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# Evaluating Best Practices for Interpretive Programs in the National Park Service

Emily Martin

Clemson University, ebmartin28@gmail.com

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EVALUATING BEST PRACTICES FOR  
INTERPRETIVE PROGRAMS IN THE  
NATIONAL PARK SERVICE

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A Thesis  
Presented to  
the Graduate School of  
Clemson University

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In Partial Fulfillment  
of the Requirements for the Degree  
Master of Parks, Recreation and Tourism Management  
Parks and Conservation Area Management

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by  
Emily Benson Martin  
December 2012

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Accepted by:  
Dr. Robert B. Powell, Committee Chair  
Dr. Marc J. Stern  
Dr. Jeffrey C. Hallo

## ABSTRACT

Since its inception, interpretation in parks and protected areas has been used to achieve a variety of desired visitor outcomes, including enhanced satisfaction, visitor experience, and behavioral change. A large body of literature has been developed regarding effective techniques and desirable styles for conducting interpretive programs. However, despite the amount of this literature, as interpretation progresses into the 21<sup>st</sup> century, a gap has been identified between empirical support for interpretation's "best practices" and their links to desired outcomes. This study aims to isolate those practices that are necessary for producing desired outcomes in national park visitors. National Park Service interpretive programs offered over the summer of 2011 are the unit of analysis and setting for this study. Quantitative analysis of these programs was employed to understand visitor reactions to various types and styles of program presentation. This was achieved using visitor surveys and researcher observations. Results led to a better understanding of specific best practices that lead to desired outcomes. Additionally, results may advance stewardship and support for individual parks and the National Park Service as a whole.

# DEDICATION

This thesis is dedicated to Lucy. I hope we visit many more national parks together.

## ACKNOWLEDGMENTS

I would first like to thank my committee, Dr. Bob Powell, Dr. Marc Stern, and Dr. Jeff Hallo, for their tireless involvement and guidance with this project. I would also like to extend thanks to my research partner Jenn Thomsen and to the team from Virginia Tech, Kevin McLean and Beth Mutchler, for working so hard through summer 2011 and beyond to collect and analyze our data.

I also would like to thank the National Park Service and the hundreds of park personnel we met for their support of this project.

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# INTRODUCTION

## BACKGROUND

Interpretation has been defined by the National Association for Interpretation as “a mission-based communication process that forges emotional and intellectual connections between the interests of the audience and the meanings inherent in the resource.” Since its inception, interpretation, especially in parks and protected areas, has been used to achieve a multitude of goals. These include increasing visitor knowledge of an area (e.g., Powell & Ham, 2008), minimizing impacts to resources (e.g., Marion & Reid, 2007), and fostering long-term stewardship behaviors (e.g., Wallace & Gaudry, 2002). Interpretation has been used in parks as an unobtrusive and positive addition to law enforcement by instilling respect for resources in visitors. A large body of literature has been developed on effective techniques and desirable styles for conducting interpretive programs.

Despite the amount of literature covering the above topics, researchers have identified a gap between empirical support for interpretations’ best practices and their link to desired outcomes (Powell et al. 2010, Knapp & Benton, 2004). Many promoted best practices may not be used effectively in real interpretive settings, leading researchers to debate what true best practices produce desired outcomes (Knapp & Benton, 2004). For example, some researchers suggest that the field has settled into a largely “one-way” form of communication rather than instigating a dynamic two-way communication channel between the audience and the interpreter (Knapp & Benton, 2004; Rogers, 1983).

As a relatively young field, researchers and practitioners are still trying to identify the key elements of interpretation necessary to achieve desired outcomes (Larsen, 2008).

A study by Machnik (2007) explored this gap by examining what interpretive practices lead to long-term attitudes or actions among visitors. Interpreters were interviewed about expectations they held concerning practices that best led to memorable experiences. Visitors to interpretive programs were then contacted eight months after their experience to assess their perceptions of the program. Findings confirmed the idea that interpretation can have lasting effects on park visitors when interpreters actively engage their audience. This was a valuable step in exploring the true outcomes of interpretive programs, and it leads to asking how interpreters can design and deliver their programs in a way that engages visitors.

In 2010, Powell, Skibins, and Stern reviewed research that measured the impact of interpretation on satisfaction, awareness, knowledge, attitudes, intentions, and behavior. In the same review, they identified best practices associated with each interpretive program. This was intended to isolate empirically-supported best practices that were linked to particular outcomes. They suggested that while these best practices were supported by research, this support appears circumstantial because they were rarely isolated and explicitly field tested (Powell et al., 2010).

## PURPOSE OF STUDY

This study aims to address the gap between empirical support for interpretations' best practices and their link to desired outcomes, and to isolate those interpretation practices that are associated with producing desired outcomes in national park visitors. A better understanding of the specific best practices that lead to desired outcomes may improve the practice of interpretation within the National Park Service (NPS) and advance stewardship and support for individual parks and the National Park Service as a whole.

## RESEARCH QUESTIONS

1. What best practices in interpretation are being utilized in the National Park Service and to what extent?
2. What best practices consistently lead to desired outcomes?

## II. LITERATURE REVIEW AND THEORETICAL FOUNDATION

### THE CONCEPT AND PURPOSE OF INTERPRETATION

Interpretation is a vital and often poorly understood program by managers in the NPS (Beck & Cable, 2002; Knapp & Benton, 2004; Stewart et al., 1998). It has been used to achieve many goals, including increasing visitor knowledge of an area (e.g., Powell & Ham, 2008), minimizing impacts to resources (e.g., Marion & Reid, 2007), and fostering long-term stewardship behaviors (e.g., Wallace & Gaudry, 2002).

Interpretation began as a poetic means to connect people with elements of nature (Beck & Cable, 2002; Knapp & Benton, 2004). Enos Mills was among the first “nature guides” to begin developing the practice of interpretation in the late 1800s (Beck & Cable, 2002). These early efforts often employed artistic language to describe factual resources and events (Beck & Cable, 2002). Later, Freeman Tilden (1957) contributed to developing the field by publishing six guiding “principles of interpretation.” These principles are still used today and are as follows:

1. Interpretation must be relevant.
2. Information alone does not constitute interpretation.
3. Interpretation is an art, and is therefore teachable.
4. The chief aim of interpretation is not instruction but provocation.

5. Interpretation must present a whole rather than a part of any picture.
6. Interpretive programs for children should have a fundamentally different design than adult programs. (Tilden, 1957)

Many other contributions have been made to the practice of interpretation since Tilden (e.g., Beck & Cable, 2002; Brochu & Merriman, 2002; Ham, 1992; Larsen, 2003; Lewis, 1981 in Beck & Cable, 2002). While researchers can generally define interpretation, there is a wide range of perspectives about how to use interpretation as an effective tool for producing desired outcomes (Knapp & Benton, 2004; Orams 1994, 1995 in Madin & Fenton, 2004). By the late 1990s interpretation was known to enhance visitor experiences, but there still was little understanding about how that enhancement took place (Stewart et al., 1998). Many past studies on interpretation focused on how much information visitors were able to recall following a program (e.g., Hughes & Saunders, 2005; Moscardo, 1999; Peake, Innes, & Dyer, 2009; Stewart et al., 1998). This ignores the wide variety of roles interpretation can play in increasing stewardship, decreasing harmful behavior, and forging the connections that Tilden promotes.

Using sense of place theory, Stewart, Hayward, and Devlin (1998) explored how interpretation influenced a sense of place. They found that even a short encounter with park interpretation can increase visitors' sense of place (Stewart et al., 1998). While this study moved away from fundamental information recall, they only delved into a small, isolated portion of the relationship between interpretation and park visitors. Their final thoughts on their study emphasized that well-designed interpretation could have

significant impacts on the way visitors perceive and behave in protected areas (Stewart et al., 1998). But what makes interpretation well-designed and effective? Beck and Cable (2002) attempted to build on Tilden's six principles by creating nine additional practices for interpreting natural and cultural resources. Beck and Cable's (2002) work included numerous case studies and examples addressing each principle; however, as suggested by the researchers, a need still existed for a deeper, more cohesive understanding of the visitor's interpretive experience.

Many studies began to address this issue by examining the complexity of the interpretive experience in parks and investigating outcomes beyond simple information recall (Brody et al., 2002, Frauman & Norman, 2003; Knapp & Benton, 2004; Madin & Fenton, 2004). Brody, Hall, and Tomkiewicz (2002) conducted a study in Yellowstone National Park, basing their research on the idea that previous knowledge is the most important factor affecting new learning. Frauman and Norman (2003) explored "mindful" design of interpretation in nature centers as a tool for increasing visitors' practice of sustainable behaviors. Madin and Fenton (2004) looked at general impacts of interpretation on visitor perceptions of the Great Barrier Reef. While these studies provide support for claims about best practices, they do not isolate particular best practices that may be more widely applied to varying contexts.

With the push in the National Park Service to standardize training for interpreters, there was a call for a defined set of empirically-supported best practices (Knapp & Benton, 2004). In 2004, Knapp and Benton, in an effort to develop a more standardized

set of best practices, conducted research investigating multiple case studies to explore successful interpretive techniques. However, one limitation was the way that they measured success, which pertained to whether or not the interpreter perceived his or her program to be successful (Knapp & Benton, 2004). Relying on interpreters' perceptions of success has the potential to be biased and may not accurately reflect the true influence of a program (Anderson & Blahna, 1996; Combs, 1999; Graft, 1989 in Machnik, 2007). Knapp and Benton also conducted semi-structured interviews with interpreters about their educated opinions about best interpretive practices. However, results provided only vague and broad techniques that were difficult to operationalize in a training program or practical guide and were skewed by the fact that it was the interpreters, not the visitors, who indicated that these were effective techniques.

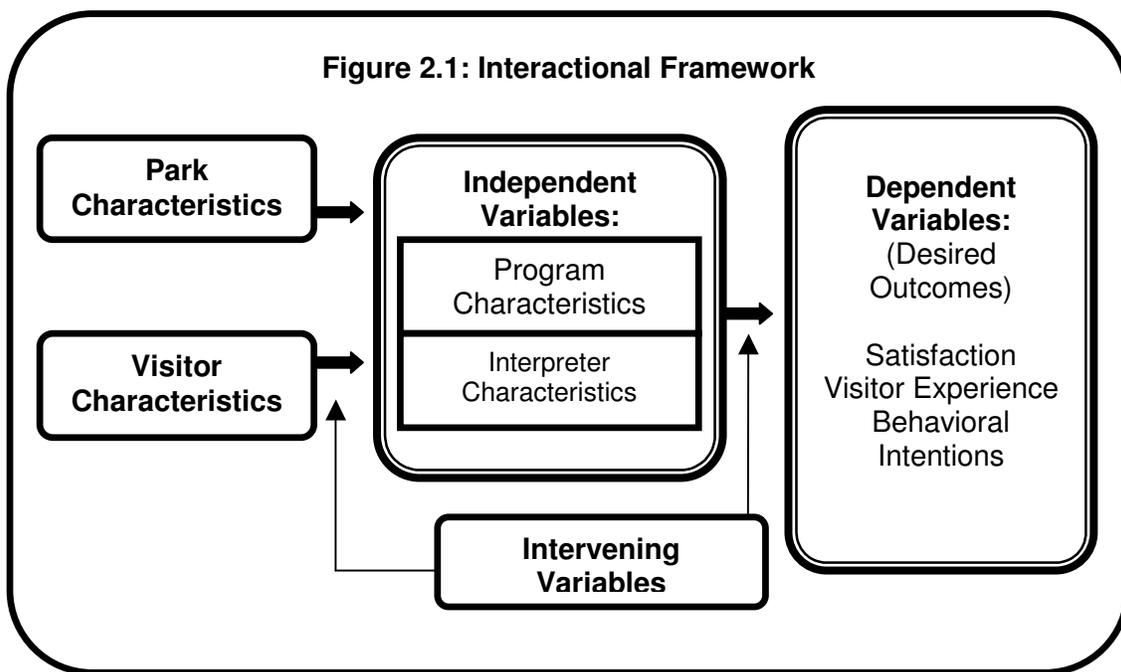
The finding from Knapp and Benton's 2004 study that most significantly informs this proposed research is the identification of a gap between literature and practice. This study suggests that trained interpreters know what makes an effective presentation (Knapp & Benton, 2004). However, practices that interpreters mentioned in interviews were largely absent when researchers observed them delivering programs (Knapp & Benton, 2004). Thus, there is a gap between what is thought to be successful and what is actually being implemented in the field (Knapp & Benton, 2004; Orams 1994, 1995 in Madin & Fenton, 2004). Knapp and Benton concluded by suggesting that field assessment of best practices should be the next step in interpretation research (2004).

Following Knapp and Benton's research, a handful of other studies explored the relationships between visitor outcomes and interpretive programs (Machnik, 2007; Ortiz, 2007). These helped clarify many aspects of interpretation that were directly useful to interpreters, such as why some visitors do not attend programs (Ortiz, 2007). However, there was little cohesiveness across research. Each study was isolated to one or a few parks or environments. From 2008 to 2010, the *Journal of Interpretation Research* continued to contain mostly theoretical and conceptual articles and limited case studies. This has created an incomplete puzzle that still has the majority of its pieces missing. As the National Park Service overhauls its training process and continues to adapt to changing society, administrators and interpreters need a more complete understanding of interpretation practices and their influence on visitors (Larsen, 2008). As a field, interpretation is still growing and maturing (Widner Ward & Wilkinson, 2006). Research needs to continue to push it forward, identify true best practices, and recognize the complexity of the interpretation experience.

## INTERACTIONAL THEORY

Park interpretation inherently involves an interactional system between visitor, ranger, program, and setting characteristics. This relationship between the socio-physical environment and the individual is the basis for interactional theory (Cassidy, 1997; and Stokols & Altman, 1987 in Powell et al., 2009). Interactional theory suggests that desired outcomes of interpretive programs are influenced by an interactive exchange between visitors, park characteristics, program characteristics, and interpreter characteristics (Altman & Rogoff, 1987; Williams et al., 1988; Archer & Wearing, 2003; Knopf, 1983;

and Arnould & Price, 1993 in Powell et al., 2009; Wearing & Wearing, 2001). This provides the theoretical basis for this research. Adapted from Powell et al., (2009), figure 2.1 provides a diagram of the hypothesized interactive relationships between key variables. The entire model was not tested in this research; rather, the independent variables “Program Characteristics” and “Interpreter Characteristics,” and their effects on “Desired Outcomes,” were the items being used.



## BEST PRACTICES REVIEW

Multiple best practices for interpretation are hypothesized in recent literature. These best practices are widely assumed to lead to certain desired outcomes and produce generally positive reactions to park programs. They range from fundamental program basics to creative techniques to facilitate engagement and meaning-making. A total of 20 best practices were identified from relevant sources and defined for this study. These

practices were explored through an intensive review of literature and were selected based on their potential for influencing visitor outcomes (Powell et al, 2010). These desired outcomes include satisfaction, awareness, knowledge, attitude, behavioral intentions, and behavior (Powell et al, 2010). The first 16 practices may be applied to all outcomes, and the last 4 specifically relate to behavioral intentions and behavior. The 20 best practices are described below.

### *Clear Theme*

This practice refers to an interpretation delivery system having a discernible theme (Beck & Cable, 2002; Brochu & Merriman, 2002; Ham, 1992; Knudson, et al., 2003; Larsen, 2003; Lewis, 2005; Moscardo, 1999; Sharpe, 1976; Tilden, 1957; Veverka, 1998; Widner Ward & Wilkinson, 2006). The Interpretive Development Program (IDP) defines a theme as a tool that develops ideas in order to inspire connections (NPS Module 101). According to the IDP, interpretive themes:

- Are single sentences that express meaning;
- Are links between tangible and intangible meanings;
- Provide organization for interpretive products;
- Are tools that are most powerful when they link a tangible resource to a universal concept.

A theme provides an audience the opportunity to create their own meanings and connections (Larsen, 2003). Without a theme, programs tend to be disjointed and haphazard bits of related information (Larsen, 2003).

### *Appropriate Sequence and Transitions*

This refers to a program following an explicit and easy-to-understand sequence (Beck & Cable, 2002; Ham, 1992; Jacobson, 1999; Larsen, 2003; Widner Ward & Wilkinson, 2006). Programs that contain interesting information may be ineffective if not organized properly (Beck & Cable, 2002). Organization should be focused on supporting theme statements and should develop opportunities for connections to resources (Larsen, 2003). One of the most straightforward ways to do this is through well-developed sections of the presentation, such as introduction, sequence, and transitions (Brochu & Merriman, 2002; Ham, 1992).

### *Links to Intangibles and Universals*

Interpretation should make a link between tangible and intangible ideas and resources and connect them to universal concepts (NPS Module 101; Beck & Cable, 2002; Brochu & Merriman, 2002; Ham, 1992; Knudson, et al., 2003; Larsen, 2003; Lewis, 2005; Moscardo, 1999; Tilden, 1957; Widner Ward & Wilkinson, 2006). A tangible resource, as described by the IDP, can be objects, people, places, or events (NPS Module 101). Intangibles are ideas, meanings, or significance that tangible resources represent (NPS Module 101.) Universals are concepts that many audience members may identify with, such as love, home, or family (NPS Module 101).

### *Multisensory*

This refers to program elements that engage two or more senses (Knudson, et al., 2003; Lewis, 2005; Moscardo, 1999; Tilden, 1957; Veverka, 1998). Involving as many senses as possible can enhance the likelihood that visitors will move past intellectual connections alone (Beck & Cable, 2002).

### *Actively Engage Audience*

Audience members should be engaged and actively participating in a program (Knudson, et al., 2003; Moscardo, 1999; Sharpe, 1976; Tilden, 1957; Veverka, 1998). This can include being physically, verbally, or cognitively engaged (Knudson, et al., 2003; Moscardo, 1999; Sharpe, 1976; Tilden, 1957). An engaging program includes visitors through various forms of participation, including incorporating their senses and allowing them to share their own knowledge in appropriate ways (Widner Ward & Wilkinson, 2006). Ideas and attitudes are best adopted by individuals when communication includes a dynamic, two-way interaction rather than a static, one-way transmission of a message (Rogers, 1983).

### *Multiple Modes of Delivery*

This suggests that interpreters should do more than simple first-person delivery (Knudson, et al., 2003; Moscardo, 1999). This may involve Powerpoint or other visual tools (Knudson et al., 2003; Moscardo, 1999). Different kinds of delivery modes that appeal to varying senses provide opportunities for each audience member's unique

learning style (Knapp & Benton, 2004). Four major learning styles include auditory, kinesthetic, visual, and tactile (Knudson, et al., 2003; Moscardo, 1999; Widner Ward & Wilkinson, 2006). Due to researcher discrepancies in coding this variable, it was eliminated from analyses and results.

### *Multiple Activities*

Literature suggests that programs should incorporate different activities to appeal to the varying learning styles mentioned above (Knapp & Benton, 2004; Moscardo, 1999; Widner Ward & Wilkinson, 2006). The primary way this practice differs from multiple modes of delivery is that multiple activities should provide opportunities for direct audience involvement. Multiple activities may be included in multiple modes of delivery.

### *Relevance to Audience*

It is thought that programs should be relevant to an audience's needs and interests (Beck & Cable, 2002; Brochu & Merriman, 2002; Ham, 1992; Jacobson, 1999; Knapp & Benton, 2004; Lewis, 2005; Moscardo, 1999; NPS Module 101; Sharpe, 1976; Tilden, 1957; Veverka, 1998). Relevance refers to using a message or theme that is related to a context or event that is familiar and important to an audience (Widner Ward and Wilkinson, 2006). NPS interpreters surveyed about best practices regularly listed relevance as a high priority (Knapp & Benton, 2004). Relevance has also been called "meaning-making" in recent years (Beck & Cable, 2002).

### *Novelty and Surprise*

Novelty and surprise can enhance messaging and increase attentiveness of the audience (Beck & Cable, 2002; Jacobson, 1999; Knapp & Benton, 2004). Delivery is considered novel when information is presented in an unusual or unexpected way (Beck & Cable, 2002; Frauman & Norman, 2003; Knapp & Benton, 2004; Moscardo, 1999). Surprise, on the other hand, refers to unexpected or contrasting messages (Beck & Cable, 2002; Moscardo, 1999).

### *Place Based Messaging*

Interpretive programs should focus on the resources of a park or context and be grounded in the uniqueness of that location (Beck & Cable, 2002; Knudson, et al., 2003; Lewis, 2005; Moscardo, 1999; NPS Module 101; Sharpe, 1976). This builds a connection between audiences and these resources and fosters mindfulness (Moscardo, 1999 in Frauman & Norman, 2003). Even poorly designed programs that contain place-based messages can develop visitors' value-in-context (Peake, Innes, & Dyer, 2009). It should be noted that researchers encountered measurement issues with this variable, resulting in dropping from our analyses to preserve reliability and validity.

### *Engagement with the Resource*

This practice suggests that audiences should be given opportunities to directly interact with resources when appropriate (Beck & Cable, 2002; Knudson, et al., 2003; Lewis, 2005; Moscardo, 1999; NPS Module 101; Sharpe, 1976; Tilden, 1957). Visitors

who are mindful of their recreation site may be more likely to develop stewardship attitudes toward it (Moscardo, 1999 in Frauman & Norman, 2003). This engagement may occur in a physical, cognitive, or verbal way.

### *Multiple Viewpoints*

Interpretive programs are encouraged to deliberately present multiple views of a resource, issue, or event, particularly if they are controversial or perceptions vary across cultures or context (Beck & Cable, 2002; Brochu & Merriman, 2002; Tilden, 1957). The North American Association for Environmental Education (NAAEE, 2010) stresses that programs should be focused on education rather than direct advocacy, so that individuals can develop their own meanings.

### *Affective Messaging*

In addition to factual accuracy, programs should appeal to audiences' emotions (Jacobson, 1999; Lewis, 2005; Tilden, 1957; Widner Ward & Wilkinson, 2006). Hughes and Morrison-Saunders (2005) mention that most park visitors do not have science backgrounds and are not interested in deep intellectual enlightenment. In the current "age of information," interpreters must be able to convey information in a way that evokes emotion and imagination (Beck & Cable, 2002; Madin & Fenton, 2004).

### *Provocation*

This refers to a program that explicitly provokes participants to personally reflect on content and the deeper meanings it presents (Tilden, 1957; Widner Ward &

Wilkinson, 2006). Provocation is one of Tilden's (1957) six foundational principles; he emphasizes that interpretation should not seek to instruct but rather to stimulate visitors to widen and deepen their knowledge and interests. Provoking visitors to want to learn more on their own is often a main goal of interpretation (Widner Ward & Wilkinson, 2006).

### *Holistic Story*

This practice refers to having all information presented tie back to a holistic story (Beck & Cable, 2002; Ham, 1992; Tilden, 1957). Storytelling is an effective way to make a program enjoyable without becoming pure entertainment, and a holistic story that is used throughout a program may help support a theme (Tilden, 1957). Additionally, as Tilden (1957) expresses, a holistic story may allow an audience to engage more fully with a program, as it "becomes their story as much as [the interpreter's]."

### *Behavior-Oriented Practices*

Some practices identified in the literature are intended to alter behaviors or attitudes of visitors. These practices draw support from the Theory of Planned Behavior, developed by Ajzen in 1988 (Ajzen, 1991). This theory identifies three factors that influence behavior intentions, which then influences behavior actions (Ajzen, 1991). These factors are attitudes towards the expected outcome of the behavior, perceived social or subjective acceptance of performing the behavior, and perceived behavioral control (Ajzen, 1991). The interpretive practices listed below address these three factors with the intent to encourage visitors to adopt certain actions.

### *Demonstrates Benefits of Action*

When a program is designed to alter audience behaviors, it should clearly explain the benefits of performing desired actions (Ajzen, 1991; Ham et. al., 2007; Jacobson, 1999; Knudson, et al., 2003; Moscardo, 1999). In a 2009 study conducted by Peake, Innes, and Dyer, guide-suggested action was a significant factor in influencing people to adopt pro-conservation behaviors.

### *Social Norms*

Programs that include information on how desired actions are supported by influential individuals and groups may be more effective in altering audience behaviors (Ajzen, 1991; Ham et. al., 2007; Jacobson, 1999; Knudson, et al., 2003; Moscardo, 1999).

### *Ease of Action*

Programs designed to change behaviors may need to emphasize the ease of performing a desired action (Ajzen, 1991; Ham et. al., 2007; Jacobson, 1999; Knudson, et al., 2003; Moscardo, 1999; Tilden, 1957). The Theory of Planned Behavior suggests that perceived ease of a desired action is based on past experiences as well as anticipated future obstacles (Ajzen, 1991).

### *Demonstrates Action*

Literature suggests that interpretive programs that seek to influence behaviors explicitly demonstrate a desired action to audiences (Ajzen, 1991; Beck & Cable, 2002;

Knudson, et al., 2003; Moscardo, 1999; Sharpe, 1976; Widner Ward & Wilkinson, 2006).

Demonstrating an action may enhance visitors' perceived behavioral control by increasing chances of their success in performing said action (Rogers, 1983).

### III. METHODS

#### SITE SELECTION

All parks included in this study were units within the National Park Service. These included national parks, national historic sites, national cultural sites, and national memorials. All programs surveyed were conducted by the interpretation division, and were led primarily by park rangers, interns, or volunteers, as well as a few concessionaires.

Park units included in this study were systematically selected to ensure variability based on the following criteria: geographic location; urban vs. rural; cultural vs. natural; and visitor makeup and volume. Six clusters of park units were selected based on these criteria and with NPS approval: Northern California, South Dakota, Missouri-Illinois, Washington DC, Southwest, and Mid-Atlantic (see Table 3.1 for full list of units).

<b>Table 3.1: Park Units Included in Study</b>			
Park Unit	Resource Focus	Park Location	Annual Recreation Visits <sup>a</sup>
Aztec Ruins National Monument	Cultural	Urban	37,437
Badlands National Park	Natural	Remote	977,778
Bryce Canyon National Park	Natural	Remote	1,285,492
Chaco Culture National Historical Park	Cultural	Remote	34,226
Ford's Theater National Historic Site	Cultural	Urban	662,298
Fort McHenry National Monument and Historic Shrine	Cultural	Urban	611,582
Gettysburg National Military Park	Cultural	Rural	1,031,554
Grand Canyon National Park	Natural	Remote	4,388,386
Great Smoky Mountains National Park	Mix	Rural	9,463,538
Harpers Ferry National Historical Park	Cultural	Rural	268,822
Independence National Historical Park	Cultural	Urban	3,751,007
Jefferson National Expansion Memorial	Cultural	Urban	2,436,110
Jewel Cave National Monument	Natural	Remote	103,462
Lincoln Home National Historic Site	Cultural	Urban	354,125
Manassas National Battlefield Park	Cultural	Rural	612,490
Mesa Verde National Park	Mix	Remote	559,712
Mount Rushmore National Memorial	Cultural	Remote	2,331,237
National Mall	Cultural	Urban	1,363,389
Navajo National Monument	Mix	Remote	90,696
Point Reyes National Seashore	Natural	Rural	2,067,271
San Francisco Maritime National Historical Park	Cultural	Urban	4,130,970
Ulysses S. Grant National Historic Site	Cultural	Urban	39,967
Wind Cave National Park	Natural	Remote	577,141
Yosemite National Park	Natural	Rural	3,901,408

<sup>a</sup> Annual visitation from 2010 (<http://www.nature.nps.gov/stats/>)

## SITE DESCRIPTIONS

Aztec Ruins National Monument is located in northwest New Mexico and preserves a set of cultural ruins that are now situated in an urban area ([www.nps.gov](http://www.nps.gov)).

Interpretation focuses on the cultural and archaeological history of the site

(www.nps.gov). In recent years, Aztec has received between 40,000 and 90,000 visitors per year (www.nps.gov).

Badlands National Park, in southern South Dakota, protects both prairie land and ancient fossil beds (www.nps.gov). Interpretive programs are primarily natural, focusing on geological and paleontological aspects of the park (www.nps.gov). Badlands receives almost a million visitors each year (www.nps.gov).

Bryce Canyon National Park is found in southern Utah (www.nps.gov). Its main focus (natural) is on the park's unique geologic formations, known as hoodoos (www.nps.gov). Other interpretive programs cover the cultural history of the area and the night sky (www.nps.gov). Bryce receives roughly 1 million visitors a year (www.nps.gov).

Chaco Culture National Historic Park is located in northwest New Mexico (www.nps.gov). It preserves multiple cultural and archaeological sites and provides programs interpreting several of these sites (www.nps.gov). The park generally sees between 35,000 and 80,000 visitors a year (www.nps.gov).

Ford's Theater National Historic Site is located in Washington DC (www.nps.gov). Program focus is cultural; the site preserves the historic site of Abraham Lincoln's assassination (www.nps.gov). Visitation averages around 600,000 visitors per year (www.nps.gov).

Fort McHenry National Monument and Historic Shrine is in Maryland ([www.nps.gov](http://www.nps.gov)). It preserves the cultural resources related to the Battle of Baltimore and the inspiration for the “Star Spangled Banner” ([www.nps.gov](http://www.nps.gov)). Visitation averages around 600,000 visitors per year ([www.nps.gov](http://www.nps.gov)).

Gettysburg National Military Park is located in Pennsylvania ([www.nps.gov](http://www.nps.gov)). It preserves cultural resources related to the Battle of Gettysburg ([www.nps.gov](http://www.nps.gov)). Visitation averages around one million visitors per year ([www.nps.gov](http://www.nps.gov)).

Great Smoky Mountains National Park is located on the border between North Carolina and Tennessee ([www.nps.gov](http://www.nps.gov)). It preserves a mix of cultural and natural resources related to the diverse bioregion and human history of the southern Appalachian mountains ([www.nps.gov](http://www.nps.gov)). Visitation averages around nine million visitors per year ([www.nps.gov](http://www.nps.gov)).

Harpers Ferry National Historic Park is located at the confluence of West Virginia, Virginia, and Maryland ([www.nps.gov](http://www.nps.gov)). It preserves cultural resources of this historic community ([www.nps.gov](http://www.nps.gov)). Visitation averages around 200,000 visitors per year ([www.nps.gov](http://www.nps.gov)).

Independence National Historic Park is located in Philadelphia, Pennsylvania ([www.nps.gov](http://www.nps.gov)). It preserves cultural resources related to the founding of the United States ([www.nps.gov](http://www.nps.gov)). Visitation averages around four million visitors per year ([www.nps.gov](http://www.nps.gov)).

Grand Canyon National Park runs for 277 miles along the Colorado River in northern Arizona ([www.nps.gov](http://www.nps.gov)). Its primary resources include the geologic and natural features of the canyon, as well as human history and culture ([www.nps.gov](http://www.nps.gov)). The park sees over 4 million visitors each year, with the heaviest visitation occurring on the easily accessible South Rim ([www.nps.gov](http://www.nps.gov)).

Jefferson National Expansion Memorial, more commonly known as the Gateway Arch, is located in St. Louis, Missouri ([www.nps.gov](http://www.nps.gov)). Interpretation (cultural) focuses primarily on westward expansion and the role of St. Louis in this expansion ([www.nps.gov](http://www.nps.gov)). Visitation averages around two million visitors per year ([www.nps.gov](http://www.nps.gov)).

Jewel Cave National Monument is located in southwest South Dakota and contains the second-longest cave in the world ([www.nps.gov](http://www.nps.gov)). Program focus is natural; interpreters lead guided tours of different areas of the cave ([www.nps.gov](http://www.nps.gov)). The monument sees about 100,000 visitors each year ([www.nps.gov](http://www.nps.gov)).

Lincoln Home National Historic Site is found in Springfield, Illinois ([www.nps.gov](http://www.nps.gov)). It showcases one of former president Abraham Lincoln's homes, as well as several other historic homes ([www.nps.gov](http://www.nps.gov)). Cultural interpretation programs lead house and neighborhood tours, as well as provide historic demonstrations ([www.nps.gov](http://www.nps.gov)). The site receives around 300,000 to 400,000 visitors per year ([www.nps.gov](http://www.nps.gov)).

Manassas National Battlefield Park is located in Virginia ([www.nps.gov](http://www.nps.gov)). It preserves cultural resources from the Civil War ([www.nps.gov](http://www.nps.gov)). Visitation averages around 600,000 visitors per year ([www.nps.gov](http://www.nps.gov)).

Mesa Verde National Park, found in southwest Colorado, protects numerous archaeological sites and cliff dwellings ([www.nps.gov](http://www.nps.gov)). The park's cultural interpretive program provides structured guided tours of several dwellings ([www.nps.gov](http://www.nps.gov)). Visitation is roughly 550,000 visitors per year ([www.nps.gov](http://www.nps.gov)).

Mount Rushmore National Memorial is found in southwest South Dakota ([www.nps.gov](http://www.nps.gov)). It memorializes four United States presidents in a large-scale, iconic sculpture ([www.nps.gov](http://www.nps.gov)). Interpretation (cultural) primarily focuses on the work of the presidents and the carving of the memorial ([www.nps.gov](http://www.nps.gov)). The memorial sees roughly two million visitors a year ([www.nps.gov](http://www.nps.gov)).

The National Mall is located in Washington DC ([www.nps.gov](http://www.nps.gov)). It preserves and interprets cultural resources related to the capital of the United States ([www.nps.gov](http://www.nps.gov)). Visitation averages around one million visitors per year ([www.nps.gov](http://www.nps.gov)).

Navajo National Monument, located in northeast Arizona, preserves several cultural ruins ([www.nps.gov](http://www.nps.gov)). Cultural interpretive programs take visitors to see cave dwellings, as well as present Navajo lore and land use ([www.nps.gov](http://www.nps.gov)). The monument sees between 50,000 and 100,000 visitors a year ([www.nps.gov](http://www.nps.gov)).

Point Reyes National Seashore is located in California ([www.nps.gov](http://www.nps.gov)). It preserves diverse natural resources along the west coast ([www.nps.gov](http://www.nps.gov)). Visitation averages around two million visitors per year ([www.nps.gov](http://www.nps.gov)).

San Francisco Maritime National Historic Park is located in California ([www.nps.gov](http://www.nps.gov)). It preserves cultural resources related to west coast maritime history ([www.nps.gov](http://www.nps.gov)). Visitation averages around four million visitors per year ([www.nps.gov](http://www.nps.gov)).

Ulysses S. Grant National Historic Site, located outside of St. Louis, Missouri, preserves one of the homes of former president Ulysses Grant ([www.nps.gov](http://www.nps.gov)). Interpretive rangers lead cultural tours of the house and discuss Grant's time in the house ([www.nps.gov](http://www.nps.gov)). The site receives between 20,000 and 40,000 visitors each year ([www.nps.gov](http://www.nps.gov)).

Wind Cave National Park, located in southwest South Dakota, preserves the fifth-longest cave in the world and its unique boxwork formations ([www.nps.gov](http://www.nps.gov)). Interpretive programs (natural) lead visitors on guided tours through parts of the cave ([www.nps.gov](http://www.nps.gov)). Wind Cave receives between 500,000 and 700,000 visitors each year ([www.nps.gov](http://www.nps.gov)).

Yosemite National Park is located in California ([www.nps.gov](http://www.nps.gov)). It preserves and interprets great natural resources in one of the country's earliest wilderness parks ([www.nps.gov](http://www.nps.gov)). Visitation averages around four million visitors per year ([www.nps.gov](http://www.nps.gov)).

## PILOT TESTING

In May 2011, pilot testing was conducted in Great Smoky Mountains National Park. Four programs were audited by researchers, followed by extensive discussion and refinement of best practice scales and definitions. This was done to ensure reliability and validity, as well as to develop consistency across researchers. Videos of interpretive programs given in an undergraduate interpretation class were also audited and then discussed.

## SAMPLING AND SURVEY ADMINISTRATION PROCEDURES

Park units were organized by geographic region into six “clusters”. Two teams of 2 researchers collected data from each park unit. One team of researchers sampled Great Smoky Mountains National Park and the mid-Atlantic, Washington D.C., and California units. The other team sampled the Southwest, Midwest, and South Dakota units.

The unit of analysis for this study was interpretive programs at each site. Programs were selected using purposive sampling. Criteria for selecting programs were based on achieving variability across interpreters and program topics.

Data concerning best practices exhibited in park interpretive programs was collected using a program audit that was completed by researchers during and immediately following interpretive programs (see Appendix A).

Visitor surveys were administered to visitors following each program (see Appendix B). Prior to each program, a researcher introduced him- or herself to the group and provided a brief synopsis of the study. The researcher then informed the audience

that he or she would be administering surveys immediately following the program and asked for visitors to complete the surveys if they had time. After the program, the researcher actively approached as many of the attendees as possible and distributed surveys and pencils to those willing to participate. Only visitors fourteen years and older were given the survey. Completed surveys were collected and placed in labeled envelopes.

In addition to this post-program survey, pre-program surveys were administered to an independent sample of visitors by park volunteers. This was a shorter survey designed to capture a representative baseline of visitor perceptions and attitudes toward various desired outcomes prior to seeing an interpretive program in order to compare with the results of the post-program surveys. At each park, volunteers were asked to survey all visitors in attendance at ten programs. Completed surveys were then mailed back to researchers by the Chief of Interpretation at each park unit. Although researchers did have full participation of many parks, an insufficient number of these surveys were administered at most park units to create a reliable baseline, so these data were dropped from further analysis and only the post surveys were used to inform the results of this research.

#### DATA CLEANING AND DETERMINATION OF FINAL SAMPLE OF PROGRAMS

Post-program surveys and program audits were coded and entered into Microsoft Access Database and Microsoft Excel to facilitate data entry. Data was then transferred to SPSS for screening and analysis.

Researchers collected 3,603 surveys from visitors who attended interpretation programs included in this study. Data from these surveys were screened for missing values and any cases missing more than 50% of the items per factor were removed. A total of 118 cases were removed as a result. Data were then screened for univariate and multivariate outliers following Tabachnick & Fidell (2007) using Mahalanobis Distance (MAH) and studentized deleted residuals (SDRESID). A total of 58 cases were removed for exceeding  $\pm 3$  S.D., or the criterion Mahalanobis Distance value. The final number of individual surveys used for our analyses was  $N = 3,427$ .

Because this research uses the program as the unit of analysis, researchers next had to determine how many completed surveys within a particular program would serve as a viable reflection of the quality of that program and its impacts on visitors. Prior research suggests that programs with particularly small numbers of attendees may be inherently different than programs with larger numbers of attendees (Forist 2003; McManus 1987, 1988; Moscardo 1999). In particular, programs with fewer than five attendees may have a high likelihood of serving only a single cohesive group (e.g., a single family). Meanwhile, programs with five or more have a higher likelihood of being comprised of multiple groups. Moreover, a greater number of observations of visitor responses enhances the reliability of the research findings. Based on this rationale, researchers removed programs with fewer than 5 attendees from the sample. This resulted in the removal of 45 programs. For programs with five or more attendees, we included all groups with ten or more respondents to the surveys. We only included those programs with less than 10 respondents if the number of respondents represented at least half of the

eligible respondents at the program. For example, if there were 8 attendees who were all eligible to take the survey, at least 4 surveys would need to be collected. This removed an additional 58 programs, yielding a total of 272 programs for analysis. We employed these rules to enhance the reliability of visitors' responses for each program.

## SURVEY DESIGN

### *Independent Variables*

The program audit, or researcher survey, first documented basic observable demographics of the program and attendees. These included program length, location, time, type, and focus, as well as group size and age ratio. It also documented the occurrence of any bad weather or Junior Ranger activities. It then determined to what extent each best practice was employed in each program. Each best practice that was formulated during the literature review went through an operationalization process. Many practices were broken down into individual characteristics suggested by the literature in order to gather more detailed information from the field. Each practice was then given its own scale to best capture variability within that practice.

Extreme ends of each scale were determined using empiric definitions and examples. Scales and operational definitions were iteratively formulated over the course of several weeks as researchers determined how to best capture variability and ensure reliability and validity. See Table 3.2 for a list of operationalized best practices.

Table 3.2: Operationalized List of Best Practices (IVs)		
Program Characteristic	Operational Definition	Scoring
<b>Introduction quality</b> (Brochu & Merriman, 2002; Ham, 1992; Jacobson, 1999)	Degree to which the introduction oriented audience to the program and captured audience's attention.	3= Oriented audience and captured attention 2= Minimally oriented audience; did not necessarily capture attention 1= Poorly executed
<b>Appropriate logistics</b> (Jacobson, 1999; Knudson et al., 2003)	Degree to which basic audience and program needs were met (i.e., restrooms, weather, technology, etc).	4= Well planned and appropriate 3= Audience/program needs mostly addressed 2= Needs marginally addressed 1= Needs not met
<b>Appropriate for audience</b> (Beck & Cable, 2002; Jacobson, 1999; Knudson et al., 2003)	Degree to which the program aligned with audience's level of knowledge, interest, and experience	5= Very appropriate 4= Appropriate 3= Moderately appropriate 2= Only slightly appropriate 1= Not appropriate
<b>Appropriate sequence</b> (Beck & Cable, 2002; Ham, 1992; Jacobson, 1999; Larsen, 2003)	Degree to which the program followed a logical sequence.	4= Enhanced messaging 3= Appropriate 2= Choppy 1= Distracted from messaging
<b>Transitions</b> (Beck & Cable, 2002; Brochu & Merriman, 2002; Ham, 1992; Jacobson, 1999; Larsen, 2003)	Degree to which program used appropriate transitions that kept the audience engaged and did not detract from the program's sequence.	4= Enhanced messaging and were smooth 3= Appropriate 2= Forced or irrelevant 1= Distracted from messaging or not present
<b>Intangibles and universals</b> (NPS Module 101; Beck & Cable, 2002; Brochu & Merriman, 2002; Ham, 1992; Knudson, et al., 2003; Larsen, 2003; Lewis, 2005; Moscardo, 1999; Tilden, 1957; Widner Ward & Wilkinson, 2006)	Intangibles: ideas, meanings, or significance that tangible resources represent Universals: concepts that most audience members may identify with	5= Extensively developed; powerful concepts 4= Well developed 3= Present but weak 2= Difficult to detect or slightly used 1= Clearly not present
<b>Multisensory:</b> (Beck & Cable, 2002; Knudson, et al., 2003; Lewis, 2005; Moscardo, 1999; Tilden, 1957; Veverka, 1998)	Degree to which the program intentionally engaged audience's five senses.	2= Three or more senses included 1= Two senses included 0= Only one sense included

<b>Physical engagement</b> (Beck & Cable, 2002; Knudson, et al., 2003; Lewis, 2005; Moscardo, 1999; NPS Module 101; Sharpe, 1976; Tilden, 1957)	Degree to which the program physically engaged audience members in a participatory experience; i.e., through touching or interacting with resource.	4= Central programming element 3= Occurred multiple times 2= Minimal effort to engage 1= No efforts
<b>Verbal engagement</b> (Knudson, et al., 2003; Moscardo, 1999; Sharpe, 1976; Tilden, 1957; Veverka, 1998)	Degree to which the program verbally engaged audience members in a participatory experience; i.e., a two-way discussion.	5= Central programming element 4= Occurred multiple times 3= Modestly engaged 2= Minimal effort to engage 1= No efforts
<b>Cognitive engagement</b> (Knudson, et al., 2003; Moscardo, 1999; Sharpe, 1976; Tilden, 1957; Veverka, 1998)	Degree to which the program cognitively engaged audience members in a participatory experience beyond simply listening; i.e. calls to imagine something, reflect, etc.	5= Central programming element 4= Occurred multiple times 3= Modestly engaged 2= Minimal effort to engage 1= No efforts
<b>Multiple activities</b> (Knapp & Benton, 2004; Moscardo, 1999; Widner Ward & Wilkinson, 2006)	Degree to which the program consisted of a variety of activities and opportunities for direct audience involvement (not including dialogue).	4= 2+ primary activities included 3= 2+ secondary activities included 2= One secondary activity included 1= One activity only
<b>Multimodal</b> (Knudson, et al., 2003; Moscardo, 1999)	Degree to which the program catered to multiple learning styles; audience was engaged in a different form of receiving messages.	2= Explicit/purposeful inclusion 1= Included by chance or in passing 0= Not included
<b>Props</b> (Jacobson, 1999; Knapp & Benton, 2005; Ham, 1992)	A visual aide beyond a screen-based slideshow.	Yes or No
<b>Relevance to audience</b> (Beck & Cable, 2002; Brochu & Merriman, 2002; Ham, 1992; Jacobson, 1999; Knapp & Benton, 2004; Lewis, 2005; Moscardo, 1999; NPS Module 101; Sharpe, 1976; Tilden, 1957; Veverka, 1998)	Degree to which the program communicated the relevance of the subject to the lives of the audience.	5= Major focus of messaging 4= Well developed efforts 3= Moderate efforts 2= Minimal efforts 1= No efforts

<b>Place-based messaging</b> (Beck & Cable, 2002; Knudson, et al., 2003; Lewis, 2005; Moscardo, 1999; NPS Module 101; Sharpe, 1976)	Degree to which the program emphasized the connection between the visitor and the site/resource. The resource in question could be tangible or intangible.	5= Central focus of messaging 4= Well-developed connection through repetition and engagement 3= Moderately emphasized through repetition or engagement 2= Slightly developed verbally 1= Not developed
<b>Affective messaging</b> (Jacobson, 1999; Lewis, 2005; Madin & Fenton, 2004; Tilden, 1957; Widner Ward & Wilkinson, 2006)	Degree to which the program communicated emotion, based on quantity rather than quality.	5= Central programming element 4= Frequent and repeated messages 3= Occasional messages 2= Minimal effort to include messages 1= Messages absent
<b>Fact-based messaging</b> (Frauman & Norman, 2003; Jacobson, 1999; Lewis, 2005; Tilden, 1957; Widner Ward & Wilkinson, 2006)	Degree to which the program communicated factual information.	4= Solely fact-based 3= Frequent and repeated messages 2= Occasional messages 1= Minimal or absent
<b>Surprise</b> (Beck & Cable, 2002; Moscardo, 1999)	Degree to which the program used the element of surprise in communication. This could include “aha” moments or unexpected or contrasting messages.	3= Major element 2= Minor element 1= Not used
<b>Novelty</b> (Beck & Cable, 2002; Frauman & Norman, 2003; Knapp & Benton, 2004; Moscardo, 1999)	Degree to which the program presented novel ideas, techniques, or viewpoints as an element of communication; i.e., using a device not usually associated with or related to resource.	3= Major element 2= Minor element 1= Not used
<b>Provocation</b> (Beck & Cable, 2002; Brochu & Merriman, 2002; Knudson, et al., 2003)	Degree to which the program explicitly provoked participants to personally reflect on content and its deeper meanings.	4= Powerful and explicit inclusion 3= Occasional inclusion 2= Isolated or vague inclusion 1= No attempt made
<b>Multiple viewpoints</b> (Beck & Cable, 2002; Brochu & Merriman, 2002; Tilden, 1957)	Degree to which the program explicitly acknowledged multiple perspectives or uncertainty within a theme or message. (Primarily for controversial messaging; when an argument is made, was a relevant counter-argument provided?)	3= Multiple viewpoints developed; none given clear priority 2= Primarily one viewpoint, with some focus on others 1= No effort NA

<b>Benefits of action</b> (Ajzen, 1991; Ham et al., 2007; Jacobson, 1999; Knudson, et al., 2003; Moscardo, 1999; Peake et. al, 2009)	Degree to which the program emphasized the potential benefits resulting from performing a particular action(s).	4= Explicitly/purposefully emphasized 3= Mentioned a moderate amount 2= Explained a little 1= No mention NA
<b>Costs of action</b> (Ajzen, 1991; Ham et al., 2007; Jacobson, 1999; Knudson, et al., 2003; Moscardo, 1999; Peake et. al, 2009)	Degree to which the program emphasized the potential costs resulting from performing a particular action(s).	4= Explicitly/purposefully emphasized 3= Mentioned a moderate amount 2= Explained a little 1= No mention NA
<b>Norms of action</b> (Ajzen, 1991; Ham et. al., 2007; Jacobson, 1999; Knudson, et al., 2003; Moscardo, 1999)	Degree to which the program emphasized the social acceptability of performing a particular behavior or desired action.	4= Explicitly/purposefully emphasized 3= Mentioned a moderate amount 2= Explained a little 1= No mention NA
<b>Ease of action</b> (Ajzen, 1991; Ham et. al., 2007; Jacobson, 1999; Knudson, et al., 2003; Moscardo, 1999; Tilden, 1957)	Degree to which the program communicated the ease (or difficulty) of performing a particular behavior or desired action.	4= Explicitly/purposefully emphasized 3= Mentioned a moderate amount 2= Explained a little 1= No mention NA
<b>Demonstrates action</b> (Ajzen, 1991; Beck & Cable, 2002; Knudson, et al., 2003; Moscardo, 1999; Sharpe, 1976; Widner Ward & Wilkinson, 2006)	Degree to which the program provided examples of, or opportunities for, performing a desired action.	4= Majority of audience engaged 3= Demonstration by ranger or small proportion of audience 2= Verbal description 1= No mention/demonstration NA
<b>Holistic story</b> (Beck & Cable, 2002; Larsen, 2003; Tilden, 1957)	Degree to which the program aimed to present a whole rather than a part.	5= All messaging tied to story 4= Some info did not relate to story 3= No single holistic story 2= Some stories used 1= No storytelling attempt
<b>Introduction and conclusion linkage</b> (Beck & Cable, 2002; Brochu & Merriman, 2002; Larsen, 2003)	Degree to which program connected introduction to conclusion in an organized or cohesive way (i.e., program “came full circle.”)	4= Enhanced messaging 3= Linked, but didn’t enhance messaging 2= Weakly linked 1= Disconnected

<b>Clear theme</b> (Beck & Cable, 2002; Brochu & Merriman, 2002; Ham, 1992; Jacobson, 1999; Knudson, Cable, & Beck, 2003; Larsen, 2003; Lewis, 2005; Moscardo, 1999; Sharpe, 1976; Tilden, 1957; Veverka, 1998; Widner Ward & Wilkinson, 2006)	Degree to which the program had a single sentence (not necessarily explicitly stated) that linked tangibles, intangibles, and universals to organize and develop ideas.	4= Theme is clearly communicated 3= Easy to detect, but not well developed 2= Difficult to detect, ambiguous 1= Unclear/not present
<b>Central message</b> (Beck & Cable, 2002; Brochu & Merriman, 2002; Jacobson, 1999)	Degree to which program's message(s) (more broad or "inspiring" than theme) was clearly communicated; i.e., the "so what?" element of the program.	4= Clearly communicated and well developed 3= Easy to detect, but not well developed 2= Difficult to detect, ambiguous 1= Unclear/not present
<b>Consistency of tone</b> (Beck & Cable, 2002; Ham, 1992)	Program tone overall was consistent; inconsistencies were not based on the element of surprise but rather a tonal shift.	3=Consistent 2=Some tonal shifts 1=Inconsistent/unclear
<b>Consistency of quality</b> (Beck & Cable, 2002; Ham, 1992)	Program quality overall was consistent.	3=Consistent 2=Some quality breaks 1=Inconsistent/unclear
<b>Pace</b> (Jacobson, 1999)	Degree to which the pace of the program allowed for clarity and did not detract from the program.	3=No issues 2=Pace too fast at any point 1=Pace too slow at any point
<b>Overall quality</b>	Grand score for both interpreter and program characteristics.	10= Extremely high quality 5= Average 0= Extremely low quality
<b>Resource as an Icon</b>	Degree to which the resource where program took place is iconic of the park.	3= Contextually iconic or grandiose 2= Pleasant but not iconic 1= Unimpressive/generic

Note: Variables dropped from analyses due to low reliability included:

Multimodal, Multisensory: Taste, Multisensory: Smell, and Place-Based Messaging.

### *Dependent Variables*

Dependent variables were developed as retrospective assessments within the visitor survey based on desired visitor outcomes. Overall satisfaction with the program was

measured on an eleven point scale anchored by 0=Terrible and 10=Excellent. A range of other desired visitor outcomes (Table 3.3) were also assessed using questions that were measured using a 5 point likert type scale with answer choices of Not at all, A little, Somewhat, A moderate amount, and A great deal. The prompt for these read: “To what degree did the program you just attended influence any of the following for you?” Two questions were used to measure visitors’ intentions to change behaviors in the park and at home as a result of attending a program. These were “Changed the way I will behave while I’m in this park” and “Changed the way I will behave after I leave this park.” Other questions explored outcomes such as appreciation for park resources and the NPS, making visits more enjoyable and meaningful, caring for the park resources and preservation, increasing knowledge, and thinking deeply and reflecting on one’s life.

<b>Table 3.3: Outcome Questions, Mean Scores, and Standard Deviations</b>		
<b>Item</b>	<b>Mean</b>	<b>Standard Deviation</b>
Made me think deeply	3.78	1.04
Made me reflect on my own life	3.14	1.27
Enhanced my appreciation for this park	4.37	.79
Enhanced my appreciation for the National Park Service	4.26	.87
Made me more likely to avoid harming park resources	4.06	1.24
Increased my knowledge about the program’s topic	4.44	.79
Made my visit to this park more enjoyable	4.39	.71
Made my visit to this park more meaningful	4.48	.78
Changed the way I will behave while I’m in this park	2.96	1.52
Changed the way I will behave after I leave this park	2.94	1.49
Made me want to tell others about what I learned	4.05	.99
Made me care more about this park’s resources	4.06	1.06
Made me care more about protecting places like this	4.20	1.04

## IV. RESULTS

### REFINEMENT OF DEPENDENT VARIABLES

Following recommendations by Devellis (2003), researchers next conducted exploratory factor analysis of the 13 outcome questions in Table 3.3 using the individual respondent data base. Two factors were identified with Eigenvalues above 1 and they accounted for 65% of total variance. The first factor (visitor experience) included seven items: *Made my visit to this park more enjoyable; Made my visit to this park more meaningful; Enhanced my appreciation for this park; Increased my knowledge about the program's topic; Enhanced my appreciation for the NPS; Made me want to tell others about what I learned; and Made me care more about this park's resources.* The second factor (behavioral intentions) included three items: *Changed the way I will behave after I leave this park; Changed the way I will behave while I'm in this park; and Made me more likely to avoid harming park resources.* Reliability analysis using Cronbach's alpha was also performed for these items.

Next, researchers conducted Confirmatory Factor Analysis, which is a form of Structural Equation Modeling, to confirm the items within each factor and to develop the most parsimonious scales (Byrne 2006; Kline 2005). We used the EQS v6.1 software (Bentler 2005) to perform the statistical analyses, which progressed in several stages. First, data were screened for univariate and multivariate deviations from normality. Researchers also conducted tests looking for patterns in missing data. Next, the structure of items was tested using Confirmatory Factor Analysis. This is an explicit test of the

hypothesized model regarding which items would relate to each latent construct (visitor experience and intentions) and is an iterative process in which diagnostics provide potential modifications to the model until the best fit is identified.

The item, *Made me more likely to avoid harming park resources*, was eliminated from the intentions factor because of low factor loading. Eliminating this item meant that factor 2 (intentions) was under-identified. Consequently, this factor was respecified and fixed to 1. Next the items, *Made me want to tell others about what I learned*; and *Made me care more about this park's resources*, were eliminated from factor 1 (visitor experience) because of cross loadings with factor 2 (intentions). The resulting fit (S-B  $\chi^2=338.41$ ; CFI=.961; RMSEA=.076) was deemed acceptable. Finally, reliability analysis was conducted on the final scales (Visitor Experience [5 items] *Cronbach's*  $\alpha=.89$ ; Intentions [2 items] *Cronbach's*  $\alpha=.94$ ). For the resulting scales, please see Tables 4.3-4.5.

## REFINEMENT OF BEST PRACTICES

First, best practice frequencies were run and variables that had little to no variation were eliminated. These variables included Multisensory: Taste (0% variation) and Multisensory: Smell (5% variation). With this cleaned data, an exploratory factor analysis (principal components analysis) was performed (Table 4.1).

Table 4.1: Exploratory Factor Analysis Weighting								
Best Practice	Component							
	1	2	3	4	5	6	7	8
Affective Messaging	.811	.127	-.024	.164	.145	-.029	-.077	.105
Cognitive Engagement	.732	.153	.038	.121	.176	.137	.208	.199
Links to Intangibles and Universals	.729	.421	-.023	.030	.001	.061	-.006	.026
Relevance to Audience	.687	.285	.162	-.058	.034	.202	.017	-.024
Provocations	.662	.257	.001	.443	.133	-.031	-.113	.150
Fact-based Messaging	-.605	-.181	-.082	.017	-.017	.044	.174	.367
Multisensory	.401	-.071	.262	.272	-.082	.015	.377	-.192
Place-based Messaging	.400	.161	.174	.296	.325	-.099	.305	.385
Clear Theme	.193	.801	.049	-.092	.061	.012	.063	-.226
Appropriate Sequence	.067	.786	.030	.092	-.068	.162	-.012	.044
Link Between Intro and Conclusion	.176	.771	.079	.209	.159	.028	.078	-.032
Transitions	.194	.712	.032	.048	.055	.154	.060	.031
Holistic Story	.324	.563	-.083	.260	-.135	.075	-.112	.007
Quality of Introduction	.141	.535	.220	.023	-.014	.222	.024	.161
Clear Message	.339	.483	.069	.147	.437	-.108	-.057	.128
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 7 iterations.								

Reliability testing was then undertaken to develop composite variables that represented an overarching theoretical theme. From these analyses, new composite variables were computed by transforming the scales of all the variables within a grouping to ensure equal weighting within the new factor. Composite variables “Organization of Program” and “Connection to Audience” and their descriptive component breakdowns are shown in Tables 4.3 and 4.4. Individual best practice descriptive statistics are shown in Table 4.5.

### *Visitor Characteristics*

3,603 took the post-program survey. 50.7% of these visitors were female. 85.5% were Caucasian, 3.6% were Asian, 3.4% were Hispanic, 1.1% were Black, .5% were Native American, and 1.4% claimed to be “Other” or “Mixed.” The minimum age surveyed was 15 years old, while the oldest was 88. Mean age was 44.8 years old. Of these visitors, 51.6% were visiting parks with others, including children, 43.9% were visiting with others not including children, and 4.5% were visiting alone. Those who visited for less than one day made up 59.7%, while 24.1% visited for one to two days and 16% visited more than two full days. Visitors who had not previously attended a program in the park they were visiting made up 62.2% of the sample.

### *Desired Outcomes*

Table 4.2 displays means and standard deviations for satisfaction, visitor experience and appreciation, and behavioral change in programs with over five attendees. Means of satisfaction and visitor experience and appreciation are relatively high, indicating visitors generally have positive reactions to park programming.

<b>Table 4.2: Descriptive Statistics for Desired Outcomes</b>		
<b>Outcome</b>	<b>Mean</b>	<b>Standard Deviation</b>
Satisfaction*	8.94	.64
Visitor Experience/Appreciation**	4.43	.65
Behavioral Change**	2.96	1.47
*Scaled 0-10      **Scaled 1-5		

## RESEARCH QUESTION 1

The first question addressed by this research was: what best practices are being utilized and to what extent? All data collected from the 376 programs audited by the researchers in 24 parks visited were used to answer this question. Data pertaining to the program characteristics that were collected by researchers are assumed valid and reliable representations of the program attributes.

### *Program Characteristics and Best Practices*

The research teams attended a total of 376 programs in the 24 parks visited. The average duration of these programs was 45 minutes. Program foci were 69.1 % cultural, 21.5 % natural, and 8.9 % mixed. Programs mainly took place in the afternoon, with 54% occurring during this time. Morning programs made up 35.4%, 7.7% in the evening, and 2.9% after dark. As far as location was concerned, 70.2% were located outside, 21.3% were inside, and 8.5% were both inside and outside. Regarding program format, 60.4% were considered guided walks, 51.6% were talks, 3.2% had a hands-on element, and 1.1% included demonstrations. Regarding age ratios, 46% of programs consisted of mostly adults while 28.2% were an even mix of adults and children and 16.5% were all adults. Please note that these are non-exclusive categories.

Tables 4.3-4.5 display the means, standard deviations, and frequencies for program best practices, including composite variables “Organization of Program” and “Connection to Audience.”

### *Organization of Program*

“Organization of Program” is made up of individual variables that all tend to enhance effective organization. For example, the Interpretation Development Program states that a theme provides organization for an interpretive program (NPS Module 101). Similarly, clarity of a theme is easier to discern in a well-organized program. As shown in Table 4.3, the composite variable “Organization of Program” had a mean of 3.27 on a 5-point scale, a standard deviation of 0.70, and a Cronbach’s  $\alpha$  of 0.82. “Quality of Introduction” saw scores clustering around a 2, while “Appropriate Sequence,” “Effective Transitions,” and “Holistic Story” tended to have a greater concentration around 3, meaning they were employed somewhat regularly and effectively. “Clarity of Theme” was more spread out over 2 and 3, as was “Link Between Intro and Conclusion.”

Table 4.3: Descriptive Breakdown of "Organization of Program"							
Variable	Mean	St. Dev.	1	2	3	4	5
<b>Organization of Program</b> (Cronbach's $\alpha = .823$ )	3.28	0.70					
<b>Quality of Introduction</b> (Scaled 1-3) 1 = Introduction poorly executed; 3 = Introduction effectively oriented audience to program and captured audience's attention	2.08	0.45	6.1	79.5	14.4		
<b>Appropriate Sequence</b> (Scaled 1-4) 1 = Sequence detracted from messaging; 4 = Sequence enhanced messaging	2.77	0.69	2.9	29.0	55.9	12.2	
<b>Effective Transitions</b> (Scaled 1-4) 1 = Transitions detracted from presentation or not present; 4 = Transitions enhanced talk and were smooth	2.68	0.75	6.6	29.8	52.9	10.6	
<b>Holistic Story</b> (Scaled 1-5) 1 = Facts and information primarily / no attempt at storytelling; 5 = Holistic story used throughout / all information tied to story.	2.74	0.98	9.1	31.8	39.8	14.4	4.8
<b>Clarity of Theme</b> (Scaled 1-4) 1 = Theme unclear/not present; 4 = Theme is clearly communicated	2.76	0.86	5.3	35.4	37.2	22.1	
<b>Link Between Intro and Conclusion</b> (Scaled 1-4) 1 = Intro and conclusion were disconnected from each other; 4 = Intro and conclusion were linked in a cohesive way that enhanced messaging.	2.56	0.84	10.9	34.6	42.3	12.2	

### *Connection to Audience*

“Connection to Audience” relates to deep engagement and the core of Tilden’s foundational principles of interpretation (Tilden, 1957). Many of the individual elements, such as “Connection to Intangibles and Universals,” are purposefully included in programs to create meaning-making and push programs beyond simple information transmission (Beck & Cable, 2000; Brochu & Merriman, 2002; Ham, 1992). As shown in Table 4.4, the composite variable “Connection to Audience” had a mean of 2.72 on a

5-point scale, a standard deviation of 0.73, and a Cronbach’s  $\alpha$  of 0.867. “Connection to Intangibles and Universals” showed a fairly normal bell curve, clustering around the mid-range of the scale. Similarly, “Cognitive Engagement” and “Relevance to Audience” showed a relatively normal distribution, whereas “Affective Messaging” was employed less often in programs. “Provocation” was also skewed more towards the lower end of its scale.

<b>Variable</b>	<b>Mean</b>	<b>St. Dev.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Connection to Audience</b> (Cronbach’s $\alpha$ = .867)	2.73	0.73					
<b>Connection to Intangibles and Universals</b> (Scaled 1-5) 1 = Universal concepts clearly not present; 5 = Extensively developed connections to powerful universal concept(s)	2.83	0.93	7.0	29.7	39.5	21.1	2.7
<b>Cognitive Engagement</b> (Scaled 1-5) 1 = No efforts to cognitively engage audience; 5 = Cognitive engagement a central element of the programming	2.82	0.90	4.5	34.7	36.8	21.9	2.1
<b>Relevance to Audience</b> (Scaled 1-5) 1 = No efforts made to create relevance; 5 = Major focus of communication is on creating relevance	2.81	0.84	3.2	35.6	39.1	21	1.1
<b>Affective Messaging</b> (Scaled 1-5) 1 = Affective messages absent; 5 = Affective messaging a central element to program.	2.42	0.90	14.4	41.9	32.8	9.3	1.6
<b>Provocation</b> (Scaled 1-4) 1 = No attempt at provocation made; 4 = Powerful and explicit call(s) for personal reflection.	2.22	0.70	13.3	54.8	29.0	2.9	

### *Individual Best Practices*

Variables that did not cluster reliably in a composite variable were left as individual elements. “Appropriate for Audience” was heavily weighted on the upper half

of its scale. “Multisensory” shows that at least two senses were often employed in programs. “Physical Engagement” was very low, with 67.7% of programs not incorporating this practice. “Verbal Engagement” was spread mainly on the mid to lower portion of its scale. “Surprise” and “Novelty” were largely absent from programs, and “Central Message” tended to be present but perhaps difficult to discern.

Table 4.5: Descriptive Statistics of Individual Best Practices							
Variable	Mean	St. Dev.	1	2	3	4	5
<b>Appropriate for Audience</b> (Scaled 1-5) 1 = Not appropriate; 5 = Very appropriate	3.91	0.73	0.0	3.2	21.9	56	18.9
<b>Multisensory</b> (Scaled 1-3) 1 = one sense engaged; 3 = Three or more senses engaged	2.36	0.50	0.8	62.0	37.2		
<b>Physical Engagement</b> (Scaled 1-4) 1 = No efforts to physically engage audience; 4 = Physical engagement a central element of the programming	1.42	0.68	67.6	25.0	5.6	1.9	
<b>Verbal Engagement</b> (Scaled 1-5) 1 = No efforts to verbally engage audience; 5 = Verbal engagement a central element of the programming	2.50	0.97	16.2	34.0	34.8	13.3	1.6
<b>Surprise</b> (Scaled 1-3) 1 = Surprise not used; 3 = Surprise used as a major element to reveal connections or information	1.07	0.27	93.1	6.6	0.3		
<b>Novelty</b> (Scaled 1-3) 1 = Novelty not used; 3 = Novelty used as a major element to reveal connections or information	1.16	0.4	85.4	13.3	1.3		
<b>Central Message</b> (Scaled 1-4) 1 = Message(s) unclear/not present; 4 = Message(s) clearly communicated and well-developed.	2.15	0.90	25.3	42.7	23.4	8.6	

## RESEARCH QUESTION 1 SUMMARY

In short, the practices rangers are most often using in the field include: appropriate for audience, multisensory (sight, sound, and tactile), and organization of program. The least often used include: surprise, novelty, physical engagement, and the Theory of Planned Behavior practices.

## RESEARCH QUESTION 2

The second research question was: what best practices consistently lead to desired outcomes? To answer this question we examined the 272 programs that had more than 5 attendees and met the following criteria: had at least 10 respondents or had at least 50% of eligible respondents complete a survey.

To examine the relationship between each of the three program outcomes and interpretation best practices, we conducted a series of bivariate Pearson correlation analyses. Below (Tables 4.6-4.8) are the results of the Pearson correlation performed between best practices and the three desired outcomes. Correlation does not imply causation, but rather identifies which variables are associated with desired outcomes in a linear and consistent way.

### *Best Practices Associated with Satisfaction*

Visitors were asked to rate their satisfaction with programs that they attended using a 0 to 10 point scale, with 0 being “terrible” and 10 being “excellent.”

Table 4.6 shows best practice correlations in programs that contained five or more audience members. The best practice most highly correlated with satisfaction was “Appropriate for Audience.” “Organized” and “Connection to Audience” were the next two most highly correlated best practices. Following these were “Consistency of Program,” “Central Message,” “Verbal Engagement,” “Multisensory” and “Appropriate Logistics”. Finally, “Fact-based Messaging” was the one best practice that was negatively associated with satisfaction.

<b>Practice</b>	<b>N</b>	<b>Satisfaction</b>
Appropriate for Audience	271	.381**
Organized	270	.362**
Connection to Audience	261	.342**
Consistency of Program	272	.271**
Central Message	268	.255**
Verbal Engagement	234	.234**
Multisensory	272	.216**
Appropriate Logistics	272	.170**
Surprise	272	.150*
Novelty	272	.145*
Physical Engagement	272	.074
Resource Iconic	272	.077
Fact-based Messaging	272	-.170**
** . Correlation is significant at the 0.01 level (2-tailed).		
* . Correlation is significant at the 0.05 level (2-tailed).		

### *Best Practices Associated with Visitor Experience*

The quality of visitors' experience was measured by combining five individual survey items. The prompt for these read: "To what degree did the program you just attended influence any of the following for you?" Relevant items were as follows:

- "Enhanced my appreciation for this park"
- "Enhanced my appreciation for the National Park Service"
- "Increased my knowledge about the program's topic"
- "Made my visit to this park more enjoyable"
- "Made my visit to this park more meaningful"

Responses were based on a five point scale, with 1 = "not at all," 2 = "a little," 3 = "somewhat," 4 = "a moderate amount," and 5 = "a great deal."

Table 4.7 shows best practice correlations in programs that contained five or more audience members. The best practice most highly correlated with visitor experience was "Appropriate for Audience." "Consistency of Program" and "Connection to Audience" were the next two most highly correlated best practices. Also significant were "Appropriate Logistics," "Verbal Engagement," "Organized," and "Central Message."

<b>Practice</b>	<b>N</b>	<b>Visitor Experience</b>
Appropriate for Audience	271	.378**
Consistency of Program	272	.281**
Connection to Audience	261	.259**
Appropriate Logistics	272	.245**
Verbal Engagement	272	.240**
Organized	270	.219**
Central Message	268	.184**
Surprise	272	.151*
Physical Engagement	272	.120*
Multisensory	272	.115
Resource Iconic	272	.068
Novelty	272	.024
Fact-based Messaging	272	-.080
** . Correlation is significant at the 0.01 level (2-tailed).		
* . Correlation is significant at the 0.05 level (2-tailed).		

*Best Practices Associated With Behavioral Change*

Visitors were asked to rate anticipated changes to their behavior using two individual survey responses. The prompt for these read: “To what degree did the program you just attended influence any of the following for you?” The specific items were:

- “Changed the way I will behave while I’m in this park”
- “Changed the way I will behave after I leave this park”

Responses were based on a five point scale, with 1 = “not at all,” 2 = “a little,” 3 = “somewhat,” 4 = “a moderate amount,” and 5 = “a great deal.”

Although not included in the previous two dependent variable correlations, the Theory of Planned Behavior variables were included in this analysis because of the focus on behavioral intentions. As shown in Table 4.8, the best practice most highly correlated with behavioral change was “Cost of Action.” However, this variable, along with “Benefit of Action,” “Demonstrates Action,” and “Ease of Action” have very small sample sizes (N = 31). This makes it difficult to draw conclusions from these practices. The next significant correlations are “Central Message,” “Verbal Engagement,” “Appropriate Logistics,” and “Appropriate for Audience.” “Fact-based Messaging” was negatively correlated with behavioral change.

<b>Practices</b>	<b>N</b>	<b>Behavioral Change</b>
Cost of Action	31	.597**
Benefit of Action	31	.349
Central Message	268	.187**
Appropriate Logistics	272	.165**
Verbal Engagement	272	.162**
Appropriate for Audience	271	.153**
Multisensory	272	.141*
Organized	270	.132*
Surprise	272	.127*
Connection to Audience	261	.124*
Ease of Action	31	.124
Demonstrates Action	31	.116
Resource Iconic	272	.065
Physical Engagement	272	.061
Consistency of Program	272	.034
Novelty	272	.014
Social Norms	31	-.055
Fact-based Messaging	272	-.135*

\*. Correlation is significant at the 0.05 level (2-tailed).  
\*\*. Correlation is significant at the 0.01 level (2-tailed).

## EFFECT OF PROGRAM CHARACTERISTICS ON OUTCOMES

To explore the relationship between desired outcomes (Satisfaction, Visitor Experience, and Behavioral Change) and program characteristics, linear regression analyses were performed. The first regression examined the effect of program characteristics on satisfaction. The second examined the effect of program characteristics on visitor experience. The third examined the effect of program characteristics on behavioral change.

As shown in Table 4.9, results of the analyses indicated that certain program characteristics were important for predicting desired outcomes. The first analysis investigated the influence of program characteristics on satisfaction. “Appropriate for Audience” ( $\beta = .240$ ) and “Consistency” ( $\beta = .377$ ) were significant predictors of satisfaction and accounted for 15% of the variation. The second analysis investigated the influence of program characteristics on visitor experience. “Appropriate for Audience” ( $\beta = .132$ ) and “Consistency” ( $\beta = .191$ ) were significant predictors of visitor enjoyment and experience and accounted for 18% of the variation. The third analysis investigated the influence of program characteristics on behavioral change. “Appropriate Logistics” ( $\beta = .098$ ) and “Clear Message” ( $\beta = .114$ ) were significant predictors of change in behavioral intentions and accounted for 5% of the variation.

Variables	Satisfaction		Visitor experience and appreciation		Behavioral intentions	
	Stand. $\beta$	p	Stand. $\beta$	p	Stand. $\beta$	p
Appropriate for audience	.240	.000	.132	.000	--	--
Consistency	.377	.000	.191	.000	--	--
Appropriate logistics	--	--	--	--	.098	.022
Clear message	--	--	--	--	.114	.007
Model statistics	$R^2 = .153$		$R^2 = .176$		$R^2 = .054$	

## RESEARCH QUESTION 2 SUMMARY

In short, best practices that appear to lead to desired outcomes are as follows.

For satisfaction: Appropriate for Audience, Organization, Consistency, Logistics, Connection to Audience, Central Message, Verbal Engagement, Multisensory

For visitor enjoyment and experience: Appropriate for Audience, Consistency, Logistics, Organization, Verbal Engagement, Connection to Audience, Central Message, Surprise, Physical Engagement

For behavioral change: TPB Practices, Central Message, Verbal Engagement, Multisensory, Appropriate for Audience, Logistics, Organization, Surprise, Connection to Audience

## V. DISCUSSION

The two purposes of this study were to determine what best practices are being used and to what extent in the NPS, and to explore what elements of interpretive programming most consistently lead to desired outcomes.

### RESEARCH QUESTION 1

*What best practices in interpretation are being utilized and to what extent?*

The practice that was most widely seen was whether a program was *appropriate for an audience*. This shows that Maslow's hierarchy of needs is generally well implemented in the field (Maslow, 1954). Programs also tended to include at least two senses beyond simply listening to dialogue, although taste was never used and smell was used in less than 5% of programs.

*Organization* practices related to fundamental public speaking were also widely used. While *introductions* were used widely in their basic sense, they were generally average, with 80% rating a 2, or "introduction used minimally to orient audience to program; did not necessarily capture audience attention." These introductions rarely used a "hook" to engage audiences (Brochu & Merriman, 2002; Ham, 1992; Jacobson, 1999). Similarly, many additional organizational practices, such as *appropriate sequence* and *transitions*, were used frequently in their functional capacity. This shows that many practices have the potential to be implemented more effectively.

Practices that are designed to develop a *connection with the audience* tended to be used less often than basic organizational practices. While *connections to intangibles and universals, cognitive engagement, and audience relevance* were relatively normally distributed, some were implemented much less often. For example, in over half of the programs observed (69%), uses of *provocation* were either isolated and vague, or completely absent.

Among the least-used practices in programs were *surprise* and *novelty*, with 93% of programs not implementing *surprise* and 85% of programs not implementing *novelty*. *Physical engagement* was also quite low, with 68% of programs not including a physically engaging element. Also worth noting was the infrequency of using Theory of Planned Behavior practices, including communicating the *benefits of a desired action, costs of an action, social norms related to an action, ease of an action, and demonstrating an action*. These practices were observed in only 31 programs. This may be because TPB is a lesser-used framework in interpretation and may not be included in many rangers' field training.

## RESEARCH QUESTION 2

*What best practices consistently lead to desired outcomes?*

### *Satisfaction*

*Appropriate for audience* was the practice most highly correlated with visitor satisfaction in programs with over five attendees. This is consistent with much of the literature in the field stressing the importance of programs being relevant to audiences

(Beck & Cable, 2002; Brochu & Merriman, 2002; Ham, 1992; Jacobson, 1999; Knapp & Benton, 2004; Lewis, 2005; Moscardo, 1999; NPS Module 101; Sharpe, 1976; Tilden, 1957; Veverka, 1998). The *quality of organization*, which is a composite factor comprised of *quality of introduction, appropriate sequence, effective transitions, holistic story, clarity of theme, and link between introduction and conclusion*, was the second most highly correlated practice. This is also consistent with a large portion of interpretive literature (Beck & Cable, 2002; Brochu & Merriman, 2002; Ham, 1992; Jacobson, 1999; Larsen, 2003; Widner Ward & Wilkinson, 2006). Ham's EROT theory, which states that a program should be engaging, relevant, organized, and thematic, is particularly applicable to this finding (Ham, 1992). Beck and Cable (2002) also suggest that interesting programs may be ineffective if not organized properly. Similar practices that were also significantly correlated with satisfaction include *consistency* and *appropriateness of logistics* in the program. *Consistency* may help visitors know what to expect in a program and may even help assist other practices such as surprise or relevance. *Appropriate logistics* makes sure basic needs are met so that deeper engagement can take place. For example, a slide show that is delayed by fifteen minutes while the projector is fixed may irritate visitors and render the following program ineffective.

It is important to note, however, that correlation implies association rather than causation. It could be inferred that rangers are already aware of the importance of a well thought-out program, and that other variables are in fact the cause of satisfaction.

However, it is likely that a program with poor fundamentals may inhibit facilitation of desired outcomes.

Several practices that go beyond program basics and logistics were highly correlated with satisfaction. These include *connection to audience, clarity of central message, verbal engagement, and engagement of multiple senses*. *Connection to the audience* is a composite variable made up of *connection to intangibles and universals, cognitive engagement, relevance to audience, affective messaging, and provocation*. These practices all are designed to move programming past factual communication. *Intangibles and universals* connect audiences to shared emotions and meanings represented by a resource. Involving *multiple senses* creates more holistic engagement and a greater likelihood of meaning-making. This could be related to *relevance to the audience*, which allows an audience to understand a message through a context they are already familiar with. Many park visitors are not interested in deep intellectual enlightenment, which makes appeals to emotions even more important for achieving visitor satisfaction (Morrison-Saunders, 2005). *Provocation* can help with this as well by encouraging visitors to reflect on deeper meanings of park resources.

Finally, *fact-based messaging* was negatively correlated with satisfaction. This does not imply that programs should seek to be purely entertainment. Fact-based messaging is a central part of any program that seeks to inform visitors about park resources. This correlation, instead, shows that those programs that are only focused on conveying facts—akin to the traditional didactic approach—may be much less effective

in creating satisfied visitors. This could be because of the association with school or academic lectures, which visitors do not necessarily seek out when they are exploring national parks.

Linear regressions were also conducted to examine what best practices are most associated with desired outcomes. For satisfaction, *appropriateness of a program* for an audience once again plays a large role. *Consistency* of programs was also a significant practice. Combined, these practices explain 15% of the variability for satisfaction. This reinforces the association of quality program fundamentals with satisfaction. Having these practices in place may allow other variables to play a role in increasing visitor satisfaction. It may also relate to visitors knowing what to expect in a program; they may come in assuming the program will be appropriate for the audience, organized in a predictable way, and consistent in its tone and messaging. Having these expectations met may lead to higher levels of satisfaction, or feeling as if they received the experience they desired.

### *Visitor Experience*

Visitor experience was based on questions concerning visitor enjoyment, meaning-making, increased visitor knowledge, and appreciation for the NPS. High correlations with visitor experience were similar to those correlated with satisfaction. *Appropriate for audience* was again the most highly correlated practice. Other basic practices such as *consistency*, *logistics*, and *organization of program* were also highly correlated. This reinforces that a quality program begins with quality fundamentals. It

may also suggest that programs that used these fundamentals beyond their functional capacity could be associated with higher levels of visitor enjoyment and quality of experience.

*Verbal engagement, connection to audience, and clarity of central message* were also highly correlated and highly significant with visitor experience, as were *surprise* and *physical engagement*. This is consistent with other research regarding communication techniques that move beyond information transmission. Attempts to connect the audience with park resources in multiple ways appear to increase visitors' enjoyment, appreciation, and value placed on their experience.

Linear regression analyses for visitor experience show high correlations with *appropriateness of a program* for an audience and *consistency*. Combined, these explain 18% of the variance for visitor experience. As with satisfaction, this may suggest that these practices should be present to allow other variables to create meaning-making and increased enjoyment.

### *Behavioral Change*

Behavioral change was based on two questions exploring visitors' behavioral intentions both within and outside the park, which were then combined into a composite index developed from the confirmatory factor analysis. In programs with over five attendees, high correlations with Theory of Planned Behavior practices and behavioral change are perhaps most noteworthy. However, their low usage in the field (31 programs) displays an important gap in field-based practice. Rangers who seek to change

visitor behaviors may benefit greatly from including TBP methods in their programs (Ham, 1992).

*Clarity of central message, verbal engagement, and multisensory* are also highly correlated and significant. This may show the importance of clearly communicating desired behaviors and giving the audience different ways to absorb information in order to foster behavioral change. *Appropriateness for audience, appropriate logistics, and organization* were again highly correlated, which demonstrate that program fundamentals must be executed properly before behavioral messaging can take place. *Surprise and connection to audience* were also highly correlated, which may imply audiences react more tangibly to practices that move past information transmission.

*Fact-based messaging* was once again negatively correlated. Simply communicating facts appears ineffective; factual messaging should be presented using practices designed to create meaning and emotional connections. Demonstrating the costs and benefits of desired behaviors can make factual information relevant and action-oriented (Ajzen, 1991; Ham et. al., 2007; Jacobson, 1999; Knudson, et al., 2003; Moscardo, 1999).

Linear regression analyses showed that *appropriate logistics* and *clear messaging* were highly associated with behavioral change. However, these only account for 5% of variability within behavioral change. The results suggest that while these best practices appear important for influencing intentions to perform stewardship behaviors, there are also other practices and factors that have not been measured.

## MANAGEMENT IMPLICATIONS

Overall, interpretation in the National Park Service is effective at achieving desired outcomes. Means for satisfaction and quality of visitor experience were very high for all programs. This shows that park visitors appreciate NPS interpretation and that programs increase the value of their park experience. It should be noted that while many best practices were statistically correlated with better outcomes, variability within the sample suggests that the entire suite of best practices is not a necessary precursor to a high quality program. Rather, each of these practices in various combinations was found to enhance outcomes across a majority of programs in which they were practiced. A wide range of diverse approaches led to positive visitor outcomes. As such, we recommend maintaining the freedom for interpreters to be creative and innovative in their presentations.

Several best practices emerged that were consistently associated with taking programs from good to excellent. One was attention to fundamentals, i.e., *organization of a program*. A well-organized program allowed audiences to look beyond basic presentation techniques to form deeper meanings and relationships with resources. Similarly, *appropriateness of a program* for an audience was highly correlated with all three desired outcomes. This implies that tailoring a program to an anticipated audience could yield higher levels of satisfaction, visitor enjoyment, and behavioral change. Usage of this practice in the field is relatively high (almost two-thirds of the programs

observed were considered either “appropriate” or “very appropriate” for audiences). Rangers may benefit from collecting information from the audience during introductions about their interests and backgrounds to increase this appropriateness.

*Connection to audience* was also highly correlated with all three desired outcomes. This composite variable, as well as the organizational practices mentioned above, contain many timeworn practices stressed in literature and interpretive training, including *connections to intangibles and universals, relevance to audience, provocation, engaging multiple senses, telling a holistic story, and having a clear theme and message* (NPS Module 101; Beck & Cable, 2002; Brochu & Merriman, 2002; Ham, 1992; Jacobson, 1999; Knapp & Benton, 2004; Knudson, et al., 2003; Larsen, 2003; Lewis, 2005; Moscardo, 1999; NPS Module 101; Sharpe, 1976; Tilden, 1957; Veverka, 1998; Widner Ward & Wilkinson, 2006). Continuing to train interpreters in using these techniques effectively may push programs beyond information transmission and reach desired outcomes such as stewardship and enhanced connection to resources.

The negative correlation of *fact-based messaging* with all three desired outcomes (but most significantly with satisfaction and behavioral change) is important to consider. Factual information should not be eliminated from programs; rather, it may be more effective to communicate it in ways that go beyond lecture-style methods and simple information transmission. Factual messaging that is made to be entertaining and meaningful to audiences may increase desired outcomes. Programs that contain only

facts and no secondary engagement run the risk of actually decreasing visitor satisfaction and behavioral change.

A significant management implication lies with the practices that are correlated with outcomes but are underused in the field. Among these are *surprise*, *novelty*, *physical engagement* and the Theory of Planned Behavior practices. The TPB practices especially may have potential to increase effectiveness of program messaging. Surprising visitors with previously unknown benefits of a desired action combines two underused practices that may increase chances of behavior change. Determining specific behaviors that visitors should take, whether it is as simple as placing money in a donation box to as complex as reducing a carbon footprint, and subsequently implementing these underused practices may greatly benefit parks, increase stewardship, and provide a new direction for interpretive programming. However, these variables showed only weak relationships to desired outcomes, so these connections are generally speculative.

## VI. EXPERIENCE-BASED INSIGHTS

The following section provides qualitative field notes that were collected by researchers during the summer. Insights and conclusions drawn from these may not necessarily be upheld by survey data provided in previous sections. Rather, this discussion is based on researcher’s judgment of program characteristics and audience reactions.

Table 6.1 shows both high and low quality examples of different program characteristics. These may provide inspiration or suggestions for how to incorporate each element into programs.

<b>Table 6.1: Qualitative Field Note Examples</b>		
<b>Characteristic</b>	<b>High Quality Example</b>	<b>Low Quality Example</b>
<b>Intro Quality</b>	Ranger began the program by saying “It is the morning of the first battle of Manassas, it’s hot and muggy, you’ve just finished breakfast, and you’re preparing for a long march over these fields you see before you. But before the day is done, half of your company will be brought down by confederate cannon and musket fire...” This captured our attention, set the tone for the program, and led directly into the theme of the program.	The ranger arrived just in time to start the program and did not interact with the audience at all or provide any information about the program before it started. The first thing he said to the audience was “OK, let’s get started,” at which point he walked off to our first stop. When we arrived at the first stop, while much of the group was still walking, he started talking about trees and listing facts about them. There was really no introduction to the talk, nothing to capture our attention, and nothing to let us know that we were even on the right program.

		<p>The ranger did not give any orientation as to what we would be doing on the program. When asked by an older couple what they could expect on our walk, he simply said "You'll just have to come along and find out." While he said this with a smile on his face, it clearly left the guests feeling unnerved and they left the group before the first stop, at which point he said "Oh, I guess they decided not to join us."</p>
<p><b>Appropriate Logistics</b></p>	<p>The ranger arrived before the program was scheduled to begin and announced several times what the program was and when it would be starting. This gave everyone the chance to get ready and know that they were in the right place. Once the program began, the ranger let the audience know how long we would be gone, what we would be doing, and what supplies they should have. He reminded everyone to use the bathroom before we went out on the trail and to wear sunscreen. Once on the trail, he made sure to keep the group together and maintain a reasonable pace. We stop at spots along the trail that were out of the way of other hikers, quiet, and cool. Once the program ended, he walked with the group back to where we had started.</p>	<p>The ranger showed up to this program three minutes after its designated start time. He told the group that it was his first time ever giving it and that he wasn't sure exactly what we were supposed to be doing. The program was scheduled for an hour, but only lasted 30 minutes. The tour only had two stops, one at the parking lot and one about 100 yards away, even though it was advertised as a walking tour.</p> <p>During the walk, we stopped at a historical structure and the ranger allowed the group to explore inside the building and around the grounds for an extended period of time. This broke up the flow of the program and left 15-20 people behind as we moved on to the next spot. The ranger made very little effort to round up the group and did not announce when we would be leaving.</p>
<p><b>Appropriate for the Audience</b></p>	<p>The audience at this campfire program consisted mainly of families, along with a few older adults. The program was very</p>	<p>Although the audiences consisted of a dozen adults and only one child, the interpreter spent the entire program</p>

	<p>family friendly, with songs and activities that everyone could enjoy. There was also a great deal of content that was relatable to a young audience, but that also taught the adults things they didn't know. For parts of the program that were rather silly, adults were given roles helping to guide the kids and be in charge</p>	<p>speaking only to the child. He used very basic language and got down on one knee to tell her certain things. This was certainly a great experience for the child, but left the rest of the group wanting more. The program was advertised as a history of FDR's life and his role in preserving the United States during war and economic depression, but everything was limited to a very basic level.</p> <p>Ranger kept the audience in the very hot sun when he could easily have led to cooler, shadier rooms. At one point, he entered a small room with a big step down, and one elderly lady didn't want to try entering. She had to wait outside the room while he continued the program for another twenty minutes--only five of which actually had to do with the room we were in. The lady left with her husband after we exited the room.</p>
<p><b>Appropriate Sequence</b></p>	<p>This program was about the life cycle of a giant sequoia tree. The program itself followed a storyline that described the life of a tree and everything it saw during its lifespan. Each stop was related to the next stage of life and provided a clear example of that stage. We moved from an area full of cones and seeds, to a stop with several tiny saplings, to young trees, and on up to full size giants. We followed the growth of a sequoia from birth to death and understood everything it must overcome in the process.</p>	<p>This talk provided a random assortment of facts and stories about both the War of 1812 and the Civil War. Each stop was disconnected from the next and jumped back and forth between the two wars. There was no logical sequence to the stops and seemed to be representative of whatever was on the ranger's mind at the time. At a single stop we talked about iron clad battleships during the Civil War and a tavern that was located on the grounds during the War of 1812, with no connection drawn between them or any of the other stops.</p>

<p><b>Transitions</b></p>	<p>As we prepared to leave each stop, the interpreter said “I want you to be on the lookout for _____ as we head for our next stop and think about how it relates to _____.” This kept the visitors curious, engaged, and thinking about the theme of the talk even while the ranger wasn’t talking. These transitions provided a logical flow from the topic of one stop to the next.</p>	<p>At each stop, the ranger would talk for a bit and then just stop. We would walk to the next stop in silence and then he would pick up right where he left off. It felt very much as if he were stopping halfway through a paragraph, waiting a bit, and then continuing without any explanation of why we had moved. It likely would have more effective to just stay in one place and deliver a talk, as these long pauses left the audience bored and distracted from the program itself.</p>
<p><b>Physical Engagement</b></p>	<p>Mt. Rushmore was a park that was difficult to create physical engagement with, but one ranger told people to feel the sidewalk because that's how smooth the carved faces of the presidents are.</p> <p>Had visitors actually march in formation like soldiers would have, following the same path used in the Civil War.</p> <p>Had visitors do traditional exercise involving circles and hand motions before entering sacred round house, as Miwok tribe members would have done before entering.</p>	
<p><b>Verbal Engagement</b></p>	<p>After sharing and explaining different sets of data on the giant video sphere, the rest of the program was treated like a discussion session with the audience members talking about what may be causing trends in climate change and how the trends may be reversed.</p> <p>Visitors sang along with campfire songs,</p>	<p>Ranger occasionally struggled for words and asked many rhetorical questions that didn't encourage visitor involvement. Eventually I stopped thinking about answers to her questions because I knew she'd answer them right away.</p>

	<p>answered questions, and were allowed to tell stories of their experiences in the park.</p>	
<p><b>Cognitive Engagement</b></p>	<p>Had visitors consider whether former inhabitants could have imagined what Yosemite Valley is like today, tied that to having us imagine what it will be like in the future. Had us picture how the valley has changed over time and how strange and foreign it would look to us 100 or 1,000 years from now.</p> <p>Walk focused much of the audience's cognitive abilities on imagining what the landscape used to look like and what features used to be there/how they played a role in the battle that took place there. At each stop and walking between them, the ranger regularly reminded visitors to imagine themselves in the places of the soldiers who were there, walking the same lines that they did, and considering the emotions/decisions they faced during the battle. Made the experience really come alive for the audience.</p> <p>During the program, the ranger did an exceptional job of portraying the viewpoints of the Confederates, the Union, and civilians in the area of the time. Combining this with a lot of calls to picture or imagine the scenery and the battle at this location really brought the history alive for visitors. He took time to describe what we would have seen if we were sitting with our family having a</p>	

	<p>picnic and watching the battle, or what it would have looked like from the perspective of one of the soldiers.</p>	
<p><b>Relevance to Audience</b></p>	<p>: Interpreter made it a priority to connect with and learn a bit about each program participant. He carried on conversations with various visitors between stops, using the information he gathered to shape what he talked about next. He related each story he told to something of particular interest to someone in the audience and kept everyone interested by connecting them in some way to the story being told.</p> <p>Ranger's main approach was connecting complex geology to something most people would understand: pizza.</p> <p>Ranger made many diverse attempts to create relevance for different people and focused on looked-over aspects of the Grand Canyon. He told us about the Harvey Girls who worked at the Grand Canyon and how the CCC boys used to flirt with them. He showed us an obviously man-made heart-shaped rock that was laid in the wall facing the girls' previous dormitories. This was a great connection for me and other young women in the audience as women's roles in many iconic parks are often glossed over; my husband and I later took our picture with the heart rock. We felt like we had been let in on a Grand Canyon secret that not many other people knew about.</p>	<p>The program provided a ton of factual information about the battle that took place here and the strategies used by either side to gain the upper hand. However, the ranger did not interact with the audience at all and knew nothing about their interests or background. She made no effort to connect the visitors to the resource, either through something of particular interest to them or by creating some relevance between what happened here and the lives of the audience.</p> <p>The ranger attempted to connect black bears breaking into cars for food to how desperate we would be if we were hungry. "If you've ever been starving hungry, you know that you'd be willing to break into a store or steal somebody's lunch"...it seems unlikely that anyone on the program has experienced this before or would know what that feels like.</p>

<p><b>Affective Messaging</b></p>	<p>The ranger discussed with us the heartache and suffering that went into sending a son off to war or finding out that a loved one had been killed in action. He spoke of the dedication to each other and to country that these soldiers displayed, the determination with which they fought, and the camaraderie on which they relied to keep their spirits up and keep fighting. He showed respect for the memorial by lowering his voice and told us about the importance that their service should have to us. Rather than focusing on numbers or specific dates/battles, he shared the emotional toll that war took on everyone.</p>	<p>This ranger relied solely on historical information to tell the story of FDR and his presidency. He told us the various offices FDR held, explained what polio was, and gave us descriptions of the design/construction of the monument itself. He told us about the impact that war and economic depression had on our country, but only in terms of money and power. He did not include any emotional connection to the struggles of poverty, the despair that people faced, the joy we felt after winning the war, or the emotional toll that polio must have taken on FDR and those around him.</p>
<p><b>Fact-Based Messaging</b></p>	<p>This walk, along with others presented by this ranger, were full of factual information (necessary in presenting detailed information in a park like this), but also incorporated a great deal of affective messaging, cognitive engagement, and place-based messaging. This played a big part in making the walk more of an experience, rather than just a factual recounting of the battle that took place here. We learned a great deal about the battle, but were not overburdened with facts or figures that we needed to remember in order for the experience to make sense.</p>	<p>This program, about the flora found within the park, provided an abundance of facts and scientific names, but did little to tell us why these plants mattered or what relevance they had to us. The ranger simply listed fact after fact after fact for the duration of an hour long program. After a point, everything began to blend together and lose its meaning.</p>
<p><b>Surprise</b></p>	<p>This program was about early western explorers and how their miscalculations/misinterpretations often led them to make the wrong decisions.</p>	

	<p>Throughout the program, the ranger provided us with information that led us to believe we were heading west toward the water, but at the end of the program we came out to a bluff overlooking the water and realized that we were even further away from it than when we had started.</p> <p>The ranger turned off the lights in the cave to illustrate how dark it really is.</p>	
<b>Novelty</b>	<p>As a part of this program, we were allowed to enter and explore an exquisitely restored historical home that was otherwise closed to the public. Throughout the program, the ranger referred back to the fact that this was an incredibly unique and valuable place, and that we were fortunate to be one of few people who got to see it.</p>	
<b>Provocation</b>	<p>The ranger told a very emotional story about how the coast Miwok tribes were torn away from their homes and lifestyle. He reminded us that their descendants are still alive today and that they can no longer visit the historic sites of their families. He reminded us to think about the impact this must have on their culture and pride.</p>	<p>At one point during this program, the ranger mentioned that urban sprawl is slowly taking over habitat and surrounding national parks in different places across the country. This was stated as a fact and then he moved on to the next subject. Rather than digging deeper or encouraging us to think about the effect that this might one day have, he just mentioned it and did nothing more with it.</p>
<b>Holistic Story</b>	<p>This ranger used the unique and sometimes valuable natural resources of the park to illustrate why native people originally settled here, why it inspired people to move westward, how they</p>	<p>This program was a jumble of dry facts about an otherwise interesting animal (bighorn sheep). There were several moments of "Hmm, what else can I tell you..."</p>

	<p>used these resources to settle and live off the land, how this led to their over-exploitation, and ultimately to their protection. Each stop taught us about a new resource (trees, rock, grazing fodder, minerals, water, etc.) that played a part in this story. As we moved along, so too did the story.</p> <p>The ranger had very clear intentions for the program and a strategy to execute this plan. He informed the audience of what we would be talking about and that each stop had some connection to our story. The story progressed linearly through time and each stop represented a new time period. Every stop was tied back to the central theme and was relevant to the story being told. He used the repetition of certain ideas and interactions with the audience to build a story that came to its conclusion at our last stop.</p>	<p>During the tour of a historical home, the interpreter listed off different facts and stories as we walked through each room. A piece of furniture or book would cause her to say "Oh, this reminds me about..." None of what she told us seemed to be connected, and although it was interesting, did not tell us a story about the place or why it is worth preserving. In the end, she talked more about which furniture pieces were original or reproductions than about the people who lived in the house we were walking through and their stories.</p> <p>As we wandered along the path of our guided walk, the ranger pointed out random trees, buildings, or objects. Each one was described in a manner unrelated to the last and we were left wondering what the point of the program was. At times we would sit and talk about a historical figure from the area, then we would stroll on to the next stop looking at things we happened to pass along the way. There was no clear topic or point to the talk and visitors seemed disconnected and bored by the talk.</p>
<p><b>Intro/Conclusion Linkage</b></p>	<p>This ranger had a purposeful, powerful introduction about the horror and unpredictable nature of war and how it affected everyone. He used various stops throughout the program to illustrate this point, and at the end reminded us that life back then (like now) could change in an instant. As a</p>	<p>The ranger went so far past the designated end time of the program that he did not get the chance to wrap it up in any way. Visitors had to leave the program while he was still talking so they could catch the bus back to the VC.</p> <p>This program was a classic example of a</p>

	<p>young man, you could quickly be enlisted in the Army and sent off to fight for your country. As he did so, he pointed out to us that we were standing next to the grave of a young man who had grown up nearby, gone off to war, and been brought back and buried here in his home town.</p>	<p>poorly executed conclusion. While it seemed like the ranger was in the middle of his talk, he simply stopped, looked at the audience, and said “ok, well that’s it.” The program ended very abruptly, with no conclusion at all, leaving the audience wondering what the point of the program was. He had all the opportunity in the world to tie things together and leave us with a lasting message to think about.</p>
<p><b>Clear Theme</b></p>	<p>This program focused on the power of Yosemite and the influence it has had in so many people’s lives throughout time. The ranger described how it had a spiritual power for native people, was a place of unrivaled beauty and reflection for early explorers, and a place of relaxation and escape for people today. Every stop supported the idea that Yosemite is a unique and powerful place worth preserving, which he reinforced by reminding us that future generations have just as much right to experience and gain from this place. He used a clear and powerful theme to tell the audience why Yosemite is worth protecting.</p>	<p>The ranger on this program told us explicitly that he was going to tell us why Independence Hall was a unique place. We then walked around and through the hall, where he told us that various treaties were signed and historical figures sat. This was the extent of his program. He did not tell us how those documents have shaped our history, what role those figures played in founding our country, or why preserving the building itself should matter to us. The program was a collection of dates and names, but little more.</p>
<p><b>Central Message</b></p>	<p>This program focused on climate change and the impact that it can have on our lives. We were told over and over again throughout the program to think about why we should care. No matter what the science or politicians say, the changes that have already occurred are something that will affect us and that we should be thinking about. The ranger</p>	<p>During the course of this program, the ranger talked about boats, earthquakes, sea life, and gold. He did was very interesting to listen to and taught the audience a lot of things they likely didn’t know before. However, these random topics together did not tell us anything important. Rather, it left you with a feeling of “huh, that was interesting,” but certainly</p>

	<p>used powerful illustrations of flooding, storm damage, and drought to keep us thinking.</p> <p>The ranger used powerful emotional language (“the struggle for freedom,” “the ultimate sacrifice,” and “the value of our freedom”) to remind us of why this monument exists and why it should matter to us. He convinced us that it deserves our respect and reverence, not because of what the monument is itself, but because of who it represents.</p>	<p>did not change the way you felt or leave you thinking.</p>
<p><b>Consistency</b></p>		<p>Ranger’s program seemed oddly split; the first half was a very engaging, tactile program about buffalo, and the second half was an abrupt switch into plant identification. The kids were not so interested in the plants and it was severely hot out on the prairie where the plant part was. The program could have easily just been about the buffalo and it would have been great.</p>

## NOTES ON PROGRAM QUALITY

One question that has often surfaced in analyzing this project’s quantitative data is, “What was the best program you saw?” This question has been largely impossible to answer. We as researchers saw a whole spectrum of programs ranging (subjectively) from excellent to poor. Different best practices were used in a wide variety of ways in both highly successful and less successful programs. One distinct best practice does not seem to unfailingly lead to a higher quality of program. Similarly, the absence of any

best practices examined in this document does not immediately denote an unsuccessful program. This reinforces results from the quantitative data about the complexity of the visitor experience with interpretive programs.

## VII. LIMITATIONS

### GENERAL

First and foremost, this study was primarily quantitative in nature, which makes it widely applicable but not necessarily detailed. The true complexity and specificity of a subject cannot be fully captured using a quantitative study. This is reflected in our low percentages of explained variance in our results. There are many factors at play in the situations researched in our study, but a large percentage of these were not explained by our analyses. Some of this was documented in the researchers' field notes, but the bulk of the information presented in this document comes from quantitative data.

### PRE-PROGRAM SURVEYS

The pre-program surveys administered to visitors had to be dropped due to low reliability and variability. As a result, much of the post-program survey was rendered unusable. Had researchers known this issue would occur, the post-program survey could have been designed differently. More specific reflective questions could have been asked to look beyond the three desired outcomes examined in this study (satisfaction, visitor experience, and behavioral change).

### UNDERREPRESENTATION OF SMALL PARKS AND PROGRAMS

Researchers visited several small park units and attended many programs with less than five people in attendance. However, during data analysis, it became difficult to draw reliable conclusions from these small parks and programs. As a result, one small

park (Aztec Ruins) and any program with fewer than five attendees were dropped from analysis. This could lead to an underrepresentation of small parks and programs in our results.

This issue could be addressed in the future by independently researching large and small parks and programs and drawing separate conclusions that could then be compared. The selection of parks for a similar study should also be based on achieving reliability and variability rather than on political reasons or convenience.

#### RESEARCHER-INDUCED INTIMIDATION

Rangers' uses of various practices may have been influenced by the presence of researchers. Researchers held clipboards and pencils and tended to dress slightly more formally than an average park visitor. They also introduced themselves to audiences and made it known that they were surveying the current program. This could have made some rangers nervous or caused rangers to alter the practices they used in their program.

Researchers attempted to counter these effects by being as subtle and non-threatening as possible. Researchers generally stood near the back while auditing programs. When introducing themselves to rangers, they also emphasized that the study was anonymous and not an evaluation.

## IIX. CONCLUSION

Generally speaking, National Park Service interpretation appears effective at increasing visitor satisfaction and quality of experience. Visitors come away feeling as if programs enhanced their park visit. Many vital best practices, such as keeping a program appropriate for an audience, are widely employed throughout the field.

As NPS interpretation progresses and develops new techniques, it will be crucial to remember fundamental program basics. Quality introductions, sequences, themes, and conclusions will always be an important part of any effective program. The IDP may benefit from reinforcing the importance of organization in creating a clear take-home message and facilitating desired outcomes. Once a program is properly organized, other practices can be executed more creatively to craft a unique and memorable park experience.

Throughout the NPS, it is clear that interpreters take their call to connect audiences to park resources seriously. Training can continue to encourage dynamic, heartfelt programs that bring people closer to their national parks in the traditions of Tilden, Mills, and others. This can usher in a new era of heightened appreciation and dedication to America's unique national treasures.

## APPENDICES

APPENDIX A: PROGRAM AUDIT

# Interpretive Program Description

Initials \_\_\_\_\_

Park: \_\_\_\_\_ Program: \_\_\_\_\_ Date: \_\_\_\_\_

## Program Information (complete each question):

Intended Program Length: \_\_\_\_\_ Actual Program Length: \_\_\_\_\_ Start on Time (Within five minutes): \_\_\_\_\_ Yes  
\_\_\_\_\_ No

Time of Program (circle one): AM PM Program Location: \_\_\_\_\_ Inside \_\_\_\_\_ Outside \_\_\_\_\_ Both

Type of Program (check all that apply): Guided walk \_\_\_\_\_ Hands-On Activity \_\_\_\_\_ Demonstration \_\_\_\_\_ Lecture \_\_\_\_\_  
Other: \_\_\_\_\_

Program Focus (check all that apply): Natural \_\_\_\_\_ Historic \_\_\_\_\_ Cultural \_\_\_\_\_ Other \_\_\_\_\_

## Group Information (complete each question):

Group size: \_\_\_\_\_

Age ratio: All kids Mostly kids About even Mostly adults All adults

Bad Weather (circle one): Yes No Explicitly for children? (circle one): Yes No

Program Description: The following table contains a list of attributes that may or may not apply to the program. For each, please read the definition carefully and consider the extent to which the observed program utilized that attribute. Circle the appropriate number in the right hand column. These attributes are neither inherently good nor bad.

Program Description: The following table contains a list of attributes that may or may not apply to the program. For each, please read the definition carefully and consider the extent to which the observed program utilized that attribute. Circle the appropriate number in the right hand column. These attributes are neither inherently good nor bad.

Program Descriptor	Definition	Scoring
Quality of introduction	Degree to which the introduction oriented audience program and captured audience's attention.	<p>3 Introduction effectively oriented audience to program and captured audience's attention</p> <p>2 Introduction minimally oriented audience to program; did not necessarily capture audience attention.</p> <p>1 Introduction poorly executed.</p>
Appropriate logistics	Degree to which basic audience and program needs were met (i.e., restrooms, weather, technology, etc).	<p>4 Program logistics were entirely well planned and appropriate for audience and context.</p> <p>3 Audience and program needs mostly addressed</p> <p>2 Audience and program needs marginally addressed</p> <p>1 Audience and program needs not met</p>
Comfort of the Audience	Degree of <b>physical</b> comfort	<p>4 Audience is very comfortable. Nothing else could have feasibly been done to make audience more comfortable.</p> <p>3 Audience is comfortable</p> <p>2 Audience is uncomfortable</p> <p>1 Audience is very uncomfortable</p>
Appropriate for Audience	Degree to which the program aligns with audience's level of knowledge, interest, and experience	<p>5 Very appropriate for audience</p> <p>4 Appropriate for audience</p> <p>3 Moderately appropriate for audience</p> <p>2 Only slightly appropriate for audience</p> <p>1 Not appropriate for audience</p>

Appropriate sequence	Degree to which the program followed a logical sequence.	<p>4 Sequence <b>enhanced</b> messaging and was appropriate for experience, terrain</p> <p>3 Sequence was appropriate, but didn't necessarily enhance messaging (could be irrelevant to experience)</p> <p>2 Sequence seemed choppy</p> <p>1 Sequence detracted from messaging.</p>																								
Transitions	Degree to which used appropriate transitions that kept the audience engaged and did not detract from the program's sequence.	<p>4 Transitions enhanced talk and were smooth</p> <p>3 Transitions were appropriate, but didn't necessarily enhance talk</p> <p>2 Transitions seemed forced or nearly irrelevant to experience</p> <p>1 Transitions detracted from presentation or not present.</p>																								
Links to intangibles and universals	Degree to which the program made links to intangible meanings and higher-level concepts. Intangibles: <b>ideas, meanings, or significance that tangible resources represent</b> Universals: <b>concepts that most audience members may identify with</b> (power, home, family, etc.)	<p>5 Extensively developed connections to powerful universal concept(s)</p> <p>4 Well developed connections to universal concept(s)</p> <p>3 Universal concepts present, but linkages are weak/not fully successful</p> <p>2 Universal concepts difficult to detect; slightly used at best</p> <p>1 Universal concepts clearly not present</p>																								
Multisensory	Degree to which the program intentionally engaged multiple senses <b>beyond a traditional (didactic) approach.</b> 2= Explicit/purposeful inclusion 1= Included by chance or in passing 0= Not included	<table border="1" data-bbox="1161 262 1226 1281"> <thead> <tr> <th></th> <th>Visual</th> <th>Auditory</th> <th>Tactile</th> <th>Smell</th> <th>Taste</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>1</td> <td>0</td> <td>2</td> <td>1</td> <td>0</td> </tr> <tr> <td>1</td> <td>0</td> <td>2</td> <td>1</td> <td>0</td> <td>2</td> </tr> <tr> <td>0</td> <td>2</td> <td>1</td> <td>0</td> <td>2</td> <td>1</td> </tr> </tbody> </table>		Visual	Auditory	Tactile	Smell	Taste	2	1	0	2	1	0	1	0	2	1	0	2	0	2	1	0	2	1
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Physical engagement	Degree to which the program physically engaged audience members in a participatory experience; i.e., through touching or interacting with resource.	4 Physical engagement a central element of the programming	3 Physically engaged multiple times throughout the program	2 Minimal effort to physically engage audience.	1 No efforts to physically engage audience																									
Verbal engagement	Degree to which the program verbally engaged audience members in a participatory experience; i.e., a two-way discussion.	5 Verbal engagement a central element of the programming	4 Verbally engaged multiple times throughout the program	3 Verbally engaged in a modest way	2 Effort made but minimal	1 No efforts to verbally engage audience																								
Cognitive engagement	Degree to which the program cognitively engaged audience members in a participatory experience beyond simply listening; i.e. calls to imagine something, reflect, etc.	5 Cognitive engagement a central element of the programming	4 Cognitively engaged multiple times throughout the program	3 Cognitively engaged in a modest way	2 Effort made but minimal	1 No efforts to cognitively engage audience																								
Multiple activities (Audience-centric)	Degree to which the program consisted of a variety of activities and opportunities for <b>direct audience involvement</b> (not including dialogue).	4 More than two primary activities included	3 Two or more secondary activities included	2 One secondary activity included.	1 One activity only.																									
Multiple modes of delivery (Delivery-centric)	Degree to which the program catered to multiple learning styles; audience is engaged in a <b>different form of receiving messages</b> . 2= Explicit/purposeful inclusion 1= Included by chance or in passing 0= Not included	<table border="1"> <thead> <tr> <th colspan="2">Visual</th> <th colspan="2">Auditory</th> <th colspan="2">Kinesthetic</th> <th colspan="2">Tactile</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>1</td> <td>0</td> <td>0</td> <td>2</td> <td>1</td> <td>0</td> <td>0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>					Visual		Auditory		Kinesthetic		Tactile		2	1	0	0	2	1	0	0								
Visual		Auditory		Kinesthetic		Tactile																								
2	1	0	0	2	1	0	0																							

Props	Were props used?	Yes	No
Relevance to audience	Degree to which the program communicated the relevance of the subject to the lives of the audience.	<p>5 Major focus of communication is on creating relevance</p> <p>4 Efforts to create relevance well developed and incorporated</p> <p>3 Moderate efforts to create relevance</p> <p>2 Minimal efforts to create relevance</p> <p>1 No efforts made to create relevance</p>	
Resource and place based messaging	Degree to which the program emphasized the connection between the visitor and the site/resource. The resource in question may be tangible (the park, the wildlife, etc) or intangibles (a story, a history, etc).	<p>5 Connection extensively emphasized and developed <b>(connection is the central focus of the communication)</b></p> <p>4 Connection emphasized and well developed <b>(repeatedly AND through some form of engagement)</b></p> <p>3 Connection moderately emphasized and developed <b>(repeatedly OR through active engagement)</b></p> <p>2 Connection only slightly developed <b>(verbally)</b></p> <p>1 Connection not emphasized or developed</p>	
Affective messaging	Degree to which the program communicated emotion, based on <b>quantity</b> rather than quality.	<p>5 Affective messaging a central element to program.</p> <p>4 Affective messages used frequently and repeatedly.</p> <p>3 Affective messages used occasionally.</p> <p>2 Effort to include affective messages is minimal.</p> <p>1 Affective messages absent.</p>	
Fact-based messaging	Degree to which the program communicated factual information.	<p>4 Solely fact-based messaging</p> <p>3 Fact-based messages used frequently and repeatedly.</p> <p>2 Fact-based messages used occasionally.</p> <p>1 Fact-based messages minimal or absent.</p>	

Surprise	Degree to which the program used the element of surprise in communication. This could include “aha” moments or unexpected or contrasting messages.	3 Surprise used as a major element to reveal connections or information	2 Surprise used as one minor element of communication.	1 Surprise not used.		
Novelty	Degree to which the program presented novel ideas, techniques, or viewpoints as an element of communication; i.e., <b>using a device not usually associated with or related to resource.</b>	3 Novelty used as a major element to reveal connections or information	2 Novelty used as one minor element of communication.	1 Novelty not used.		
Provocation	Degree to which the program explicitly provokes participants to personally reflect on content and its deeper meanings.	4 Powerful and explicit call(s) for personal reflection.	3 Occasional calls for personal reflection throughout program.	2 Isolated or vague call for personal reflection	1 No attempt at provocation made.	
Multiple viewpoints about central message or theme	Degree to which the program explicitly acknowledged multiple perspectives or uncertainty within a theme or message. <b>(Primarily for controversial messaging; when an argument is made, is a relevant counter-argument provided?)</b>	3 Multiple viewpoints developed. None given clear priority	2 Program primarily focuses on one viewpoint, with some acknowledgement of others.	1 No effort to present multiple viewpoints	NA	
Demonstrates benefits of action	Degree to which the program emphasized the potential benefits resulting from performing a particular action(s).	4 Benefits explicitly and purposefully emphasized a lot	3 Benefits mentioned a moderate amount	2 Benefits explained a little.	1 No mention of benefits.	NA
Demonstrates costs of action	Degree to which the program emphasized the potential costs resulting from performing a particular action(s).	4 Costs explicitly and purposefully emphasized a lot	3 Costs mentioned a moderate amount	2 Costs explained a little.	1 No mention of Costs.	NA

Social norms	Degree to which the program emphasized the social acceptability of performing a particular behavior or desired action.	4 SN explicitly and purposefully emphasized a lot	3 SN mentioned a moderate amount	2 SN explained a little.	1 Social norms not mentioned.	NA
Ease of action	Degree to which the program communicated the ease (or difficulty) of performing a particular behavior or desired action.	4 Ease of action explicitly and purposefully emphasized a lot.	3 Ease mentioned a moderate amount	2 Ease explained a little.	1 Ease of action not addressed.	NA
Demonstrates action	Degree to which the program provided examples of, or opportunities for, performing a desired action.	4 Participatory demonstration with majority of audience engaged.	3 Actual demonstration by ranger or small percentage of audience.	2 Verbal description of desired action.	1 No mention/demonstration of desired action.	NA
Holistic story vs. individual facts	Degree to which the program aimed to present a whole rather than a part.	5 Holistic story used throughout; all information tied to story.	4 Holistic story present; some information does not relate to story.	3 Equal mix of storytelling and factual information, no single, holistic story	2 Factual information primarily used; some stories used to create relevance.	1 Facts and information primarily; no attempt at storytelling.
Linkage between introduction and conclusion	Degree to which program connected introduction to conclusion in an organized or cohesive way (i.e., program "came full circle.")	4 Intro and conclusion were linked in a cohesive way that enhanced messaging.	3 Intro and conclusion were linked, but didn't necessarily enhance messaging.	2 Intro and conclusion were weakly linked	1 Intro and conclusion were disconnected from each other.	

Thematic	Degree to which the program had a clearly communicated theme(s). A theme is defined as a <b>single sentence (not necessarily explicitly stated) that links tangibles, intangibles, and universals to organize and develop ideas.</b>	4 Theme is clearly communicated	3 Theme easy to detect, but not particularly well developed	2 Theme difficult to detect, present but somewhat ambiguous	1 Theme unclear/not present							
Central Message(s)	Degree to which program's message(s) (more broad or "inspiring" than theme) is clearly communicated. This is the <b>"SO WHAT?"</b> element of the program.	4 Message(s) clearly communicated and well-developed.	3 Message(s) easy to detect, but not particularly well developed	2 Message(s) difficult to detect, present but somewhat ambiguous	1 Message(s) unclear/not present							
Pace	Degree to which the pace of the program allowed for clarity and did not detract from the program.	Pace too fast at any point										
Consistency of tone	Program tone overall was consistent (i.e., tone remained humorous, or light-hearted, or serious, etc.).	3 Tone was consistent.	2 One or more shifts in tone that were not attributed to the element of surprise.	1 Tone was inconsistent or unclear throughout program.	NA							
Consistency of quality	Program quality overall was consistent.	3 Consistent	2 Minor or isolated break in quality	1 Inconsistent								
Overall Quality		10 Extremely high quality	9 Excellent	8 Very Good	7 Good	6 Above average	5 Average	4 Fair	3 Below average	2 Poor	1 Very poor	0 Extremely low quality

**Comments:**



## APPENDIX B: VISITOR SURVEY

**Study of Visitor Programs  
in the National Park Service**

*Please use the space below to provide any additional comments you'd like to make about the program in which you just participated.*

*Thank you for coming. This survey will help us to understand how to improve programs for visitors in the future. Your participation is voluntary. The survey is designed to take no longer than five minutes to complete and can be filled out by anyone over the age of 15 in your group.*

**1. Which of the following best describes your group today? Check the appropriate box.**

- I am visiting alone       I am visiting with others, including children       I am visiting with others, not including children

**2. How much time have you spent in this park on this visit?**

- Less than one full day       One to two days       More than two days

**3. Have you attended a ranger-led program in this park before coming to this one?**

- Yes       No

**4. Based on your time here so far, how would you rate the overall quality of this park on a scale from 0 to 10, ten being the best. Circle a number.**

<b>Terrible</b>	0	1	2	3	4	5	6	7	8	9	<b>Excellent</b>

If you have questions or comments contact Robert Powell by phone at 864-656-0787 or by email at [rbp@clemsontech.edu](mailto:rbp@clemsontech.edu). You may also contact the Clemson University Office of Research Compliance by email at [irb@clemsontech.edu](mailto:irb@clemsontech.edu) or toll-free at 866-297-3071 if you have questions regarding your rights as a research participant.

**5. To what extent do you agree with the following statements?**

	Not at all	A little	Somewhat	Moderately	A great deal
Knowing that this place is protected makes me feel good	<input type="checkbox"/>				
I understand the reason(s) why this place is protected	<input type="checkbox"/>				
I care about the protection of this park	<input type="checkbox"/>				
This park is important to me personally	<input type="checkbox"/>				
Spending taxpayer money to support this park is worthwhile	<input type="checkbox"/>				

**6. If given the opportunity, how likely would you be to do the following?**

	Not at all likely	Somewhat unlikely	Neutral	Somewhat likely	Very likely
Explain the importance of this park to other people	<input type="checkbox"/>				
Donate money to help this park	<input type="checkbox"/>				
Learn more about how to protect the resources of this park	<input type="checkbox"/>				
Volunteer to help a park or parks near my home	<input type="checkbox"/>				
Vote to protect federal funding for parks	<input type="checkbox"/>				
Join an organization that actively supports the protection of National Parks	<input type="checkbox"/>				

**7. On a scale of 0 to 10, ten being the best, please rate your overall level of satisfaction with the program you just attended (circle a number).**

<b>Terrible</b>	0	1	2	3	4	5	6	7	8	9	10	<b>Excellent</b>
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**8. To what degree did the program you just attended influence any of the following for you?**

	Not at all	A little	Somewhat	A moderate amount	A great deal
Made me think deeply	<input type="checkbox"/>				
Made me reflect on my own life	<input type="checkbox"/>				
Enhanced my appreciation for this park	<input type="checkbox"/>				
Enhanced my appreciation for the National Park Service	<input type="checkbox"/>				
Made me more likely to avoid harming park resources	<input type="checkbox"/>				
Increased my knowledge about the program's topic	<input type="checkbox"/>				
Made my visit to this park more enjoyable	<input type="checkbox"/>				
Made my visit to this park more meaningful	<input type="checkbox"/>				
Changed the way I will behave while I'm in this park	<input type="checkbox"/>				
Changed the way I will behave after I leave this park	<input type="checkbox"/>				
Made me want to tell others about what I learned	<input type="checkbox"/>				
Made me care more about this park's resources	<input type="checkbox"/>				
Made me care more about protecting places like this	<input type="checkbox"/>				

**9. Are you male or female? Please circle one.**

**10. How old are you? \_\_\_\_\_ years**

**11. What is your home zip code? (If you live outside the USA, please write in your country)**

Zip code: \_\_\_\_\_ OR Country: \_\_\_\_\_

**12. Which of the following best describe(s) your racial or ethnic background? Please check one or more.**

- White, not of Hispanic descent
- Black, not of Hispanic descent
- Hispanic
- Native American
- Asian
- Other \_\_\_\_\_

**Thank you for participating!**

## REFERENCES

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Decision-Making Processes*, 50(2), 179-211.
- Babbie, E. (2011). *The basics of social research*. (5<sup>th</sup> ed.). Belmont, CA: Wadsworth, Cengage Learning.
- Beck, L., & Cable, T. T. (2002). *Interpretation for the 21st century: Fifteen guiding principles for interpreting nature and culture* (2nd ed.). Champaign: Sagamore.
- Bentler, P.M. 2005. Eqs 6 structural equations program manual. Encino, CA: Multivariate Software (www.mvsoft.com).
- Brochu, L., & Merriman, T. (2002). *Personal interpretation: Connecting your audience to heritage resources*: InterpPress.
- Brody, M., Hall, R., Tomkiewicz, W., & Graves, J. (2002). Park visitors' understandings, values and beliefs related to their experience at Midway Geyser Basin, Yellowstone National Park, USA. *International journal of Science Education*, 24(11), 1119-1141.
- Byrne, B.M. 2006. Structural equation modeling with eqs: Basic concepts, applications and programming. Second ed. Mahwah, NJ: Erlbaum.
- DeVellis, R. F. (2003). *Scale development, theory and applications*. Sage Publications, Inc.
- Forist, B. 2003. Visitor Use and Evaluation of interpretive Media. A Report on Visitors to the National Park System. National Park Service Visitor Services Project. [http://nature.nps.gov/socialscience/docs/Visitor\\_Use\\_and\\_Evaluation.pdf](http://nature.nps.gov/socialscience/docs/Visitor_Use_and_Evaluation.pdf). Accessed May 24, 2012.
- Frauman, E., & Norman, W. C. (2003). Managing visitors via "mindful" information services: One approach in addressing sustainability. *Journal of Park and Recreation Administration*, 21(4), 87-104.
- Ham, S. H. (1992). *Environmental interpretation: A practical guide for people with big ideas and small budgets*. Golden: Fulcrum.
- Ham, S. H. (2007). Can interpretation really make a difference? Answers to four questions from cognitive and behavioral psychology. Paper presented at the *Proceedings of the Interpreting World Heritage Conference*, 25-29.
- Ham, S. H., Brown, T. J., Curtis, J., Weiler, B., Hughes, M., & Poll, M. (2007). *Promoting persuasion in protected areas: A guide for managers*. Developing

- strategic communication to influence visitor behavior*. Southport, Queensland, Australia: Sustainable Tourism Cooperative Research Centre.
- Hughes, M., & Morrison-Saunders, A. (2005). Influence of on-site interpretation intensity on visitors to natural areas. *Journal of Ecotourism*, 4(3), 161-177.
- Jacobson, S. K. (1999). *Communication skills for conservation professionals*. Washington, D.C.: Island Press.
- King, M. F., & Bruner, G. C. (2000). Social desirability bias: A neglected aspect of validity testing. *Psychology and Marketing*, 17(2), 79-103.
- Kline, R.B. 2005. Principles and practice of structural equation modeling. Second ed. NY, NY: Guilford Press.
- Knapp, D., & Benton, G. M. (2004). Elements to successful interpretation: A multiple case study of five national parks. *Journal of Interpretation Research*, 9(2), 9-25.
- Knudson, D. M., Cable, T. T., & Beck, L. (2003). *Interpretation of cultural and natural resources* (2nd ed.). State College: Venture Publishing.
- Kubota, Y. (2009). The realities and effectiveness of ecotourism operations on Moreton Island. *ISP Collection*, 642.
- Larsen, D. L. (2003). *Meaningful Interpretation: How to Connect Hearts and Minds to Places, Objects, and Other Resources*. Eastern National.
- Larsen, D. L. (2008). Certification and the National Park Service. *Journal of Interpretation Research*, 13(1), 47-50.
- Lewis, W. J. (2005). *Interpreting for park visitors* (9th ed.). Fort Washington: Eastern National.
- Machnik, L. K. (2007). *Visitors' delayed responses to interpretive talks and interpreters' expectations for visitor responses*. Unpublished doctoral dissertation, Clemson University, Clemson, SC.
- Madin, E. M. P., & Fenton, D. M. (2004). Environmental interpretation in the Great Barrier Reef Marine Park: An assessment of programme effectiveness. *Journal of Sustainable Tourism*, 12(2), 121-137.
- Maslow, A. (1954). *Motivation and personality*. New York: Harper.
- McManus, P.M. 1987. It's the company you keep: the social determination of learning-related behavior in a science museum. *The International Journal of Museum management and Curatorship* 6, 263-270.

- McManus, P.M. 1988. Good companions. More on the social determination of learning-related behavior in a science museum. *The International Journal of Museum Management and Curatorship* 7, 37-44
- Moscardo, G. (1999). *Making visitors mindful: Principles for creating quality sustainable visitor experiences through effective communication*. Champaign: Sagamore.
- National Association for Interpretation. Mission, vision, and core values. <[http://www.interpnet.com/about\\_nai/mission.shtml](http://www.interpnet.com/about_nai/mission.shtml)>
- National Park Service. (2008) Interpretive Development Program. *Module 101: Foundations of interpretation*.
- North American Association for Environmental Education. (2010). *Nonformal environmental education programs: guidelines for excellence*.
- Ortiz, M. A. (2007). *Motivations for attending ranger-led interpretive programs in Yosemite National Park*. Unpublished master's thesis, Stephen F. Austin State University.
- Peake, S., Innes, P., & Dyer, P. (2009). Ecotourism and conservation: factors influencing effective conservation messages. *Journal of Sustainable Tourism*, 17(1), 107-127.
- Powell, R. B., & Ham, S. H. (2008). Can ecotourism interpretation really lead to pro-conservation knowledge, attitudes and behaviour? Evidence from the Galapagos islands. *Journal of Sustainable Tourism*, 16(4), 467-489.
- Powell, R. B., Kellert, S. R., & Ham, S. H. (2009). Interactional theory and the sustainable nature-based tourism experience. *Society & Natural Resources*, 22(8), 761-776.
- Rogers, E. M. (1983). *Diffusion of innovations* (3rd ed.). New York, NY: Free Press.
- Sharpe, G. W. (1976). *Interpreting the environment*. New York: John Wiley & Sons.
- Stewart, E. J., Hayward, B., M., & Devlin, P., J. (1998). The "place" of interpretation: a new approach to the evaluation of interpretation. *Tourism Management*, 19, 257-266.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics*. (5th ed.). New York, New York: Pearson Education Inc.
- Tilden, F. (1957). *Interpreting our heritage* (3rd ed.). Chapel Hill: The University of North Carolina Press.

- Veverka, J. A. (1998). *Interpretive master planning: the essential planning guide for interpretive centers, parks, self guided trails, historic sites, zoos, exhibits and programs* (2nd ed.). Tustin: Acorn Naturalists.
- Wallace, G. N., & Gaudry, C. J. (2002). An evaluation of the “authority of the resource” interpretive technique by rangers in eight wilderness/backcountry areas. *Journal of Interpretation Research*, 7, 43-68.
- Wearing, S., & Wearing, B. (2001). Conceptualizing the selves of tourism. *Leisure Studies*, 7, 11-23.
- Widner Ward, C., & Wilkinson, A. E. (2006). *Conducting meaningful interpretation: A field guide for success*. Golden: Fulcrum.