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# Contents

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- 3 A Note from the Editor  
*Carolyn C. Ward*

## Research

- 9 Roving with a Digital Visual Library: Increased Learning Opportunities at Carlsbad Caverns National Park  
*Martha Merson, Louise C. Allen, Pam L. Cox, Nickolay I. Hristov*

## In Short

- 33 Multiculturalism, Language Barriers, and Service Quality  
*Mark Morgan, Kai Qiao*
- 37 Sharing Experiences, Constructing Memories: An Ethnographic Report of Naturalists in the Field  
*Joshua E. Hunter*
- 41 Evaluation of New Interpretive Elements in an Aquarium Renovation  
*Brian Ogle*

## In My Opinion

- 45 I Believe, Therefore I Am!  
*Will LaPage*

## Appendix

- 49 Submission Guidelines for Authors



# A Note from the Editor

The editor's note from the previous issue of the *Journal* (Vol. 20 No 2), started like this: "I have had lots of conversations lately about research, the *Journal*, and the field of interpretation in general. Many of the conversations were uncomfortable and unsettling. Questions were asked that were challenging and difficult to answer, but made me think... made us all think. If we, as professionals in the field, are unwilling or unable to ask difficult questions, to challenge the status quo, to advance the ideas, then who will?"

This editorial was followed by a call to action requesting my colleagues to join in a conversation to discuss solutions, review options, and generate ideas for advancing the field. I would like to thank all of you who responded to my request for feedback in the last issue of the *Journal* about the current state of research, the *Journal* itself, and the field of interpretation in general.

Unlike many of the previous conversations where problems and issues were outlined, these conversations surrounding solutions and ideas were uplifting and promising. Three key ideas emerged along with several approaches to begin implementation.

One underlying idea is that research is essential to advance and evolve the discipline. In fact, one of the basic elements defining a profession is that knowledge and skills developed and practiced are derived from research. Without the advancement of the methods, theories, and strategies of interpretation through critical examination, the practice will suffer and the profession will die. With changes in technology, the environment, and the population, we simply cannot continue to practice interpretation as we have always done, just because it has always been done that way. For many this will require a paradigm shift, and to be successful that new direction must be informed through careful critical research. It was refreshing to hear so many colleagues echo the absolute need to ask difficult questions that challenge many of our basic tenets. In order to accomplish this task, more research needs to be funded, conducted, and disseminated.

A second main idea that emerged is that research must be more accessible to practitioners, managers, and administrators. Research itself needs to be physically (or virtually) readily accessible. Individuals need to be able to easily find the answers they are looking for to improve their practice (and thus reinforce the value of research). Think about how an interpreter at a small state park, a remote Forest Service location or a large National Park acquires information? How easily accessible is the *Journal* to the members of field? And once the research is accessed, how valuable is it? There was wide agreement that

published research needs to include a section of “application” value. What does the average reader do with the information? How can it be used to inform either the practice or the science of interpretation? This is the “So what?” of the research. If the field is to continue to evolve as a profession, research and development needs to be communicated to the field in a way that allows for application of the new ideas. This field testing of new advancements is a critical step in ground-truthing ideas.

Another aspect that became clear is that we must break down the silos that are pervasive in interpretation. Interpretation is not a function in a vacuum. Environmental management challenges, protection of cultural resources, and critical law enforcement issues should all be guiding forces for interpretive programming. Interpretation should be as critical of a management function as any other. And using research and evaluation, we can begin to show the bottom-line value of our interpretive programs for all other divisions within resource operations. In addition, we must remove the barriers separating work in environmental education, museums, and zoos from interpretation. There is much that we can learn from each other, and the value of the research in these closely related fields often has wide applications to interpretation.

Strategies for helping address some of these concerns have been identified, and working with leadership from NAI, many will begin to be implemented immediately. One key approach to expanding the reach and impact of *JIR* is through direct dissemination of the *Journal*. I have begun working with key leaders in many of the agencies to determine the most efficient mechanism to get the *Journal* into the hands of field practitioners, managers and administrators for free. Increased accessibility to research will not only benefit the field but the researchers conducting evaluation who will see their work more widely distributed, valued and applied.

A second strategy identified to bring interpretation research into the 21st century is to index the *Journals* and get them on Google Scholar. Like everything, time has evolved how research is accessed. The days and nights I spent in graduate school searching indexes and pouring through paper copies of *Journals* in the corner of a library are no more. Today, the primary method for accessing information is electronic and searchable through a variety of key words, filters, and other features I could not have imagined years ago. The ease through which information is obtained today is staggering, and most journals are already easily accessible on-line. I am happy to announce within the next several months the *Journal of Interpretation Research* will also be available and searchable on-line.

A third approach will involve strategic partnerships and alliances with other journals, organizations, and agencies. I will be seeking out opportunities to cross promote, publish and otherwise partner to expand the reach of interpretation research and to expand the research interpreters are exposed to. We will also work with key leaders to begin to identify gaps in research and critical questions. Imagine if the leaders in public land management agencies got together and identified the key research questions they need answered, and NAI partnered with universities to promote the research.

A final area of emphasis will be working directly with authors to help them promote and distribute their work independently. There are numerous avenues that authors can use to help increase the access and application of their work from LinkedIn to ResearchGate. We will no longer be requiring *JIR* to have exclusive rights to the work and thus can help authors promote and disseminate to a larger audience. Proprietary rights to research are less important than the ultimate impact of the work for the field.

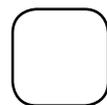
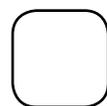
These strategies should have several long-term outcomes including increased interest

in conducting interpretation research, publishing it in the *Journal*, and increased funding for research. These outcomes will all help in preserving and growing the profession of interpretation.

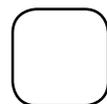
I want to thank those who are asking hard questions, challenging the answers and thinking. These steps outlined above should be considered the beginning. Please call me with ideas, thoughts and questions. I challenge each of you to ask yourself how you can help. I look forward to many more conversations to come with you all. Thank you all for your time and commitment to interpretation.

—C





RESEARCH





# Roving with a Digital Visual Library

## *Increased Learning Opportunities at Carlsbad Caverns National Park*

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### **Abstract**

At Carlsbad Caverns National Park, park rangers blended traditional personal interpretation with technology to showcase park-based research and to advance science literacy among visitors. *Interpreters and Scientists Working on Our Parks* (iSWOOP) provided interpreters with professional development and a selection of visualizations from scientists' research on Brazilian free-tailed bats and their habitat at Carlsbad Caverns. After using tablets containing these visualizations for informal interpretive interactions, the interpreters responded to an open-ended survey. The authors examined interpreters' responses, finding that interpreters regarded tablets as helpful in accomplishing several interpretive goals, especially in particular locations. Interpreters were strategic in initiating and sustaining interactions. Visitors' reactions were positive; nevertheless, there were challenges indicating that this new form of interpretation is worthy of further research.

## Keywords

interpretation, informal education, park-based science, roving, tablet technology, revelation, science communication, National Park Service, iPad

## Introduction

With its second century at hand, the National Park System has challenged its staff and partners to offer visitors interactive experiences, incorporating new technology, and highlighting current scholarship (National Park Service, 2012). Increasing visitors' science literacy; that is, the understanding of how we know what we know, has the potential to stimulate intellectual and emotional connections to national parks. With limited resources to accomplish these new and traditional interpretive goals, the demand for creative approaches is high.

Committed to increasing science learning opportunities and literacy, *Interpreters and Scientists Working on Our Parks* (iSWOOP) seeks to meet these challenges. iSWOOP delivers professional development that ensures interpreters have both a working knowledge of recent and current studies as well as questioning strategies to engage the public in two-way conversations about them. We are extending research in the areas of informal science learning with handheld devices in museums and school settings to parks while attending to the fit with the literature on personal interpretation.

In its pilot at Carlsbad Caverns (a pathways project funded by the National Science Foundation for professional development of interpreters), the project shared a library of scientists' visualizations on two tablets. During roves, which are informal conversations usually within an assigned area, interpreters used tablets to display a variety of visual media to visitors, revealing the research behind the scenes. Interpreters' assessment of the value of blending traditional personal, informal interpretation with 21st-century technology and the challenges they encountered established a starting point for further research on the value of tablets in park interpreters' hands.

## Literature Review

Learning for park visitors can start on websites long before the visitors' arrival and can continue on after the visit. On-site, visitors can take advantage of ranger talks, service learning, citizen science projects, and special events. This is typical of informal learning, which is idiosyncratically pieced together across different venues and times, from a wealth of opportunities and through varied media (Falk & Dierking, 2010; National Research Council, 2009). In addition to structured tours and talks at national parks, visitors often interact informally with park rangers whose focus is interpretation and education. Informal education researchers are beginning to investigate the dynamics at work in these interactions. Reflecting on interviews with Cape Hatteras National Seashore visitors who interacted with rangers, Knackmuhs (2015) noted that all respondents remembered the general topic of conversation, while the ability to recall more detailed content varied widely. Respondents spoke at length about how they appreciated the ranger's time, genuine interest, and one-on-one attention. Pattison and Dierking (2013) argue for analyzing visitor-interpreter interactions using a mediated discourse perspective to gain insight into how adults negotiate roles, identities, power, and authority within these informal learning opportunities. Their research on interactions between museum educators and family groups makes it clear that adult family members play a critical role in shaping the nature of the interactions. In a

mixed methods study at a zoo, Mony and Heimlich (2008) found where and how the interactions were initiated influenced the length of the interactions and the number of key educational messages the interpreter delivered. Taken together, the literature suggests that in addition to analyzing discourse content, the field would do well to have a more nuanced understanding of the techniques for initiating and sustaining substantive engagement, as well as the value visitors ascribe to these interactions.

In the eyes of the National Park Service, an interpreter's job is to create opportunities for the audience to form their own intellectual and emotional connections with the meanings and significance inherent in the resource. In order to foster visitors' instincts to care for and protect natural resources, interpreters draw on techniques such as storytelling, questioning, and demonstrations with props. Interpreters are accustomed to finding a style and approach that works for them (K. Haynie, personal communication, January 2016). In a study of more than 300 interpretive programs, 66% of interpreters had the freedom to write a script, develop a delivery style, and select information to present even when the program topic was provided (Stern & Powell, 2013). Today's visitors are accustomed to richly interactive environments, where their stories, comments, and creativity contribute to a greater whole (Rudy, 2014). Furthermore, evidence from visitor interviews conducted months after an interpretive experience suggests that two-way communication can increase the strength of the impression interpreters make on visitors (Forist & Knapp, 2013, 2014). The Park Service is noticeably taking steps to endorse particular approaches. For example, the new competencies from the National Park Service's Interpretive Development Program emphasize audience involvement in programs that evolve with significant audience contributions (National Park System Advisory Board Education Committee, 2014; National Park Service's Interpretive Development Program, 2016).

At a glance, the interpretive assignment of roving sounds like a simple task: during roves interpreters simply greet and chat with groups of people (Ham, 1992). However, skilled interpreters listen for visitors' interests and look for opportunities to connect them with the natural resources (Miller, 2015; Bonnell, 2015; Sexton, 2015). The literature stresses that impressing visitors with facts about the park is not sufficient, whereas revelation—helping visitors explore and interpret what they see—is (Larsen, 2003; Tilden, 1957). In this article we also regard revelation as worthwhile and central to interpretation. We have seen how a striking or well-timed revelation focuses visitors' attention. Pavis and Crowley (2015) found that parents and children who established joint attention using flashlights in an exhibit were more likely to engage in learning talk about an exhibited object than those who did not have a tool to focus their gaze. Thus revealing aspects of an artifact or resource can lead visitors to appreciate visible but easily overlooked details and such revelations can propel conversations. Flashlights, signs, and as we assert, tablets, have the potential to increase joint looking.

Tablets have gained traction as the device of choice in a variety of settings. In the absence of multiple published studies of their uses and benefits to casual, recreational visitors in parks, we broadened our review of the literature to include articles on handheld devices and mobile computers in park and museum settings. In all settings a key affordance of handheld devices is the potential to increase visitors' appreciation for artifacts or places. MacArthur (2014), observing at Acadia National Park, found visitors offered more exclamations of interest when an interpreter used a tablet than when he used books or brochures alone. In two articles about using hand-held devices in

museums, the visitors were in control of the devices. Mobile device users were able to tap into the collection, accessing information customized to their dominant senses (Linzer, 2013; Goodwin, 2013). Swift (2013) describes intersections in London coming alive with sounds and typical sights from past eras. Handheld devices were a vehicle to reveal aspects of what was on display that visitors might otherwise not have perceived or imagined.

In the case of 21-Tech, a collaboration of five science museums, tablets started off in the hands of floor educators rather than visitors. Then floor educators invited visitors to use apps on the tablets to explore the exhibit content. Evaluators found that visitors benefitted particularly when the apps had a tight relationship to the physical exhibit that was easy to understand and yet were not so compelling that they took visitor attention away from the exhibit (Garibay & Ostfeld, 2013). The literature suggests that keeping interpreters interacting with visitors yields benefits to learning such as stay time, knowledge gains, and enjoyment (Benne, Pattison, Rubin, & Dierking, 2016; Garibay & Ostfeld, 2013; Perdue, Stolinski, & Maple, 2012). However, having staff facilitate interactions with handheld devices is not a trivial undertaking. 21-Tech found that the staff needed time to practice using the devices in order to explore connections with exhibits, and handle the technology and transitions while effectively interacting with visitors (Garibay & Ostfeld, 2013).

Zimmerman and Land (2014) proposed design guidelines for mobile computers to advance place-based learning. The design guidelines underscore the potential for tablets to 1) amplify observations revealing aspects of a place or its artifacts; 2) explore non-visible aspects of a place through visualizations; and 3) be a catalyst for disciplinary conversations with personal relevance and explorations of new perspectives or representations of data. Even in relatively short, unplanned informal interactions, interpreters using the iSWOOP visual library reported conversations along these lines, which will be discussed later in this article. Although Stern and Powell (2013) didn't look for revelation as a program characteristic per se, when they observed interpretive programs, they did code for novelty and surprise. They drew a distinction between the two, defining novelty as the degree to which a program presented novel ideas, techniques, or viewpoints as an element of communication; i.e., using a device not usually associated with or related to the resource, whereas surprise was defined as an "aha" moment. Both characteristics were minimally represented in the 312 programs analyzed. Mean ratings hovered around 1.15 for groups of five or more, based on a three-point scale where novelty and surprise were 1, not used, 2, used as a minor element, and 3, used as a major element. The emphasis on revelation in the interpretive literature is well established, but the question of whether this is an interpretive practice that correlates with visitor satisfaction, visitor experience and appreciation, or behavior change is still to be determined. And the full extent of what this term of *revelation* encapsulates or how to operationalize it needs further articulation and agreement in the field.

## Research Questions

Interpreters recruited to participate in the project at Carlsbad Caverns National Park in New Mexico forged the iSWOOP approach of integrating handheld devices into the visitor experience. In this article on iSWOOP implementation, we look at: 1) how interpreters characterized the benefits of the iSWOOP visual library; i.e., what did it help them accomplish; 2) the strategies they used to initiate and sustain iSWOOP tablet-based

interpretive conversations on park-based research; i.e., how they began and sustained conversations; and 3) the challenges interpreters mentioned; i.e., challenges encountered when integrating tablets into their practice.

## Methods and Data Sources

### *Methods*

We selected a qualitative approach using interpretive methods to understand interpreters' perspectives and experience using tablets during their roves. Analyzing responses to an open-ended survey provided an opportunity to see the variation in interpreters' experiences, as well as to draw out thematic patterns. Observations and blog posts confirmed interpreters' assertions and informed categories and themes.

### *Setting*

Carlsbad Caverns National Park attracted approximately 397,000 visitors in 2014. During summer months visitors gathered in the amphitheater at sunset to watch the emergence of hundreds of thousands of bats. Most park visitors followed the self-guided tour route through the cave. Low light, simple signage, and tours by candle-lit lanterns helped visitors imagine the experience of cave explorers a century ago. Curious visitors read signs, rented an audio guide, or asked rangers questions. Roving interpreters walked through the cave against visitor traffic or took up standing positions at specific locations for periods of about 90 minutes. Interpreters' roving styles varied from nods to actively inviting interaction with tour groups, families, singles, and couples. Interpreters used flashlights to point out features of the resource the visitors could easily overlook: an imprint of a prehistoric shellfish or a droplet of water forming a crust (Dillon, 2011). Not surprisingly, conversations about bats occurred most naturally at the sign that pointed out the passage to bat cave. At this spot, the sign abutted an area with a stone bench and standing space for about ten people.

### *Participants*

Interpreters in both seasonal and permanent positions (8 seasonal; 9 permanent) took part in the iSWOOP project. Their experience at the Caverns ranged from several weeks to multiple seasons. All interpreters had worked at other parks and the majority had college degrees reflecting varied interests including environmental science, geology, anthropology, and history. The majority were in their 20s and 30s, with men being the slight majority of the participants. Comfort levels with the tablets varied; however, all expressed a strong interest in communicating science. During the project period, 17 staff were trained; however, due to turnover, 13 trained staff were on-site during the data collection timeframe. Of these, nine roved regularly with the tablets and completed the open-ended survey. (All interpreters named here have been assigned pseudonyms.) Supervisory interpreter Cox set up the system for collecting data on the number of interactions and synthesized the tallies. Project director Merson followed up to solicit the perspectives from three of the four interpreters who did not rove with the iPads. All of the authors had input in the design of the professional development and offered support for iSWOOP implementation.

Sample Visitor Questions	iSWOOP Approach—Visitors are prompted to observe, speculate, predict	Visual Library Support
How many bats are there?	About 300,000. This took researchers years to answer. Why do you think it is difficult to count bats? What tools can you imagine would help researchers overcome the obstacles of studying a small, fast, nocturnal, animal?	Videos of bat flight emergence in real time, in slow motion, being counted with a computer algorithm
When is the best time of year to see the bats?	It varies a lot. We tell visitors to come in July or August, but take a look at these graphs, which show the number that emerged in April, July, and September. What do you notice?	Graphs of numbers of bats emerging over the course of three evenings
Where do the bats live?	About 1/3 mile down this passage from the sign I can show you what it looks like when bats fly in from the cave entrance. This video is based on laser scans [describe how laser scanning works]. Ever wondered what the bats are doing back in the cave all day?	Fly-through animation of the passage to bat cave; thermal video from the roost taken during the day

Table 1: Fostering Science Literacy

*Professional Development*

Beginning in January 2014, iSWOOP conducted 24 hours of seminar-style and field-based professional development for interpreters, and made available a visual library and display devices to Carlsbad Caverns. To ensure compatibility with researchers’ file formats, the project used Apple products, which is the reason interpreters refer to iPads rather than tablets in their survey responses. During professional development sessions, participants in seminars and field-based experiences became familiar with cutting-edge methods for studying wildlife. They operated laser scanners and thermal cameras. Project leaders encouraged interpreters to design programs with opportunities for visitors to observe, speculate, and make predictions based on elements from the visual library. Professional development and interpretive programming were designed to build on the curiosity that drives individuals to ask questions and figure out ways to answer them (Firestein, 2012). In June 2014, biologists Allen and Hristov configured two tablets with a visual library of colorful images, video, animations, and graphs based on a decade of their research on the Brazilian free-tailed bat, its habitat, and colony dynamics. As a result of the iSWOOP project, interpreters had access to arresting visual examples of research on public lands, strategies for discussing scientists’ findings, and a greater knowledge base of the research on Brazilian free-tailed bats (Char, 2015).

Once interpreters had tablets at their disposal, they had the means to convey information based on current scholarship, along with the mobility and flexibility to customize the content as they engaged visitors. An interpreter described her approach as follows:

“As I rove the cave and I approach groups I will say hello and ask them how they are doing and if they are enjoying the cave. This usually helps them warm up and invites them to talk to me. I will then ask them if they have any questions. Depending on what they say I will then use the iPad or not. If they have questions regarding studies in the cave, or the bats I will use the iPad.” —Mina, 8/22/14

As shown in Table 1, when met with a question, interpreters could promote science literacy and provoke thinking about what and how scientists know what they know. With iSWOOP they had questioning strategies and the visual library with graphs, videos, animations, and still images they could draw on to invite visitors to take an active part in answering their own questions.

#### *Data Sources*

For this study, we used a qualitative approach, drawing from techniques in constructivist grounded theory (Charmaz, 2006) to understand interpreters’ perspectives and experiences using tablets during their roves. Emerging themes from several data sources were used to inform the open-ended survey on roving and subsequently to organize and analyze open-ended responses.

During the project, the research team collected a variety of data. Interpreters were shadowed during formal programs and roves; this generated field notes on roves led by iSWOOP interpreters. Email exchanges, approximately 75 blog posts, notes from three conference calls, interpreters’ feedback on the professional development sessions, and pre- and post-surveys administered before and approximately 12 weeks after professional development were collected. According to park-collected statistics, the number of visitor interactions ranged from three to 300 per rove. “Interactions” were cases where interpreters showed one or more visitors visualizations on the project tablet and conversed for some time, usually between two and 20 minutes. Each visitor present for the interaction counted as a contact. Table 2 summarizes the park-collected statistics. The table shows the number of roves, number of contacts, and



RYAN LEBAR



JONATHAN PRINDSTEIN

**Figure 1: Roving with a Tablet-based Visual Library** Using iPads during roves in the visitor center and in the cave became an accepted practice. Interpreters shared scientists’ visualizations with interested visitors.

Location	Roves & Contact	Interpreters' Comments Noted alongside Contact Numbers
Main Corridor/Bat Cave Turn-off	26 Roves: 791 contacts	"Very interested, visitors engaged and excited" 56 contacts "Good contacts, great questions" 47 contacts "Kids loved the bat photos" 21 contacts "Twenty-five minute iSWOOP interlude" 5 contacts
Big Room	15 Roves: 369 contacts	"Pairs and singles; long, high quality conversations" 7 contacts "Very busy rove, but traffic prevents more contacts" 112 contacts
Visitor Center Rove	48 Roves: 489 Contacts	"One couple was really interested" 6 contacts Visitor Comment: "Thanks for showing me this" 9 Contacts "Critter program, used iPad to augment program" 42 contacts

Table 2: Summary of the Park's Statistics: 89 Roves with Tablets, 1,649 Contacts

includes examples of comments from three locations. (One location, the visitor center, is shown in Figure 1.)

The main data source analyzed for this article is the set of responses to the open-ended survey that interpreters submitted via a completed Google form and/or blog post. The intent of the form was to elicit information that would document 1) effective practices for initiating and sustaining conversations, 2) the visitor response, 3) new challenges, and 4) opportunities. Examples of themes and prompts appear in Table 3. Nine interpreters responded, summarizing multiple uses of the iPads, which occurred during periods of two to four weeks. Each interpreter completed the survey one time during his or her first eight weeks of iPad use. The lead author followed up with three interpreters who did not complete the survey. They were asked to confirm whether they had or had not used the iPads and if they had not, to answer the question, "What were the barriers for you?" We have email responses from two of them; one responded verbally.

A number of other data sources were pertinent to substantiating interpreters' expectations and experience. The iPad sign-out form and park-collected statistics on contacts during roves confirmed that 9 of 13 iSWOOP interpreters were regularly roving with iPads from July 2014 through March 2015. For every rove, interpreters signed iPads in and out, recorded tallies of contacts made, and made notes on unusual responses or interactions. During conference calls held every four to six weeks, the conundrum of where and when to interact with visitors about park-based research dominated conversations. Observers' field notes also served as confirmation of interpreters' survey responses. Following a set of written guidelines, two observers shadowed eight interpreters during eight hours of roves. Observers were as unobtrusive as possible, taking care to stand out of the way while visitors and interpreters were interacting.

Theme	Prompts
Initiating and sustaining conversations	Did you usually start conversations with visitors, or did they usually approach you first? What questions did you ask to initiate a conversation with a visitor?  Give examples of questions that generated dialogue.  List which images and animations you used.
Visitor response	What kind of responses did you hear to information you gave to visitors?
Challenges	Using iPads on roves is new. What challenges do you see?
Opportunities	What value do you see in this approach?

Table 3: Themes and Prompts

### *Data Analysis*

Text from blog posts was segmented into units by topic, axially coded, and analyzed by constant comparison. On the blog, comments fell into eight categories including: hopes and expectations of visitor response; technology—its attractiveness and potential; program descriptions, including crafting programs; and logistics. These categories were in alignment with project priorities and were thus useful as the basis for categories for coding interpreters' responses about their experience using tablets six months later.

In conference calls with researchers, interpreters debated the advantages of various locations for their formal programs. These back-and-forth exchanges were significant as they spoke to competing priorities such as visibility vs. safety; visitors' passive vs. active posture; and audience stability vs. fluidity. Being at the right place and time to respond to visitors was an important part of making connections between visitors and the resource. Therefore, we looked at the theme of location along with the strategies interpreters mentioned for initiating and sustaining conversations.

Eliciting and analyzing challenges was important during this proof-of-concept project. We analyzed survey responses for challenges, noting frustrations and possible solutions. Each element of iSWOOP—the devices, the professional development, and the content of the visual library were all scrutinized and targets for revision, further investment, or elimination.

The salient categories defined with examples appear in Table 4.

One of the known problems of relying on self-report is that participants may answer in a way that will please researchers (Hoskin, 2012). To establish the trustworthiness of the data, we reviewed observers' field notes. In this way authors were able to confirm the accuracy of interpreters' statements about visitors' enthusiasm and engagement, opportunities, and logistical constraints and disconfirm exaggerations or embellished responses that would have distorted results. Furthermore, the fact that one-third of

Category & Theme	Definition	Sample Responses
Opportunities afforded for accomplishing interpretation; Interpreters' hopes and expectations	Interpreters' intent to make connections for visitors. The ways that tablets increased the likelihood that interpreters could advance their mission to make personal connections between the visitors and the resource (cave or bats)	Great potential for rewarding encounters. The flythrough of the Natural Entrance and to Bat Cave seem to enrich the experience of visitors who wish to go but cannot set foot in these areas. Evan, 1/10/15
Location & interpreters' bids to initiate and sustain interactions	Strategic placement of self to invite interaction; Opening questions, bids for attention or interaction and the techniques used to sustain conversations, such as questions, eliciting interest, attending to cues from body language that indicated the visitor might want to see or hear more	[Interpreter tended to] rove in the area near the bat cave sign and, when visitors stopped there, he asked if the individual or any members of the group were particularly interested in our bats here at CAVE. Marvin, 7/14/14  I find that asking why they think things are happening tends to generate questions. Shawn, 10/4/14
The visitor response	Verbal or physical reactions to visuals or interpreters' questions or comments	Smiles, wow's, "Thank you for showing us that"; "That is amazing!" "Do we have to pay extra for this? This is awesome!" Evan, 1/10/15
Challenges	Factors that interfered with maximizing the interpretive opportunity or that interfered with the interaction	The biggest challenge I have come across is that if I don't check, sometimes the battery is low. I have also found that showing the slides can be hard to be fluid. Shawn, 10/4/14

Table 4: Categories & Themes, Definitions, and Sample Responses

interpreters who could have used the iPads did not and that two were forthcoming in voicing their concerns confirms that some interpreters were not under undue pressure to comply with researchers' expectations.

## Findings

The findings are reported by theme: accomplishing interpretive goals with the iSWOOP visual library, optimal locations for using the iSWOOP visual library, initiating and sustaining interactions, and the challenges posed by integrating tablets into roving assignments.

### *Interpretation*

Typically during roves, interpreters satisfied curiosity, answering visitors' questions if they were able to do so. In this section we look at the ways the tablet-based iSWOOP visual library helped accomplish interpretive goals. Interpreters reported increasing understanding of the resource, both the bats and a spatial understanding of the cave system. At the same time they felt they increased visitors' science literacy by building awareness of the research program and technological applications to the study of wildlife and its habitat, they strengthened emotional and intellectual connections to the wildlife and caverns which can inspire concern and stewardship activities.

Of the nine interpreters, eight explained the value they saw in roving with iPads. Interpreters gave 13 examples of what they could accomplish. Their examples fell into two categories, one related to informing visitors about bats (seven examples) and the other related to informing them about relevant research and technology (six examples). Within each category we coded a spectrum of responses. Within the category of informing visitors about bats, three of the seven responses included straightforward supplying information and satisfying curiosity. An interpreter observed, "When visitors are receptive and genuinely interested in the bats, the iPad is a great tool for...enhancing their understanding of the bats" (Winston, 8/19/14). Two comments referenced the more complex task of eliciting and changing attitudes. An interpreter wrote, "These tools and our training have also helped a great deal to change or clarify the perceptions and superstitions many of our visitors hold on bats" (Evan, 1/10/14). Interpreters expressed confidence that the tablet-based interactions were having an impact on visitors' perceptions of bats. An interpreter reported that, a visitor exclaimed, "Oh! They're cuter than I thought they would be," upon seeing the close up image of the free-tailed bat (Rico, 12/7/14; Figure 2). The realization that bats—which are often feared—can be perceived as cute was noteworthy. A revelation precipitated a shift in attitude, which had the potential to lead to increased concern for bats and their survival.

Within the category of research and technology four of six responses were about showing and telling, implying a one-way dissemination of information, while two responses indicated interactive two-way discussions. Winston's response exemplifies the show and tell approach: "The iPad...allows rangers to get out the message regarding the interesting research being done here" (8/19/2014). In his comment, the agency rests with interpreters who get the message out. In contrast, Mina commented, "The videos of the scans of the cave are also really neat because we can see what other areas of the cave look like virtually *and discuss* [authors' emphasis] how technology has changed the way we look at things and study them" (8/19/14). Notice that Mina uses the first-person plural *we*, making it clear that she and the visitor play an active role.

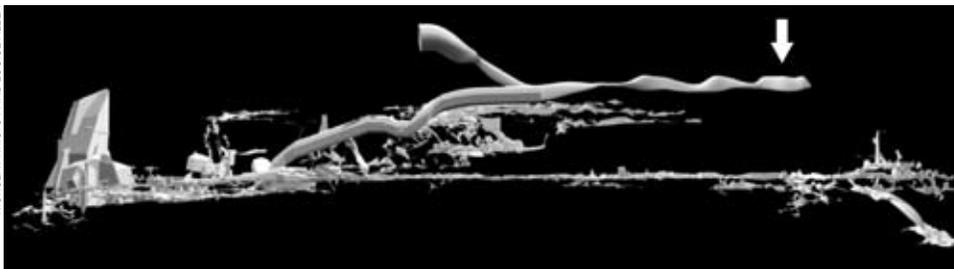
NICKOLAY HRISTOV AND LOUISE ALLEN



**Figure 2: Infant Bat Pups Gathered in the Roost and Nursing**

Sample images visitors found enchanting. Visitors rarely get a chance to see baby bats in the roost despite their keen interest in mother-pup interactions.

NICKOLAY HRISTOV AND LOUISE ALLEN



**Figure 3: Schema of Caverns**

Three-dimensional model of Carlsbad Cavern indicating relative position of main cave features (e.g. the arrow indicates the location of the bat roost). This visualization was helpful for fostering understanding of the spatial layout and distances in the cave system.

The visual library enabled interpreters to reveal parts of the cave that visitors could not or did not see on their own, like the bat cave, which especially interested children, according to Kate (7/22/14). Of the 10 survey responses, nine explicitly or implicitly spoke to interactions that fostered understanding of the spatial layout, capacity, or distances in the cave system. Interpreters could use elements of the visual library to relate where visitors were standing to other parts of the cavern (Figure 3). One interpreter witnessed the visualizations compensate for a limited first-hand experience. He noted:

“The fly-through of the Natural Entrance and to Bat Cave seems to enrich the experience of visitors who wish to go but cannot set foot in these areas. Particularly for visitors with physical or psychological limitations that keep them from walking the Natural Entrance.... Instead of feeling left out [after seeing the fly-through], visitors feel fortunate.” —Evan, 1/10/15

When interpreters foregrounded technology like laser scanners and thermal cameras, visitors were impressed. One interpreter enjoyed letting visitors know that the park had access to such technology. Two interpreters reported visitors' comments of this type: "Wow! Technology is amazing!" in response to laser scans of the cave (Rico, 12/7/14). Lena noted visitors' body language: gasps, wide-eyed faces, and large grins (7/14/14). Another interpreter captured this visitor's response: "That is amazing! I didn't know you could film the bats like that" (Mina, 7/22/14). The quotes speak to appreciation expressed for technological innovation, with the second quote explicitly addressing applications to the study of wildlife. These comments further support the observation cited above that the iPad allowed rangers to get out the message regarding the interesting research being done in the park.

Overall interpreters' responses confirmed the value of the tablet-based visual library in supporting their efforts to increase awareness of the resource and research activities at Carlsbad Caverns. The tablets were a tool for colorfully displaying behind-the-scenes work researchers have undertaken to better understand Brazilian free-tailed bats and their habitat. Interpreters with the visual library were able to highlight new perspectives on park-based research. They revealed areas of the cave, offered up-close images of the bats in the roost, nursing, and in flight, and provided examples of the visualizations possible with thermal cameras and laser scanners. Visitors expressed pleasure, astonishment, gratitude, and curiosity in response to interpreters' efforts to illustrate and inform them about how we know what we know about the bats and their Carlsbad Caverns habitat.

### *Location*

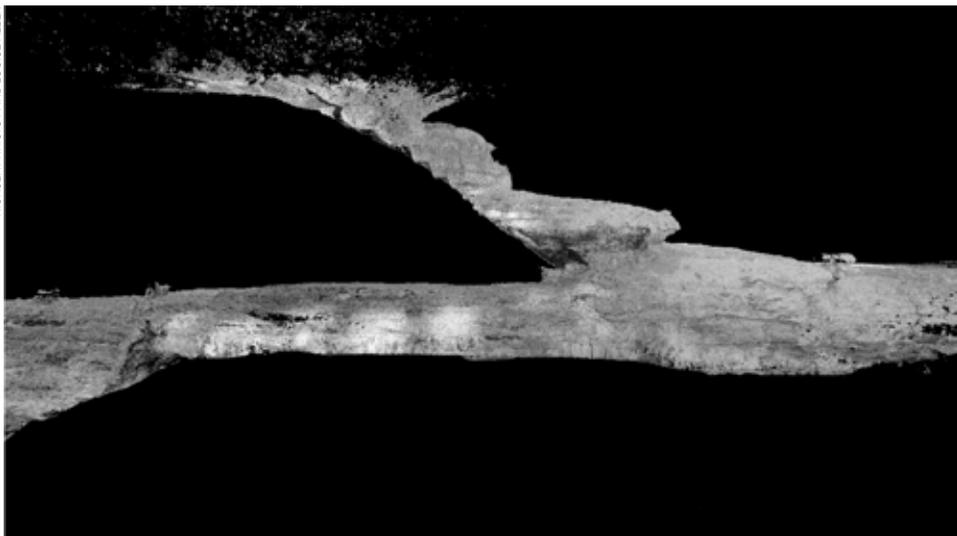
All interpreters using tablets were successful in initiating contact with visitors and engaging them in STEM learning in a variety of locations. According to interpreters' survey responses, only one of the 1,649 visitors who were approached by an interpreter offering to show images on iPad or tablets chose not to engage. In five of the interpreters' survey responses, they named locations where they were successful in engaging visitors. One approach was to leverage the opportunities the resource presented; for example, elaborating on the sign pointing out the passage to the bat cave. The other was to seek out locations where visitors might have time and mental space to absorb something new. Kate and Lena talked about such opportunities: engaging visitors who were resting on stone benches and those waiting for a guided tour. In both instances interpreters were being strategic, talking to visitors in places where they avoided causing traffic jams.

### *Initiating and Sustaining Tablet-based Interactions*

During roves, interpreters greeted visitors. One interpreter noted that because she is an introvert, in the past she has had a hard time starting conversations. Having images to display on a tablet made her feel more at ease when striking up conversations with visitors. Although she stated that she didn't want to become too dependent on the tablet, she acknowledged that it made her more comfortable initiating contacts during roves (Observer's field notes, July 2014).

In one-third of survey responses, iSWOOP interpreters explicitly mentioned that iSWOOP conversations over the iPads were longer and more substantive than typical interactions. More time in conversation meant more opportunities to forge intellectual and emotional connections, more time to learn about the visitors' interests and to

NICKOLAY HRISTOV AND LOUISE ALLEN



#### Figure 4: Still Image of Fly-through

Still image taken from the fly-through sequence (on top) reveals the cavern beyond the natural entrance (pictured below the fly-through still). Using long-range laser scanning technology, the cave is captured as a three-dimensional point-cloud generated from billions of points.

offer information tailored to these interests. Of the five interpreters who quantified how often they initiated contact with visitors, four estimated that they initiated 75% to 85% of contacts, while one reported that visitors approached him 75% of the time. An interpreter offered this description: “While stationed at Bat Cave, I initiate conversations with visitors if they pause to look at the wayside exhibit. If they just walk by, I usually just offer a greeting, but don’t stop them” (Rico, 12/7/14).

Most often the cave itself, or research on the cave, made sense as an overture. Two interpreters began conversations by asking visitors if they were interested in seeing the cave in a new light and continued the dialogue after showing the fly-through (animated laser scans from a bat’s eye perspective) by asking if they saw something familiar in the video (See Figure 4 for a screenshot from the fly-through video). Another said he simply asked if visitors were interested in bats or in research being done in the cave.

To sustain conversations, interpreters tailored their comments to visitors’ interests and questions. Visitors frequently had questions about bats and their cave habitat. Interpreters took these questions as opportunities to invite discussions on bat reproduction, behavior in the roost, and the location of the bat cave relative to other areas of the cavern, as well as wildlife biologists’ research agenda. Some interpreters found ways to incorporate iSWOOP images and video even when the topic of conversation was not related to bats. In one instance, a visitor asked if the cave was safe during earthquakes. During their exchange the interpreter learned that the visitor was studying engineering. This prompted the interpreter to offer to show the fly-through as an example of new technology researchers and interpreters are using to survey caves (Lena, 7/14/14).

In sum, nine of the 13 interpreters in the project found using the iSWOOP visual library beneficial. Interpreters gave a variety of responses when asked what they could accomplish with iPads, seeing value in opportunities to inform visitors about bats and the research program at the Caverns. As Rocko explained, “It allowed me an added bonus of having planned interpretive moments on topics in further depth that I couldn’t have built up as well without the benefit of the visual” (9/18/14).

The iSWOOP visual library and professional development equipped interpreters to show compelling visuals that revealed more than visitors could see on their own. Interpreters who roved with the iPads found they could 1) use visual media to shift visitors’ attitudes towards bats by adding to their knowledge base about bat behavior, 2) discuss the role for technology both in wildlife research and in the park experience, and 3) showcase parts of the cave system visitors couldn’t experience first-hand due to park-imposed limits or visitors’ choices or physical limitations. During roves interpreters were sensitive to location, and initiated conversations in ways that increased the potential for making connections with a receptive audience.

### *Challenges*

Though the visual library and the tablet interface provided new opportunities for showcasing technology, bats, and scientific research, at the time of this article not all iSWOOP-trained interpreters had adopted them for use. Interpreters articulated two concerns: 1) the visual competition with the caverns, and 2) the awkwardness of roving with a tablet.

Echoing the findings of the 21-Tech project, interpreters worried that visualizations intended to complement the main attraction had the potential to upstage it, competing

for visitors' time and attention. An interpreter mentioned that a tablet flashing colorful video in the cave was too compelling. She and two other interpreters were reluctant to shift visitors' focus to a screen that could easily detract from visitors' appreciation of the cave.

Unlike an illustrated talk projected on a wall or screen, tablets allowed interpreters to rove with visuals. Yet, when interpreters spoke simultaneously to shorter and taller visitors, struck up conversations in narrow passages, and attempted to expand conversations to enable newcomers to get a view, handling a tablet was tricky. An interpreter wrote: "I found it to be cumbersome.... [I had to] juggle it from hand to hand when I wanted to use my flashlight to point out something in the resource" (Rocko, 9/17/14). On days with high attendance, interpreters had to be especially strategic about where they initiated conversations in order to avoid blocking foot traffic.

An ongoing challenge will be to keep the conversations fresh and interactive. As with any device, there are logistical challenges in managing updates and upgrades. Three interpreters specifically requested additional content, such as visuals on cave formations and White Nose Syndrome. Ideally a park's visual library would contain images on a range of topics from a number of researchers.

## Discussion and Next Steps

Tablets and smart phones are increasingly part of the visitor experience at national parks as cameras, field guides for animal and plant identification, and as crowd-sourcing tools for citizen science. Until the iSWOOP project provided two tablets for interpreters' use, visitors' cameras and the park's audio-guides were the most prevalent forms of technology in the dimly lit cave. Interpreters recruited to participate in the project at Carlsbad Caverns National Park in New Mexico forged the iSWOOP approach of integrating handheld devices into the visitor experience. Their survey responses revealed how they characterized the benefits of the iSWOOP visual library, how they began and sustained conversations, and the challenges they met when integrating tablets into their practice. Interpreters with the visual library were able to highlight new perspectives on park-based research. They revealed areas of the cave, offered up-close images of the bats in the roost, nursing, and in flight, and provided examples of the visualizations possible with thermal cameras and laser scanners. A few dwelled on the possibility of detracting from the experience of the cave, while the majority found comfortable locations and strategies for initiating and sustaining conversations with visitors.

Based on this study and articles cited in the literature review, we can expect opportunities for revelation and connections when a portable visual library is placed in the hands of interpreters. Tablets, like flashlights, facilitate new perspectives and joint looking, making it possible for park interpreters to reveal the natural resources to visitors that they would not ordinarily see. With scientists' visualizations, interpreters can leverage intriguing juxtapositions of current and past conditions, change visitors' perspectives, and reveal non-visible aspects of the natural resource, infusing interactions with novelty and surprise.

In some sense, explaining features of the park and its bats with a tablet is not such a large departure from interpreters' use of other props at Carlsbad Caverns. Props are a recognizable part of the interpretive toolbox. Skeletons, skins, and puppets help the public learn about wildlife. Tablets are less furry than some of the traditional props, but fulfill a similar function. With them interpreters can reveal aspects of park resources that are out of sight, out of season, notable when juxtaposed with a contrasting example,

or too large or too small for the naked human eye to perceive, playing on novelty and surprise to captivate visitors and spark conversations. Tablets, like flashlights, make it possible for interpreters to establish a joint focus for attention. One major difference between flashlights and tablets is that with tablets visitors' attention initially is directed away from their environment and to a screen, whereas a flashlight focuses attention on features of the environment. Interpreters were aware of the potential for iPads to compete with the natural resource and explicitly stated that they wanted visitors to be awed by the cave. Another difference is that the cave was relatively static in comparison to the visual library, which included video, and enabled interpreters to shift visitors' perspectives in surprising ways, i.e., taking a bat's-eye view down a passage. With this control, interpreters showed visualizations in a sequence that made sense in accordance with visitors' questions and interests.

Many visitors whom interpreters treated to the iSWOOP library expressed gratitude, curiosity, pleasure, and astonishment. Conducting think-aloud protocols as visitors watch a fly-through sequence or other visualizations might give interpreters and researchers a better understanding of what was new, compelling, or of value to visitors. This feedback would be useful in the design of visual libraries for other parks. In informal interactions it can feel awkward to ask visitors to explain their reactions, so until we do further research, we can only speculate about the characteristics of a visual library that are most likely to arouse strong positive reactions or contribute to visitors' science literacy. Think-aloud protocols could yield useful information for interpreters—describing the place of visualizations and interpreters' provocative comments for visitors who might otherwise silently connect their personal experiences to the scenery or phenomenon at hand.

It is clear, both from the literature and from interpreters' experiences at Carlsbad Caverns, that tablets can stimulate wonder and understanding of how scientists know what they have come to know. In interpreters' hands, scientists' visualizations can advance interpretive goals, but this does not happen magically. As researchers of the 21-Tech project found, interpreters need time to become fluid with the technology (Garibay & Ostfeld, 2013). At Carlsbad Caverns individual interpreters found locations and strategies for initiating conversations. To meet the 21st-century standards for audience-driven interpretation, professional development may need to place an even stronger emphasis on techniques for fostering dialogue.

Based on the responses of nine Carlsbad Caverns interpreters, the data suggest that interpreters with tablets have the potential to increase awareness of parks as sites for research, highlight innovative uses of technology, give visitors reasons to appreciate bats, and extend a behind-the-scenes look at the park. These are all aspects of revelation that could be described more fully in tandem with the guidelines suggested by Zimmerman and Land (2014), the categories used by Stern and Powell (2013), or the new interpretive competencies (2016). Researchers could then develop measures for the effectiveness of different strategies and techniques in inspiring concern for and connection to the resource. However, parks have limited resources. Bearing this in mind, ascertaining patterns of where and how visitors embrace opportunities for conversation and learning with interpreters can help parks target resources strategically.

In spite of professional development sessions that stressed interaction and questioning techniques, some interpreters and visitors easily fell into the comfortable roles of expert and listener. A benefit of establishing joint attention is its potential to jumpstart conversation, to spur the visitors to comment, observe, and speculate. Additional

opportunities to practice this way of interacting may increase the likelihood that interpreters give visitors a chance to connect park-based scientific research to their prior experiences.

We believe tablets are a worthwhile focus for continued use and study. Further research could investigate and confirm that roving with tablets shifted where and how interpreters approached visitors, increased the number of contacts, added value to visitors' experience, and increased two-way communication about the relevance of scientific research to visitors. iSWOOP project leaders will be talking about possibilities in consultation with interpreters and supervisors at Carlsbad Caverns and other parks in the near future with support from another National Science Foundation grant (DRL# 1514776). The tablets have proved themselves as a tool that advanced interpreters' mission to reveal the aspects of the park's resources to visitors. With collaborative effort and plans we hope to document further the short- and medium-term impacts of tablet-based technology in interpreters' hands, more precisely describing types of revelation interpreters readily use, learning which visualizations visitors find most compelling and why, as well as how opportunities for increased science learning can dovetail with visitors' interests and motivation.

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## Appendix A: iPad Reporting Form Prompts

### 1. *Images / Animations used*

Please say which images and animations you used (fly through sequences only, other iSWOOP cart images, etc.)

### 2. *Interactions with visitors*

Did you usually start conversations with visitors, or did they usually approach you first? What percent of interactions would you say are initiated by you, versus by visitors?

What questions did you ask to initiate a conversation with a visitor?

Give examples of questions that generated dialogue.

### 3. *Visitor Responses*

What kind of responses did you hear to information you gave to visitors?

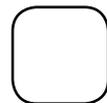
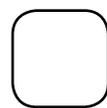
### 4. *Challenges and opportunities*

Using iPads on roves is new. What challenges do you see? (For example, showing the screen to very tall/ very short people, or trying to have an educational interaction in this way.)

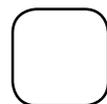
What value do you see in this approach? Would you say it changed your roves? How so?

If there are things you're looking forward to trying or refining, please describe them.





IN SHORT





# Multiculturalism, Language Barriers, and Service Quality

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## **Abstract**

If the White majority becomes a minority population in the United States by 2050, as predicted, this shift might result in a dilemma for the National Park Service (NPS) because Caucasians have provided the mainstay of agency support over the past century. According to published reports, recommendations to improve park awareness and relevance for underserved groups are being addressed by the National Parks Conservation Association. Although Asians are one of the fastest growing minorities in the U.S., they are infrequent NPS visitors. One possible explanation is language barriers, compounded by English-only websites and printed material. A service-quality test using a Chinese confederate was designed to examine some performance measures. Of the 370 national parks queried, less than 18% had any information for Chinese visitors. Some managerial implications for Asian inclusiveness are discussed.

## **Keywords**

Asians, minorities, visitation, national parks, policy, management

## **Introduction**

In 2008, the National Parks Conservation Association (NPCA) formed the National Parks Second Century Commission, an independent team of national leaders and experts to

create a 21st-century vision for the National Park Service (NPS). *Connecting People and Parks* was one of eight reports published by NPCA in 2009. The first recommendation (2009, p. 7) was, "Establish a universal commitment within the Park Service to engage and serve people of all backgrounds with an urgency and dedication that equals the commitment to preserve park resources." Action item 1 (2009, p. 7) stated, "Make a sustained commitment from the top of the National Park Service through its ranks to embrace our country's diversity and shape the Service to make our national parks welcoming and relevant to all Americans."

This report also revealed some uncertainty on ways that Americans were receiving information about national parks and how they were making connections with natural and cultural resources. Use of English-only websites and printed material were identified by the Office of Management and Budget as language barriers for some audiences to fully enjoy and appreciate park resources. Multiculturalism is both an opportunity and a challenge for the NPS, as every racial and ethnic group in the U.S. is expected to increase in number and percent before 2050, except for Whites (the traditional base of political and financial support). In response to anticipated demographic changes, the vision produced by the commission (2009, p. 1) clearly stated, the NPS "will connect with individuals and communities in ways that are meaningful in the context of the diverse perspectives, interests, and values that our communities represent." Anecdotal evidence suggests that few national parks have the resources to offer translation services for the spectrum of international visitors. A service-quality test was designed to examine some performance measures in the NPCA report.

## Literature Review

Recognition and subsequent study of undeserved audiences in parks and outdoor areas began in the 1970s (Pease, 2015). During that time, some minorities have received more attention in the outdoor recreation literature than others. Little is known about Asians who visit NPS sites because they are often combined with other ethnic groups to form a small and meaningless "other" category (Floyd, 1999). Yet, one study revealed that Asians were more likely to agree with the statements, "I just don't know that much about NPS units," "NPS units are too crowded," and "NPS employees give poor service to visitors," as compared to other NPS visitors when segmented by race (Taylor, Grandjean, & Gramann, 2011). Morgan and Hwang (2014) measured interpretive theme perception of Korean visitors who toured the Gateway Arch in St. Louis, Missouri, and found that simple educational interventions (DVD and a guided tour) led to a significant improvement in scores.

According to the U.S. Census Bureau (2012), Asian-Americans were the fastest growing minority group from 2000 to 2010. This population is expected to double by 2060. Moreover, outbound Asian tourism to the U.S. is increasing rapidly, at least for some travel markets. For example, the National Travel and Tourism Office (U.S. Department of Commerce, 2014) reported the number of Chinese tourists in the U.S. had increased over 450% from 2007 to 2014, and 40% of them visited a national park/monument on their trip (approximately 875,000 visitors). Despite a growing resident population and burgeoning travel market, the number of Asian visitors at most national parks is insignificant compared to other market segments according to reports published by the Visitor Services Project at the University of Idaho. However, one NPS study indicated that 29% of Asians visited at least one national park within a 24-month period (Solop, Hagen, & Ostergren,

2003). Although many Asians can speak English, one reason for non-attendance at national parks might be due to real or perceived language barriers. Other groups often affected by language issues include first generation immigrants or immigrants having low assimilation levels (Stoldolska, 2000; Scott, Lee, Lee, & Kim, 2006).

## Methods

A list of NPS websites (n=489) was obtained and consolidated after removing units under shared management (n=370). A Chinese visiting scholar at the University of Missouri, acting as a potential visitor, sent an email to each of the national parks in February 2015 using a private Gmail account created specifically for this project. The exact correspondence was, "I plan to visit several national parks while on vacation this summer. Do you have any form of Chinese translation at your site, such as brochure, audio-visual, or sales item from the gift shop? Thank you." One reminder email was sent to non-respondents about 10 days after the initial contact was made. The analysis is based on NPS response to this one question, measured yes or no.

## Results

Only 343 of 370 NPS websites had valid email addresses. Of the 343 emails sent, replies were received from 256 parks (74.6% response rate). Slightly less than 18% of the sites (n=46) had any information for Chinese visitors. On average, the response time was 2.19 days.

## Discussion and Implications

Although one item is an imperfect indicator of service quality, it was useful for providing some initial feedback on foreign language availability in the NPS and their responsiveness to visitor inquiries. Perhaps this study will stimulate greater research interest in service quality measurement. The 27 units having broken or missing email addresses should be updated immediately, as this represents a lost opportunity for anyone who attempts to contact the park using this popular form of communication. The non-response rate (25.4%) is hardly a "welcoming" statistic for potential visitors, especially since the NPS enjoys such a high level of satisfaction among federal resource management agencies.

The speed of response, slightly over 2 days, was a pleasant surprise. This showed a sense of urgency and dedication on behalf of the staff who answer general park inquiries, via emails. Not surprisingly, few national parks provide any information in Chinese (presumably this figure would have been even lower if the parks who did not respond were included). This finding may address park relevance, at least for the Chinese visitor population. In contrast, the visiting scholar noted that virtually all federal parks in China have English translations.

The NPS has been a standard bearer for resource preservation and public enjoyment since 1916. Now is time for the agency to prioritize for the "second century." Parallel versions of the websites are a possible solution, yet this benefit must be weighed against the cost of each park having information available in multiple languages. Although many national parks include Spanish translations, this strategy is impractical for every foreign language. A less-costly approach is the use of auto-translation programs on websites, if validity can be assured. The Virginia State Park system uses Google Translate™ for this purpose.

Geographical areas where concentrations of Asians live and/or visit (i.e., large urban

areas and the Pacific Coast) should be targeted initially, serving parks that have the greatest need. This would include units of cultural and historical significance, in addition to resource-based parks. Since brochures and pamphlets are basic forms of communication, a variety of translations should be available upon request. Headset applications are a cost-efficient language solution for some guided tours, such as in caves. GoPro™ cameras could add an exciting dimension to the park experience for international visitors.

The use of technology, diversity training, and strategic (minority) hires are several ways for the NPS to improve service quality as America continues to develop into a multicultural society. The agency should experiment with different options—much hangs in the balance during the next century.

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# Sharing Experiences, Constructing Memories: An Ethnographic Report of Naturalists in the Field

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## **Abstract**

Within this short research report, the author provides a succinct introduction to ethnographic fieldwork in a Midwestern U.S. state park and exhibits a small sample of data gathered from park interpretive naturalists that highlights ways that a group of naturalists perceive the construction of memories. Subsequently, the author explores a salient interpretation from the data, in which memories are dependent upon shared experiences and interactions. By highlighting one specific group of naturalists, this research sheds light on how they conceive their role in the memory construction of others.

## **Keywords**

naturalists, memory construction, shared interactions, connections, ethnography

In this brief research report, ethnographic fieldwork conducted in a Midwestern state park in the United States is exhibited. I provide a concise explanation of the study and subsequently, offer some snapshots of data from ethnographic fieldwork, and provide a short reflection on their value and application. The fieldwork was conducted from February to December and included participant observations, interviews, and archival documentation. On average, four days a week were spent at the park, ranging from two to eight hours in duration. The long tenure in the field is a hallmark of ethnographic work in the attempt to capture the particular worldview and emic perspective of a cultural group.

Data collection included one-on-one interviews with the one full-time and four

seasonal naturalists at the park, participant observations of the naturalists in their various roles, and artifacts, including written histories, reports, and program documentation. To broaden the scope, three full-time naturalists from three other state parks (who had affiliations with the park in the study) were interviewed, as were two administrators (both of whom had extensive backgrounds in field interpretation and connections to the park of the study). A majority of the research was spent in participant observations of naturalists while engaging with the public and each other, and wandering in the forest to train or lead hikes. The observational field notes and field interviews provide rich, *in situ* contextualization of the practice of this group of naturalists.

This research fits into a broader discourse concerning the role memories play in engendering connections and meaning between people and their environment. This coupling of early memories and constructing connections has been construed as an essential part of environmental education (Brandt, 2013; Measham, 2006). Relative to interpretive work, there is consensus on the need for interpreters to provide the conditions in which visitors construct connections or meaning by tapping into their own experiences and memories (Beck & Cable, 2002; Chen, 2003; Dec, 2004; Tilden, 1977). Turek (2006) focuses upon this concept of connections between people and place as a first priority for interpretation, superseding other objectives. Taken together, the literature has focused upon the interweaving of memories and making connections to a particular place. This requires sharing experiences and memories through social interactions between naturalists and visitors.

The short pieces of data below provide a small, yet representative sample of interviews, observations, and artifacts collected during fieldwork. It is important to note that these were shared perceptions among this group and the samples below are supported across the data collected. Thus, there is strong triangulation of the findings across the interviews, observations, and artifacts.

The following two quotes derived from observational field notes (casual conversation interviews) subsequent to public programs. Each naturalist was responding to a question regarding the role of interpretation in the state parks.

“I think the interpretive service is in the business of building memories.”  
(Maggie)

“Interpretation builds memories.... The memories transcend generations. The stories become rich and the need to share and continue to experience stays strong.” (David)

Adding additional voices to the above quotes, the two below are examples taken from one-on-one interviews and were given in response to a follow-up question asking for clarification after each naturalist independently used the term *connection*.

“Connecting with nature is a kind of drawing back, you know, being able to draw on experiences that people may have had before or in their lives at some time and connecting that to something they’re seeing right now.” (Kate)

Maybe [I can] tie in something that maybe conjures up a thought that they had earlier in life. Or, remember when you were a kid and you saw this? Or for the

first time, how many remember the first time they saw this? Or experienced a rain storm, or wind, or climbing up into a tree.” (Jack)

Highlighted in these quotes is not only the perception that making connections is dependent upon earlier experiences, but that naturalists have an intrinsic role in this process. Supplementing the interview materials, this next piece of data is taken from observational field notes, in which a Wild Edibles Snack Break program in September is described.

There are many people, maybe a 120 or so. It is warm and sunny in the outdoor program area. The buffet contains fresh hickory nuts, wild ginger candy, fresh bread with wild grape jelly, garlic mustard pesto, black walnut bars, spicebush tea with local honey, and sumac lemonade. All are laid out with small artifacts of nuts, leaves, berries, and twigs strewn across the tables. Most of the visitors have a full plate and cup and are talking in small groups while sitting in the amphitheater. All of the naturalists are here and are dispersed among the crowd. Joan stands at the tables of food helping fill plates and cups and answering questions. A young man in jeans, T-shirt, and ball cap is interested in the drinks and continues to ask her questions. An older man, thin as a rail, chats with the young man in a lighthearted tone, “Boy, you could’ve just asked me. I’ve known all this long before today. I remember all this.” And then in an aside to Joan says, while winking, “My son-in-law doesn’t know much, but he could have simply asked me. I’ve eaten all this since I was a kid. Hunting mushrooms, drinking sassafras tea. All of it.” Joan smiles at the man and says, “It’s great you have these experiences and it must be nice to share them with your family as they enjoy the wild edibles and woods.”

Finally, this last piece of artifact data provides one example of many in which memories and experiences are described in the weekly *Interpretive Programs* bulletin.

**A Box Full of Memories (craft):** Create a unique vacation box to collect mementos and memories of your summer experiences. As we craft our boxes, we’ll share favorite camping spots and park memories. [Bring your box back in September and show us where you’ve been!] Nature Center Outdoor Program Area (45 min).

By triangulating all of these various pieces of data, patterns relating to how memory construction is perceived begin to emerge. Interpreting the data as a shared sense of constructed meaning among these naturalists begets some conclusions that can have impacts on interpretive work. Among these are that making connections to the park and constructing memories are bound up within shared interactions between people. As an example, both David and Maggie claim that “interpretation builds memories,” and this is a testament to their perception of the social nature of memory creation and their own role in the relationship. Likewise, in explaining the concept of connection, both Jack and Kate describe ways that they, personally, try to build connections by tapping into previous experiences and connecting visitors to what they are sharing in a program. By acknowledging their role in the process, there is an underlying awareness of the

necessity of shared social interactions for connections and memories to be kindled. These statements are supplemented by both the observational and archival data in which there is an embedded significance of sharing experiences and memories.

While ethnographic research is not typically concerned with external generalizability, this research highlights internal generalizability across the individual naturalists and the data collected. This ethnographic inquiry of a particular group of naturalists and localized meaning construction enlarges the broader discourse concerning interpretation, shared human experiences, and memories. In this context, memories are seen as being derived through social interactions and shared experiences of the park as connections to a place are fostered. This bears out in how the naturalists practice interpretation (evident in observations), how they chronicle their practice (evident in documents/artifacts), and how they talk about interpretation (evident in interviews). Awareness of an intrinsic social component and the need to share is a reminder of the importance and complexity of interpretive work. And, in addition, the value that ethnographic work adds to this field of research.

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# Evaluation of New Interpretive Elements in an Aquarium Renovation

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Evaluation was completed for Omaha's Henry Doorly Zoo & Aquarium focusing on the effectiveness of the education media, or interpretive elements, at creating knowledge transfer in adult visitors visiting the recently renovated Scott Aquarium. This exhibit features modern elements, which includes the use of movies, audio soundbites, rotating static graphics on a screen, and permanent static graphics.

This study utilized a participant-oriented evaluation model. Data was collected over a course of eight consecutive days during regular operating hours. Participants were recruited during their visit prior to entering the aquarium. A total of 134 participants fully participated in the study. Sixty-six percent of participants held at least a bachelor's degree and 61% were female. Fifty percent of participants reported visiting the zoo two times per year and 41% visit monthly or more.

Participants were placed equally into one of two conditions: one that completed a pre- and post-assessment and one that only completed an assessment at the conclusion of their visit. Each assessment contained the same questions, which examined information presented by the interpretive elements within the exhibit space. The initial assessment was completed before entering into the exhibit and consisted of a pre-test and the development of a Personal Meaning Map (PMM). Upon exiting the exhibit area, participants completed a post-test and were allowed to revise their PMM. Some participants were randomly selected to wear a video recording device while in the exhibit space.

Participants self-reported how often they engage with educational components within an exhibit space. Twenty-four percent stated they always look at signage within an exhibit, 23% stated they often or frequently do, and 47% of participants stated they sometimes or infrequently look at signage. When asked how they would prefer to learn

about animals, 11% of participants stated educational signage and 15% stated videos. Forty-three percent stated they would prefer to interact with a live person.

Chi-square tests of independence were performed to determine whether the likelihood of engaging with interpretive elements was associated with educational background or frequency of visiting the zoo. Video recording data for individual participants were examined for social interactions and utilization of educational media. Additionally, time spent performing major behaviors, such as looking at animals or looking at the media, was measured in seconds. An activity budget was then developed and used for analysis.

Education level was associated with the likelihood of interacting with educational and interpretive media,  $\chi^2(15, N=144) = 23.917, p < .05$ ; individuals with baccalaureate-degrees were more likely than expected to engage with the media. There were no associations between frequency of zoo visit and the likelihood of interacting with educational media  $\chi^2(15, N=144) = 14.282, p > .05$ . The relation between gender and likelihood of engaging with media was not significant;  $\chi^2(3, N=144) = 2.341, p > .05$ .

Static graphics demonstrated a change in visitor knowledge from the pre-test to the post-test that was not significant,  $t(133) = -1.06, p > 0.05$ . However, movies demonstrated a significant change in visitor knowledge,  $t(66) = -2.28, p < 0.05$ . When participants were asked to provide a statement about what they learned during their exhibit experience, 38% were able to provide a correct, specific statement, such as “jellyfish populations are increasing due to climate change.” A majority of correct responses were information presented in the movies with audio. Twenty percent of individuals noted that they enjoyed the videos within the building.

Data from the video analysis demonstrated that on average, participants remained in the exhibit area for a total of 21 minutes (range: 12–30 minutes). During their time within the exhibit space, the collective group of participants looked at the educational media, on average, a total of 13 times ( $SD=7.06$ ) for a total of 125 seconds ( $SD=109.55$ ). Approximately 10% of the visitor’s time within the exhibit area was spent engaged with the interpretive elements, while a majority (62%) of time was spent looking at animals. Of the 10% of time spent looking at the educational media, roughly 8% of this time was devoted to watching videos. On average, participants engaged in three social interactions as a result of engaging with the interpretive elements. On average, participants were able to hear audio presenting educational messages for approximately 15% of their experience. Two of the three most common locations for stopping in the exhibit space were near videos, both with and without narration.

The inclusion of audio and moving images appears to have increased the likelihood of interacting with interpretive elements compared to static graphics. In addition, the inclusion of videos within the exhibit space helps to promote knowledge transfer in adult visitors. Effectiveness may be attributed to the enclosed space and close proximity visitors to the media as well as the media to animal exhibits.

IN MY OPINION



# I Believe, Therefore I Am!

Excerpted from the forthcoming book, *Belief: A Challenge to Science*

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*“Interpretation forges emotional and intellectual connections between the audience and the meanings inherent in the resource.”*

—NAI Definition of Interpretation

René Descartes’s *cogito ergo sum*, “I think therefore I am,” is generally credited as the foundation of rational thinking. Unfortunately, it is also viewed as a rejection of belief. However, true rational thinking would never discard any concept as being unworthy of deep analysis. “Deep interpretation” is an expression of a belief that if we want our messages to stick, to have lasting value, they have to be able to penetrate the belief system of the recipient. When this fails to happen, the message may still be highly informative, wildly entertaining, even memorable, but it will not have a high likelihood of being provocative. Without provocation, interpretation fails its primary mission of encouraging change—change in appreciation at a minimum, but hopefully, change in our desire to learn more, to challenge, and to become advocates.

With provocation as our goal, tapping into the belief system of others can be as simple as asking “What do you believe about wolves?” (or whatever it is that you are interpreting). The answers can be fascinating, but what’s really interesting is that you very quickly learn that many people have a deep reluctance to articulate their beliefs and to express themselves publicly. Beliefs are personal. Sharing them makes us vulnerable. So, it may be better to begin by sharing one of your own beliefs—not a fact—a belief. Of course we can believe a fact, but that’s really a copout. The scientist who discovered that fact is more likely to regard it as an approximation, knowing that contradictory “facts” can always come along. So, to avoid the copout, you’d really have to explain why you believe it more than does the scientist<sup>1</sup>. This requires a little searching because, unfortunately, we’ve never been encouraged to examine our beliefs for what they really are, an amazing window on ourselves. But, even before that can happen, we have to have a better understanding of the incredible importance of our beliefs—how they operate and how they influence every

facet of our lives. We have a powerful, and unfortunate, need to separate belief from logic, to treat them as separate realms. It's totally arbitrary. We believe in logic and in science. Science could not operate without our belief in it and its own beliefs, however flawed, in peer reviews, and that it can find answers. So, where do the underlying beliefs come from?

THE NEED TO BELIEVE is as primal a need as is the need to survive and the need to procreate. Abraham Maslow<sup>2</sup> rejected belief as a basic human need. He consequently failed to see basic needs to procreate and to eat as something more than physical acts. Without nurturing, raising, and protecting, all of which require some form of belief in individual and communal responsibility, procreation and survival ultimately fail. Without believing that certain things are safe to eat and others are not, we would have never seen the dawn of civilization—itsself a belief in the need for community.

THE POWER OF BELIEF is undoubtedly humankind's greatest strength. Without a belief in science, how could science exist and get funded? Science got us to the moon only because we believed it to be possible. Science can end wars, but it takes a strong belief to start them. Medical miracles happen in the same way; the Placebo Effect<sup>3</sup> is 100 percent belief. Belief is what got us here. We can, therefore, believe our future into reality, personally and collectively, for both good and bad.

THE ORIGIN OF BELIEF, or more precisely, the origin of the ability to believe, is genetic<sup>4</sup>. The ability to believe is inseparable from the ability to think. We are endowed with an open operating system that runs on what gets imprinted into it. From our earliest days we believed that our mothers would protect us from danger while also believing in the reality of danger and in our inability to protect ourselves. This openness to imprinting stays with us throughout our lives, and is the basis for our belief in the efficacy of experience and education.

THE EVOLUTION OF BELIEF is a necessity flowing from the need to survive. If we were incapable of modifying our beliefs we would be in severe physical danger and lack the ability to compete in our changing world. We are constantly shedding and fine-tuning our beliefs, from the tooth fairy and Santa Claus to believing that good behavior is its own reward. A large part of our being rational lies in our abilities to doubt and to discard outdated beliefs.

THE ECOLOGY OF BELIEF recognizes our human need for trust and companionship; it is the foundation stone of community. A community of like-minded people, whether they be scientists or activists for day-care, share a common bond—a bond that opens the door to effective communication. We are linked, with varying degrees of strength, to a wide variety of communities. And those communities are similarly linked to other communities in a vast network of believers.

THE COMFORT OF BELIEF comes from the reassurance our beliefs give us through knowing who we are, that we are worthwhile, a part of something bigger than ourselves, and that there is a better future. The act of sharing our beliefs is a source of comfort, whether through communal prayer, activism, debate, interpretation, or caring for another. When we plant a seed, there is comfort in believing it will grow and spread more seeds; otherwise why would we bother?

THE PERSONALITY OF BELIEF, or, "we are what we believe," is our signature, our psychological fingerprint. Our complex belief system of hundreds of beliefs is uniquely, individually, ours. It's what makes us introverts and extroverts, progressives or conservatives, humans not machines. The sharing of a belief is always a personal statement, far more human and vulnerable than the sharing of an opinion, an attitude, or a judgment.

THE PURPOSE OF BELIEF is to provide order in an unbelievably disorderly world. From order comes happiness; and our lifelong pursuit of happiness is sanctioned and endorsed by our Declaration of Independence. Order is never perfect, as we've seen from Maslow's classification of human needs, and from the psychologists' separation of attitudes, opinions, and beliefs. But, along with Reinhold Niebuhr's Serenity Prayer, they're probably pretty good starting points. However, they are only starting points.

THE MAGIC OF BELIEF and believing, is fundamental to the human needs for self expression, self actualization, and creativity. By believing in ourselves, we are tapping into that magic, becoming risk-takers in what would otherwise be a monotonously dreary life. Each of us has a magic kingdom that we can visit anytime we wish, and there discover that the future belongs to those who believe in their dreams.

THE TENSION OF BELIEVING is that element called "doubt," allowing our beliefs to grow and even be discarded. Doubt is also the very essence of rational thinking and science. It opens the door to discriminating between a good belief and a bad one. A good belief is one that contributes to our health without doing damage to those communities we are a part of, including the natural world. Without that essential tension in our beliefs, we would be very dogmatic, unattractive, humans.

THE UBIQUITY OF BELIEF would be boring if it weren't so endlessly amazing. We are awash in a sea of beliefs, our own and those of others, and are rarely even aware of it. Political beliefs, marketing beliefs, science beliefs, education beliefs, child-rearing, investments, religion, health, and environmental beliefs batter our every wakeful moment. We believe in the efficacy of traffic controls, in the stock market, and in airplane mechanics we've never met. Is it any wonder that we seldom take the time to examine our own beliefs except in the sometimes-shocking context of those of others?

In one of the many remarkable paradoxes that characterize human nature, our love for the thrill of frontiers has yet to extend to studying the frontier of belief. The literature on any of these eleven facets of belief is unbelievably slim. Even more curiously, the profession of interpretation has not jumped into the void and assumed the leadership in addressing this gulf. However, that should not stop us from appreciating the exciting potential of dabbling in the waters of belief and perhaps provoking a eureka moment or two as researchers and interpreters.

It may be that we have become a society of doubters who no longer trust the authority of science, the leadership of politicians, and the promises of corporations. But, it may also be that politicians, corporations, and scientists could learn a thing or two from the profession of interpretation, a profession that has, over the years, earned the public trust not through the science of its methods, but through the passion of its beliefs. It shares those beliefs and that passion because it deeply cares.

In my opinion, interpretation is more art than science. And, by "art" I mean: "a truth powerfully rendered." Because interpretation is an art, it has a special connection to the visitor—a connection not necessarily stronger than science, but different, going directly to the heart. If the science of interpretation seeks to do more than scratch the surface of that relationship it must seek to understand it. That very special relationship allows us to learn from visitors. If there is a meaning inherent in the resource to visitors it will resonate with their beliefs. What are beliefs of the schoolchild, the first-time visitor, the volunteer, the student, the artist, the potential benefactor? What are the beliefs of the litterer, the vandal, the thief of public property, the disturber of the peace, the violator of rules? Interpretation is all about sharing—sharing information, sharing concerns, sharing heritage, sharing

beauty. With provocation our goal, and sharing our medium, let us “Provoke Sharing,” and stop worrying about the rarity of inflicting interpretation. Until we appreciate the role of belief in interpretation, we will never get beyond studying the method of interpretation.

If I were to do just one thing to improve the grabbing power of my messages, I’d share a short personal belief along with a message on the back of a business card, saying: *I believe, therefore I am!* Such a message was used in the preamble to *Americans Outdoors: The Legacy and the Challenge*<sup>5</sup>: “We believe that the outdoors is a statement of the American Condition.” Now, what do we believe about interpreting that statement?

*Will LaPage is an NAI Fellow and the author of Rethinking Park Protection: Treading the Uncommon Ground of Environmental Beliefs, CABI, London, 2012; and Parks for Life: Moving the Goal Posts, Changing the Rules, and Expanding the Field, Venture Publishing, State College, PA, 2007.*

Further references on the role of belief and disbelief in understanding, see also:

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Dodd, Ray. (2003). *The Power of Belief: Essential Tools for an Extraordinary Life*. Hampton Roads Publishing, Alexandria, VA.

Fine, Cordelia. (2006). *A Mind of its Own: How Your Brain Distorts and Deceives*. W. W. Norton and Co., New York.

Lipton, Bruce. (2005). *The Biology of Belief: Unleashing the Power of Consciousness, Matter, and Miracles*. Mountain of Love/Elite Publishers, Santa Rosa, CA.

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Mooney, Chris. “The Science of Why We Don’t Believe Science.” *Mother Earth News*, May–June 2011.

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## Notes

1. See: Atul Gawande, The Mistrust of Science. *The New Yorker*, News Desk. June 10, 2016
2. See: Simply Psychology. Maslow’s Hierarchy of Needs. Saul McCloud. 2007–2014.
3. See: Web MD. What is the Placebo Effect? “It is due to the patient’s expectations (beliefs).”
4. See: *The Biology of Belief: Unleashing the power of consciousness*. Bruce Lipton. 2005. Elite Books.
5. *The Report of The President’s Commission on The American Outdoors*. Island Press. 1987.

# Appendix: Manuscript Submission

## *Instructions to Authors*

### **Purpose**

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

### **General Information**

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

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

Additionally, the *Journal* will publish thought pieces that exhibit excellence and offer original or relevant philosophical discourse on the state of heritage interpretation. The “In My Opinion” section of the *Journal* encourages the development of the profession and the practice of interpretation by fostering

discussion and debate. Submissions for the “In My Opinion” section should be limited to 1,000 to 1,200 words and will be reviewed by the editor and two associate editors.

### **Research Manuscript Submission Guidelines**

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

#### *Manuscripts*

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

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

#### *Titles*

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

#### *Affiliation*

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

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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](http://www.interpnet.com/JIR)).

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

Examples of references:

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

Ryan, C. & Dewar, K. (1995). Evaluating the Communication Process Between Interpreter and Visitor. *Tourism Management*, 16(4): 295-303.

Tilden, F. (1977). *Interpreting Our Heritage* (2nd ed.). Chapel Hill: University of North Carolina Press.

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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.

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

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### **Contact**

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