun	Sat	Sun	Sat	Sun
	17	97	21	101	25	105	29	109
	18	98	22	102	26	106	30	110
	19	99	23	103	27	107	***31***	111
	20	***100***	24	***104***	28	***108***	32	112
Injunctive-Prescriptive	Sat	Sun	Sat	Sun	Sat	Sun	Sat	Sun
	33	113	37	117	41	***121***	45	125
	34	114	38	118	42	122	46	***126***
	35	115	***39***	119	43	123	47	127
	36	116	40	120	44	124	48	128
Descriptive-Prescriptive	Sat	Sun	Sat	Sun	Sat	Sun	Sat	Sun
	49	129	53	***133***	57	137	***61***	141
	50	130	54	134	58	138	62	142
	51	131	55	135	***59***	139	63	143
	52	132	56	136	60	140	64	144
Control	Sat	Sun	Sat	Sun	Sat	Sun	Sat	Sun
	65	145	69	149	73	153	77	***157***
	66	146	***70***	150	74	154	78	158
	67	***147***	71	151	75	155	79	159
	68	148	72	152	***76***	156	80	160

[1] The four numbers in this cell and column correspond to the four timeblocks (e.g., 8:30 to 10:30am).
[2] Entries selected for the sample are in bold and italics.

Table 1. Grid Used for Random Selection of Day of Week, Time of Day, Location, and Condition

Big Trees Trail has no railings along the main trail, other than those placed around the front entrance that frame the meadow. The trail is paved in most sections, although some sections are wooden boardwalk. The point of observation that was selected included the front-most portion of the trail around the main meadow, with two Sequoias in full view. Crescent Meadow is free of railings and the path to the northeast from the southern end at the parking area is paved. The trail to the left, heading northwest from the parking area, through the picnic area is unpaved and winds around the section of the meadow furthest from the parking lot. The selected point of observation was to the northeast edge of the meadow, on the trail towards Tharp's Log, focused on the viewpoint overlooking the meadow and adjacent to signage reminding visitors to stay on the

trail. This site was unique from the others in that trespass off the trail at the point of observation would lead a recreationist into the meadow rather than around the big trees. Grant Grove trail is paved and framed in wooden railings for the majority of the trail. The observation point selected was the main viewpoint directly in front of the General Grant tree.

Random Process for Construction of Experimental Sessions

Sessions were scheduled using a random assignment process. A grid was designed to facilitate random assignment (Table 1). Five rows were set in the grid, matching the five experimental conditions. The grid had four columns, matching the four locations where observations were to occur (Congress Trail, Big Trees Trail, Crescent Meadow, Grant Grove). Twenty cells resulted from this method (five conditions by four locations). In each of these cells eight numbers were entered. These numbers represented time blocks for observations on Saturday and Sunday. Two morning time periods (8:30 to 10:30 and 10:30 to 12:30) and two afternoon time periods (13:30 to 15:30 and 15:00 to 17:00) were represented in each of these cells. The eight numbers in each cell were in sequence. First all Saturday numbers were entered, working by row and then column, such that the first row, first cell, had numbers 1 through 4, and then the first row and second column had numbers 5 through 8, and so on through number 80 in the fifth row, fourth column. The process was repeated for Sunday time blocks, assigning numbers 81 through 160 representing the four possible time blocks within each condition and location.

Random Selection of Cell Numbers

Random number lists were generated from www.random.org, one for 1 through 80, and another for 81 through 160. The lists were without replacement, meaning that each number would only appear once. Alternating between the Saturday and Sunday lists, the number on the list first encountered was matched to the corresponding cell number in the grid, and assignment of a day of week, time, condition, and location was made. If a cell had already been assigned (one of the eight numbers already came up in the random selection process) that cell was excluded (because that condition and location was already accounted for), the number crossed out, and the next number appearing in the randomized list represented the selected day, time, condition, and location. Only one team was assigned to any one weekend (due to travel and staffing costs) and travel time was necessary between a.m. and p.m. blocks for observations at the different trailheads. Specific weekends selected for the study were based on field team availability during the summer season.

Method of Data Collection

Observational records were gathered with continuous monitoring of traffic along each selected point. Each group observed was categorized according to number of members, approximate age categories represented in the group, numbers of males and females in the group, and on/off-trail behavior where possible. Observers also took field notes as the session was conducted, noting weather, level of activity, presence of wildlife, and any factors that might have influenced recreationist behavior.

Before each session began, two versions of the same sign were posted, on iron signposts, at key entrance points to each trail. A digital camera with tripod was then placed

in a strategic location focused along the trail, and two hours worth of digital recordings from each session were taken. This lens view was replicated to the fullest extent possible upon each subsequent observational session at the site. The camera was placed within full view of park visitors, helping to avoid ethical issues regarding secret recordings.[1] Sound was deleted from the recordings upon delivery to the research office in order to preserve the privacy of the field team.

Each tape was transferred to computer and then transferred onto DVDs. The software and hardware descriptions and further description of the transfer process are available upon request.

Field Notes

The field notes were entered as Microsoft Word documents after review by the principal investigator.

Field Logs

Data from each field log was entered into an SPSS file, and each entry was verified for accuracy by the principle investigator.

DVD Recordings

Each DVD held a two-hour session, with 20 sessions total. Each of these 20 sessions was then sent to two coders. Each coder received a set of five to seven DVDs, coding sheets, and instructions. Coders were blind to the experimental hypotheses and study purpose. Coders watched the simplest DVDs first (based on the fewest recreationists observed for that session as recorded in the field logs) and proceeded to the most complex (the most recreationists observed in a two-hour session). Coding was done independently in private and the DVDs remained secure during the coding phase. Coders signed privacy agreements.

A total of five coders were used across two batches of coding. No coder was assigned more than three DVDs for the same trail, and no more than three DVDs from the same experimental condition.

Each DVD was sent out to two independent coders. Each DVD was also assigned to an in-house arbitration coder, who also coded each session. This step ensured that lack of familiarity with the settings on the part of the independent coders, and unclear camera views, did not lead to errors in coding of off-trail use. This was done to address concern over a few camera views that prevented clear-cut determination of trail boundaries. Since in-house staff had also been the majority of the field crews out conducting the experiments, they were only assigned DVDs that were not from sessions they were responsible for in the field.

Coders were trained in advance of receiving their coding sets through in-depth conference call or in-person training sessions. During the sessions the coding sheets and cat-

[1] While placing the camera in full view of visitors resolved ethical concerns it presented a potential impact on recreationists' off-trail hiking. The expected direction of effect was a possible reduction in off-trail hiking, however this was not measured. Since the camera was in full view across all conditions its effect was held constant.

Item	Categories
Event	Walking on trail
	Walking off trail within 12 inches of trail
	Walking off trail beyond 12 inches of trail
Activity	Walking/running
	Picking up natural objects (e.g., sticks)
	Touching natural features (e.g., trees)
	Throwing/dropping objects
	Taking photographs/posing for photographs
	Climbing/sitting on railing
	Climbing/sitting on built feature (not railing)
	Climbing/sitting on natural feature/object
	Reading signs
	Carving/marking on tree or other natural feature
	Carving/marking on built structure
	Other (specify)

Table 2. Event and Activity Categories Used in DVD Coding Process

egories were reviewed, along with the procedures for progressing from the simplest to the most complex DVDs. Instructions were given regarding receipt and return of the materials to be coded. Coders were reminded that although DVDs could be watched using either a computer with a DVD player or a stand-alone DVD player, devices could vary in their recording of time, especially if the coder needed to scan back and forth across a section of recording or to freeze sections. Because of this coders were encouraged to verify the timing of events as they were coding each session. Finally, coders were instructed to contact the principle investigator as questions arose during the coding process. Questions raised during the coding process were shared by e-mail with all other

coders, along with a response from the principal investigator.

Coding was conducted for each of the following variables: ID number, time, person type, mobility, event, and activities. "ID number" was a subsequent numbering of each person appearing in the screen. Multiple appearances of the same person were possible. The rule given to coders was that if the individual was out of the frame for more than 10 minutes they would be entered as separate appearances. However, if multiple appearances occurred within less than a 10-minute period all appearances would be considered as one, and all activities would be coded into a singular line for that individual. "Time" was recorded in minutes from the start of the DVD and was noted at the first appearance of each individual. "Person" was the coder's best guess on gender and age group (over 16 years old, 16 or younger, or infant that could not be classified as male or female). (The 16-year-old cutoff was selected based on prior field experience demonstrating that field team observers are able to determine whether individuals are younger than, or older than 16, with a fair degree of confidence.) "Event" was divided up into three categories (Table 2) addressing whether the person was on or off trail. "Activity" allowed for up to six individual actions for each person observed and concerned behaviors that took place while on or off trail (Table 2).

The coding process led to three sets of coding sheets from each of the 20 observational recordings (two from the independent coders assigned to that session and one from an in-house arbitration coder). These coding records were entered into a Microsoft Excel spreadsheet, and matches and mismatches were identified within each set. The principal investigator then reviewed each instance of a mismatch by viewing the applicable DVD and making a final determination of the appropriate codes. Following this review, each of the verified cases was corrected as necessary, and the file transferred over to SPSS.

Inter-rater reliabilities were calculated based on agreement of overall entries on the coding sheets, as well as agreement on each key aspect of the final DVD codes including person type, mobility, event (on or off trail), and activities observed. The range shows the lowest and highest reliabilities across all 20 sessions within each variable type. Average reliabilities were satisfactory within each category ranging from a low of 0.859 to a high of 0.986 (Table 3).

Results

In total, 2,897 recreationists were observed and coded from the DVDs for this study. The number of people observed at each trail location varied, with Grant Grove showing the highest level of visitation during the observational sessions (Table 4). These variations reveal the diversity in levels of use across the sites selected.

The number of recreationists observed also varied by time of day (Table 4). The most recreationists were observed in the early afternoon (between 13:30 and 15:30).

The total number of recreationists observed on Saturdays (1,480) was greater than on Sundays (1,059). Finally, the number of recreationists observed varied by condition, with the fewest observed in Condition IV (Table 4). The randomization of each observational session across day, time, and site helped to reduce concerns over these variations.

The number of people observed going off-trail varied significantly by experimental condition ($\chi^2_{4,\, n=2,838} = 149.26$, $p < .01$). The greatest proportion of off-trail use occurred in the control condition (Condition V, when no additional sign was added, fig. 2)

	Person Type	Mobility	Event	Activity
mean	0.913	0.986	0.859	0.906
SD	0.048	0.027	0.122	0.041
range	0.794-0.979	0.882-1.0	0.629-1.0	0.818-0.967

Table 3. Inter-rater Reliabilities by Variable Coded

Location	Number of Recreationists
Congress Trail	1,012
Big Trees Trail	446
Crescent Meadow	385
Grant Grove	1,054
Time of Day	
8:30 to 10:30	426
10:30 to 12:30	695
13:30 to 15:30	1,167
15:00 to 17:00	609
Condition	
Injunctive-Proscriptive (I)	602
Descriptive-Proscriptive (II)	659
Injunctive-Prescriptive (III)	665
Descriptive-Proscriptive (IV)	373
Control (V)	598

Table 4. Number of Recreationists Observed by Location, Time of Day, and Condition

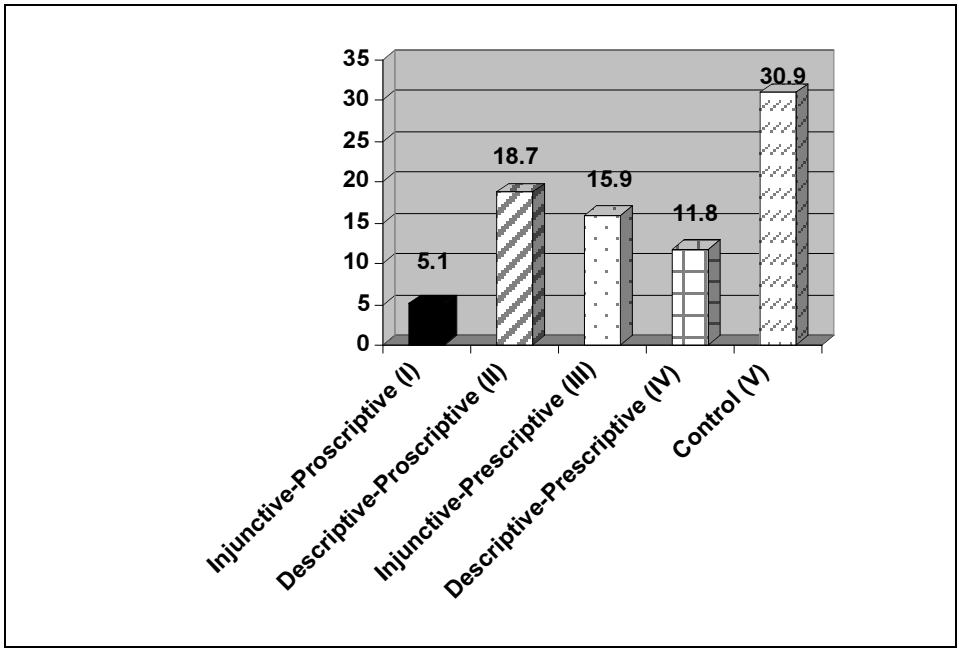

Figure 2. The Proportion of Recreationists Observed Going Off Trail by Condition

The least off-trail use in any experimental condition occurred under the Injunctive-Proscriptive condition (Fisher's exact test, $p < .01$; in Condition I = 5.1 percent of people observed went off trail, vs. all other experimental conditions where 16.1 percent of people observed were off trail). The highest incidence of off-trail use occurred under the Descriptive-Proscriptive condition (Condition II with 18.7 percent of people observed off trail), compared to all other experimental conditions (11.0 percent went off trail, Fisher's exact test, $p < .01$).

Instructing visitors to stay on the trail appeared to be much less effective than an admonishment against going off trail (Fisher's exact test, $p < .01$). Visitors were three times less likely to go off trail when the Injunctive-Proscriptive message (5.1 percent in Condition I, "Please don't go off the established paths and trails, in order to protect the Sequoias and natural vegetation in this park") was posted than when the Injunctive-Prescriptive message (15.9 percent in Condition II, "Please stay on the established paths and trails, in order to protect the Sequoias and natural vegetation in this park") was posted.

However, in the case where the behavior of others was presented, it seemed better to describe the desired behavior than the undesirable one. When comparing the Descriptive-Proscriptive message ("Many past visitors have gone off the established paths and trails, changing the natural state of the Sequoias and vegetation in this park") and the Descriptive-Prescriptive message ("The vast majority of past visitors have stayed on the established paths and trails, helping to preserve the natural state of the Sequoias and vegetation in this park"), the Proscriptive form (Condition II at 18.7 percent) was associated with significantly greater off-trail use (compared to 11.8 percent under the Prescriptive form).

Likelihood	Activity	Incidence On Trail %	Incidence Off Trail %
Approximately equal	Picking up natural objects	<1	1
	Climbing or sitting on built features	<1	2
	Throwing or dropping objects	<1	<1
	Climbing or sitting on natural features	<1	1
	Climbing or sitting on railings	2	<1
More likely on trail	Walking or running	46	41
	Reading signs	17	6
More likely off trail	Taking or posing for photos	10	18
	Touching natural features	<1	11

Table 5. Activities Engaged in On and Off Trail

Activities Engaged in by Visitors Observed On and Off Trail

In addition to on- and off-trail use, selected activities were noted. A comparison of these activities by visitors on trail and off trail showed that many of the activities were of approximately equal likelihood including: picking up natural objects (Table 5), climbing or sitting on built features, throwing or dropping objects, climbing or sitting on natural features, and climbing or sitting on railings. Two activities were more likely among those staying on the trail, including walking or running, and reading signs. Among those going off trail, taking or posing for photographs, and touching natural features were more likely. The natural features touched most often were the Sequoias.

These patterns match informal observations about motivators that seemed to influence off-trail use. People going off trail were frequently seen posing for photographs, or taking photographs. There were many groups of hikers that gathered around and in front of Sequoias to pose for pictures. Others were seen going up to Sequoias to touch the bark, walk around the trees, and sometimes to wrap their arms around the trees.

At Crescent Meadow the off-trail use was of a different nature. At this site hikers were seen going off trail to take close-up photos of the flowers and insects in the meadow, and at times, especially later in the summer, to walk across the meadow to the logs in the center. Walking through the meadow more often later in the summer seemed to be in part because of the trampled vegetation, indicating the presence of past hikers who had taken the same route. This evidence of off-trail use was potentially quite powerful, sending the message that the norm was to go off trail (see Cialdini, Kallgren, & Reno, 1991 for evidence of this effect). Off-trail use was noted even among those who were directly

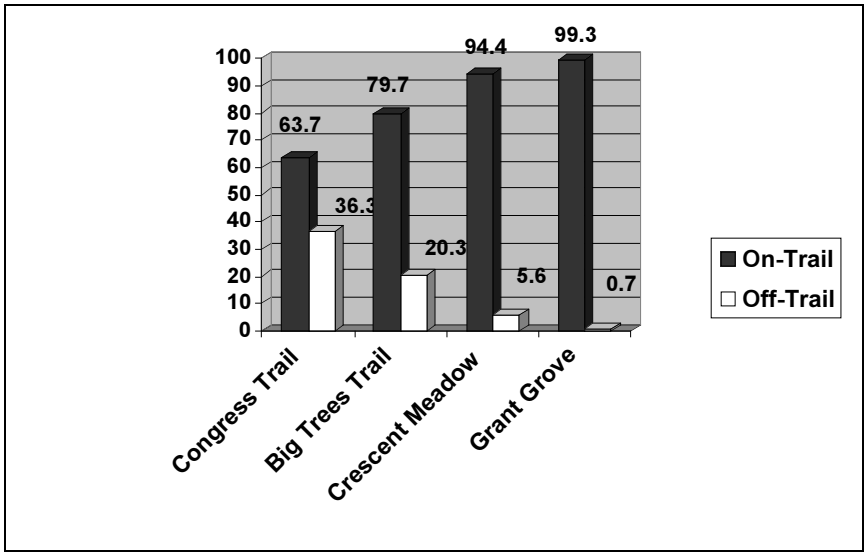

Figure 3. The Proportion of Visitors Observed On and Off Trail by Site

observed reading the sign that included information about staying on the trail.

Another example of physical traces observed in the park was the footprints in the dirt off trail, and sometimes the dramatically worn-down areas of dirt and small plants. Interestingly enough, the park signs suggesting people stay off the wildflowers and other plants seemed to encourage people to step around the plants while they were off trail (the actual sign read, "Give Plants a Chance Please Keep Off" and was paired with a graphic of a shoe situated above some plants and a red circle and line through the middle of the graphic).

On other occasions, the observational teams noticed that when hikers entered an area, if others were already off trail in the setting, it seemed more likely that the newcomers would go off trail as well.

A final issue that presented itself during this study was the lack of clarity between what was on and off trail. At Crescent Meadow if a hiker entered the area from the southern end of the meadow, traveling through the picnic site first and then heading northwest, the path wound around the trees and up against the meadow, sometimes passing directly over roots of the Sequoias. If a hiker only traveled along the southeast to the northeast edge of the meadow, the experience was quite different in that much of the way was paved. In addition, the instruction to enter the meadow by walking across the logs seemed a bit confusing, as people crossed the meadow from the point of observation directly to the logs.

At Congress Trail there was the impression relayed in conversation and through behaviors observed that since the railing was not present as it was around the General

Sherman tree and the main path, that walking through the dirt and around the trees was acceptable.

An examination of the proportion of visitors observed on and off trail also speaks to the impact of site features, such as railings and the factors mentioned above (fig. 3).

It should be noted that observers and DVD coders were instructed to watch for other depreciative behaviors, such as littering, carving or spraypainting on trees or other surfaces, and causing other forms of environmental damage. These activities were not seen at all in the full 40 hours of recordings.

Discussion and Conclusions

This study was conducted in order to examine the effectiveness of selected messages in signs, contrasting four normative message types. In keeping with past research conducted at the Petrified Forest (Cialdini et al., 2006), the injunctive-proscriptive message was the most effective normative message in discouraging off-trail use by recreationists. This message politely presented an admonishment against the undesired behavior (basically, "Please don't go off the trail"). Second in effectiveness was the descriptive-prescriptive message, which stated the desired behavior as the norm (a short version would be "Most visitors stay on the trail"). Third in effectiveness was the injunctive-prescriptive message, (basically saying "Stay on the trail"). The least effective message of the four tested was the descriptive-proscriptive message, which presented the undesirable behavior as the norm. The reader will note that all four messages included a very brief justification for the behavior.

The contrast between the prescriptive and proscriptive message forms is of special interest. While interpreters may prefer prescriptive messages (Winter et al., 2000), the power of the negative statement may lie in its ability to be more memorable. Bad or negative information is more thoroughly processed and remembered than is positive information (Baumeister et al., 2001). Setting up the proscriptive-descriptive message might be particularly powerful in eliciting an undesirable action because of this effect, paired with the effect of presenting the undesirable behavior as the norm, thereby invoking the principle of social proof (Cialdini, 2001).

Renovations at the Congress Trail that have occurred since the experiment was conducted may have altered the behavioral patterns observed at that site. The sites with the greatest levels of off-trail use might be good candidates for further interventions through site modification, signage, and placement of volunteers or other uniformed personnel who could remind visitors to stay along the designated trail, or preferably, not to go off. These contacts should probably follow the same principles as those discovered in this test of signs, that is, the emphasis should either be on "not going off trail" or, if the preference is towards describing the actions of others, "the vast number of visitors stay on the trails and paths."

These findings are instructive because they point resource managers towards the selection of the most effective wording in signs. Messages that are focused on rules and regulations are ideally brief in their informational presentation, are polite (adding "please") and that present a succinct statement about *not* doing a particular action. In contrast, the least effective would be those that present undesirable behaviors as occurring frequently. While there have been a number of studies conducted on signage and messages that should be contained in signs, studies have often, upon replication, led to mixed results (Widner & Roggenbuck, 2000). This line of inquiry has been replicated beginning with the work reported by Cialdini and others (2006) and continuing with the

present study, with a similar pattern of results across both studies in different settings with different focal behaviors. One of the key benefits of the particular approach examined is that its content is free of threats of punishment or offerings of incentives, both which are difficult to maintain and whose effects tend to be short-lived (Geller, 2002).

Future replications are of interest with different types of recreation-use groups, and in settings that are outside of National Parks to continue to refine the understanding of applying normative message framing to real publics. As suggested by Gramann (2000) urban settings may reveal a different prescription for effective signage. In addition, it might be helpful to add an additional layer to the normative message, combining the prescriptive-descriptive message and the proscriptive-injunctive message into one sign (based on conservation research by Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2005). While it would be crucial to continue to keep messages brief and easy to understand (Nickerson, 2003), the expectation is that this combination would be more effective in reducing depreciative activities than would use of either of the normative message approaches alone. It should be noted however that the signage along the trail is a situation in which the appropriate behavior is desired within a very brief time period from exposure to the message. In cases where longer-term maintenance of actions is desired, making immediate prompts impractical, other interventions should be employed (Manning, 2003). Examples of these other interventions would be conservation and environmental education efforts onsite, offered through visitor centers and interpretive programs, as well as conservation education within schools. Such efforts work to build an enduring and personally held land ethic.

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IN SHORT: REVIEWS AND REPORTS

The Concept of Authenticity: Implications for Interpretation

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Abstract
Although the concept of authenticity has received considerable attention in tourism literature, it has received little in interpretation literature despite its importance to practitioners and administrators involved in planning, marketing, and managing interpretive sites. Interpreters may seek to provide authentic experiences at their sites regardless of whether they are interpreting natural resources or cultural heritage. However, many interpreters may not realize that what constitutes an authentic experience for visitors is difficult to define and that authenticity is a complex concept. A framework showing three key types of authenticity—the objective, the constructed, and the personal—can be applied to interpretive sites. Doing so can help interpretation researchers and practitioners understand the indicators of authentic experiences and to provide authentic interpretive experiences to visitors. In exploring the varying meanings of authenticity for interpretation, we also expand prior analyses of such variation to little-examined issues such as birding, hiking, or other outdoor recreation.

Keywords
authenticity, interpretation, heritage tourism, interpretive experience, outdoor recreation

Introduction
In Hurricane Katrina's aftermath, pundits worried that a

rebuilt New Orleans might not be authentic—that it would not accurately reflect the community's identity and sense of place. Louisiana officials quickly included tourism leaders in rebuilding plans to preserve local flavor, or "New Orleans as we have known it," for visitors (Puente, 2005). Such concerns over authenticity and its economic and cultural importance are not new, having pervaded tourism research at least since MacCannell (1976) wrote that the search for authenticity was the motivator for "touristic consciousness" (p. 102). If visitors indeed value the authentic, then interpreters might learn much from the rich literature of authenticity in tourism.

Popular usage of the term "authentic" refers to something real or true, rather than imaginary, false, or imitative. In this context, interpreters have had a strong, long-standing tradition of valuing authenticity in their educational and inspirational functions. This is implicit in interpretive principles and practices; Tilden's classic definition of interpretation specifically mentions "use of *original* objects" as a defining characteristic of interpretation (Tilden, 1977, emphasis added). Interpretive principles are concerned with presenting information reflecting the reality of nature, history, or culture. Beck and Cable (2002), for instance, offer these principles related to truth, accuracy, and authority, all key elements of authenticity:

- The purpose of interpretation goes beyond providing information to reveal deeper meaning and truth.
- Interpreters must concern themselves with the quality and quantity (selection and accuracy) of information presented.
- Interpretive writing should address what readers would like to know with the authority of wisdom and its accompanying humility and care.

Although authenticity as popularly defined is valued and pursued in the interpretation profession, tourism researchers have gone beyond basic notions of authenticity and explored deeper perspectives associated with defining, creating, and experiencing authenticity. These can contribute to understanding and advancing the planning, marketing, and management of authentic experiences in interpretive settings. This paper reviews concepts of authenticity in tourism literature, demonstrates their relevance to interpretation, encourages their application in providing authentic interpretive experiences, and encourages related research.

Review of the Tourism Literature

The concept of authenticity has been called "the single most important influence on social science studies of tourism" (Bruner,1993) and various scholars (e.g., Hughes, 1995; Echtner & Jamal, 1996; Uriely, 1997; Wang, 1999) have noted its significant role in shaping the academic discipline of tourism. It was introduced into tourism studies by Dean MacCannell, a sociologist whose book *The Tourist* (1976, 1989) is "something of a minor classic of sociological literature" (Bremer, 2000). Yet, despite the term's heavy use for almost three decades since, authenticity remained an ill-defined concept that calls to mind the famous definition of obscenity from U.S. Supreme Court Justice Potter Stewart: ". . . I know it when I see it."

While the threads of authenticity and inauthenticity run throughout MacCannell's book, his exploration of what, exactly, authenticity is left much to be desired. With only minimal discussion, he listed six "stages" of authenticity, ranging from stage one (a front region or social space tourists attempt to overcome and get behind) to stage six (a back

region and social space that motivates touristic consciousness). Although MacCannell did note that one could "theoretically" distinguish the stages through empirical indicators, he listed very few: a fishnet hanging on the wall of a "stage two touristic seafood restaurant" or a "stage four magazine exposé of the private doings of famous personages." Perhaps the closest he came to defining the term "authentic" succinctly was by claiming that the "the dialectic of authenticity" was concerned with "attacks on what is phony, pseudo, tacky, in bad taste, mere show, tawdry, and gaudy" and that the "dividing line between structure genuine and spurious is the *realm of the commercial*" (MacCannell, 1976, p. 155; MacCannell's emphasis).

It seems that for MacCannell, inauthenticity was the contemporary, tasteless, and the commercial, while authenticity was primarily historic sites that were "true" or "genuine." Although many might agree with MacCannell's assertion that we are driven by a search for authenticity, the concept's practical usefulness may have been limited by post-MacCannell scholarly discussions that are often dense and inaccessible. In fact, MacCannell himself described much of the language used to answer his own book's most important questions as "evasive and patently annoying" (MacCannell, 1989, p.xiv).

Resulting scholarly tendencies, according to Jamal and Hill (2002), were: (1) to ascribe characteristics such as "real" or "true" to touristic experiences or objects in ways that might suggest various biases or philosophical assumptions, and (2) to broadly characterize tourism experiences as "authentic" or "inauthentic," often by implication only. Jamal and Hill found that scholars had developed an almost "mythical" notion of authenticity built on unstated assumptions, vague references, and minimally discussed personal interpretations, coupled with only rare exploration of authenticity's components or indicators. They found works that characterized sites as inauthentic because they commercialized Santa Claus (Pretes, 1997) or charged admission to a once-free Indonesian sculpture garden featuring statuary of non-native hippopotami, Flamenco dancers and Greek athletes (Teo and Yeoh, 1998). The characterizations' irony lies in implications that there are "authentic" ways to represent hippos in Indonesia—or Santa Claus in any place.

Other scholars have taken a broader view. Cohen (1988) wrote that tourism does not succeed through mass deception, but because tourists entertain concepts of authenticity much looser than those held by intellectuals and "experts" like curators and anthropologists. Examining ethnic art, Cohen advanced the notion of "emerging authenticity," which results when ethnic artists depart from traditional symbols to those depicting more recent and difficult events, a new and evolving cultural expression that still uses traditional methods. Salamone (1997) compared Mexico City's original San Angel Inn with a "daughter" hotel in Disney World, Florida, and defined "authentic culture" as comprising anything from a local community to a transnational "tourist culture" and an "evershifting . . . kaleidoscopic 'reality'" contingent on negotiations, personal backgrounds, and partially shared understandings (p. 307). While the original stressed the romance and dignity of Old Mexico, the Disney site presented a different authenticity, highlighting classical Mexico's great achievements, cultural pluralism, folkloric dress, high cuisine, and exhibits on pre-Columbian, Spanish colonial, and modern Mexican culture.

Moscardo and Pearce (1986) found visitors to Australian historic theme parks generally perceived parks as authentic, even though sites were primarily recreated versions and not actual historic remains. The researchers found large majorities of tourists believed they were

gaining insight into the past, directly refuting what they saw as MacCannell's argument that tourists are unable to have such insight. The researchers concluded that perceived authenticity is very important to historic theme-park visitors, people vary in their perceptions of authenticity, and public perceptions conflict with the views of social scientists as reflected in tourism literature.

Redfoot (1984) developed a typology of tourists ranging from the first-order "true tourist" (traveling with camera in hand, photographing landmarks to later re-experience a temporary escape from life at home) to the fourth-order "spiritual tourist" who participates in the "most intense" search for reality (p. 291). Redfoot found each type capable of experiencing individual forms of authenticity, indicating that the perception of authenticity depends on visitor characteristics and motivations. Even the first-order tourist, whose primary purpose might be simple liberation from everyday cares, might have an authentic experience while walking on a beach, shopping in a market, or relaxing on a park bench.

Because of the balancing views of scholars like Redfoot, Cohen, Salamone, and Moscardo and Pearce, Jamal and Hill (2002) found that despite widespread inclinations to focus on "inauthentic" aspects of touristic experiences, tourism literature provides a broad range of meanings for authenticity. Jamal and Hill concluded authenticity has been unnecessarily mystified by scholars and, in spite of prevailing views, authenticity is in the eye of the beholder. It can be commercial, historically young, and perhaps (to some) even tacky and out-of-place.

Three Types of Authenticity

Jamal & Hill (2002, 2004) examined meanings and uses of the word "authenticity" within tourism literature and delineated aspects of its nature that are apparent in varying usages. They derived a typology of authenticity and identified aspects that support notions of a broader meaning for the term. They also examined practical indicators of what people consider authentic to illustrate how types of authenticity are found in cultural, historic, and other sites. The typology focuses on three types of authenticity related to experiences—objective, constructed, and personal. Each is characterized by differences in dimensions of place and time (past or present), as well as intellectual approaches to and assumptions behind different views of authenticity. The core idea of the Jamal and Hill typology is that there is no single meaning or single type of authenticity, and an experience might include multiple types of authenticity for visitors.

Objective authenticity requires experiences to be "genuine," historic, or (in some views) noncommercial to be authentic. This type is tied strongly to original artifacts, historic buildings, places where well-known events occurred, and other tangible aspects of authenticity. It is the type of authentic experience most limited by circumstance, by the value in what once happened at a site. An obvious but important implication is that because the past is gone, it can no longer be "experienced" in an absolutely genuine way. For example, more than a million tourists annually visit the *USS Arizona* memorial in Honolulu, Hawaii. Rusting wreckage and first-hand accounts from elderly docents who witnessed the Pearl Harbor attack contribute an emotionally moving aura of authenticity to visitor experiences. At the same time, presence of genuine artifacts clearly does not include a full personal experience of the objects and events of Dec. 7, 1941.

The experience's objective authenticity lies in artifacts, while other types of authenticity must be recreated or constructed by docents. Such constructed authenticity is in

the realm of the negotiated. Stakeholders with differing perspectives contribute to an emergent authenticity in which experiences and objects hearken to the past while being adapted to current circumstances.

Constructed authenticity occurs in what Jamal and Hill (2004) called "heritage time" (following Kirshenblatt-Gimblett, 1998) and in "constructed or reconstructed space." The notion of heritage time is grounded in the idea of an appropriation of past objects and events for the making of present interpretive contexts (or, as Jamal and Hill noted, "stories" or "myths" that conform to economic, social, or political interests in a particular domain; 2004, p. 357). Heritage time is clearly seen in Cohen's (1988) previously discussed account of ethnic art. In this view, modern-day art using traditional methods becomes tomorrow's history—thus showing (simultaneously) its "objectively authentic" nature. This view means that traditional symbols, products or art created in newer ways can be authentic in a constructed sense. An important point is that various stakeholders may have differing views of what is authentic, which does not mean a particular object, event, or perspective is inauthentic. Competing authenticities exist, as becomes even clearer when considering the third type of authenticity.

Personal authenticity takes place in "visitor time" and interactive/performance space. In this realm, the visitor may transcend both time and space. Regardless of circumstances, visitor experience is the focus and visitors perceive authenticity when an experience is well managed. Even if a historic moment never again can occur or a place be visited as it was in its exact particulars, the visitor is "there." The complex philosophical underpinnings of personal authenticity are more fully explored in Jamal and Hill (2004; see also Wang, 1999, for analysis of a parallel notion Wang termed "existential authenticity"). Revisiting the Pearl Harbor example illustrates this concept. Objectively authentic artifacts and constructed-yet-authentic views of docents may lead to a personally authentic experience for visitors who feel that they do experience the attack in a meaningful way. Likewise, others may perceive the interpretation as inauthentic; this may occur, for instance, if they do not react sympathetically to views of docents.

Implications for Interpretation

The typology of authenticity presented above can help interpreters move past the vagueness and assumptions associated with the term. Likewise, recognition that different types of visitors hold varied perceptions and expectations of authenticity is important for interpreters, managers, and interpretive planners.

While tourism studies often focus on historic sites or destinations featuring cultural elements, it is important to note that there are many experiences not tied to history or culture but in which authenticity is salient. Even in their examination of objective authenticity, Jamal and Hill (2004) did not explore how authenticity might be found in such experiences as hiking, whitewater rafting, birding, or other activity in natural settings—perhaps even in one's own backyard. Such experiences can seem mundane, but to those choosing them, they are authentic. Authenticity in a natural setting was briefly explored by Dudley (1996), who wrote that authenticity defines a forest's value and measures its biodiversity. An authentic forest often (but not always) closely resembles an original natural forest, but present conditions are more important than "original" conditions and a proportion of non-native trees is acceptable in forests with high ecological and functional authenticity, Dudley wrote. Here, authenticity helps conservators focus on ecosystem workings. It also has implications for

interpreters considering visitor-ecosystem interactions.

Ecotourism and outdoor recreation experiences focus on enjoyment of the natural world and normally are tied to "real" places (e.g., a real rainforest instead of one in a greenhouse or conservatory, or river rapids instead of a waterslide) and objects that have tangible dimensions of authenticity (e.g., a real fossil, wildflower, river or mountain). More limited tangible aspects of a real rainforest may be found, however, in a greenhouse or conservatory: hues and shades of greenery, smells of living organisms, sounds of actual tropical birds. In such settings, constructed and personal aspects of authenticity—how a rainforest is recreated, how people experience its setting even if in the middle of an urban metropolis—are critical to perceptions of authenticity.

Three Types of Interpretive Authenticity

The Jamal and Hill (2004) typology can be readily applied to interpretation. *Objective authenticity* is closely tied to traditional interpretation practices, as Tilden's focus on "original objects" makes clear. Simply put, objective authenticity can be thought of as *what is there*—artifacts, buildings, rocks, trees, or wildlife. For this reason, it is often limited by circumstance. Whether out on the trail or in a museum, visitor center, or amphitheater, interpreters provide authenticity by presenting real human artifacts, natural objects, and organisms to audiences.

Moreover, interpreters help people discern objective authenticity and distinguish real objects and events from the inauthentic. For example, the Alamo in San Antonio, Texas, contains many tangible but inauthentic features. None of the perimeter walls are original and most of the reconstructed buildings do not closely resemble the originals. The most recognizable feature, the famous roofline, is a later addition. Interpreters increase a site's objective authenticity by interpreting what is tangible and yet inauthentic. Interpreting relevant myths associated with an interpretive theme is a key opportunity and responsibility of interpreters (Beck & Cable, 2002). By making truth as interesting and memorable as myth, interpreters help visitors sort through and understand the milieu of authentic and inauthentic objects and stories at interpretive sites.

Constructed authenticity is represented by interpretive sites or objects created by experts, communities, or other stakeholders. It can be thought of as what people have made from what was originally there or something created to represent what was originally there. For example, visitors to Chicago's Museum of Science and Industry take a miners' elevator to enter an amazingly realistic facsimile of a working coal mine. Interpreters in reconstructed sites such as forts or villages work in the realm of constructed authenticity. Likewise, at nature centers and natural history museums, detailed dioramas of natural habitats and wildlife bring nature indoors.

Constructed authenticity can include competing perspectives and interpretations, allowing visitor reflection on different views about what happened or what a site was like. The Alamo is again a useful example. Traditional interpretation and popular movies encouraged visitors to view Alamo defenders as heroic patriots who sacrificed their lives for a greater good, but others may see opportunistic soldiers-of-fortune and land-grabbing foreign invaders (Long, 1990). Such conflicting views complicate creation and provision of constructed authenticity at historical sites. Examples are the Little Bighorn Battlefield, where the story of General Custer's demise has changed over time, and sites dealing with Christopher Columbus and Spanish Conquistadors, where views differ as to just who were

the heroes or villains (Beck and Cable, 2003).

Personal authenticity is the type that interpretation most often seeks to provide because it focuses on visitor experiences. The National Association for Interpretation defines interpretation as "a communication process that forges emotional and intellectual connections between audience interests and meanings inherent in the resource." Likewise, Tilden's (1977) classic definition speaks of "revealing meanings and relationships." Facilitating such revelations from a resource and emotional connections with it involves exchange between interpreters and audiences, creating an authentic experience with real feelings, convictions, and connections.

As Tilden (1977, p. 14) stated, visitors ultimately see things through their own eyes. The interpreter offers possible new meanings targeted to audience interests and provokes both consideration of those meanings and exploration of alternative personal meanings. Living history interpreters are especially well positioned to create personally authentic experiences, transcending time (and sometimes space) to personalize the past and relate it to visitor interests and meanings. The power of living history is in serving as a "time machine" challenging visitors to think and feel differently (Anderson, 1984). Likewise, the power of natural resources comes from a capacity to reveal meanings in visitors' hearts and minds (Beck, 2001). Interpreters release this power by promoting personally authentic experience.

Authenticity Approaches and Issues

Because authenticity types are not mutually exclusive, authenticity combines the tangible, negotiated, and intangible. The meaning-making approach to interpretation is a communication paradigm that cuts across each type. Authenticity's role in meaningful interpretive experiences—especially personal or perceived authenticity—has been noted by Barrie (2002), who sought common elements among visitors' meaningful interpretive experiences. Instead of a linear sender-receiver process, meaning-making is negotiated, with information being created rather than transmitted. Individuals receiving information shape meaning based on past knowledge and experiences (Silverman, 1997; Beck & Cable, 2002). Interpreters assist and encourage visitors to create meaning based upon contexts they bring to sites.

The National Park Service (NPS) interpretive philosophy is to do this by connecting physical or tangible (objective) aspects of a site with its associated intangible dimensions (those not perceived by the senses; Dahlen, Fudge, Lacome, Larsen, & Weber, 2000; Larsen 2003). NPS interpreters seek to link tangible park elements with broader meanings such as ideas, processes, systems, and values. Moreover, NPS interpreters aspire to link tangible resources with a special class of intangibles called universal concepts—those anyone can relate to (even if in different ways), such as beauty, community, courage, and freedom (Larsen, 2003). For example, at the Liberty Bell, interpreters help visitors make connections between the bell (objective authenticity) and personally authentic, universal concepts such as courage and freedom (Dahlen, et al., 2000). Beck and Cable (2002, p. 8) state, "The charge of the interpreter, then, is to help make the connection between the tangible and intangible meanings of the resource in the hearts and minds of the visitors."

Any interpretive experience or setting can exhibit multiple dimensions from the types of authenticity, and all interpretive efforts should result in a personally authentic experience. A recent traveling exhibit about the *Titanic* effectively mixed the three types of authenticity. Original display objects included items belonging to passengers. A hallway and cabin rooms

were reconstructed to give the feeling of walking through the ship, and visitors encountered a woman portraying a passenger in a first-person living history presentation format. Upon entering, each visitor was given the boarding pass of a *Titanic* passenger to personalize the experience. An emotional response was elicited when, upon exiting, the visitor learned whether the person named on the boarding pass survived or drowned.

Identifying the appropriate mix of authenticity approaches depends on audience characteristics and the nature of themes presented. Knowledge of audience expectations regarding what constitutes an authentic experience can help interpreters provide it, making interpretation more meaningful and credible. This mix is critical in controversial and sensitive issues; interpreting war, slavery, genocide, and even animal welfare (e.g., inhumane treatment of chimpanzees) requires wisdom and sensitivity to strike the complex balance between being true to history, telling the whole story, and grabbing people's attention without being exploitive or offensive. Edward Linenthal's (1995) book *Preserving Memory* is a profound discussion of appropriate levels of authenticity in designing the United States Holocaust Museum (e.g., should real human hair be used in an exhibit or real shoes of victims? Can anything be too authentic in communicating horror to audiences?). Self-imposed limits on authenticity resulted—for example, not having a room with shower heads or doors clanging behind visitors.

Battle reenactments, extremely popular at interpretive sites, bring together many salient authenticity issues. Their appeal and potential profitability lend themselves to commercialization, in turn providing incentive for maximizing drama and entertainment—sometimes at the expense of authenticity. Most hobbyists are knowledgeable and pride themselves on the accuracy of costumes, props and performance, but some fall short of objective and constructed authenticity when performing. Moreover, the NPS has policies that might be seen as restricting authenticity in that they prohibit firing at opposing lines or taking casualties (Beck & Cable, 2002). These policies recognize that violent or repulsive themes should be avoided and that a battle simulation is a travesty to those who endured the battle. Instead, exhibits, brochures and other media interpret the tragedy of war. Still, authentic landscapes (battlefields) and tangible objects (cannons), constructed objects (replicated uniforms and weapons), and emotion-evoking performances can create an authentic experience for audiences.

Conclusion

Interpreters with opportunities to demonstrate authenticity and create authentic experiences should be aware that there are at least three different types of authenticity (objective, constructed, and personal) and that despite what much scholarly literature indicates, visitors might find sites and activities to be authentic even when the interpreter considers them inauthentic or inaccurate portrayals of history, culture, architecture, or nature. A fundamental conclusion is that interpreters should not necessarily avoid something they perceive as inauthentic (e.g., using a replica, model, or a fictional story to illustrate a point) to achieve goals.

This is especially important when it comes to commercialism. Some interpretive programs' popularity makes them vulnerable to becoming mere money-making entertainment. The lure of profits may cause interpreters to offer less-than-authentic experiences as they try to jazz up programs to attract larger audiences. However, providing services or products that are commercial in nature will not necessarily mean an experience becomes inauthentic. The

obvious need for economic support of interpretation means we must charge admission, establish fee-based services, and establish costs for use of necessary equipment. Financial infrastructure often means the difference between being able to offer an experience or not, and any experience is, generally speaking, more authentic than none. In the same vein, offering mementoes, literature, arts and crafts, and other products for sale does not mean an experience becomes less authentic; in fact, well-conceived and thoughtfully executed commercial offerings may enhance perceptions of authenticity and allow visitors to understand and later relive, however fleetingly, the experience in an authentic way.

A caveat is that authenticity is not a situation in which anything goes. We already know (and are reminded by much scholarly literature) that commercialism, among other things, can detract from an experience and lead visitors to perceive something less positively. Poorly conceived exhibits, a lack of genuine artifacts, spurious ties to a culture or an event, habitat degradation, and myriad other issues may cheapen or ruin an experience for anyone—or all.

The message to interpreters is that any site can and should produce authentic experiences in visitors' minds, even if the site does not have pristine habitat or original historic buildings or artifacts. By knowing how audiences define authenticity, interpreters can enhance the meaning and credibility of interpretive experiences. Interpreters should assess and plan experiences to enlighten, inspire, and help visitors have a personally authentic experience—however those visitors define it. This assumes that any site has something that people seek and therefore has elements able to produce an authentic experience.

The study of how interpreters and visitors to interpretive sites perceive and value authenticity is warranted and would be of interest to frontline interpreters, managers, and planners. This is particularly true for defining empirical indicators of the types of authenticity at sites. Whether those indicators are objective measures related to physical objects or settings, meanings associated with constructed presentations, or measurements related to visitor perceptions of site authenticity, interpretive specialists who open their thinking to a broad view of authenticity are likely to find more and better ways to provide it.

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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.

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

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- 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.

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On the title page include full names of authors, academic and/or other professional affiliations, and the complete mailing address of the author to who 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.

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Authors must supply five (5) to ten (10) key words or phrases that identify the most important subjects covered by the paper.

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Examples of references:

McCool, S., and Braithwaite, A. (1992). Persuasive Messages and Safety Hazards in Dispersed and Natural Recreation Settings. In M. Manfredo (Ed.), *Influencing Human Behavior*. Champaign, IL: Sagamore Publishing.

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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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