NAI Staff

Tim Merriman  
Executive Director

Lisa Brochu  
Associate Director

Paul Caputo  
Art and Publications Director

Jamie King  
Membership Manager

Deb Tewell  
Events Manager

Beth Bartholomew  
Business Manager

Carrie Koch  
Certification Program Specialist

Russell Dickerson  
Creative Technologies Manager

Lou Anderson  
Administrative Assistant

Advisory Board

Cem Basman  
Assistant Professor  
Department of Recreation and  
Park Administration  
Indiana University  
Bloomington, Indiana

Larry Beck  
Professor  
Department of Recreation, Parks  
and Tourism  
San Diego State University  
San Diego, California

Ted Cable  
Assistant Department Head and  
Professor  
Dept of Horticulture, Forestry,  
and Recreation Resources  
Kansas State University  
Manhattan, Kansas

Sam Ham  
Professor and Director  
Center for International Training  
& Outreach (CITO)  
Department of Resource  Recreation and Tourism  
College of Natural Resources  
University of Idaho  
Moscow, Idaho

Bernard Lane  
Director  
Rural Tourism Unit and  
Architectural Conservation  
Programme  
Co-editor, Journal of Sustainable  
Tourism  
Center for the Historic  
Environment  
Department of Archaeology  
University of Bristol, England

Gary Machlis  
Professor of Forest Resources  
and Sociology, National  
Coordinator for the CESU  
College of Natural Resources  
Department of Forest Resources  
University of Idaho  
Moscow, Idaho

Michael Manfredo  
Professor, Department Chair  
Colorado State University  
Natural Resource Recreation and  
Tourism  
Fort Collins, Colorado

Joseph Roggenbuck  
Professor  
Natural Resource Recreation  
Virginia Polytechnic Institute and  
State University  
Department of Forestry  
Blacksburg, Virginia

Sam Vaughn  
Associate Manager, Interpretive  
Planning  
Harpers Ferry Center  
Denver Service Center  
Denver, Colorado

Betty Weiler  
Professor of Tourism  
Department of Management  
Berwick Campus  
Monash University  
Narre Warren, Australia
Contents

3  A Note from the Editor
   Carolyn Ward

Research

7  What Information Do Zoo and Aquarium Visitors Want on Animal Identification Labels?
   John Fraser, Ph.D., AIA; Jessica Bicknell; Jessica Sickler; Anthony Taylor, Ph.D.

21 Improving the Efficacy of Visitor Education in Haleakalā National Park Using the Theory of Planned Behavior
   Nathan Reigner, Steven R. Lawson

In Short

49 From Interpretation to Protection: Is There a Theoretical Basis?
   Sam H. Ham

59 Adult Participants’ Preferences for Interpretation at a Japanese Nature Park
   Naoko Yamada, Doug H. Knapp

Appendix

67 Submission Guidelines for Authors
My recent trip to the NAI National Workshop in Hartford reminds me of how critical it is that research is conducted, disseminated, and incorporated. Listening to Sam Ham’s keynote served as a reminder that it is only through the critical evaluation and assessment of what we do, why we do it, and what results from it that our profession will truly advance and develop. For those of you who missed it, a summary of Dr. Ham’s remarks can be found in this issue of the Journal.

Our field seems to continually struggle with assessment. I have been admonished more than once regarding what we should call research, how it should be done, and what we should do to disseminate the results. My answer to all of those discussions and questions is, “Just do it!” All too often we enlist real or perceived barriers as the reasons why we don’t conduct assessment, why the results aren’t useful, or why we can’t communicate what we have done to others. Again I say, “Just do it!” Let people find the problems, let them learn from the mistakes, and let our discipline grow from the continued critical examination of what works, when, why, and for whom.

One of the primary things we know about research and assessment is that you can always poke holes of varying sizes in the methods, the underlying theory, the literature used to base the study, the analysis of the data, and implications of the results. In our field especially, there is rarely a tightly controlled true experiment. Instead, we study the person (or group) in a particular situation (or place) interacting amidst any number of uncontrollable variables. From this often gray matter, we extract what understanding we can to help us manage better, advance the development of theory, research more tightly, present the issues more clearly, and perhaps build a body of knowledge that is specific to the issues faced in interpretation.

I am not advocating the reduction in the quality of research that we should demand, expect, or hope to achieve. I am not suggesting that our critical eye be stymied and that our collective bar for research be lowered. But I am saying that as a discipline, in whatever capacity we serve, whether practitioners, researchers, managers, or administrators, we must be thinking about what we are trying to do, why, and whether or not we did it. In its basic form, at its lowest level, this is the essence of research.

Just do it! Ask what your goals are and whether or not you achieved them, and then tell the rest of us so we can learn. Assessment is happening on all levels from the field interpreter who is trying to build a better program to the regional director who is
trying to create a better system. We can all learn from the mistakes of others. If your questions are bad, I will learn from them and ask better ones. If your methods are faulty, I will learn from them and create a tighter design. But this entire process relies on that initial dissemination of what you did and what you learned from what you did. At whatever level you may be practicing, communicate what you are learning. Whether you tell your fellow employees, make a presentation at a conference, or publish in the Journal, just do it! And remember, we have three categories of submission in the Journal that should enable everyone to communicate the lessons they have learned.

The survival of interpretation depends on the critical examination of what is done, how it is done, and what results from it. Research is the foundation of the science of interpretation. Just do it!

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

—C
RESEARCH
What Information Do Zoo & Aquarium Visitors Want on Animal Identification Labels?

John Fraser, Ph.D., AIA
Director IIL-New York, Institute for Learning Innovation,
Adjunct Assistant Professor, Hunter College of City University New York
WCS Fellow, Wildlife Conservation Society
3168 Braverton St., Suite 280
Edgewater, MD, 21037
410-956-5144
Fax: 410-956-5148
fraser@ilinet.org

Jessica Bicknell
Exhibit Developer
Wildlife Conservation Society
Exhibition and Graphic Arts Department
Bronx, NY
jbicknell@wcs.org

Jessica Sickler
Senior Research Associate
Institute for Learning Innovation
Edgewater, MD 21037
sickler@ilinet.org

Anthony Taylor, Ph.D.
Professor Emeritus
State University of New York
Psychology Department
Cortland, NY
Abstract
Identification labels remain an important aspect of interpretation in zoos and aquariums, and although studies exist documenting results of specific exhibit labels, the field lacked a formal, general, multi-institutional study on visitor preference regarding label content. Researchers conducted a survey across five institutions (two aquariums, three zoos) to determine what kinds of information visitors thought was most interesting or important to include on exhibit signs using both closed-ended (N=367) and open-ended (N=372) instruments. Researchers found that visitor preferences for kinds of information were generally consistent regardless of animal type and institution. Overall, visitors preferred to see the following kinds of information on an exhibit label: odd facts/behaviors, endangered status of the animal, where they live in the world, and the number of years they live. Participants expressed the least interest in the animal’s scientific name, length of pregnancy, and phylogeny.

Introduction
Contemporary zoos and aquariums seek to promote conservation through the construction of animal exhibits featuring a variety of interpretive signs and interactives. Despite the variety of tactics used for interpretation, animal identification labels (IDs) are the one type of sign that is found in virtually every zoo or aquarium, a sign type that appears to be consistently relied on to satisfy the basic curiosity of visitors. IDs are ubiquitous in all exhibitions and standalone exhibits irrespective of the familiarity people might have with the species on display. Traditionally these IDs at minimum present the name of the animal in the exhibit, frequently feature a photograph or illustration to help identify that animal in the exhibit, and contain a few descriptors based on the hope that this information will aid the visitors’ development of knowledge about the animal, its habitat, its natural history, or its conservation status.

Zoos and aquariums have come to rely on IDs as one of the most important types of communication in the institution. We know that IDs are frequently the only labels that some visitors read because IDs are brief and accessible, and often answer visitors’ basic questions about an animal (Serrell, 1996). Other than the photograph and the animal’s common name, zoos and aquariums have generally operated under the notion that a visitor’s desire for information is met by the traditional label formula. Such assumptions have been well challenged in the literature on the basis that labels are not designed to meet the needs of the visitor (i.e., Screven, 1992), that the purpose of the message must clearly have a function related to the delivery of valuable information (Screven, 1995), and that the structure is objectively clear for the visitor (Rand, 1990). Although the literature may have addressed such questions from a functional design perspective, such strategies do not necessarily address the primary question about whether the content on the ID label has an a priori value to the visitor.

Unlike other types of signs throughout the park, the content for IDs is usually standardized by the institution and rarely changes, even when exhibits themselves are redesigned to change the species or the appearance of the display, or to construct a new overarching interpretive scheme. At the Bronx Zoo, one of the study sites for the project reported here, the IDs are similar to those found in most zoos and aquariums, they provide a standard set of natural history data based on the type of animal that is on exhibit. For instance, mammal IDs often list length of pregnancy (gestation) and number of offspring (Figure 1) regardless of species, because this is the information
assumed to be of greatest interest to that zoo’s visitors. However, it is now well established that visitors construct meaning from prior knowledge and experiences (Hein, 1998), which suggests that it may be useful to test these assumptions by evaluating whether these basic questions are in fact of common interest, whether these questions are consistent for all animals or animal types across a large group of visitors, and whether providing this information would be considered relevant or offer the foundational information necessary for these visitors to make sense of their experience with a live animal.

A review of the label design literature revealed no evidence of empirical research surrounding visitor desire for ID label content at zoos or aquariums. A great deal of comparative research has been conducted on how to create an effective label that could also be considered relevant to ID label strategies (e.g., Blais, 1995; McClean, 1993; Screven, 1999; Serrell, 1996), including numerous studies on how visitors respond to labels in exhibitions (for review, see: Serrell, 1981). A small amount of research has demonstrated that knowing what content satisfies visitor preferences on basic exhibit labels can increase visitor satisfaction with the overall experience and perceived enjoyment (Eisenberger, 1999; Yalowitz, 2002). Yalowitz further demonstrated that such satisfaction was linked to repeat visitation. This topic has also appeared tangentially in overall studies of zoo interpretation (i.e., Bitgood, Patterson, & Benefield, 1988; Bitgood & Richardson, 1986; Dierking, Burtnyk, Buchner, & Falk, 2002), but these papers did not specifically address visitor preferences for information types on animal ID labels.

To redress this deficit, researchers from three zoos and two aquariums in the United States collaborated on a project to assess visitors’ basic interest in information types on animal ID labels. The first exploratory study was conducted at all five institutions in an effort to determine whether there was institutional variation in visitor preferences based on type, location, or simple institutional variation. Based on these results, a second, two-part confirmatory study was undertaken to ensure the validity of the findings.
Study 1: Exploratory Surveys at Five Institutions

Method
A brief survey of content on existing animal identification labels (IDs) at the institutions represented by the research team and through anecdotal reports by the team based on their familiarity with IDs at most other zoos and aquariums in the USA confirmed that information types tend to vary based on the class (or type) of animal on display. That is, ID information is different for birds or reptiles, mammals or fish, but within a class of animals, there is consistency. However, the investigation into label variation also illustrated that mammal label copy tended to vary at the level of order and family. The team noted that most zoos and aquariums manage their collections based on taxonomic specialization within their curatorial ranks, and ID label content appeared to be consistent with the standards for scientific research for that taxonomic categorization of animals. As a result, it was determined that focusing on information preferences by class of animal would offer the most generalized level for first investigation of birds and reptiles, while mammals and sharks were evaluated at the level of order and family in order to most accurately represent the of display strategies currently used in most zoos and aquariums. We referred to these different levels of taxonomic identification as a “category” of animals (i.e., “big cats” instead of “tigers”) in order to provide the most usefully generalized information for the majority of zoos and aquariums in the USA.

To assess visitor desire for information types, a survey instrument was designed to solicit the opinion of visitors in a zoo or aquarium about what kind of information they would most like to see on a sign for a category of animal on display. We operationalized this study with eleven animal categories at five institutions.

The surveys were conducted within the vicinity of a species exhibit that belonged to the group being tested (i.e., the big cats surveys were conducted as visitors arrived at a tiger exhibit). Data were never collected in view of exhibit signage and only in rare instances could the visitor actually observe an animal representing the category. This strategy was employed in order to avoid cues (or priming) about the existing ID information and to ensure that the visitor was not swayed by a species when they were asked to consider a larger group.

In this study, both open-ended and closed-ended versions of the instrument were tested. The closed-ended survey provided survey participants with a preprinted list of 19 kinds of information about animals that was compiled based on anecdotal reports from zoo educators, zoo staff, exhibit developers, and the researchers’ experience of visitors’ most frequently asked questions. Visitors were given a pre-printed card with a list of topics (Appendix A) and verbally asked to identify the three most interesting or important kinds of information that they would personally like to see on a sign at an exhibit containing the category of animal in question. They were also asked to list any other information they wanted but did not see on the card.

A second, separate, open-ended survey was conducted to verify that the 19 items selected for use on the closed-ended survey were representative of types of information desired by visitors. The open-ended survey followed the same protocol as the closed-ended survey but omitted the pre-printed list of information types.
Table 1. Visitors Selected Topic Priorities for Animal Categories

<table>
<thead>
<tr>
<th>Kinds of information</th>
<th>Frequency</th>
<th>% total</th>
<th>Apes (PZ)</th>
<th>Big Cats (PZ)</th>
<th>Sharks (SA)</th>
<th>Sharks (MBA)</th>
<th>Dolphins (SA)</th>
<th>Monkeys (BZ)</th>
<th>Birds (BZ)</th>
<th>Birds of Prey (WPZ)</th>
<th>Fish (MBA)</th>
<th>Reptiles (BZ)</th>
<th>Bear (BZ)</th>
<th>Deer (BZ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odd facts, behaviors, Endangered Status</td>
<td>124</td>
<td>34%</td>
<td>6</td>
<td>9</td>
<td>14</td>
<td>9</td>
<td>9</td>
<td>5</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>11</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Where in the world Years they live</td>
<td>113</td>
<td>31%</td>
<td>12</td>
<td>8</td>
<td>5</td>
<td>8</td>
<td>6</td>
<td>11</td>
<td>16</td>
<td>6</td>
<td>11</td>
<td>7</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>How they came to Zoo Name of animal</td>
<td>103</td>
<td>28%</td>
<td>13</td>
<td>8</td>
<td>2</td>
<td>8</td>
<td>4</td>
<td>15</td>
<td>8</td>
<td>11</td>
<td>13</td>
<td>5</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>How heavy/big they get Social and Family life</td>
<td>92</td>
<td>25%</td>
<td>9</td>
<td>8</td>
<td>10</td>
<td>5</td>
<td>13</td>
<td>13</td>
<td>8</td>
<td>4</td>
<td>7</td>
<td>4</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Where in the world Years they live</td>
<td>88</td>
<td>24%</td>
<td>5</td>
<td>2</td>
<td>7</td>
<td>5</td>
<td>14</td>
<td>7</td>
<td>8</td>
<td>4</td>
<td>2</td>
<td>8</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>How they came to Zoo Name of animal</td>
<td>76</td>
<td>21%</td>
<td>9</td>
<td>9</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>13</td>
<td>8</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>How they came to Zoo Name of animal</td>
<td>60</td>
<td>16%</td>
<td>6</td>
<td>6</td>
<td>9</td>
<td>8</td>
<td>6</td>
<td>6</td>
<td>1</td>
<td>5</td>
<td>6</td>
<td>2</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>How they came to Zoo Name of animal</td>
<td>60</td>
<td>16%</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>8</td>
<td>7</td>
<td>5</td>
<td>1</td>
<td>7</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>How many in wild Food in wild Appearance</td>
<td>54</td>
<td>15%</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>How many in wild Food in wild Appearance</td>
<td>53</td>
<td>14%</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>9</td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>M vs. F</td>
<td>49</td>
<td>13%</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>6</td>
<td>7</td>
<td>2</td>
<td>6</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>No. of babies at a time Food at Zoo</td>
<td>46</td>
<td>13%</td>
<td>4</td>
<td>3</td>
<td>8</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Food at Zoo</td>
<td>35</td>
<td>10%</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Habitat How long before leave parent Age of animal in exhibit</td>
<td>33</td>
<td>9%</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>7</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>6</td>
<td>2</td>
<td>1</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Habitat How long before leave parent Age of animal in exhibit</td>
<td>31</td>
<td>8%</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Habitat How long before leave parent Age of animal in exhibit</td>
<td>28</td>
<td>8%</td>
<td>4</td>
<td>6</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Length of pregnancy Animals related to Scientific Name</td>
<td>27</td>
<td>7%</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>6</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Length of pregnancy Animals related to Scientific Name</td>
<td>21</td>
<td>6%</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Length of pregnancy Animals related to Scientific Name</td>
<td>7</td>
<td>2%</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes:

(1) Participants were asked to select three kinds of information they thought were most interesting or important to include on a label.

(2) Zoo acronyms: BZ: Bronx Zoo, MBA: Monterey Bay Aquarium, PA: Philadelphia Zoo, SA: John G. Shedd Aquarium, WPZ: Woodland Park Zoo

(3) Three topics were selected per respondent (N=367)

(4) % selected represents the total number of times that topic was selected
### Table 2. Visitor Volunteered Topic Priorities for Animal Categories

<table>
<thead>
<tr>
<th>Kinds of information</th>
<th>Frequency</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diet/Feeding in wild and/or in zoo</td>
<td>188</td>
<td>51%</td>
</tr>
<tr>
<td>Where in the world</td>
<td>158</td>
<td>42%</td>
</tr>
<tr>
<td>How heavy/big - size, tall</td>
<td>71</td>
<td>19%</td>
</tr>
<tr>
<td>Years they live - lifespan</td>
<td>67</td>
<td>18%</td>
</tr>
<tr>
<td>Habitat</td>
<td>67</td>
<td>18%</td>
</tr>
<tr>
<td>Odd/Interesting/ Unique behaviors, features</td>
<td>51</td>
<td>14%</td>
</tr>
<tr>
<td>Endangered status</td>
<td>41</td>
<td>11%</td>
</tr>
<tr>
<td>Others</td>
<td>39</td>
<td>10%</td>
</tr>
<tr>
<td>Social/Family Life</td>
<td>37</td>
<td>10%</td>
</tr>
<tr>
<td>Name of animal</td>
<td>36</td>
<td>10%</td>
</tr>
<tr>
<td>Daily activities</td>
<td>36</td>
<td>10%</td>
</tr>
<tr>
<td>Common</td>
<td>36</td>
<td>10%</td>
</tr>
<tr>
<td>Name/What is it</td>
<td>27</td>
<td>7%</td>
</tr>
<tr>
<td>Life in Captivity</td>
<td>24</td>
<td>6%</td>
</tr>
<tr>
<td>Age of each animal on exhibit</td>
<td>21</td>
<td>6%</td>
</tr>
<tr>
<td>Birth Information</td>
<td>19</td>
<td>5%</td>
</tr>
<tr>
<td>What are different kinds of this animal</td>
<td>19</td>
<td>5%</td>
</tr>
<tr>
<td>Ecological Niche - Fit into Environment</td>
<td>17</td>
<td>5%</td>
</tr>
<tr>
<td>If dangerous, poisonous</td>
<td>17</td>
<td>5%</td>
</tr>
<tr>
<td>Shark attacks</td>
<td>14</td>
<td>4%</td>
</tr>
<tr>
<td>How they came to zoo</td>
<td>13</td>
<td>3%</td>
</tr>
<tr>
<td>How fast they can move/swim</td>
<td>13</td>
<td>3%</td>
</tr>
<tr>
<td>Physiological info</td>
<td>13</td>
<td>3%</td>
</tr>
<tr>
<td>Differences M vs.F</td>
<td>12</td>
<td>3%</td>
</tr>
<tr>
<td>Training animals</td>
<td>12</td>
<td>3%</td>
</tr>
<tr>
<td>Intelligence</td>
<td>11</td>
<td>3%</td>
</tr>
<tr>
<td>Total</td>
<td>1059</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

1. Participants were asked to list three kinds of information they thought were most interesting or important to include on a label.


3. Three topics were selected per respondent (N=372)

4. % selected represents the total number of times that topic was selected
Participants
During the summer of 2005, adult visitors were surveyed using a convenience sampling technique during the regular operating hours of the zoo or aquarium. A total of 367 visitors participated in the closed-ended version of the study and 372 visitors participated in the open-ended study at the same locations. Basic demographic data confirmed that the sample was consistent with attendance statistics and that the sample represented a cross section of typical visitors to each zoo or aquarium.

Results
Results from all institutions and animal types were combined for the closed-ended study to determine whether any type of information was particularly captivating. Odd facts and behaviors emerged as the most popular form of information (34%), followed by information on endangered status (31%), where the animal may be found living in the wild (28%), their lifespan (25%), and how they came to be displayed in the zoo or aquarium (24%) respectively (Table 1). Data for individual animal categories were found to be consistent with the combined data for 10 out of 12 animal groups. The two exceptions were apes (Philadelphia Zoo) and monkeys (Bronx Zoo). For these two groups, more visitors chose where animals are found living in the wild, endangered status, lifespan, and the common name of the animal.

In general, the least interesting types of information to include on exhibit signs were length of pregnancy (selected by 7% of respondents), taxonomic relationships (6%), and scientific or Latin species name (2%). The scientific name was, by far, the least popular answer across all species and represented the lowest ranked information topic for eight out of the twelve animal categories, and second lowest for three of the remaining four.

By examining the results of the open-ended survey, it was found that most visitors (51%) listed what an animal eats to be one of the most interesting fact for a sign, although they did not specify whether this information encompassed the animal’s diet in the wild or in the zoo/aquarium (Table 2). Where animals are found in the wild was listed by 42% of participants as another valuable piece of information for a sign. Considered as a whole, while the results of the open-ended study suggested a slightly different priority for topics than the closed-ended study, the participant-generated topics did not vary from the initial list generated by the zoo staff, which was what this instrument was designed to test.

The open-ended exploration did generate more specific questions that gave clarity to what types of information visitors would include under the closed-ended survey category entitled “odd facts and behaviors” for some animal types. For instance, visitors requested information about whether reptiles are poisonous, shark attacks, and how dolphins are trained.

Data on desired information about sharks were collected at both aquariums involved in this study, and these two institutions showed some differences in results for the closed-ended survey. Odd facts and behaviors emerged as the most popular type of information at both locations, but lifespan and number of offspring were much more important to visitors at the John G. Shedd Aquarium (Chicago) than to visitors at the Monterey Bay Aquarium. Visitors to the John G. Shedd Aquarium tended to rank where an animal can be found in the wild less frequently than visitors at most other zoos/aquariums.
Discussion

While it was assumed that different categories of animals would produce different rankings for desired information, we found that the rankings were generally consistent despite different categories of animal and different institutions. The consistency of both the most popular and least popular choices can help guide decision-making about what information may satisfy basic visitor desire for information on an animal ID label. Odd facts, endangered status, and where animals can be found living in the wild appear to represent types of information that will satisfy the curiosity of most general zoo visitors. In contrast, the scientific or Latin name of an animal, the taxonomic relationships to other animals, and duration of pregnancy appear to serve the interests of only a very small group of visitors, unless this information represents and is presented as an odd fact or behavior.

These results seemed to confirm that the majority of IDs at zoos and aquariums contain information that people believe is interesting or important to them based on the researchers’ survey of such IDs. The high interest in odd facts, a possible catch-all category, may support the constructivist paradigm (e.g., Hein, 1998) because visitors prioritized this information because it can help them engage others in the socially valuable conversations studied by other researchers (Clayton, Fraser, & Saunders, 2009) or serve as a catch-all for visitors who seek to understand why an animal is considered worthy to display at a zoo or aquarium.

These findings suggest that some information important to zoo staff, such as Latin name, phylogeny, and breeding are rarely interesting for zoo visitors. While this information may help exhibit developers highlight the zoo’s scientific interests, these findings recommend caution in assuming that such information will be engaging. Repetition of uninteresting information may even encourage visitors to ignore other signs. However, highlighting the “odd or interesting” nature of these facts may help overcome this challenge.

Curiously, the lifespan of an animal emerged as a popular information choice for several animal categories studied, even though that information is rarely found on typical ID labels. We surmise that this interest in the life of the specific animal on display and the need to calibrate the lives of these animals to the visitors’ own lives, the lives of their children, or possibly to understand the limits of life itself. It would seem that interest in lifespan may provide a valuable way for adults to engage in discussions about animal habitat needs, survival, and conservation challenges.

It is important to caution that two concerns arose during the data analysis that suggest the need for further assessment. The first concern was related to the low ranking of the animal name, since naming something is a primary tool for discussing that thing. However, this may have been a limitation of the instrument structure and that the participants in this study may have assumed that any ID would offer the common name for that species and therefore made selections from the remaining items. The wording of the item may have also led some participants to assume that “name” meant the individual animal’s name (i.e., Joe) rather than the common name of the animal. As a result, it is difficult to assess what exactly was the cause of the low selection frequency, but one could assume that visitors generally expect the common name of a species to be featured prominently on an ID.

The second concern was that visitors in the zoo had likely already seen an ID on the day of the survey, and it is possible that they were primed to think about the kinds
of information currently found on IDs in that institution. The fact that scientific name is almost always featured on IDs, yet was seldom selected as desired, is a sign that such priming did not excessively influence their choices. Additionally, the survey wording was carefully constructed to minimize the social desirability factor, prompting visitors to give the three responses they “personally” thought were most interesting or important to include on a sign.

The difference in topical interests that emerged regarding the shark category at the two aquariums in this study may be the result of factors such as institutional priorities or focus revealed in exhibits visitors had seen prior to participating in the survey, regional differences between visitors in the Midwest and California, or random chance. These findings reinforce the value of front-end evaluation before creating labels of any kind, especially with emblematic animals like sharks. The consistency of the other data from these institutions suggests, however, that people have a fairly predictable set of topics that engage their interest in zoos and aquariums.

Study 2: Application and Confirmatory Survey at the Bronx Zoo
A separate ID is usually made for each species on display in an exhibit, even if the format is standardized for a class or family. In order to assess whether the findings from the first study could be applied to specific species within a category, a second study was designed to compare visitors’ information preferences for an animal category (birds) with their preferences for a specific species in that type. A second purpose was to develop a streamlined, standardized list of information items that exhibit developers could use for front-end evaluation to identify the most satisfying set of topics for an ID.

Methods
Based on the results of the first study, a shortened list was produced, containing the nine most frequently selected information types from the original 19 items. The least desirable kinds of information were removed from the original list, thereby forcing participants to select only from the more popular items (Appendix B). One additional change was the separation of the two possible interpretations of “animal name” (individual name “Joe” or the species name) to remove the potential confusion that emerged in the first study. The evaluation of this shortened list was implemented following the same protocol as Study 1, with the sole exception being that data were collected in front of the exhibit animal while the animal was on display. All existing labels and species information at these study sites were covered during the time of the survey, except for the common name and species name for each of the animals. Data for “birds” were collected outside of the exhibit building and followed the same protocol as Study 1.

The species selected for this study, Great Hornbill (Buceros bicornus), Nicobar Pigeon (Caloenas nicobarica), Taveta Golden Weaver (Ploceus castaneiceps), and Crested Tinamou (Eudromia elegans), were selected because they were all resident in a single taxonomy-based exhibition building at the Bronx Zoo (World of Birds) and represented a great deal of morphological and behavioral variation.

The data from the modified list were tallied and assessed for popularity. The data for the category of birds were first compared to those of the original study to determine if the modified list led to a new order in the ranking. Then the data for the animal category and the individual species were compared, and the individual species were compared to one another.
Participants

In the winter of 2006, 242 adult Bronx Zoo visitors participated in this study. Thirty-nine responded to the general category of birds, 49 were asked about the Nicobar Pigeon, 60 were asked about the Taveta Golden Weaver, 44 were asked about the Crested Tinamou, and 50 were asked about the Great Hornbill. Visitors were intercepted using convenience sampling consistent with Study 1.

Results

In comparing the two versions of the list of information (the nine-item list with the original 19-item list), the top three choices of information for the category birds were the same, and the rankings of other item were nearly identical in both versions. Within the second study, the highest ranked topics for each study species generally matched the desired information for birds as a category (Table 3). The highest-ranked topics included endangered status, where these animals can be found living in the wild, and odd facts or behaviors for three of four species. The topic rankings for the Nicobar Pigeon were just slightly different than the other species, with fewer visitors selecting endangered status and more visitors selecting common name.

Discussion

The follow-up study confirmed several points of interest. First, using a shortened list of information items produced almost identical rankings as the original 19-item list, confirming that the shorter version can reliably produce clear rankings for topics of visitor interest.
interest. Second, it showed that participants wanted to know the same types of information about both specific species and birds in general. This suggests that results about information preferences by animal category could be broadly applicable to creating IDs for specific species, which is useful for front-end evaluation. However, the slight difference in rankings for Nicobar Pigeon suggests that some variation by species could exist, perhaps due to morphology, behavior, or common name. When it is hypothesized that an individual species could differ from its larger group, more detailed evaluation could be employed.

Conclusion
This study set out to discover what information visitors might prefer to see on an animal ID label. Based on these data, the most popular types of information for an ID were shown to be odd facts or behaviors, endangered status, and where an animal can be found living in the wild. Scientific names, length of pregnancy (or gestation), and phylogeny were only of interest to a small percentage of visitors. The confirmatory study demonstrated that informational interests for a broad category of animals can potentially be applied to species within that category, but that some species might elicit different types of interest. The first study also showed that the type of zoo or aquarium or region where an institution is situated may have an impact on visitors’ desired information, although general patterns of most interesting topics were quite consistent.

This study was not intended to establish rules for what information should be displayed on an ID label. Rather, these results are offered as tools for exhibit developers to understand what information will be perceived as personally relevant for and satisfy the curiosity of the majority of visitors. By taking such preconceptions and desires into account, an exhibit developer may be able to be more tactical in how they target interest and engage their audience, potentially increasing satisfaction, visitor enjoyment, and attentiveness to the overall interpretive messages.

We feel that exhibit developers would be well served if they undertake quick front-end sampling of their visiting public to determine what basic questions they want answered about an animal to be displayed. This can be done at a general animal category or a species level, depending on the circumstances, in order to understand whether there are unique attributes that can alter the information most desired by visitors. We believe the shortened list of topics developed though this study and the method itself can be broadly useful for quick assessment of visitor interests, can help to refine where unique conditions occur within an animal category, and can help zoo administrators determine what animal ID label text is most relevant to promoting an exhibit’s learning goals.

Acknowledgements
The authors wish to thank the overwhelming number of zoo staff and volunteers who helped shape this study and aided in the data collection for this multi-institutional project. Special thanks to Kathryn Owen at the Woodland Park Zoo in Seattle, Washington, independent consultants Kathleen Wagner and Dr. Melissa Chessler who helped with this study while working at the Philadelphia Zoo, our colleague at the Institute for Learning Innovation, Dr. Steve Yalowitz, and Jon Deuel who were both working at the Monterey Bay Aquarium in California during the development of this study, Linda Wilson from the John G. Shedd Aquarium in Chicago, Illinois, Chris Sheppard and Nancy Clum at the Bronx Zoo, all the curators, volunteers, and staff who helped with data collection at the zoos and aquariums where the study was conducted.
References


Appendix A: Information Preference List for All Animal Categories

A. The length of their pregnancies
B. If they are endangered or not (in danger of dying out)
C. The number of years they live
D. Where they live in the world
E. The food they eat here at the zoo
F. The food they eat in the wild
G. The number of babies they have at one time
H. The name of the animal
I. Other animals they are closely related to
J. How many exist in the wild
K. The number of years before they can leave their parents and become independent
L. How heavy/big they get
M. How they came to the Bronx Zoo
N. The age of each animal in the exhibit
O. The difference in appearance between males and females
P. The main features of their social and family life
Q. Their scientific (classification) name
R. Odd or unusual features or behaviors they have
S. The kind of land they live in (such as forests, swamps, etc.)

Appendix B. Modified List of Topics for Study 2 “Birds” as a Category

A. If they are endangered or not (in danger of dying out)
B. The number of years they live
C. Where they live in the world
D. The food they eat (in the wild or at the zoo)
E. The name of the animal (for example: We call this owl Fred.)
F. Odd or unusual features or behaviors they have
G. The kind of land they live in (such as forests, swamps, etc.)
H. How they came to the Bronx Zoo
I. Common name of animal species (for example: This is a barn owl.)
Improving the Efficacy of Visitor Education in Haleakalā National Park Using the Theory of Planned Behavior

Nathan Reigner  
University of Vermont  
361 Aiken Center  
Burlington, VT 05405  
nreigner@uvm.edu  
802-656-7412  
Fax: 802-656-2323

Steven R. Lawson  
RSG, Inc.  
55 Rail Road Row  
White River Junction, VT 05001  
slawson@rsginc.com  
802-295-4999

Keywords  
Theory of Planned Behavior, park management, communications theory, message efficacy, depreciative behavior, visitor use management, national park

Acknowledgements  
The authors would like to thank the following people for their contributions to the research presented in this paper: Karen Hockett, Dr. Jeffery Marion, Dr. Marc Stern, and Sally Fae Dymond, Virginia Tech; Brett Kiser, RSG Inc.; Kerri Cahill, Marilyn Parris, Eric Andersen, Liz Gordon, and Ron Nagata, National Park Service; Alan Bright, Colorado State University; and Troy Hall, University of Idaho. This project was funded by the National Park Service and conducted while the authors were affiliated with Virginia Tech.

Abstract  
Degradation of resource and experiential quality from recreational use at the Pools of ʻOheʻo in Haleakalā National Park has led officials to discourage visitor use of the area. Using the Theory of Planned Behavior (TPB), this study examines relationships among visitors’ attitudes, subjective norms, and perceived control regarding exploration of
the pools, their intentions to explore and their actual behaviors at pools. Further, the study examines the influence of persuasive messages on visitors’ behavior at the pools. TPB is found to be an effective model for understanding visitor behavior at ‘Ohe’o’s Pools, revealing a desire among visitors to act in accordance with National Park Service wishes. Results indicate that attitudes and subjective norms are influenced by exposure to the persuasive messages. Additionally, messages emphasizing the resource impacts of exploring the pools are found to be more effective at influencing visitor attitudes than messages emphasizing the dangers of exploring the pools.

Introduction
Visitor education and information are commonly used to minimize and prevent social and environmental impacts of recreation in national parks and related protected natural areas (Ham et al., 2008; Marion & Reid, 2007). They are the generally preferred recreation management approach of both visitors and managers, largely because they are perceived as unobtrusive and consistent with experiential values associated with natural resource-based recreation on public lands, and are often less costly than other management tactics (Bullock & Lawson, 2007; Hendee & Dawson, 2002; Manning, 1999; Martin, Marsolais, & Rolloff, 2009; Park, Manning, Marion, Lawson, & Jacobi, 2008; Roggenbuck, 1992; Vistad, 2003). Furthermore, the use of visitor education and information has proven to be effective at reducing a variety of undesirable behaviors in park settings, including off-trail hiking, animal feeding, theft of petrified wood, and littering (Bradford & McIntyre, 2007; Hockett & Hall, 2007; Liu & Sibley, 2004; Marion & Reid, 2007; Widner & Roggenbuck, 2000).

Although there is a general preference among visitors and managers alike for informational approaches to managing visitor behavior in parks, previous research suggests that information and education are not always effective at persuading visitors to behave in a manner that minimizes their impacts to park resources and the quality of other visitors’ experiences (Vande Kamp, Johnson, & Swearingen, 1994; Park et al., 2008). Such is the case at the ‘Ohe’o Pools (referred to hereafter as “the pools”), a primary visitor attraction in the Kipahulu area of Haleakalā National Park. Within the Kipahulu area of the park, a formal trail leads visitors to the rim of ‘Ohe’o Gulch in which the pools are located, and concrete steps descend from the trail into the gulch itself. While some visitors remain on the trail above the pools, most descend the stairs into the gulch. Many of these visitors venture further, leaving the landing at the base of the stairs to explore the pools by hopping from rock to rock along Palikea Stream, “bushwhacking” through vegetation on the steep sides of the gulch, wading through and swimming in the pools, and cliff-jumping into the water. Exploring and swimming in the pools has become a popular visitor activity, and is a centerpiece of many tourism brochures and related promotional materials circulated to island visitors. Exploring and swimming in the pools is a legal activity when the National Park Service (NPS) determines the stream level does not pose a threat to visitors’ safety. However, the NPS discourages visitors from exploring and swimming in the pools for reasons related to visitor safety, public health, resource protection, Native Hawaiian cultural protection, and the quality and nature of visitors’ experiences. The NPS relies exclusively on indirect management in the form of onsite signage designed to dissuade visitors from exploring the pools, except on days when the stream is closed to visitors due to unsafe water levels. In particular, the NPS employs signage and interpretive information in the visitor center and along trails that focus primarily on the dangers and
safety hazards associated with entering and exploring the pools area. Despite the NPS’s current informational campaign, a large number of visitors choose to explore and/or swim in the pools.

The purpose of this study is to improve the design of visitor education and information messages to enhance their efficacy as tools to minimize the number of visitors who explore the pools. Further, the study is designed to assess whether indirect management alone is sufficient to meet NPS management objectives with respect to visitor use of the pools, or if more direct forms of management are needed to supplement visitor education and information. To do this, the study uses the Theory of Planned Behavior (TPB) to examine the cognitive factors that influence visitors’ decisions about whether or not to explore the pools. Additionally, the study uses an experimental approach to assess the relative efficacy of two persuasive messages designed to act upon and influence the cognitive factors that are hypothesized within TPB to “drive” visitor behavior. The following section of the paper reviews previous studies concerning the efficacy of visitor-use management through education and information. This is followed by a presentation of TPB, which provides the theoretical framework for the study. Results of the study are presented, and the paper concludes with a discussion of findings and their implications for research and management.

Previous Research on the Efficacy of Visitor Education and Information

Previous research suggests that the efficacy of visitor education and information depends on the characteristics and circumstances of informational messages, target resource impacts, recreation settings, and visitor experiences and behaviors to which they are applied. Informational messages whose content explains the depreciative consequences of specific recreation behaviors and discusses the reasons for management policies have been found to effectively capture visitors’ attention, influence their behavior, and even enhance their experience, in some cases (Bullock & Lawson, 2007). In contrast, regulatory messages that do not include a rationale for rules and regulations can have a negative effect on visitor experiences and be less effective at persuading visitors to adopt desired behaviors. Further, messages that attribute impacts of recreation behaviors to visitors so they can identify with and reflect upon them have been found to be more effective at reducing depreciative behavior than those that only instruct visitors to refrain from engaging in specific behaviors (Bradford & McIntyre, 2007). Additionally, results from a study of National Association for Interpretation members suggest that interpretation professionals perceive visitor information that uses prescriptive messages emphasizing desired behaviors to be more effective than proscriptive messages that focus on discouraging undesirable behaviors (Winter, Sagarin, Rhoads, Barrett, & Cialdini, 2000).

For visitor education and information to be effective, targeted visitor experiences and behaviors must be of a nature that facilitates visitor exposure and receptiveness to persuasive messages (Park et al., 2008). Managerially undesirable recreation behaviors that are careless, unskilled or uninformed have potential for management with information that educates visitors about and connects them with their impacts (Roggenbuck, 1992). Recreation impacts to resources that are wantonly illegal, such as theft from cultural sites, or unavoidable, such as disposal of human waste, are unlikely to be influenced by informational tactics (Roggenbuck, 1992; Widner-Ward & Roggenbuck, 2003). Results of a study of off-trail hiking on the summit of Cadillac Mountain in Acadia National Park found that signage encouraging visitors to stay on trail, rather than hiking off-trail and
trampling alpine vegetation, was ineffective (Park et al., 2008). The authors concluded that this result could be explained, in part, by the fact that site visits were brief and visitors, focused on the site’s highly attractive and accessible setting, generally did not spend time reading informational signs. Thus, the duration, pace, and focus of people’s visits served to influence the efficacy of onsite signage.

Persuasive messages have been found to be most successful when they exploit the central route to persuasion as described by the Elaboration Likelihood Model of human behavior (Ham et al., 2008; Petty, McMichael, & Brannon, 1992). This route to persuasion is accessed when messages prompt individuals to consider the message’s arguments, elaborate on the meaning of those arguments, and then respond by changing basic behavioral beliefs to align beliefs, attitudes, and behaviors with the message. Behavior changes via the central route to persuasion are likely to be more durable and lasting than those achieved with peripheral route persuasion. Peripheral route persuasion relies on cues within the message and its delivery, including the credibility of the messenger and the number of arguments offered, to effect behavior change. This route to persuasion may result in behavior change, but change is often temporary and not reflective of actual change in underlying behavioral beliefs (Ham et al., 2008).

Findings from studies of the efficacy of visitor education and information suggest that theories of moral development can inform the design of persuasive messages based on the targeted audience and behaviors (Ham et al., 2008; Hockett & Hall, 2007; Marion & Reid, 2007; Park et al., 2008). Kohlberg (1976) and Gilligan (1982) developed spectra of moral development. These theories posit that individuals are motivated to behave by a diversity of interests and that these interests can be arranged in a hierarchical spectrum along which one may progress throughout life. Within both theories, moral behavior is initially motivated by a primary concern for the self, then by concerns focused on others, and ultimately by justice, responsibility, and integration of caring for self and others. With respect to these spectra, persuasive messages emphasizing the dangers of or punishment for a behavior are directed toward individuals at lower orders of moral development, focusing on the negative effects of specific behaviors to the self. Messages presenting the negative effects of behavior to communal or mutually valued resources appeal to higher levels of moral development by encouraging behavior change for reasons of justice and equity. This review of literature suggests that there are a number of factors that influence the efficacy of visitor education and information tactics in achieving resource protection and visitor-use management objectives in national parks.

**Theoretical Framework**

TPB provides a theoretical framework that is potentially useful in understanding visitor behavior at the pools. Behaviors as understood within TPB are specific, spatially and temporally bounded, and volitional (Ajzen, 1991). This study defines its behavior of interest as exploring the ‘Ohe’o Pools in Haleakalā National Park. The behavior exploring addresses the visitor activity of management concern to the NPS and can be understood as an explicit behavior by visitors. TPB posits that an individual’s behavior is largely determined by one’s intention to behave and one’s perceived control over behaving in the intended manner. The theory further explains behavioral intention as the product of one’s attitudes, subjective normative assessments, and perceived behavioral control (PBC). These constructs are themselves the product of behavioral, normative, and control beliefs, corresponding to attitudes, subjective norms, and PBC, respectively.
Attitudes and their underlying behavioral beliefs are the rational assessments individuals make with respect to the behavior of interest. In this case, where the behavior of interest is exploring the pools, attitudes are visitors’ own beliefs about and evaluations of potential outcomes of exploring the pools. Examples of such potential outcomes considered in this study are falling and getting hurt on rocks and having a true Hawaiian experience. Subjective normative assessments and their underlying normative beliefs are individual evaluations of the normative judgments of others. In this study, subjective normative assessments are visitors’ perceptions of the extent to which others approve or disapprove of them exploring the pools, and the importance of others’ approval of their behavioral decisions. PBC and its underlying control beliefs reflect individuals’ perceptions of their ability and autonomy to engage in a behavior. At the pools, PBC addresses visitors’ perceptions of their physical ability and autonomy to explore the pools.

This study applies Ajzen’s (1991) TPB model with adaptations in construct measurement to better fit the behavior of interest, exploring the pools, and to more directly address the management interests of Haleakalā National Park. This operationalization varies from Ajzen’s (1991) original TPB model in two substantive ways: 1) behavioral intention is hypothesized to be the sole predictor of behavior and; 2) behavioral and normative beliefs are used as measures of attitudes and subjective norms, respectively, rather than direct measures of the constructs themselves. The TPB model adapted and measured in this study positions behavioral intention as the product of behavioral beliefs, normative beliefs, and perceptions of behavioral control (Figure 1).

Most visitors to the pools come with an expectation to explore—that is, with
high perceptions of behavioral control over exploring (Lawson et al., 2008). Thus, PBC is not thought to be a barrier mitigating behavioral intention from being fulfilled. Subsequently, it is addressed only as an influence on behavioral intention in this study’s TPB model. This decision is supported by research. When investigating hunting intention and participation, Hrubes, Ajzen, and Daigle (2001), who found that PBC did not contribute directly to the prediction of behavior. Additional support is lent by Sutton (1998), who notes that behavioral variation explained by the combined influences of behavioral intention and PBC is similar to the behavioral variation explained when behavioral intention is modeled as a sole influence on behavior.

Ajzen’s original TPB model is further adapted in this study’s operationalization and measurement of attitudes and subjective norms through their constituent beliefs. That is, rather than measure attitudes and subjective normative assessments directly, this study measures behavioral and normative beliefs. Several studies have found that the informational foundation of behavioral and normative beliefs correlate highly with and directly form attitudes and subjective normative assessments (Armitage & Conner, 2001; Hrubes et al., 2001). In this study, behavioral belief measures are used in place of the attitude construct, and normative belief measures replace the subjective normative assessment constructs. To specifically address NPS management interests, two normative beliefs are included as influences on behavioral intention, one for study participants’ traveling companions and one for NPS officials.

Several studies have applied TPB to model behavior in the context of outdoor recreation and natural resources management. Examples include the prediction of hunting behavior, participation in outdoor recreation activities, use of bear-resistant food storage canisters, and engagement in wild fire preparation and mitigation activities by private land owners (Ajzen & Driver, 1992; Bright & Burtz, 2006; Hrubes et al., 2001; Kouthouris & Spontis, 2005; Martin & McCurdy, 2009; Rossi & Armstrong, 1999). While previous TPB studies have used behavioral surrogates including reported past behavior as the dependent variable or “end point” of the TPB model, our study includes a measure of actual behavior, which allows us to examine the validity of stated behavioral intention as a precursor to actual behavior (Ajzen & Driver, 1992; Bright & Burtz, 2006; Hrubes et al., 2001).

Beyond prediction of behavior and behavioral intention, TPB has been used to examine the efficacy of visitor education and information. TPB posits that prior to engaging in a behavior, individuals form an intention to behave in a particular manner, and that this intention is constructed from cognitive assessments, or beliefs, with respect to the behavior (Ajzen, 1991). In identifying the relative salience (i.e., influence) of cognitive precursors to behavior, TPB can be used to target persuasive messages for maximal efficacy. Ham and others (2008) provide an extensive review and application of TPB to the evaluation of persuasive information campaigns for management of three deprecatory behaviors in recreation settings: littering, wildlife feeding, and allowing dogs to run off-leash. Message interventions were examined using TPB analysis to isolate the most salient behavioral beliefs for decision-making, with respect to littering, wildlife feeding, and keeping dogs from running off-leash. Results were used to guide the design of information interventions to optimize their influence on visitor behavior.

In addition to testing potential persuasive messages, TPB has been used as a conceptual framework to evaluate existing programs of visitor education and management. Using TPB’s positioning of behavioral beliefs as a foundational influence on behavioral intention, Lackey and Ham (2003) elicited salient behavioral beliefs
from overnight campers in Yosemite National Park regarding bear-wise food storage. Salient beliefs identified in the study were compared to messages in current food storage informational campaigns, providing a basis for suggesting improvements in message design to target beliefs with the greatest potential to influence visitor behavior. TPB has also been used to evaluate the programs designed to promote the use of bear-resistant food canisters among backpackers in Yosemite Wilderness. Using TPB to examine these visitors’ intentions to use canisters, Martin and McCurdy (2009) measure intention to comply with food storage guidelines and identify attitudes and subjective normative assessments as the primary influences on behavioral intention.

As the TPB studies reviewed here illustrate, the progressive and quantifiable relationships among beliefs, intention, and behavior modeled by TPB provide a theoretical and empirical basis to evaluate and optimize the design of persuasive messages. This study builds on research reviewed by applying TPB to identify the salient cognitive precursors to visitor behavior at the pools and evaluate the relative influence of alternative messages on those cognitive factors. Thus, the study is designed to assess and enhance the efficacy of the NPS’s visitor education efforts to influence visitors’ behavior and achieve natural, cultural, and experiential resource protection objectives at the pools in Haleakalā National Park. In doing so, park managers can minimize the limitations of information-based visitor management (i.e., insufficient protection for intensive impacts at high-use, attraction-based sites) and maximize their benefits (i.e., increased visitor freedom and awareness of the effects of their behavior).

Treatment Messages
Two persuasive treatment messages were developed for evaluation within the TPB framework as potential informational management interventions at the pools. One message, designated the “fear message,” states that the NPS discourages exploration of

`Ohe`o Pools Area
The National Park Service discourages people from exploring the `Ohe`o Pools area because of the risk of injury or death. Falls on slippery rocks and from steep cliffs can result in serious injury to even the most sure-footed of visitors. Submerged rocks pose dangers to cliff jumpers and sudden flash floods have washed people to sea. A water-borne bacterial disease known to exist in the stream can cause rashes and more serious symptoms such as vomiting and diarrhea, which could lead to death. Please consider these potential health and safety issues when you decide whether or not to explore the `Ohe`o Pools area today.

Figure 2: Fear Treatment Message
The National Park Service discourages people from exploring the `Ohe`o Pools area because visitor use along the banks of the stream tramples native vegetation, and wading and swimming may harm rare native fish, shrimp, and snails that live in the stream. The often loud and large crowds also detract from the experience of those visitors who wish to appreciate the natural beauty of the area in a more quiet and peaceful way. These crowds can also diminish the area’s value for traditional use by Native Hawaiians. Please consider these potential impacts to the natural resources and experiences of Native Hawaiians and park visitors when you decide whether or not to explore the `Ohe`o Pools area today.

Figure 3: Warm Glow Treatment Message

The messages were designed to incorporate elements of communications and moral development theory to maximize their effect in influencing visitor attitudes toward exploring the pools. As such, the messages prescribe desired behavior, explain why the prescribed behavior is desired, and address motivations for compliance at a variety of moral developmental levels (Marion & Reid, 2007; Petty et al., 1992; Winter et al., 2000). The persuasive messages are also designed to exploit the central route to persuasion as proposed by the Elaboration Likelihood Model (Petty et al., 1992). That is, the messages are intended to change behavior through visitor comprehension, self-attribution of consequences, and internalization of information, as opposed to the emphasis on message delivery associated with the peripheral route. The central route to persuasion is found to be effective and appropriate for delivering persuasive messages when targeting recreation behavior that is unintentionally depreciative, as exploring the pools is understood to be (Roggenbuck, 1992). While both messages are designed to address the same route to persuasion, they are targeted at different levels of moral development. The fear message is designed to address the lower levels of moral development, focusing on the potential negative outcomes of exploring for the individual visitor. The warm glow message is designed to address the higher orders of moral development.
development, focusing on the potential of one’s actions to impact communal resources and the experiences of others.

**Methods**

**TPB Implementation in the Survey**

Behavioral, normative, and control beliefs, as well as visitors’ behavioral intentions regarding exploration of the pools were measured using a survey administered to visitors prior to their visit to the pools. The survey was designed in a manner to capture multiple measures for each of the cognitive constructs (Ajzen, 2006). Individual measures for each construct within the survey were compiled into a set of five composite measures corresponding to: 1) behavioral...

<table>
<thead>
<tr>
<th>Behavioral Beliefs</th>
<th>My exploring the ‘Ohe’o Pools area today would result in me…</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioral Belief Strength</td>
<td>Outcome Evaluations</td>
</tr>
<tr>
<td>$b_{ij}$</td>
<td>$\sum_{i} b_{ij} e_{ij}$</td>
</tr>
<tr>
<td>Danger</td>
<td>not at all likely 1 $\rightarrow$ extremely likely</td>
</tr>
<tr>
<td>…getting caught in a flash flood</td>
<td>…getting caught in a flash flood</td>
</tr>
<tr>
<td>…getting a rash</td>
<td>…getting a rash</td>
</tr>
<tr>
<td>…falling on rocks and getting hurt</td>
<td>…falling on rocks and getting hurt</td>
</tr>
<tr>
<td>Resource</td>
<td>…harming native plants and animals</td>
</tr>
<tr>
<td>…reducing the area’s value for native Hawaiians</td>
<td>…reducing the area’s value for native Hawaiians</td>
</tr>
<tr>
<td>…preventing others from experiencing the natural beauty of the ‘Ohe’o Gulch</td>
<td>…preventing others from experiencing the natural beauty of the ‘Ohe’o Gulch</td>
</tr>
<tr>
<td>Experiential</td>
<td>…having a true Hawaiian experience</td>
</tr>
<tr>
<td>…having a fun adventure</td>
<td>…having a fun adventure</td>
</tr>
<tr>
<td>…having a story to tell when I get home</td>
<td>…having a story to tell when I get home</td>
</tr>
<tr>
<td>Normative Belief Strength</td>
<td>Motivation to Comply</td>
</tr>
<tr>
<td>$n_{ij}$</td>
<td>$\sum_{i} n_{ij} m_{ij}$</td>
</tr>
<tr>
<td>Normative Belief Traveling Companion</td>
<td>disapprove 1 $\rightarrow$ 7 approve</td>
</tr>
<tr>
<td>If I were to explore the ‘Ohe’o Pools today, the people I am traveling with would…</td>
<td>How important is it to you that the people you are visiting the park with today approve of what you do?</td>
</tr>
<tr>
<td>Normative Belief NPS Officials</td>
<td>not at all important -3 $\rightarrow$ 7 approve</td>
</tr>
<tr>
<td>If I were to explore the ‘Ohe’o Pools today, National Park Service Officials would…</td>
<td>How important is it to you that National Park Service officials approve of what you do?</td>
</tr>
<tr>
<td>Perceived Behavioral Control</td>
<td>$\sum_{i} x_{ij}$</td>
</tr>
<tr>
<td>Control Beliefs</td>
<td>Self-Efficacy</td>
</tr>
<tr>
<td>$x$</td>
<td>extremely difficult 1 $\rightarrow$ extremely easy</td>
</tr>
<tr>
<td>My physical ability would make exploring the ‘Ohe’o Pools area today…</td>
<td></td>
</tr>
<tr>
<td>Controllability</td>
<td>strongly disagree 1 $\rightarrow$ strongly agree</td>
</tr>
<tr>
<td>It is entirely up to me and not National Park Service officials whether or not I explore the ‘Ohe’o Pools area today.</td>
<td></td>
</tr>
<tr>
<td>It should be up to each visitor to evaluate how dangerous it is to explore the ‘Ohe’o Pools area.</td>
<td></td>
</tr>
<tr>
<td>Behavioral Intention</td>
<td>$\sum_{i} x_{ij}$</td>
</tr>
<tr>
<td>Behavioral Intention</td>
<td>strongly disagree 1 $\rightarrow$ strongly agree</td>
</tr>
<tr>
<td>I intend to explore the ‘Ohe’o Pools area today.</td>
<td></td>
</tr>
<tr>
<td>I expect to explore the ‘Ohe’o Pools area today.</td>
<td></td>
</tr>
</tbody>
</table>

**Table 1: TPB Construct Composite Score Formation from Survey**
beliefs, with respect to visitor safety, resource protection, and visitor experience outcomes; 2) normative beliefs, with respect to the NPS; 3) normative beliefs, with respect to traveling companions; 4) PBC; and 5) behavioral intention (Table 1).

This study’s deductive measurement of behavioral and normative beliefs toward exploring requires identification of beliefs that are salient to the decision to explore. It is recommended that such beliefs are elicited from the study population through preliminary research (Ajzen, 2006; Francis et al., 2004). This study’s remote location and resource constraints prevented eliciting salient behavioral or normative beliefs from the study population (i.e., park visitors) prior to developing questionnaire items. However, a systematic approach was used to identify beliefs thought to be salient to visitors at the pools. In particular, an informal survey was conducted among NPS officials and research scientists familiar with the study area and management issues associated with the pools. Participants were asked to list positive and negative outcomes they perceived visitors might associate with exploring the pools. Responses from NPS officials and university scientists were compiled and circulated to park managers and researchers for peer review and prioritizing. The result of this process was the set of behavioral and normative belief items included in the survey instrument.

The study’s behavioral belief construct is a combination of behavioral belief strengths about and evaluations of potential outcomes from exploring the pools. Behavioral beliefs were measured as $\Sigma b e_i$, where $b$ represents behavioral belief strength and $e$ represents outcome evaluations (Francis et al., 2004). Questions designed to measure behavioral belief strength and outcome evaluations for nine potential outcomes were included in the survey. The nine potential outcomes address the visitor safety and health risks, resource and cultural impacts, and visitor experiences associated with exploring the pools. Danger outcomes from exploring include getting caught in a flash flood, contracting a rash, and falling and getting hurt on slippery rocks. Resource and cultural impact outcomes include harming native plants and animals, devaluing the area for traditional use by Native Hawaiians, and preventing others from enjoying the pools’ natural quiet and beauty. Experiential outcomes of exploring include having a true Hawaiian experience, having a fun adventure, and having a story to tell when back at home. Behavioral belief strength, $b$, is an assessment of the likelihood of potential outcomes of exploring the pools and is measured in the survey instrument on a scale of 1, not at all likely, to 7, extremely likely. Outcome evaluations, $e$, are assessments of the goodness or badness of potential outcomes of exploring the pools and were measured on a scale of 1, extremely bad, to 7, extremely good. For analysis, outcome evaluations were recoded to -3, extremely bad, to +3, extremely good (Ajzen, 2006). The composite behavioral belief score for each respondent was calculated as $(\Sigma b e_i)/9$, and ranges in value from -21 to +21. Positive values indicate favorable attitudes toward exploring the pools, while negative values indicate unfavorable attitudes toward exploring.

In this study, normative beliefs with respect to a pair of referent groups were considered: 1) NPS officials, and 2) subject’s traveling companions. Normative beliefs were measured as $\Sigma n m$, where $n$ is normative belief strength and $m$ is motivation to comply (Francis et al., 2004). Normative belief strength, $n$, is an evaluation of the referent group attitude toward the behavior. Respondents were asked in two questionnaire items if they believed that their traveling companions or NPS officials would approve or disapprove of their exploring the pools. Each question was measured in the survey instrument on a scale from 1, disapprove, to 7, approve. For analysis,
normative belief strength was recoded into a scale ranging from -3, disapprove, to +3, approve (Ajzen, 2006). Motivation to comply, \( m \), is the importance of referent group approval of one’s behavior. This was measured in the survey instrument by two questions asking visitors to evaluate if the approval of traveling companions or NPS officials was 1, not at all important, to 7, extremely important, when making the decision to explore. The normative belief composite measure was computed as \( \sum m \), and ranges in value from -21 to +21. Positive values represent a perception that the corresponding referent group would approve of one’s exploring the pools, while negative values represent a perception that the corresponding referent group would not approve of one’s exploration of the pools. Respondents traveling alone were excluded from normative belief measures with respect to traveling companions.

PBC is the level of control an individual believes they have over engaging in a specific behavior. PBC is understood to include self-efficacy and controllability components (Ajzen, 1991). Self-efficacy is one’s inherent ability to engage in a behavior (i.e., Are you able to perform the behavior?). Controllability is one’s volitional power or locus of control over a behavior (i.e., Are you permitted to engage in the behavior?). In this study, the survey instrument was used to measure self-efficacy as respondents’ perceived physical ease or difficulty of exploring the pools on a scale from 1, extremely difficult, to 7, extremely easy. Controllability was evaluated through two variables measuring visitor agreement with statements that visitors, and not NPS officials, should be responsible for deciding whether or not to explore and evaluating the danger of exploring on a scale ranging from 1, strongly agree, to 7, strongly disagree. For analysis, all PBC scores were reversed coded to a scale ranging from 1, strongly disagree, to 7, strongly agree. Reverse-coded responses to each of the three PBC questions were averaged to provide an overall PBC score ranging from 1 to 7. High PBC scores (5 to 7) represent strong perceptions of control over exploring the pools, and low values (1 to 3) represent a lack of perceived control with respect to exploring the pools.

In this study, behavioral intention was measured using two questions. In particular, visitors were asked to rate whether they intended to explore the pools on a scale ranging from 1, extremely unlikely, to 7, extremely likely, and whether they expected to explore the pools on a scale ranging from 1, strongly agree, to 7, strongly disagree (Francis et al., 2004). For analysis, responses to the expectation measure were reverse-coded to a scale ranging from 1, strongly disagree, to 7, strongly agree. Responses from the intention and expectation measures were averaged to form a behavioral intention composite score ranging from 1 to 7—high values (5 to 7) represent intentions to explore, while low values (1 to 3) represent behavioral intentions to not explore. For some analyses, a binary behavior intention variable was formed from the behavioral intention composite scores. Values of 4.5 through 7 were recoded to 1 and treated as indicating intention to explore. Values 1 through 3.5 were recoded 0 and treated as an intention to not explore. Records with behavioral intention composite scores of 4 (the neutral point on the scale) were excluded from the behavioral intention binary variable, as they cannot be classified as either intending or not intending to explore the pools.

**Sampling & Survey Administration**
The survey instrument was administered on 15 randomly selected days between May 23 and July 13, 2007 to visitors at the start of their hikes on the trail to the pools, in the Kipahulu area of Haleakalā National Park. Sampling was conducted between 9:00 a.m.
and 4:00 p.m. All visitors on the trail to the pools over the age of 18 were eligible for participation in the study. Respondents were recruited approximately 70 meters from the Kipahulu area parking lot as they walked toward the pools along the main trail, prior to viewing most signs and on-site information about exploring the pools. Visitors who agreed to participate were shown a poster depicting the pools and read a description of the area and definition of exploring the pools that stressed a distinction between viewing and exploring the pools (Figure 4). Viewing the pools was described as going no further than the rock landing at the base of the stairs into `Ohe`o Gulch to view the pools. In contrast, exploring the pools was described as leaving the rocks at the base of the stairs to wade or swim in the water, or walk or climb on the shores and cliffs surrounding the pools. The distinction between viewing and exploring the pools was designed to establish a common understanding among respondents of the concept of exploring the pools before asking them to complete the questionnaire.

After receiving the description of exploring the pools, respondents were randomly assigned to one of three respondent groups: 1) a control group that received no message about exploring the pools; 2) a “fear” treatment group that was asked to read the fear message before answering questions in the survey designed to measure TPB constructs; or 3) a “warm glow” treatment group that was asked to read the warm glow message before answering questions in the survey designed to measure TPB constructs.

Behavioral Observation
Unobtrusive observation of visitor behavior at the pools was conducted in tandem with the visitor survey on a subset of sampling days. The purpose of the unobtrusive observations was to assess whether survey respondents’ actual behavior was consistent with their stated
behavioral intentions, with respect to exploring the pools. Observations were conducted by researchers dressed in clothing similar to that worn by most visitors. Randomly selected survey respondents were unobtrusively followed to the pools area from the survey location. Upon crossing through the gate near the top of the stairs descending into the ‘Ohe’o Gulch, selected respondents were observed for a maximum of 10 minutes. If the observed visitor entered the “exploration zone” of the ‘Ohe’o Gulch (as depicted in Figure 4) within 10 minutes, they were designated as having explored the pools and the observation was concluded. If the observed visitor: 1) did not explore the pools within 10 minutes of having crossed through the gate at the top of the stairs; 2) did not cross through the gate within 25 minutes of having completed the questionnaire; or 3) left the pools area within 10 minutes or less without having explored the pools, the observation was concluded and the visitor was designated as having not explored the pools. Information characterizing the observed visitor’s group size, group composition, and clothing was also recorded to assist in matching observation and survey data. A binary variable was created for each observed respondent’s behavior, and assigned a value of 1 for explorers and a value of 0 for non-explorers. An additional variable, intention–behavior consistency, was created, and coded as 1 in cases where respondents’ observed behavior was consistent with stated behavioral intention, and 0 otherwise. The intention–behavior consistency variable was computed only for those survey respondents whose behavior was observed by the research team and had a behavioral intention composite score of 1 to 3.5 or 4.5 to 7. As with the binary behavior intention variable, the intention–behavior consistency variable was not computed for respondents with behavioral intention composite scores of 4 because this value represents the neutral point on the intention scale.

Data Analysis
Analyses of survey response and observation data were conducted to examine several hypotheses. The hypothesis tests were designed to assess the validity of the TPB model as a framework for understanding visitor behavior with respect to exploring the pools, and provide insight into the relative efficacy of the fear and warm glow messages in minimizing the number of visitors who choose to explore. Data analysis was conducted with SPSS 15.0 in a stepwise fashion, corresponding to the progression of hypothesized relationships within the TPB model as outlined here:

H1: In comparison to the control group respondents, respondents who receive either the fear or warm glow persuasive message will have less favorable behavioral beliefs, normative beliefs, and PBC with respect to exploring the pools. ANOVA with Tukey’s HSD post-hoc tests were used to evaluate Hypothesis 1.

H2: Visitors’ behavioral beliefs, normative beliefs, and PBC with respect to exploring are significant predictors of intention to explore the pools. Linear regression models were used to evaluate Hypothesis 2.

H3: Exposure to either the fear or warm glow persuasive message will reduce visitors’ intentions to explore the pools. This hypothesis was examined with two statistical tests, ANOVA and Chi-square, both of which used respondent group (i.e., control, fear treatment, or warm glow treatment) as the independent variable. Behavioral intention served as the dependent variable for the ANOVA test, while the binary version of behavioral intention was the dependent variable for the Chi-square test.
H4: Visitors’ stated behavioral intention with respect to exploring is a statistically significant predictor of actual exploring behavior. A Chi-square test was used to compare the intention-behavior consistency variable with stated behavioral intention.

H5: Exposure to either the fear or warm glow persuasive messages will reduce exploration behavior at the pools. A Chi-square test was used to compare observed behavior, by respondent group, to evaluate Hypothesis 5.

Results

Response Rates
Of the 1,635 individuals solicited to participate in the study, 997 (63.1%) agreed to do so. Usable surveys were obtained from 947 (95.3%) study participants, resulting in an effective response rate of 57.9%. Respondents were evenly distributed among respondent groups, with 315 (33.3%) in the control group, 316 (33.4%) in the fear treatment group, and 316 (33.4%) in the warm glow treatment group.

Visitor & Trip Characteristics
Most respondents (68.8%) spent two or more hours traveling to the Kipahulu area of Haleakalā National Park on the day of their visit. Men and women are equally represented in the study (49.7% and 50.3%, respectively). A substantial majority of visitors to the pools were residents of the United States (92.7%); completed some college or more formal education (92.6%); did not consider themselves to be Hispanic or Latino (94.1%); and identified themselves as White (81.8%). Very few (1.4%) visitors to the pools identified themselves as Native Hawaiian. Thirty-one percent of respondents are between the ages of 25 and 54. When planning their visits, a minority of respondents (7.1%) used information from the NPS, while a majority of respondents (81.2%) used information from previous experiences, word-of-mouth sources, tourist activity outlets, and tourism brochures and guidebooks.

A series of statistical tests was performed to assess whether respondent group sub-samples differed significantly with respect to visitor and/or trip characteristics. The purpose of the tests was to confirm that differences found among respondent groups with respect to the study’s hypothesis tests could not be attributed to differences in demographics and/or trip characteristics among the respondent groups. No significant differences were found among the three respondent groups with respect to commercial tour status ($\chi^2 = 1.840, p = 0.398$), previous vs. first-time visit ($\chi^2 = 4.495, p = 0.106$), time spent traveling to the park ($\chi^2 = 10.154, p = 0.254$), gender ($\chi^2 = 2.072, p = 0.355$), age ($\chi^2 = 9.746, p = 0.283$), and education ($\chi^2 = 4.143, p = 0.387$). These results support a high degree of confidence that differences among respondent groups with respect to results of the study’s hypothesis tests are not the result of sampling bias.

TPB Model Analysis
The hypothesized influence of treatment messages on first level TPB model constructs (H1) is supported for behavioral and normative beliefs, but not PBC (Table 2). In particular, the control group had behavioral and normative beliefs that were statistically more favorable toward exploring than either group who received a persuasive message discouraging exploration. However, no statistical difference in the mean composite
Table 2: Persuasive Message Treatment Effects on TPB Constructs

<table>
<thead>
<tr>
<th>Attitude Potential Outcome from Exploring the Pools</th>
<th>Control (n=269-308)</th>
<th>Fear (n=258-314)</th>
<th>Warm Glow (n=254-316)</th>
<th>ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Mean</td>
<td>Mean</td>
<td>F-value</td>
</tr>
<tr>
<td>Danger</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Getting caught in a flash flood</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>behavioral belief strength</td>
<td>b</td>
<td>2.5</td>
<td>2.4</td>
<td>2.5</td>
</tr>
<tr>
<td>out come evaluation</td>
<td>e</td>
<td>-2.2</td>
<td>-2.3</td>
<td>-2.3</td>
</tr>
<tr>
<td>Getting a rash</td>
<td>b</td>
<td>3.1</td>
<td>3.5</td>
<td>3.4</td>
</tr>
<tr>
<td></td>
<td>e</td>
<td>-1.7</td>
<td>-1.7</td>
<td>-1.7</td>
</tr>
<tr>
<td>Falling on rocks and getting hurt</td>
<td>b</td>
<td>3.6</td>
<td>3.5</td>
<td>3.8</td>
</tr>
<tr>
<td></td>
<td>e</td>
<td>-1.9</td>
<td>-1.8</td>
<td>-2.0</td>
</tr>
<tr>
<td>Resource</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harming native plants and animals</td>
<td>b</td>
<td>3.1</td>
<td>3.4</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>e</td>
<td>-1.9</td>
<td>-1.8</td>
<td>-1.9</td>
</tr>
<tr>
<td>Reducing the area’s value for native Hawaiians</td>
<td>b</td>
<td>3.2</td>
<td>3.5</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td>e</td>
<td>-1.7</td>
<td>-1.6</td>
<td>-1.7</td>
</tr>
<tr>
<td>Preventing others from experiencing the</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>natural beauty of the ‘Ohe’o Gulch</td>
<td>b</td>
<td>2.6</td>
<td>3.0</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td>e</td>
<td>-1.6</td>
<td>-1.2</td>
<td>-1.6</td>
</tr>
<tr>
<td>Experiential</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Having a true Hawaiian experience</td>
<td>b</td>
<td>5.2</td>
<td>4.7</td>
<td>4.3</td>
</tr>
<tr>
<td></td>
<td>e</td>
<td>1.9</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Having a fun adventure</td>
<td>b</td>
<td>5.9</td>
<td>5.4</td>
<td>5.3</td>
</tr>
<tr>
<td></td>
<td>e</td>
<td>2.1</td>
<td>1.7</td>
<td>1.5</td>
</tr>
<tr>
<td>Having a story to tell when I get home</td>
<td>b</td>
<td>5.6</td>
<td>5.2</td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td>e</td>
<td>1.7</td>
<td>1.1</td>
<td>1.1</td>
</tr>
<tr>
<td>Subjective Norm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traveling Companions</td>
<td>normative belief strength</td>
<td>n</td>
<td>2.4</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>motivation to comply</td>
<td>m</td>
<td>4.7</td>
<td>4.3</td>
</tr>
<tr>
<td>National Park Service Officials</td>
<td>n</td>
<td>2.0</td>
<td>0.4</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>m</td>
<td>5.6</td>
<td>4.8</td>
<td>5.1</td>
</tr>
<tr>
<td>Perceived Behavioral Control</td>
<td>My physical ability would make exploring difficult/easy for me</td>
<td>6.0</td>
<td>5.7</td>
<td>5.9</td>
</tr>
<tr>
<td></td>
<td>It is up to me, not NPS, to decide to explore…</td>
<td>5.9</td>
<td>3.9</td>
<td>4.3</td>
</tr>
<tr>
<td></td>
<td>It is up to each visitor, not NPS, to evaluate dangers of exploring…</td>
<td>3.8</td>
<td>3.7</td>
<td>4.1</td>
</tr>
<tr>
<td>Behavioral Intention</td>
<td>I intend to explore the pools</td>
<td>5.8</td>
<td>4.7</td>
<td>4.6</td>
</tr>
<tr>
<td></td>
<td>I expect to explore the pools</td>
<td>5.9</td>
<td>5.0</td>
<td>4.9</td>
</tr>
</tbody>
</table>

NOTE: Within each row, subscripts denote statistically different means (α = 0.05).

Table 3: Comparison of TPB Survey Items, by Respondent Group

<table>
<thead>
<tr>
<th>Respondent Group Means</th>
<th>ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control (n = 207)</td>
<td></td>
</tr>
<tr>
<td>Fear (n = 210)</td>
<td></td>
</tr>
<tr>
<td>Warm Glow (n = 203)</td>
<td></td>
</tr>
<tr>
<td>Behavioral Beliefs</td>
<td></td>
</tr>
<tr>
<td>Normative Beliefs</td>
<td></td>
</tr>
<tr>
<td>Traveling Companions</td>
<td></td>
</tr>
<tr>
<td>NPS Officials</td>
<td></td>
</tr>
<tr>
<td>Perceived Behavioral Control</td>
<td></td>
</tr>
<tr>
<td>F-value</td>
<td></td>
</tr>
<tr>
<td>p-value</td>
<td></td>
</tr>
<tr>
<td>557.05*</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>4,727.90*</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>26,057.29*</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

NOTE: Within each row, means with different subscripts are statistically different (α = 0.05).
scores for PBC was found among respondent groups. Behavioral belief scores are statistically different among all groups. Those in the control group had the most favorable, and indeed positive, behavioral beliefs toward exploring the pools. Negative behavioral belief scores were measured for both treated groups. The warm glow message, emphasizing the resource and experiential impacts of exploring the pools, resulted in less favorable behavioral beliefs than the fear message, which focused on dangers and safety issues associated with exploring. All respondent groups generally believed that their traveling companions would approve of them if they explored the pools. However, respondents who received persuasive messages discouraging exploration of the pools were less certain than control group respondents that their traveling companions would approve of them exploring. Differences between control and treatment groups, with respect to normative beliefs in reference to NPS officials, were more pronounced. In particular, control group respondents believed NPS officials would approve of them if they explored the pools, while treatment group respondents generally believed NPS officials would not approve of them exploring the pools. However, normative belief strength scores for the two treatment groups were near the center of the measurement scale, suggesting uncertainty among treatment group respondents about NPS officials’

Table 4: Regression Model Coefficients for Prediction of Behavioral Intention from TPB Constructs (Standard Errors in Parentheses)

<table>
<thead>
<tr>
<th></th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control</td>
</tr>
<tr>
<td>Constant</td>
<td>4.002***</td>
</tr>
<tr>
<td></td>
<td>(0.369)</td>
</tr>
<tr>
<td>Attitude</td>
<td>0.135*</td>
</tr>
<tr>
<td></td>
<td>(0.030)</td>
</tr>
<tr>
<td>Subjective Norm</td>
<td>0.237***</td>
</tr>
<tr>
<td>Traveling Companion</td>
<td>(0.012)</td>
</tr>
<tr>
<td>Subjective Norm</td>
<td>0.208**</td>
</tr>
<tr>
<td>NPS Officials</td>
<td>(0.010)</td>
</tr>
<tr>
<td>Perceived Behavioral</td>
<td>0.215**</td>
</tr>
<tr>
<td>Control</td>
<td>(0.070)</td>
</tr>
<tr>
<td>$r^2$</td>
<td>0.263</td>
</tr>
</tbody>
</table>

* 0.05 > p-value ≥ 0.01; ** 0.01 > p-value ≥ 0.001; *** p-value < 0.001

Table 5: Persuasive Message Treatment Effects on Intention to Explore and Actual Exploring

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Control</th>
<th>Fear and Warm Glow Groups Combined</th>
<th>$\chi^2$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intend to Explore</td>
<td>825</td>
<td>89.7%</td>
<td>68.8%</td>
<td>44.346</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Observed Exploring</td>
<td>134</td>
<td>59.1%</td>
<td>40.0%</td>
<td>4.332</td>
<td>0.037</td>
</tr>
</tbody>
</table>
approval of exploring (Table 3). There was no statistical difference between the two treatment groups with respect to subjective normative assessments for traveling companions or NPS officials.

Results of regression analyses to examine H2 suggest that, for all respondent groups, behavioral beliefs, normative beliefs, and PBC were significant, positively related predictors of behavioral intention (Table 4). That is, respondents with more favorable behavioral beliefs toward exploring, greater perceptions that traveling companions and NPS officials approve of their exploring, and stronger senses of personal control over exploring were more likely to state intentions to explore the pools. More of the variation in behavioral intention was explained for groups that received a persuasive message than for the control group. Within each regression model, traveling companion normative beliefs were the strongest predictor of behavioral intention.

Respondents who were exposed to either the fear or warm glow treatment messages were significantly less likely than control group respondents to report an intention to explore, thus supporting H3 (Table 5). However, there is no statistical or substantive difference between the behavioral intentions of either treated message group using Tukey’s post hoc test (Means: control = 5.895, fear = 4.854, warm glow = 4.739; F = 36.847, p < 0.001). The fourth hypothesis (H4) posited behavioral intention as a predictor of actual behavior. Relatively low numbers of behavioral observations prevent tests of this hypothesis from being conducted by respondent group. Of all survey respondents who were observed by the research team, close to two-thirds (60.3%) behaved in a manner consistent with their behavioral intention, as stated in their responses to the survey questions. Respondents who indicated in the survey that they did not intend to explore the pools acted more consistently than those who intended to explore—87.0% of “non-intenders” acted consistently, while 53.8% of “intenders” acted consistently by actually exploring the pools during the observation period. The hypothesized effect of treatment message on actual behavior (H5) was supported by the higher proportion of control group respondents observed exploring the pools (59.1%), compared to the proportion of treatment group respondents who were observed exploring (40.0%; Table 5).

Discussion
Visitor education and information are generally preferred tools for managing visitor use in national parks, however, their acceptability to managers and visitors alike depend on their effectiveness at protecting park resources and visitors’ experiences. This study illustrates the use of TPB as a tool to assess and improve the efficacy of visitor education and information through an empirical understanding of visitor behavior and its cognitive precursors, and the influence of persuasive messages on them. The results of the study have implications for the validity of TPB as a model of human behavior and the efficacy of visitor education and information as tools to manage visitor use at the pools in Haleakalā National Park and other similar protected natural areas contexts.

TPB proves to be a useful model for understanding visitor behavior at the pools and for evaluating the efficacy of persuasive messages designed to discourage visitors from exploring the pools. In general, hypothesized relationships among constructs within the TPB model were supported: behavioral beliefs, normative beliefs, and PBC shape behavioral intention; behavioral intention predicts behavior; behavior and the cognitive factors that shape behavior were influenced with persuasive messages. More
specifically, the study results suggest that visitors’ normative beliefs with respect to traveling companions were the strongest predictor of intention to explore the pools, across control and treatment respondent groups. The results also suggest visitors’ behavioral beliefs regarding exploration of the pools were a markedly more robust predictor of behavioral intention among warm glow treatment group respondents than either the fear treatment or control respondent groups. These findings are somewhat in conflict with the findings of other studies using TPB to understand outdoor recreation and wildland behaviors. Studies of participation in hunting, outdoor leisure activities, and adoption of wild fire mitigation strategies by wildland-urban interface homeowners have concluded that PBC and attitudes are the greatest predictors of behavioral intentions, and that normative assessments are of lesser importance (Ajzen & Driver, 1992; Burtz & Bright, 2006; Hrubes et al., 2001; Martin & McCurdy, 2009). It may be that the use of specific referent groups in this study to elicit normative beliefs increased the relevance of this cognitive factor in shaping behavioral intention. Additionally, and excepting the finding of Martin and McCurdy (2009), other TPB studies referenced examined behavioral intentions for activities occurring in and around the communities where respondents live. Most visitors to the pools were there as part of vacations and were a long distance from home (Lawson et al., 2007). Visitors may use a different balance of cognitive assessments when making decisions regarding their behavior while on vacation in distant places than they do within their communities. Although the relative contribution of TPB constructs found in this study differs somewhat from applications of TPB to presumably similar contexts, the study model’s power to predict variation in behavioral intention (26.3% control, 57.5% fear, 55.3% warm glow) compares favorably with the findings of a meta-analytic review of 185 TPB studies published before 1997 (mean = 39%; Armitage & Conner, 2001). Using Cohen’s guidelines for calculating effects sizes, the predictions of behavioral intention found in this study can be interpreted as being of large effect size (Cohen, 1992).

The results of this study point to the cognitive factors that influence the behaviors of two populations of park visitors: 1) current visitors to the park, whose decisions about whether or not to explore the pools were based solely on the information they gathered prior to arriving onsite (i.e., control group respondents); and 2) potential future visitors, represented by the fear and warm glow treatment groups, whose pre-trip planning information is supplemented with onsite information they receive from the NPS designed to discourage exploration of the pools. Results of this study suggest that current visitors, as represented by the control group respondents, arrive at the park with the impression that exploring the pools is a desirable and sanctioned way to experience the Kipahulu area of the park. They have favorable behavioral beliefs about exploring, believe that both the NPS and their traveling companions support exploring, believe that it is within their power and ability to explore, and generally intend to explore the pools during their visit. Upon arriving at the pools, most visitors who received no message discouraging exploration did indeed explore. When making the decision to explore with only currently available off-site information, results of regression analysis suggest visitors relied equally on perceptions of behavioral control and normative beliefs with respect to traveling companions and the NPS, all of which were judged to support decisions to explore. Context to help explain these findings is provided by the results of a separate survey conducted in the Kipahulu area of the park in tandem with this study’s survey. Results of the companion study suggest that the vast majority of current visitors
planned their visit to the park based on information they obtained through guidebooks, word of mouth, and tourism brochures (Lawson et al., 2007). These information sources emphasize the appeal of exploring the pools as a primary reason for visiting the Kipahulu area of the park, and they do not discuss the NPS’s efforts to discourage visitors from exploring the pools or the reasons why they have adopted such a policy.

Visitors exposed to either treatment message had less favorable behavioral beliefs about exploring the pools than control group respondents. This finding suggests that the persuasive messages modified visitors’ rational assessments of the personal and social costs and benefits of exploring the pools. Additionally, treatment group respondents, who were specifically informed that the NPS discourages exploring the pools, were less likely than control group respondents to believe the NPS would approve of them exploring. Consequently, treatment group respondents were less likely to express an intention to explore and actually explored less than control group respondents. In this general sense, the results of the study suggest that visitor education and information can be an effective approach for reducing the number of visitors who choose to explore the pools. However, like the control group, treatment group respondents believed that their traveling companions would support a decision to explore and that exploring was within their power. Furthermore, although treatment group respondents’ cognitive assessments were generally less favorable toward exploring than those of the control group, more than two-thirds (68.8%) indicated that they intended to explore the pools (though less than half—40.0%—actually did). These results suggest that even with exposure to persuasive messages like those used in this study, a substantial proportion of visitors will choose to explore the pools. This may be due, in part, to visitors’ reliance on normative assessments with respect to traveling companions when deciding to explore, as illustrated by results from this study’s regression analyses. For both treatment groups, visitors’ traveling companions were judged to support exploring and these judgments contributed greatest to prediction of behavioral intention. The perception that traveling companions support exploring was perhaps an artifact of the generally pro-exploring information visitors used to plan their trips and form expectations of their visit.

Differences in the cognitive precursors of behavior, and in exploration behavior itself, are observed between control group respondents and those who received a treatment message. These differences support the use of visitor education and information as at least part of the strategy for dissuading visitors from exploring the pools. Study findings also provide a basis for evaluating the relative effectiveness of an education approach aimed at public health and visitor safety considerations, versus an approach focused on resource stewardship and protecting the quality of visitors’ experiences. Results of the study’s hypothesis testing suggest that the warm glow message may be more effective than the fear appeal at discouraging exploration of the pools. Visitors’ rational assessments, as measured in this study by behavioral beliefs, were influenced to a greater degree by the warm glow appeal than by the fear appeal. This is reflected in the differences between treatment and control group behavioral belief measures for each potential outcome assessed (Table 3). The mean scores for the three potential outcomes specifically addressed by the warm glow message (i.e., harming native plants and animals, reducing the area’s value for native Hawaiians, and preventing others from experiencing the natural beauty of the ‘Ohe’o Gulch) were all significantly lower for the warm glow treatment group than the control and fear groups. That is, visitors who received the warm glow treatment message internalized the resource,
experiential, and cultural impacts emphasized and consequently believed more strongly than the other respondent groups that their exploring would cause such impacts. A similar effect was not seen for the fear message, which was designed to emphasize the public health and visitor safety risks associated with exploring the pools. Within the fear treatment group results, only one mean score of the three behavioral beliefs for potential outcomes specifically addressed by the fear message was lower than that of the control group. The fear message did not prompt overall change in most of the behavioral beliefs it was designed to influence. These findings suggest that visitors’ attitudes regarding exploration of the pools are more effectively influenced by appealing to a sense of resource stewardship and social responsibility than to fears about the potential dangers of exploring the pools. Further, the results of this study suggest that warm glow treatment group respondents’ behavioral intentions were shaped to a larger degree than those of either of the other two respondent groups by their attitudes about exploring the pools. These findings are particularly noteworthy, given that virtually all of the onsite information provided by the NPS to visitors concerning the pools is designed to emphasize the public health and visitor safety risks associated with exploring the pools. The results of this study suggest that re-focusing onsite information provided to visitors to emphasize themes contained in the warm glow message may allow the NPS to more effectively exploit the central persuasion route to capitalize on lasting and fundamental behavior change at the pools.

The warm glow message’s greater influence than the fear message in reducing impactful visitor behavior at the pools is consistent with conclusions from a study in Acadia National Park in which visitors remained on trails for reasons of social altruism and justice associated with higher levels of moral development (Park et al., 2008). The warm glow message was written to stimulate just such cognitive processing. This study’s findings also align with those of anti-littering and other pro-environmental behavior reviewed and investigated by Ham et al. (2008). However, fear messages appealing to more individualistic motivations that can be classified within lower orders of moral development have been found to be more effective at reducing wildlife feeding in recreation settings (Hockett & Hall, 2007). Thus, the results from this and similar studies are mixed with respect to the relative efficacy of persuasive messages appealing to higher or lower orders of moral development, suggesting that message efficacy is context-sensitive. The results of this study provide an empirical basis to support an approach that targets higher orders of moral development in the case of exploring the pools in Haleakalā National Park.

Results of this study with respect to visitors’ normative assessments of NPS officials add further insight into how visitors’ decisions to explore can be more effectively influenced through improved message design. The control group’s normative belief strength with respect to NPS officials suggests that current visitors to the pools generally believe the NPS approves of them exploring the pools. This is presumed to be a result of the prevalence of pro-exploration information contained in guidebooks and tourism brochures used by visitors to plan their trips. When treatment group respondents, after having established pro-exploration expectations for the pools, are exposed to messages explicitly stating that the NPS discourages exploring, they are uncertain whether or not the NPS approves of visitors exploring the pools. Evidence of this confusion is found in mean normative belief strength scores for treatment group respondents near the neutral point of the measurement scale. Comparison of the
treatment groups’ near neutral normative belief scores to their relatively high motivation to comply scores, suggests that the uncertainty induced by expectation-message conflict constitutes a missed opportunity to use informational messages that leverage visitors’ desire to comply. These findings are significant in light of the fact that none of the onsite signage at the time of the study explicitly stated that the NPS discourages visitors from exploring the pools. Our study suggests that using messages that explicitly state the NPS discourages exploring the pools would be a relatively easy and effective improvement to current efforts. These results also suggest that it is important for the NPS to contribute, to the extent possible, to the design and content of messages contained in the primary information sources visitors use to plan their trips prior to arriving at the park. This, coupled with increased efforts to direct visitors to the park’s official media for trip planning, is a key element of a strategy to inform visitors’ expectations and begin to shape their behavior in advance of their arrival onsite.

Efforts to improve visitor education and information about exploring the pools, as described here, should be implemented within the framework of adaptive management. That is, changes to the NPS’s visitor education and information strategies should be accompanied with monitoring to assess the extent to which such changes are effective at reducing the actual number of visitors who explore the pools and the associated resource, cultural, and experiential impacts of concern. If monitoring results suggest continued problems, this would imply the need to supplement or replace visitor education and information with more direct forms of management. Such efforts might include requiring visitors to venture no further than the rock landing at the base of the stairs into ‘Ohe’o Gulch, or closing the stairs into the gulch and only allowing visitors to view the pools from the trail above the gulch. These more direct management approaches are likely to be less popular with visitors than the current use of visitor education, require costly changes to park infrastructure, and depend on the presence of park staff to enforce closure of the pools. Thus, it would be advisable to adopt such strategies only if improvements to visitor education and information like those described above fail to produce the results required to adequately protect park resources and the quality of visitors’ experiences. Further, if more direct management strategies are ultimately adopted, it is recommended that they be coupled with increased information, both onsite and in information sources used by visitors to plan their trips, about other recreation opportunities in the Kipahulu area of Haleakalā National Park.

While the results of this study provide an empirical basis for supporting visitor education and information strategies to manage exploration of the pools, the study has limitations that should be noted. Research on persuasive communications to manage visitor impacts in parks suggests the effectiveness of such visitor information may be further enhanced, beyond that of the messages tested in this study, by fully incorporating principles of attribution and prescription (Bradford & McIntyre, 2007; Winter et al., 2000). Messages tested in this study included an explicit statement discouraging exploring and describing the undesirable consequences of that behavior. Their content, particularly the absence of language personally attributing those consequences to individual visitors and description of alternative desired behaviors, can be seen as a limitation to their effectiveness. Future tests of persuasive messaging for management of park visitors should more fully integrate attribution and prescription in message design.

Another potential limitation of this study arises from the fact that survey
administrators did not systematically control whether or not traveling companions accompanied respondents while they were participating in the study or whether or not the companions were exposed to the treatment messages. Thus, normative assessments made by respondents in the company of normative referents (i.e., their traveling companions) may be systematically different than those made by respondents whose traveling companions were not with them when they were exposed to treatment messages and/or completed the questionnaire. While these unaccounted for interactions may influence normative assessments and behavioral decision-making, normative beliefs with respect to traveling companions have consistent and powerful positive influence on exploration. Further, the circumstantial, rather than systematic manner in which traveling companions did or did not accompany respondents during treatment message and survey administration is arguably similar to the manner in which visitors do or do not read onsite signage in the company of their traveling companions.

In addition to the above limitations, the potential influence of existing on-site signage on visitor perceptions and behaviors should be discussed. Prior to completing this study’s questionnaire, visitors had the opportunity to encounter only a limited amount of signage presenting either danger or resource protection messages focused on exploring the pools. Thus, the potential for onsite signage to have influenced TPB construct measurement is limited. However, following survey completion but before arriving at the pools, respondents did have the opportunity to encounter many signs communicating information about exploring the pools. This information was exclusively danger related with no discussion of potential resource impacts from exploring. While this signage may have influenced respondents, it would have only affected measurement of observed behavior. This potential influence can not be tested with data from the current study. Although the influence of onsite signage on observed behavior can not be tested here, the statistically significant and substantial differences between rates of exploration for the control and the combined message treated groups indicates that the treatment messages did indeed reduce exploration behavior at the pools.

**Conclusion**

In summary, results of this study suggest TPB provides a valid model of visitor behavior at the pools and a useful framework for assessing the efficacy of persuasive messages designed to influence visitors’ choices about whether or not to explore the pools. Further, the study findings support several recommendations regarding the NPS’ use of visitor education and information to dissuade visitors from exploring the pools. In particular, the results of this study suggest the NPS should re-focus information delivered to visitors through onsite signage and park staff to emphasize themes associated with the warm glow message. That is, the information provided to visitors onsite at the time of the study emphasizing the public health and visitor safety risks of exploring the pools should be supplemented, if not largely replaced, with messages that emphasize the resource, cultural, and experiential consequences of visitors exploring the pools. Further, communication with visitors about the pools should be designed to explicitly inform them that exploring the pools is discouraged by the NPS.
References


IN SHORT
From Interpretation to Protection: Is There a Theoretical Basis?

Sam H. Ham
Department of Conservation Social Sciences
University of Idaho, USA
sham@uidaho.edu
208-885-7911

Keywords
Tilden, beliefs, attitudes, behavior, elaboration likelihood model of persuasion (ELM), theory of planned behavior (TPB)

Abstract
Perhaps the most oft-cited phrase in all the interpretation literature is a sentence written by an anonymous U.S. National Park Service ranger in an obscure administrative manual a half century ago:

Through interpretation, understanding; through understanding, appreciation; through appreciation, protection.

When Freeman Tilden quoted the manual in Interpreting Our Heritage, little did he know that those few words would evolve into a philosophical orientation around which interpreters all across the globe would soon rally. In this article, Tilden’s claim is reexamined in light of contemporary cognitive and social psychology. Does the chain of events Tilden describes really stand up, or is it just a nice, warm, and fuzzy phrase? Is there a substantiated theoretical basis for claiming that “interpretation” can create a kind of “understanding” that would indeed lead people to “protect” the places they visit? According to the weight of evidence from cognitive science, the answer is yes.
Perhaps the most oft-cited phrase in all the interpretation literature is a nine-word sentence written by an anonymous U.S. National Park Service ranger in an obscure administrative manual a half century ago:

Through interpretation, understanding; through understanding, appreciation; through appreciation, protection.

When Freeman Tilden (1957: 38) quoted the manual in *Interpreting Our Heritage*, he said he hoped interpreters everywhere would remember and recite the philosophy frequently:

...almost like a canticle of praise to the Great River of all we have, for in the realest sense it is a suggestion of which must always be the finest end product of our preserved natural and man-made treasures. (p. 38)

Were Tilden alive today, however, even he might be struck by the reach of his own impact. A half century later, those nine words have evolved into a philosophical orientation around which interpreters all across the globe have rallied.

But does the chain of events Tilden describes really stand up, or are his words just a nice, warm, and fuzzy phrase? Is there a substantiated theoretical basis for claiming that “interpretation” can create a kind of “understanding” that would indeed lead people to “protect” the places they visit? I think the weight of the evidence says yes.

If we see interpretation as a communication process, we’re able to draw on recent advances in cognitive and behavioral psychology to examine the cause-and-effect-relationships he (and the anonymous ranger) claimed would occur when interpretation is done well. In fact, in just the past 30 years, hundreds of published studies have looked at these very relationships. The two main theoretical foundations that have guided these studies are the elaboration likelihood model of persuasion (ELM) and the theory of planned behavior (TPB). When we re-examine Tilden’s hypotheses in light of these theories, a plausible conclusion is that the man was even more brilliant than we earlier realized. The ideas contained in his famous quotation turn out to be not only defensible according to many studies, but because he promoted this view of “protection through interpretation” nearly 20 years before either the ELM or TPB were known to cognitive scientists, his insights into the communication process seem all the more impressive.

In this article, I separately consider the three logical assertions contained in Tilden’s quotation and attempt to analyze each in terms of its consistency with the research record. Respectively, the three assertions are that “interpretation can lead to understanding,” that “understanding can lead to appreciation,” and that “appreciation can lead to protection.”

**Through Interpretation, Understanding**

In the fifth chapter of *Interpreting Our Heritage* (1957), Tilden was emphatic that we mustn’t see interpretation as some sort of “instructional” or “teaching” exercise in the academic sense. Borrowing from Ralph Waldo Emerson, he gave us a now famous dichotomy, “not instruction, but provocation,” as a basic framework to show what interpretation should and should not try to achieve:
It is true that the visitors...frequently desire straight information, which may be called instruction and a good interpreter will always be able to teach when called upon. But the purpose of Interpretation is to stimulate the reader or hearer toward a desire to widen his horizon of interests and knowledge, and to gain an understanding of the greater truths that lie behind any statements of fact...to search out meanings for himself. (p. 32–33, 36)

In this way, Tilden was telling us that the main thing interpretation should aim to accomplish is provoking visitors to think for themselves, and in doing so, to find their own personal meanings and connections. Furthermore, he cautioned against seeing interpretation as serving some sort of academic teaching function. Readers familiar with Tilden's philosophy will know that his formula for “success” hinged on two “Rs,” relevance and revelation. The best (most successful) interpretation, as he envisioned it, would connect to what people care most about (themselves and their own experience in life) and it would be presented in such a way that the thing being interpreted would “reveal” its inner meanings (or “greater truths”) to the people—that is, they, themselves, would find their own personal meanings in the thing.

Tilden’s idea that interpretation’s success would be based on the meanings that visitors themselves make, as opposed to the knowledge interpreters want them to acquire, was a “constructivist” approach to thinking about interpretation. Although the term wasn’t used much in park management in those days, Tilden was thinking like a constructivist when he wrote “not instruction, but provocation.” Today, however, it is common for analysts of interpretation to invoke constructivist thinking. Examples can be found in Ballantyne and Hughes (2006), Brody, Tomkiewicz, and Graves (2002), Falk and Dierking (2000), Falk and Storksdieck (2005), Goldman, Chen, and Larsen (2001), Ham (2007), Larsen (2003), Leinhardt and Knutson (2004), Markwell (2004), and Silverman and Masberg (2001).

Thus, in Tilden’s view, interpreters shouldn’t be trying to teach anything to anybody in the instructional sense, but rather attempting to provoke them to deep thought. In psychology, effortful thought is called elaboration. The process of thinking about something produces a person’s subjective understanding of it. That is, when we think deeply about a thing, we make our own meanings about it, and these meanings constitute our understanding of it. Therefore, the more interpretation provokes people to think about something, the more they understand the thing in their own way. Tilden referred to these as “personal truths.”

Research on the ELM has indeed demonstrated that the more communication provokes us to think, the more we create personal meanings about the subject (Petty & Cacioppo, 1986). Studies also show that the more personally relevant a presentation is to its audience, the more likely those people are to attend to and elaborate on the information being presented (Petty & Cacioppo, 1979; Petty, Cacioppo, & Goldman, 1981). That is, relevant messages provoke thinking, which in turn leads to the formation of subjective meaning, or personal understanding.

It is important to recognize, however, that “understanding” is not necessarily the same as “knowledge” that one might be expected to master and later recall (on a test or exam of some kind). In fact, one study (Cacioppo & Petty, 1989) found that the more strongly relevant a message was to an audience, the less likely they were to do well on a test of the facts they were actually presented. Cacioppo and Petty found that although a
highly relevant message led to greater attitude impacts, people exposed to that message could recall significantly less about the content of the message than could people who were exposed to a less-relevant message. A conclusion from this finding is that the people who were exposed to the more personally relevant message were provoked to think more about what the message meant to them, rather than about what the message itself, actually was. This conclusion is corroborated by other ELM studies showing that even when a message is highly relevant to an audience, it does not necessarily lead to greater memory of actual message content (Cacioppo, Petty, & Morris, 1983; Petty & Cacioppo, 1979; Petty, Cacioppo, & Goldman, 1981; Petty, Cacioppo, & Heesacker, 1981; Petty, Cacioppo, & Schumann, 1983). It is also consistent with interpretive research by Tarlton and Ward (2006) and Bucy (2005), who found that connection-making caused by an interpretive encounter can be high even when audience memory of the program’s content is modest. Cacioppo and Petty (1989) explained it this way:

This is not to suggest that memory is unimportant, but rather that comprehension, associations, elaborations, and inferences are more important than verbatim memory of the arguments. (p. 10)

In this sense, understanding is a more personal set of “facts” (what Petty, Cacioppo, & Goldman (1981) have called a “self-schema”) that wouldn’t necessarily be included in a factual-recall evaluation. It is apparent from Tilden’s advice on provocation versus instruction that he already knew this, even though it was inconsistent with prevailing communication theory during his time.

Our understanding about something is simply what we think about it; it is composed of a set of beliefs we have about the thing that psychologists call a “schema.” To be sure, our beliefs about something may not be entirely accurate, and other people might disagree with them, but they are, for all intents and purposes, our understanding of it. So when interpretation provokes a person to think, it causes an elaboration process that creates or otherwise impacts understanding, generating a sort of internal conversation in the person’s mind that, in turn, produces new beliefs or causes existing beliefs either to be reinforced or changed. Since what we believe about something constitutes our understanding of it, Tilden indeed seemed to be on the right track by claiming that interpretation, done well, can lead to personal understanding.

**Through Understanding, Appreciation**

But how might understanding lead to appreciation? Enter here the TPB that has led to literally hundreds of studies showing that people’s beliefs about something give rise to their attitude about it (Ajzen & Fishbein, 2005). Attitudes are not the same as beliefs. Whereas a belief describes what “is,” an attitude describes a person’s evaluation of the thing, whether it’s good or bad, right or wrong, positive or negative. Sentiments such as liking, loving, caring, and appreciating are attitudinal. When Tilden says that our understanding of something can lead to an appreciation of it, he’s saying that our beliefs about a thing give rise to attitudes about it that are consistent with the beliefs. This is well established in psychological research, provided that we’re clear on the thing the beliefs and attitude refer to.

The last sentence above is important because a concept like “appreciation” is vague until the object of appreciation is specified. In other words, what is it that is being
appreciated? For understanding to lead to appreciation—that is, for beliefs to lead to attitudes—the beliefs and attitude must focus on the same thing. If we wish visitors to appreciate a place, then it will be their understanding of the place that will determine their attitude about that place; if we want them to appreciate a concept like “biodiversity,” then it will be their beliefs about biodiversity that will determine their attitudes about it. This need to match beliefs and attitudes to their object (the place, the concept, etc.) is called in psychology the principle of compatibility (or symmetry). The evidence supporting this principle is so strong that it is now being discussed as a law of human psychology (Ajzen, 2005). To strongly influence an attitude about something (an attitude object), a communicator must first influence the beliefs a person holds about that same thing. Tilden rightly saw a far-reaching range of potential attitude objects:

…a national park, a prehistoric ruin, an historic battlefield, or a precious monument of our wise and historic ancestors. (p. 37)

What he was saying, and which is supported by many studies conducted in just the past two decades, is that if an interpreter provokes an audience to think and make personal meanings about any one of these things, then a positive evaluation of that thing is likely, provided that the meanings made are positive ones (Ajzen & Fishbein, 2005; Fishbein & Ajzen, 1975; Chaiken, 1980; Holbrook, Berent, Krosnick, Visser, & Boninger, 2005; Petty, Haugtvedt, & Smith, 1995; Petty, Rucker, Bizer, & Cacioppo, 2004). If we take “appreciation” to mean a generally positive evaluation of something, then we can conclude from these studies that understanding can indeed lead to appreciation.

Through Appreciation, Protection

When Tilden described the link between appreciation and “protection,” he was saying that having an appreciative attitude about something would lead to certain behaviors. For the most part, he was referring to deterring vandalism and careless actions such as throwing lit cigarettes into dry vegetation:

He that understands will not willfully deface, for when he truly understands, he knows that it is in some degree a part of himself…. If you vandalize a beautiful thing, you vandalize yourself. And this is what true interpretation can inject into the consciousness. (p. 38)

“Appreciation” to Tilden was a special type of attitude, a general one of the kind a parent feels for a child. He reasoned simply that people would not knowingly harm the things they care about. Since he was referring to a general case, he couldn’t possibly anticipate every conceivable action a person might or might not carry out. But the point he was trying to make was that if a person is provoked to deep thought about a thing then that person will make a lot of personal meanings with respect to it. Meaningful things matter to us, and given the opportunity to act one way or another with respect to a meaningful thing, we will normally choose to behave in a respectful or protective way. Both common sense and research back up this claim.

Today, however, interpreters are often interested in using interpretation as a management tool aimed at deterring or eliminating specific visitor behaviors in fragile settings. My own research over the past 10 years has dealt with problems of proper food
storage by campers in bear country (Lackey & Ham, 2004), reducing wildlife feeding and persuading national park visitors to carry out litter left by other visitors (Ham, Weiler, Hughes, Brown, Curtis, & Poll, 2008), keeping dogs on leashes in protected areas (Hughes, Ham, & Brown, in press), and convincing tourists to donate to local conservation funds (Ham, 2004; Powell & Ham, 2008). The behavior of interest in each of these cases was very specific and different from the rest, and the word “protection” in Tilden’s philosophical statement doesn’t capture the specificity of each of these behaviors or the differences between them.

A consistent finding in studies on human behavior modification is that in order to be successful in influencing people to behave consistently in a given way, we must succeed in influencing those people’s beliefs about that specific behavior (Ajzen, 2005; Ajzen & Fishbein, 2005; Fishbein & Manfredo, 1992; Fishbein & Yzer, 2003). If their beliefs about engaging in the behavior are predominantly positive, it will lead them to have a positive (appreciative) attitude about the behavior, which in turn increases the likelihood that they will behave as we want.

Studies, however, do not back up the idea that a general attitude about a thing will lead to specific behaviors with respect to the thing (Ajzen, 2005; Ajzen & Fishbein, 2005; Bamberg, 2003; Fazio, 1986; Fishbein & Ajzen, 1974; Weigel, 1983; Weigel & Newman, 1976). Rather they show that other factors influence our attitudes about a specific behavior that might have little to do with our general attitude. This explains why all environmentalists don’t recycle at home, and not all of them donate money to every cause or join every conservation organization. Those behaviors (recycling at home, donating, and joining) are subject to beliefs, not just about nature and the environment, but about the specific behavior in question. This is the above-cited “principle of compatibility” at work again. According to many TPB studies, to influence a behavior we would do well to start by influencing people’s beliefs about that specific behavior.

But the principle of compatibility does not in any way refute Tilden’s logic that “appreciation” leads to “protection.” Indeed, if we think of “appreciation” as having a positive attitude about something, and if that something is a behavior, then the attitude-behavior link holds up well according to dozens of studies conducted in the past 30 years or so (Ajzen & Fishbein, 2005). Therefore, interpretation that provokes the formation of positive beliefs about the outcomes of a given behavior will result in a positive attitude about that behavior. When this occurs, the likelihood that a visitor will engage in the desired behavior (if presented the opportunity) is significantly enhanced. In other words, through appreciation, protection.

**Conclusion**

While it may not surprise some to hear that Tilden actually knew what he was talking about, we must remember that the chain of events he described was based on an intuitive understanding of communication that was not supported or advocated by cognitive science during his time. His constructivist idea that meanings were personal conclusions generated in the visitor’s mind (rather than being put there by the fact-bearing interpreter) was nothing short of radical thinking in the 1950s when a more didactic view of communication was prevalent (Ajzen, 1992). Yet Tilden apparently already understood that the only caring any of us is capable of doing will be that which is based on the meanings we, ourselves, make. Interpretation that provokes visitors to think in positive ways about a thing can make that thing matter to them. When things matter to us, we are
likely to act in their behalf if confronted with the opportunity to do so. Although today this makes plain sense to most interpreters, Tilden’s understanding of this process, and his articulation of it in those nine words 50 years ago, suggest that he (and perhaps the anonymous ranger) were even brighter than some of us might have thought.

References


Silverman, L., & Masberg, B. (2001). Through their eyes: The meaning of heritage site experiences to visitors who are blind or visually impaired. *Journal of Interpretation Research, 6*(1), 31–47.


Adult Participants’ Preferences for Interpretation at a Japanese Nature Park

Naoko Yamada
Association for Interpretation Japan
2-1-22 Nishikicho Tachikawa
Tokyo, 190-0022 Japan
katura3@hotmail.com

Doug H. Knapp
Indiana University
HPER 133, 1025 East Seventh Street
Bloomington, Indiana 47405-7109
812-855-3094
Fax: 812-855-3998
dknapp@indiana.edu

Introduction
One of the important issues that interpreters should consider when designing a program is audiences’ background, such as demographic characteristics, motivations, interests, needs, and experiences (Gross & Zimmerman, 2002; Knudson, Cable, & Beck, 1995). Without proper knowledge of the audience, it is difficult to develop programs that will reach them in a meaningful way (Beck & Cable, 1998). When designing programs, it must be remembered that interpretation serves non-captive audiences (Ham, 1992). Non-captive audiences typically participate in free-choice learning, which is self-directed, voluntary, and guided by an individual’s needs and interests (Falk & Dierking, 2000). Many of these participants are adults who, in general, are intrinsically motivated to learn (Knowles, 1989) and want to control their education as self-directed learners (Brockett & Hiemstra, 1991). Some adult learning theories suggest that adults need social interaction so that they can see things from different perspectives, construct knowledge, and acquire knowledge (Mezirow, 1991, 2000; Tweedell, 2000). Interactions with group members and mediators are also important for free-choice learners because they create meanings of what they see or experience through their interactions (Falk & Dierking, 2000).

Interpretation that matches the participants’ interests connects them to stories
more completely (Brochu & Merriman, 2002). Interpretation that encourages adults to interact with others may stimulate their learning. To accomplish this task, participants’ preferences for interpretation and manners of interactions need to be considered. To date, little information has been provided on adult interpretive participants in terms of their needs and preferences. The present study attempted to understand the preferences of adult participants in a Japanese nature park to obtain baseline information that will help design adult-involvement programs.

**Study Focus**
This descriptive study was guided by two major research questions: (1) How varied are adult participants’ preferences in subjects on an interpretive program? and (2) How do adult participants want to interact with group members and interpreters during an interpretive program?

**Methods**
This study was conducted at Okutama-Kohan Park in Japan. The park was set aside in Tokyo as a prefectural (state) nature park. Approximately 20,000 people visit the park annually. The park is typical among Japanese nature parks in terms of interpretation and offers a range of interpretive programs and services.

Prior to conducting the survey, interviews with 30 adult participants and observations of 10 programs were carried out to assist in developing the questionnaire. The questionnaire was reviewed by two university researchers and by six park interpreters to verify content validity and determine the appropriate vocabulary for the visitor survey. The instrument was also pre-tested with program participants five times, asking them about ambiguity of instructions or wordings. Changes were made according to their feedback. The questionnaire consisted of six rating scale items, eight closed-ended, multiple-choice questions, and some demographic information.

The questionnaire was hand-delivered to adult participants in all interpreter-led programs in the park between September and November 2006. The sampling took place over 10 consecutive weekends and holidays on which the park had high visitation and therefore could offer programs. Every adult participant (18 years and older) in the interpreter-led programs was approached (n = 559). Overall, 535 individuals agreed, and 492 completed questionnaires were personally collected by the researcher (92% return rate).

Some limitations exist in this study. Visitors in the park may not be representative of those at other nature parks in Japan. The data reflects visitor responses during the study period and may not represent visitors in the park during other times.

**Results**
Participants were asked to indicate which type of program they preferred. The largest number of the respondents indicated that they liked viewing the exhibits accompanied by an interpreter (80%). Participating in craft projects with an interpreter was next (43%), followed by interpretive talks (27%), slideshows (25%), guided walks (23%), and visitor center exhibits without an interpreter (22%).

Next, participants were asked about their preferred topics, timing, and length of programs. Nature was the most common topic (90%), followed by stars (65%), culture and history (39%), and lake and dam (33%). The best timing of a guided walk was reported as morning (55%), afternoon (47%), night (46%), early morning (32%), and
midnight (15%). The length of a guided walk that participants were interested in taking was one hour (72%), half-hour (43%), two hours (17%), and half-day (6%).

The preferred way of social interaction was talking to an interpreter during a guided walk (75%) or at the visitor center exhibits (60%). Working on an activity with their group members during a guided walk (63%) or at the visitor center exhibits (48%) was second. While viewing the exhibits alone received a relatively large frequency (47%), listening or watching a guided walk alone received a small frequency (17%). Fewer participants indicated that they liked talking with other group members during a guided walk (19%) or at the visitor center exhibits (11%).

Discussion and Conclusion

Participants indicated that they liked contact with an interpreter, since viewing the exhibits with interpreters received more than three times as many responses as viewing exhibits without interpreters. Talking to an interpreter was a favorable way of interactions. This finding supports other studies that reported the presence of interpreters positively influenced the visitors’ program experience (Knapp, 2006; Knapp & Benton, 2005; Morgan, Absher, & Whipple, 2003). The importance of conversing with an interpreter has also been a subject of some debate in the literature (Higham & Carr, 2003; Knapp & Benton, 2004). In free-choice learning settings, a mentor or facilitator can play an important role because people have a strong desire to learn from individuals who have more expertise (Falk & Dierking, 2002). Perhaps a focus on personal interpretation at the visitor center exhibits and informal dialogues with interpreters during a program is warranted.

A greater number of participants liked within-group interactions than intra-group interactions during a guided walk. This finding contradicts other studies that reported a desire for social interactions outside of group members (Brockmeyer, Bowman, & Mullins, 1983; Packer & Ballantyne, 2002). This discrepancy may be explained by cultural differences, as some studies reported that people from different cultures have dissimilar preferences of social interactions (Wallance & Smith, 1997). In a study of British tour guides’ perceptions of tourists, Pizam and Sussmann (1995) reported that Japanese tourists mainly kept to themselves and avoided socializing with others. Therefore, attempts to facilitate intra-group interactions might not work well for Japanese audiences.

Although variances existed in audience preference, this information should encourage interpreters to design programs to facilitate adult involvement in interpretive programs. It is further recommended that other studies be conducted in Japan to learn more about the backgrounds of visitors to interpretive programs.

References


Manuscript Submission

Instructions to Authors

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

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

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

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

**Research Manuscript Submission Guidelines**

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

**Manuscripts**

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

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

**Titles**

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

**Affiliation**

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

**Abstract**

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

References and Citations
Include only references to books, articles, and bulletins actually cited in the text. All references must follow the *Publication Manual of the American Psychological Association* (APA), 5th edition. References in the text should cite the author’s last name, year of publication, and page (if appropriate). All references used in the text should appear at the end of the typed script in alphabetical order using APA style.

Examples of references:

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

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

Permissions
If any figure, table, or more than a few lines of text from a previously published work are included in a manuscript, the author must obtain written permission for publication from the copyright holder and forward a copy to the editor with the manuscript.

Copyright
Under U.S. copyright law, the transfer of copyright from the author to the publisher (National Association for Interpretation, DBA *Journal of Interpretation Research*) must be explicitly stated to enable the publisher to ensure maximum dissemination of the author’s work. A completed copyright form sent to you with the acknowledgment must be returned to the publisher before any manuscript can be assigned an issue for publication.
Proofs
All proofs must be corrected and returned to the publisher within 48 hours of receipt. If the manuscript is not returned within the allotted time, the editor will proofread the article, and it will be printed per his/her instruction. Only correction of typographical errors is permitted. The author will be charged for additional alterations to text at the proof stage.

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
If you have comments or questions regarding the Journal of Interpretation Research, please contact the editor:

Carolyn Widner Ward
Editor, Journal of Interpretation Research
Program Director, Healthy Kids/Healthy Parks
Blue Ridge Parkway Foundation

Blue Ridge Parkway
199 Hemphill Knob Road
Asheville, NC 28803

e-mail: cward@brpfoundation.org

Subscriptions
If you have questions regarding subscription rates or delivery services, please contact the National Association for Interpretation toll-free at 888-900-8283, online at www.interpnet.com, or by mail at P.O. Box 2246, Fort Collins, CO 80522.