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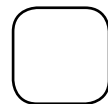
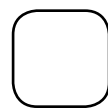
A Note from the Editor

This issue of *JIR* includes two research articles, one “In Short” submission and one “In My Opinion” piece. Topics include examining the importance of memories in making meaning during new experiences in nature, reviewing interpretation accommodations in the National Park Service, and hot interpretation and its impact on visitor experiences.

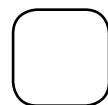
As you read through the *Journal*, traveling from historic sites to the International Crane Foundation, remember that our discipline is as varied and diverse as our locations, mediums, and messages, but what unites us as a field is our desire to make a measurable difference.

All of the articles in this issue provide information, guidance and insight into how to capture that “measurable” difference and how to begin to communicate that to each other, managers and practitioners of the science of interpretation. Remember to ask tough questions, imagine the impossible, and think beyond that which is now. In this economic climate, we have to be able to demonstrate our impact to the visitors, the resources, and the managers that we serve. If we cannot, we make those tough economic decisions too easy.

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



RESEARCH



Evaluating Environmental Interpretation with Mixed Method

A Case Study at the International Crane Foundation, Wisconsin

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Abstract

A mixed method approach was used to evaluate effectiveness of environmental interpretation on visitors' knowledge, environmental attitude, and pro-environmental behavioral intentions at the International Crane Foundation. Quantitative analysis suggests that participating in personal interpretation has the advantage of improving an audience's knowledge level, but is no more effective than nonpersonal interpretation in influencing attitude and behavioral intentions. Personal and nonpersonal interpretive methods are both effective in promoting knowledge and behavioral intentions for conservation, but do not influence environmental attitude. Qualitative results indicate that participation in personal interpretation makes more of an impression in the visitors' long-term memory than nonpersonal interpretation.

Keywords

environmental interpretation, conservation education, evaluation research, mixed method, International Crane Foundation

Problem Statement

Environmental interpretation, which connects audiences to natural resources, has often been considered an approach that not only provides experience and inspiration but also contributes to conservation and management of the resources (Knudson, Cable, & Beck, 2003; Munro, Morrison-Saunders, & Hughes, 2008; Powell & Ham, 2008; Weiler & Ham, 2010). The increasing demand for these practical objectives requires empirical research to evaluate the effectiveness of interpretive programs in order to optimize allocation of limited resources and maximize outcomes. However, the evaluation of environmental interpretation as a conservation strategy and management tool is difficult and insufficient. Short time spans, non-captive audiences, and various site-specific situations make the evaluation effort difficult. Some problems in interpretation research include lack of generic instrument and methodology (Munro et al., 2008; Weiler & Ham, 2010), lack of understanding of the longer-term effects (Orams, 1997), and lack of understanding of the differences between various types of the programs.

In this study, we evaluated the environmental interpretive program at the headquarters of International Crane Foundation (ICF) near Baraboo, Wisconsin, where on-site interpretation is applied as a strategy in the overall environmental education effort of the organization. Our goal was to investigate the effectiveness of the environmental interpretation program with a method that combined quantitative and qualitative measurements. We aimed to explore evaluation tools as well as inform management of interpretation and educational strategy. Our quantitative hypotheses and qualitative research focus were:

- Visitors who participate in personal interpretation (Group PI) have significantly greater changes in knowledge, attitude, and behavioral intention than the completely self-guided visitors (Group SG, Research Question 1).
- The qualitative proportion of the study takes an inductive approach and explores the key factors in the visitors' on-site experiences (Research Question 2).

Review of Literature

The roots of interpretive activities reach back to the early days of national parks, and it is now applied in various places (e.g.; museums, historical heritage sites, other recreational attractions). The sites that carry out environmental interpretation often expect to achieve conservation and management objectives by offering programs to a variety of audiences. These objectives may include mitigating the negative impacts on the natural environment (Kim et al., 2011), increasing supportive behaviors for conservation (Orams, 2004; Powell & Ham, 2008), and promoting visitors' understanding of conservation and pro-environmental attitudes (Kohl, 2005; Zeppel & Muloin, 2008). In this framework, interpretation is utilized as a communication tool that serves practical conservation purposes in various scenarios.

Orion and Hofsten (1994) reported that empirical research on the effectiveness of environmental interpretation has been growing substantially in recent decades (cited in Knapp & Yang, 2002;). Informing management and justifying the resource input have been mentioned frequently as the assumption and justification for the empirical evaluation of interpretive programs (Kim et al., 2011; Munro et al., 2008; Powell & Ham, 2008).

Observations of successful cases have been collected as examples of interpretation being used as an effective management tool (Knudson et al., 2003; Sharpe, 1976).

Meanwhile, researchers have been seeking empirical evidence to support the conjectured effectiveness and identify gaps. Skibins, Powell, and Stern (2012) indicated that “While there is much anecdotal evidence to support the basic principles of interpretation, there is often a gap in empirical evidence for whether these principles influence visitor outcome...” (p. 26). The current principles and guidelines for interpretation are largely based on experience in practices and are mostly intuitive as opposed to rational. Therefore, the information provided by empirical research would be beneficial for those managers who have limited resources and want to use them wisely.

Researchers have also been attempting to adopt or construct theoretical frameworks for environmental interpretation. Istvan (1993) indicated that behaviorism provides the central dogma for the methodology and framework through which the transmission model maps the interpretive communication. The behaviorism-centered framework is consistent with the shared purpose of behavioral modification as a problem-solving approach that blends environmental interpretation and environmental education. In fact, studies in these two disciplines often adopt similar theories and methodologies as well (Knapp & Poff, 2001).

Theories of reasoned action (Fishbein, 1979) and planned behavior (Ajzen, 1991) are often applied as the basis for measuring changes in knowledge, attitude, and behavior in research of environmental interpretation and education; also, they provide a theoretical framework to draw connections between practices and desired outcomes. Yet, the connections and routes that lead to behavioral change are not thoroughly understood. Ham (2007, p. 42) indicated that “most research does not support the assumption that increasing visitors’ general factual knowledge about something will necessarily influence their attitudes in any particular direction” (Holbrook, Berent, Krosnick, Visser, & Boninger, 2005; Wiles & Hall, 2003).

One of the most commonly used means of classification for interpretation is to distinguish personal from nonpersonal interpretive media (Bacher et al., 2007; Ham, 1992; Knudson et al., 2003). Personal interpretation refers to interpretive programs that involve face-to-face communication between interpreters and visitors, such as guided tours and demonstrations (M. Jones & Georgen, 2012; Weiler & Ham, 2010). In contrast, nonpersonal interpretation tends to make use of “static” interpretation methods such as printed materials, exhibits, self-guided walks, and electronic media (Ham & Weiler, 2002; Ruchter, Klar, & Geiger, 2010). Personal interpretive programs are often considered to have greater intensity and influence than nonpersonal interpretive programs (Hughes & Morrison-Saunders, 2005). Interpersonal communication potentially has more influence on visitors through interaction between the interpreter and the participants and by addressing specific needs (Wearing & Neil, 2013) as well as allows for flexibility in terms of various visitor types and methods of communicating messages (Magill, 1995). This assumed advantage has been rarely verified by empirical studies, and the different outcomes of the two types of interpretive approaches are poorly understood. Most previous evaluative studies either only focused on one type of interpretation or assessed both methods separately (Forist, 2003; Munro et al., 2008; Weiler & Ham, 2010), and very few studies have evaluated the effectiveness of interpretation from the perspective of comparing the two types.

In a review of empirical studies on interpretation that was based on 70 articles, Skibins et al. (2012) indicated that 24% of the studies employed qualitative methods, but only 11% were solely qualitative. Although several authors noted that using qualitative

Personal interpretation	Non-personal interpretation
<ul style="list-style-type: none"> • 2-hour public guided tours – Cranes of the World • Short public guided tours – Spirit of Africa, Flyways, Whooping Crane, North American Cranes, Cranes and Agriculture, Conservation Leadership 	<ul style="list-style-type: none"> • Watching exhibit birds • Looking at interpretive signage • Looking over exhibits • Watching videos • Reading printed materials (<i>Bugle, Reflections</i>, fact sheets, crane adoptions, brochures, visitor guide)

Table 1. Types of interpretation activity/media at ICF

methods itself provides valuable information in understanding the effectiveness of interpretive programs (Knapp & Poff, 2001; Stewart, Hayward, Devlin, & Kirby, 2003; Trotter, 2014), quantitative methods remain dominant in the research due to their duplicability and reliability. A mixed methodology approach is a useful to take advantage of both quantitative and qualitative methods.

Method

We used both quantitative and qualitative approaches to examine the outcomes of two different types of interpretation at ICF. We employed a quasi-experimental design to compare the outcomes of personal interpretation and self-guiding in influencing visitors' knowledge, environmental attitude, and behavioral intentions about conservation. Both immediate and longer-term (three-month) changes were measured using repeated measurements approach, which is commonly applied in clinical and psychological research (Frison & Pocock, 1992; Dunlap, Cortina, Vaslow, & Burke, 2002). Qualitative analysis was conducted to identify key components in the visitors' on-site experience.

Study site

Founded in 1973, International Crane Foundation (ICF) is a conservation organization which maintains a 225-acre campus as its world headquarters. ICF's mission is to work "worldwide to conserve cranes and their habitats, ecosystems, watersheds, and flyways on which they depend" (International Crane Foundation, 2014a). The public facilities include the captive crane exhibit, visitor center, theater, education center, gift shop, and four miles of trails. In 2011, the ICF campus was visited by over 25,000 people (International Crane Foundation, 2012). ICF provides various types of conservation education opportunities including public tours and various types of nonpersonal interpretive media (Table 1).

Instrument design

Three questionnaires were developed for the pre-, post-, and three-month follow-up

surveys, measuring the same dependent variables: knowledge, attitude, and behavioral intentions. The knowledge module contained five true/false questions about cranes and their habitats. In the attitude section, we used a revised scale based on the New Ecological Paradigm scale (Dunlap, Van Liere, Mertig, & Jones, 2002) to evaluate the respondents' pro-environmental attitude. The scale consisted of six items about the relationships between humans and wildlife/natural environment. For each item, the participants chose a point from the five-point Likert alternatives ranging from "strongly disagree" to "strongly agree." Three of these items were worded in a "pro-environmental" way and the other three were worded in the opposite manner. Behavioral intentions were measured by a unidirectional five-point Likert scale that contained five items about willingness to support ICF and take actions to benefit the environment.

The pre-questionnaire contained a short demographic section, and the post-questionnaire had an additional section about allocation of time during the visit. At the end of the post-questionnaire, respondents were asked if they were willing to take a follow-up online survey three months later. The three-month follow-up questionnaire had two open-ended questions about the participant's experience visiting ICF and the same basic modules as in the previous questionnaires.

Data collection

The on-site surveys took place from June 1 until August 20, 2013. A total of 33 survey days were randomly selected in the period with the proportion of two weekdays and one weekend day per week.

On each survey day, we carried out paper-and-pencil questionnaire surveys in the visitor center from 9 am to 4 pm. Each participant was requested to wear a badge that had a unique tracking number. Upon finishing the post-survey, the respondents who had agreed to participate in the three-month follow-up survey were asked to provide their email addresses on a separate sign-up sheet. We recorded the tracking number along with every email address to ensure that the three-month follow-up questionnaire could be matched with the corresponding previous questionnaires. The follow-up online survey took place from November 15, 2013, to January 31, 2014, using Survey Monkey.

Data analysis

Quantitative statistical analyses were performed in SAS 9.3 and SPSS 21. For the knowledge section, the respondents received one point for each correct answer or zero points for a wrong answer or skipped question. The points of all questions were added to generate the overall score (K) for each individual questionnaire.

We intended to measure attitude and behavioral intentions with multiple-item Likert scales. Factor analysis was performed prior to all of the following analyses in order to test the internal consistency of the scales. Because low internal consistency occurred for both attitude and behavioral intention scales, we did not use the whole set of items as a single factor, but analyzed each of the items as individual variables. Paired t-test was used to compare the changes within a group over time, and two-sample t-test was applied to compare the differences between the two groups of visitors.

For the Likert-type variables, we coded the responses of the five-point Likert items from 1 to 5 (Strongly disagree=1, Disagree=2, Unsure=3, Agree=4, and Strongly agree=5). The three reversely phrased items, 2, 3, and 5, were also reversely coded in order to make all items unidimensional.

Research objective	Data collected	Analysis
1. To detect the change of knowledge, attitude and behavioral intentions between participating in personal interpretation and self-guiding	<ul style="list-style-type: none"> • Measurement of knowledge, attitude and behavioral intentions before, immediately after and three months after the visit • Type of interpretive programs in which visitors participated 	<ul style="list-style-type: none"> • Two sample t-tests for comparing the two groups • Paired t-test for comparing pre- vs. post- as well as pre- vs. 3-month follow-up survey
2. To identify the impressive components of the visiting experience	<ul style="list-style-type: none"> • Responses to two open-ended questions about the most impressive experience during the visit and the reason for being impressed 	Post coding and emerging themes

Table 2. Research objectives and corresponding data collections and analyses

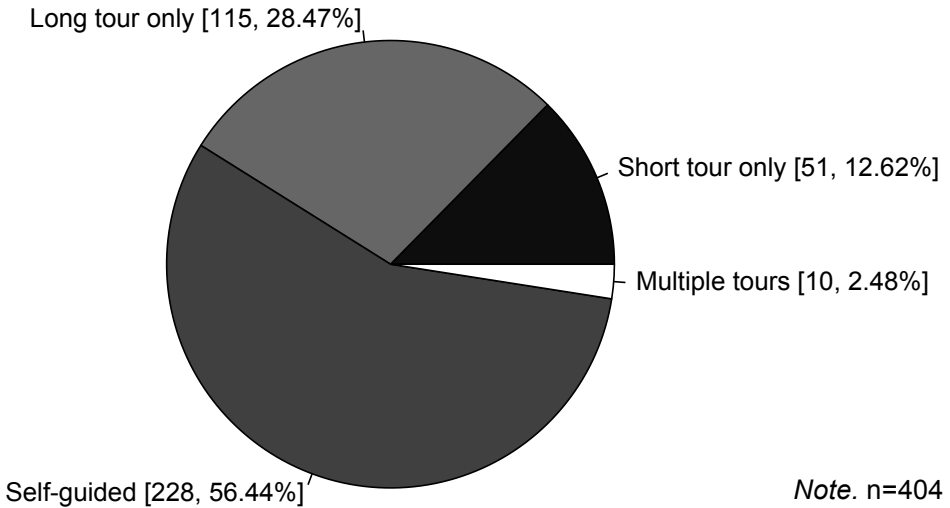


Figure 1. Number of visitors who participated in different programs

Table 2 summarizes the data collected and how we analyzed them for each research question (objective).

Results

Descriptive Statistics

We asked 451 visitors to participate in the research, and 404 agreed and completed (at least part of) both pre- and post-questionnaires. The response rate was 89.6% for the on-site surveys. Among these respondents, 375 (92.8%) completed the crucial components (activity type, knowledge, attitude, and behavioral intentions) on both questionnaires. And 105 (26.0%) participants signed up for the follow-up online survey. Out of these signed-up volunteers, 60 actually participated in the online survey and 55 completed it entirely. The response rate of the online survey was 57.1%.

A total of 393 participants reported their nationality, and 385 of them were from the United States. We also had 8 international participants from Canada (3), England (1), Switzerland (1), Denmark (1), Germany (1), and Japan (1). Little less than a half of the US visitors were from Wisconsin (178), and the other 207 were from 28 other states, leading by Illinois (69), Minnesota (26), Mississippi (13), Ohio (10), and Idaho (10). Only adults were recruited in the survey (all of the participants were above 18 years old).

Among the 404 respondents, 176 (43.6%) participated in guided tours (Group PI) and 228 (56.4%) were self-guided (Group SG). For Group PI, 115 visitors participated in the Cranes of the World tour, which was offered twice a day, and 51 participated in the featured short tours (Spirit of Africa/Flyway) offered daily. In addition, 10 visitors participated in both the two-hour tour and the featured tours (Figure 1).

Internal consistency and factor analysis

Computation of Cronbach's Alpha showed a low internal consistency between the items within each of the scales used for testing environmental attitude and behavioral intentions. Then we attempted to screen out individual inconsistent items using factor analysis. Four factors were kept in the analysis using principle component method, but none of the factor explains an adequate proportion to the total variance (>70%). Based on the contribution to factors, Cronbach's Alpha was examined again for the items that have a loading larger than 0.5 on a single factor, with exception for the three-month follow-up survey on attitude, no Cronbach's Alpha was found to be larger than 0.7 based on more than two variables. Therefore, each item was examined individually in the following analyses.

Research Question 1

Knowledge

No significant difference in knowledge was detected between the two groups in the pre-survey ($p=0.1573$, $\alpha=0.05$). After the visit, Group PI received significantly higher scores than Group SG ($p<0.0001$, $\alpha=0.05$). However, the two groups were very close on the knowledge score in the three-month follow-up survey ($p=0.9414$, $\alpha=0.05$) (Table 3).

The paired t-test on the difference between pre- and post- knowledge scores for each group indicates significant improvement in the post-survey for both groups. Meanwhile, the comparison of pre- and 3-month follow-up scores shows that the visitors that participated in PI (Group PI) maintained this improvement after three months

Variable	Type	N	Mean	Std Dev	DF	t Value	Pr > t
Kpre	PI	176	3.0398	0.8510	402	1.42	0.1573
	SG	228	2.8991	1.0839			
Kpost	PI	176	3.5568	0.8330	402	4.25	<.0001*
	SG	228	3.1272	1.1250			
Kpp	PI	28	3.5000	1.0000	53	0.07	0.9414
	SG	27	3.4815	0.8490			

Note. Where (applied to Table 2-5)

PI= visitors who participated in personal interpretation

SG = self-guided visitors

K is knowledge score

pp is 3-month follow-up survey (online)

diff = pre-score – post-score

diff OVT = pre-score – 3-month follow-up score

* $p < \alpha = 0.05$

Table 3. Descriptive statistics and two-sample t-test results of knowledge scores in all surveys

Group PI

Variable	N	Mean	Std Dev	DF	t Value	Pr < t
Kpre – Kpost	176	-0.5170	1.0308	175	-6.65	<.0001*
Kpre – Kpp	28	-0.4286	1.2889	27	-1.76	0.0449*

Group SG

Variable	N	Mean	Std Dev	DF	t Value	Pr < t
Kpre – Kpost	228	-0.2281	1.1499	227	-2.99	0.0015*
Kpre – Kpp	27	-0.1852	1.2101	26	-0.80	0.2169

* $p < 0.05$

Table 4. Results of paired t-test (left-sided) on the change of knowledge scores for each group

Variable	t	df	Sig. (right-sided)
K diff	2.62	402	0.0046*
K diff OVT	-.721	53	.2369

Note. Test based on Group PI – Group SG

* $p < 0.05$

Table 5. Results of two-sample t-test on the difference in change of knowledge scores between the two groups

Experience	Code count	Proportion
Experience with cranes	40	70.18%
Education/Interpretation	8	14.04%
Natural environment	6	10.53%
ICF's conservation works	3	5.26%
Total	57	

Table 6. Code occurrence of the responses on types of impressive visiting experience (Q1)

($p=0.0015$, $\alpha=0.05$), whereas the SG (Group SG) did not score differently from their own pre-survey ($p=0.2169$, $\alpha=0.05$) (Table 4). The improvement from pre-survey to post-survey for Group PI was significantly greater than that of Group SG ($p=0.0045$, $\alpha=0.05$); however, the improvement over the three-month period was not significantly different between the two groups (Table 5).

Attitude

The distributions of all items in the attitude module are left-skewed. When comparing the results of two-sampled t-test between the two groups, none of the items showed any significant difference. According to the results of paired t-test for each group, only item 2 had a significant difference change for both Group PI ($p<0.001$) and Group SG ($p<0.001$); however, the subsequent two-sample t-test found no significant difference in the degree of change on item 2 between groups ($p=0.253$).

Behavioral intentions

The two-sample t-test on the score differences showed that none of the individual item scores of behavioral intention was significantly different between the groups except for item 3 (I plan to visit ICF again this season) in pre- and post-surveys ($p=0.013$). The results of paired t-test on the differences in behavioral intention items between pre- and post- as well as pre- and three-month follow-up surveys indicate that significant differences existed in pair 1 (B1pre–B1post, $p<0.001$), pair 2 (B2pre–B2post, $p<0.001$), pair 3 (B3pre–B3post, $p<0.001$), and pair 8 (B3pre–B3pp, $p<0.001$) for both groups. Then the differences in these four pairs were compared between groups, but no significant difference was found in any of the items.

Research Question 2

For the first question (the most impressive component of the visiting experience), four master codes were generated by categorizing the root codes of the first question (Table 6). The inter-rater reliability between the two coders was found to be Kappa = 0.816 ($p<0.001$), 95% CI (0.629, 0.960).

Coding of the second question (why the particular experience impressed the

Category of experience	Code	Count	Proportion
Experience with cranes	Visual/auditory experience with the cranes	26	45.61%
Education/Interpretation	Education/Interpretation	10	17.54%
Experience with cranes	Varieties/quantity of cranes	7	12.28%
Natural environment	Quality of environment (trails/landscape/architecture)	6	10.53%
ICF's conservation work	ICF's conservation work	4	7.02%
Experience with cranes	Unusual opportunity	4	7.02%
Total	Total	57	

Table 7. Code occurrence of the responses on reasons for impressive experience (Q2)

respondent) showed that the most common reason was a visual or auditory experience with the cranes (45.61%, Table 7).

Further breaking down the responses under the code “education/interpretation” shows that personal interpretation plays a vital role in the visitors’ experience. Out of the 10 responses related to interpretive or educational experience, six mentioned that the educator or guided tour added most to their experience (Table 8).

Code	Count	Proportion
Personal interpretation (educator)	6	60%
Meaningful	2	20%
Interpretive signage/exhibit	1	10%
Unspecified	1	10%
Totals	10	

Table 8. Code occurrence of the responses about experiences related to interpretation/education

Discussion

Compared to self-guided, personal interpretation participants improved their knowledge about cranes and ecosystems significantly more through the program and they were able to maintain the knowledge over a longer period time. However, the advantage in knowledge improvement obtained from personal interpretation reduced over time. Our hypotheses about the advantage of personal interpretation in knowledge delivery was supported.

Attitude change over the course of the program was similar between the two groups. When individual items were examined, both groups of visitors had a significantly higher concern after the visit in regard to “Humans can easily replace wetlands lost to development.” The personal interpretation participants also scored higher on item 5, “Too much damage has already been done to the environment for individuals to make a difference” in the three-month follow-up survey. All visitors became more positive

about individuals making a difference to conserve the natural environment in the online survey. On the other hand, the scores of items 4 and 6 in the online survey were lower than their pre-scores. Self-guided visitors scored more conservatively on “Humans and other wildlife benefit from the protection of cranes” and “I am concerned about wetland loss and degradation” in the three-month follow-up survey. The results reveal the complex relationships between knowing the facts, changing attitude, and making conscious decisions to help the environment, and also show inconsistency with the current frameworks such as planned behavior.

The results do not support our hypothesis that the personal interpretation participants would have a more significant change in attitude than self-guided visitors; however, it merits attention that a shift toward the pro-conservative end in the three-month follow-up survey occurred on two of the items for SG. This tendency did not occur among visitors who participated in personal interpretation. The clearest assumption of the results is that both personal and nonpersonal interpretations have strong influences on visitors’ concerns about losing natural wetlands to development; however, the effectiveness does not differ between the types, and effects over a relatively long term require further examination. The assumed advantage of personal interpretation in current literature (Hughes & Morrison-Saunders, 2005) needs to be examined at more sites in order to justify the intensive resource inputs.

On individual items, the personal interpretation participants and self-guided visitors did not score much differently except for item 3 in the pre- and post-surveys. The personal interpretation participants actually had lower intention to visit ICF again that season in both pre- and post-surveys. They might have had a satisfied experience and not feel necessity to visit again. Also, it is possible that personal interpretation participants tend to have longer travel times and it is unrealistic for them to visit again in the same season.

In the behavioral module, the personal interpretation participants and self-guided visitors both scored significantly higher on item 1 (consider becoming a member of ICF), item 2 (tell others about ICF), and item 3 (visit ICF again this season) in the post-survey. The self-guided visitors also indicated that they became more positive about making a change at home to benefit the environment. In the three-month follow-up survey, both groups had higher intentions to visit ICF again compared to their pre-survey responses. The self-guided visitors also had a significant improve in their intentions to become members of ICF in the three-month follow-up survey.

The qualitative analyses indicate that the indubitable major factor was “experience with cranes,” and the most important experience for the visitors was simply viewing the cranes up close. Many visitors mentioned that they appreciate the diversity of cranes and the unique opportunity to see the varieties of cranes at ICF. The second most influential experience was participating in the interpretive program or educational experience. The most favorable experience under this category was taking the guided tours and listening to presentations, which indicate that personal interpretation played a highly significant role in the overall educational experience.

These findings reflect intricate results of interpretation activities. Some of the expected outcomes of interpretation identified by the literature, including improving participants’ awareness of conservation, promoting pro-environmental attitudes (Kohl, 2005; Zeppel & Muloin, 2008), and increasing supportive behaviors for conservation (Orams, 2004; Powell & Ham, 2008) were not completely affirmed in this study. The

visitors' responses showed some retention, largely on memorizing scientific facts, but changes in attitude and behavioral intentions were inconsistent and difficult to be endorsed, especially in a longer time period.

Meanwhile, the results show discrepancies between changes in knowledge and attitude/behavior, which would undermine the framework of behaviorism based on theories of reasoned action and planned behavior. This observation is consistent with several other studies (Holbrook, Berent, Krosnick, Visser, & Boninger, 2005; Wiles & Hall, 2003) summarized by Ham (2007). The three-month follow-up survey also reveals that the long-term influences of interpretation programs are precarious. If encouraging long-term behavioral changes is one of the core values of environmental interpretation, obviously we still have long way to go in order to understand how to make it happen. This also posts questions on the adoption of behaviorism-based survey indicators that showed popularity in the meta-analysis conducted by Munro et al. (2008). Introducing innovative measurement approaches from social psychology and behavioral research is a potential future direction.

Although personal interpretation participants did better in memorizing communicated facts, the presumed advantages of personal interpretation recognized by the literature (Hughes & Morrison-Saunders, 2005; Wearing & Neil; Magill) were not completely affirmed by outcomes on attitude and behavior intentions. More research is needed in order to inform and justify the prioritization of limited resources. In addition, the nonpersonal interpretation assessed in this study were mostly static while interactive interpretation with technologies are increasingly popular, and therefore understanding the potentials of these new methods and comparison between different approaches would also be valuable for the practices in environmental interpretation.

The results should be interpreted in a cautionary but not definitive manner due to the limitations of our methodology and potential sampling biases. Our attempt of using multiple items to assess an overarching latent variable (environmental attitude) was unsuccessful due to the lack of internal consistency, and this brought up the question if designing the variables individually would be a more legitimate approach. At least, conducting a preliminary survey with a decent sample size and testing the internal consistency of a set of items when possible would be beneficial to reveal the latent variable of interest more convincingly. Biases from on-site semi-convenient sampling introduce potential errors, and exploring cost-efficient sampling methods for interpretation research is desired.

Summary

Inclusion of guided tours produces an advantage in delivering information and influencing the visitors' knowledge about conservation. This advantage is more substantial immediately after the visit, and evidently remains significant for a relatively long time. The two types of interpretation do not differ much in causing attitude changes and behavioral alterations in visitors. Neither of them changes the visitors' environmental attitude much, but both of them improved some immediate behavioral intentions.

The visitors are mostly impressed by sensory experiences with the captive cranes, such as seeing cranes up close in the natural environment. It is reasonable to assume that changes in attitude and behavioral intentions for both visitor groups could be highly related to their direct exposure to the natural environment and associated emotional components.

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Memories on the Trail

Families Connecting Their Prior Informal Learning Experiences to The Natural World During Nature Walks

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Abstract

This study examined the importance of memories of informal learning experiences as families shared their prior experiences during meaning-making talk during nature walks. The families' memories came from previous visits to interpretive sites and were used to shape their observations of the natural world during conversations in the outdoors. Using ethnographic data collection and thematic analysis, findings are first presented through one family case study, then across all 16 participant families. Three findings include: (1) for one family, prior informal learning experiences provided an essential learning tool for making meaning together during their hike; (2) across the dataset, when families observed the landscape along the trail, they often connected memories gleaned from previous visits to the nature center, while encounters with natural objects sparked memories originating from other informal learning sites; and, (3) children most often recalled prior visits to the nature center, while parents made connections to other settings. This study revealed that families' personal memories were salient—months and even years later—as they attempted to make meaning with new experiences on the trail. Our work suggests that informal learning spaces that provide the opportunity to make previous connections to life experiences can have a long-term impact on families' new understandings about the environment.

Keywords

meaning making, prior knowledge, prior experience, memory, family learning, environmental education, informal education, outdoor education

Over the past decade, research attention is being placed on the potential of out-of-school learning settings—including naturalistic settings—to provide profound experiences for science learners of all ages (National Research Council, 2009; 2015). Researchers (Falk & Dierking, 2010) find that the majority of the United States' population learns about science topics through out-of-school settings (such as museums, zoos, science centers, and nature centers), and through media (including the Internet, television, print and online books). Additionally, informal-based learning is often accomplished socially with friends or family members as learning partners (Dierking & Falk, 1994). When surveying 334 adults regarding their memories of being in the outdoors as a child (Waite, 2007), a prominent feature of these memories was the inclusion of a sibling, parent, or grandparent. Furthermore, research has shown that family groups comprise the largest visiting social group to outdoor-based U.S. national parks (Falk & Heimlich, 2009; Forist, 2003), while a similar pattern of high levels of family visitation has been documented in museums, aquariums, and zoos (Falk & Dierking, 2000; Smithsonian Institution, 2004). Given these understandings of where, when, and with whom informal learning occurs, our research was motivated to learn more about the role of prior experiences in interpretive, informal learning settings as being supportive for family group's future understandings and meaning-making talk about the natural world during outdoor learning.

This analysis, which is part of a larger outdoor-based family learning project (Zimmerman & McClain, 2014), delves deeply into the role of experiences in informal learning settings and how these past experiences influence new meaning-making talk during outdoor activities, such as nature walks. In addition, this article's analytic focus on family learning in outdoor settings through the verbal recall of prior experiences is an important means for understanding how the most populous social group to informal education spaces (Falk & Dierking, 2000) learns together through their talk. For our study, we sought to better understand the role of families' memories from prior visits to interpretive sites in supporting new environmental learning and meaning-making talk within the out-of-doors. As such, the findings presented here draw from data collected using ethnographic methods to represent how 16 participant families (54 people) shared personal memories during nature walks in order to make new meaning of the surrounding flora and fauna.

Theoretical Framework

We approach our investigation of the role of memories as a meaning-making tool to support informal learning with a sociocultural view of learning, which acknowledges the influence that the setting, people, and tools within a learning event have on an individual's understandings of the world (Vygotsky, 1978). We take a holistic view of learning building from the National Research Council's report (2009), which reviewed the research and evaluation literature on informal science learning. Learning in this view is making meanings or the process by which people make sense of a new experience. Prior knowledge comes to the forefront of that meaning-making experience as a tool to filter and organize the new information (Ignelzi, 2000). At the core of meaning making, an individual creates their own meaning from an event; however, the process of meaning making is often social

(Ansbacher, 2002)—meaning making is facilitated through discussions with other people, objects, and tools available to the learner. Interpreting the world and making meaning of new experiences is something we encounter every day, but we each approach new events armed with our own cultural beliefs, values, and knowledge to shape those experiences. This process leads to the formation of unique connections made between different contexts for learning, and therefore personalized meaning with each new experience we encounter.

Informal learning occurs within a “broad array of settings” that provide opportunities for science learning outside of school (National Research Council, 2009, p.1). Learning experiences include visits to museums or zoos, participation in summer camps or clubs, and everyday activities such as gardening, hiking, or fishing (Falk & Dierking, 2000; National Research Council, 2009). While much research in the field of interpretation looks to understand learning within one educational intervention or setting, our research takes a different approach: we examine learning at one environmental center in order to understand the role of episodic memories (Tulving, 1972) gleaned from a variety of other informal learning settings that support families’ meaning-making talk related to the natural world. Given our research goals, the framework employed here draws from previous work in interpretation research related to the role of meaning-making talk, memories, and family learning in informal science education settings to understand how prior experiences shape new family learning opportunities, each of which are described in more detail in the following sections.

Episodic Memories Shared in Family Conversations to Make Meaning During Informal, Outdoor-based Learning Experiences

All new learning experiences are shaped by learners’ previously constructed understandings of the world (Rennie & Johnston, 2004). Learning is not simply a process of information acquisition; instead, it is a socio-cultural process whereby new information is considered alongside one’s prior knowledge and experiences—often in social groups. Roschelle (1995) aptly illustrates the importance of prior experiences to learning when he asserts that, “Prior knowledge determines what we learn from experience” (p. 38). Correspondingly, when considering the processes of visitors’ learning and meaning-making talk at interpretive sites, prior knowledge is inherently tied into the visitors’ on-site discussions.

Episodic memories are important for out-of-school learning

When prior knowledge is stimulated during a new learning event, it can take the form of memories from previously experienced activities. In this study, we focus on personal memories that are shared with others when the memories are spoken aloud during intergenerational conversations—which are called episodic memories (Tulving, 1972). Our focus on episodic memories contrasts from a focus on the cognitive view of internal memory recall, which does not readily regard the social nature of meaning-making conversations with memory sharing. As has been suggested by interpretation researchers (Knapp, 2006; 2007), Tulving’s long-term memory theory (1972) provides a theoretical basis for analyzing the effects of long-term recollections of informal programs. Since a major goal of interpretive programming is to connect visitors to resources through short-term attention factors, knowledge, and long-term memories of the program (Benton, 2009), Tulving’s memory theory is apt for better understanding informal learning processes and outcomes.

Tulving (1972) describes episodic and semantic memory systems as both being able to receive information, retain various aspects of this information, and transmit particular information to other systems. More specifically, Tulving (2002) connects the episodic memory system with the act of remembering personal experiences and “happenings in particular places at particular times” (p. 3). Regarding interpretive programs, Knapp (2006) suggests that when a learner feels a personal connection to the content, vivid episodic memories are more likely to be formed. The semantic memory system, on the other hand, is related to disciplinary, conceptual knowledge (i.e., knowing), rather than reminiscing about a personal experience. Semantic memories need not recount a specific time or place where that knowledge was developed (Tulving, 2002). Knapp (2007) suggests that well-executed interpretive programs provide experiences that encourage both episodic and semantic memory development. In our research, we focus on episodic memories given their role as meaning-making tools within family conversations.

Family learning in informal settings

While Knapp’s (2007) and Tulving’s research (2002) on episodic memories has helped to inform best practices in the field of interpretation, we adapt their ideas so that episodic memory is aligned to a social view of learning. Memories are important to families in informal settings because families bring their own cultural histories, patterns of dialogue, and interests to each new learning setting (Ellenbogen, Luke, & Dierking, 2004). Previously shared experiences shape the development of new knowledge (Bell & Linn, 2002), and similarly, when family groups visit informal education sites, they connect personally relevant experiences to new concepts they encounter together, while they also rely on one another to explore new ideas.

Researchers argue that learning can be analyzed through visitor’s spoken connections between the previous and current learning experiences (Rennie & Johnston, 2004). Through talk, people connect prior experiences to that of the new experience (Falk & Dierking, 2000; Rennie & Johnston, 2004). More specifically, Rennie and Johnston posit that:

Visitors learn during a museum visit based on their recollection of previous information and experiences evoked by the exhibits, enabling them to construct new understanding, or a different way of thinking or acting. Learning involves making links to, or between, previously separate ideas, or the potential to make new links in the future (2004, p. S7).

Consequently, the verbally shared episodic memories are connections between informal learning sites that serve as evidence for learning. As families discuss and develop shared understandings and construct meaning together (Ash, 2003; Crowley et al., 2001; Ellenbogen et al., 2004), episodic memories facilitate the learning process. Indeed, prior research with families in the outdoors (McClain & Zimmerman, 2014) has observed families using prior experiences as meaning-making tools within conversations pertaining to the natural world. Given the findings of this previous work, our theoretical lens is based on the personal episodic memories shared between family members in order to understand the (a) catalysts for these conversations and (b) roles that parents and children take on during these meaning-making conversations.

Research Questions

Based on our review of the literature and associated theoretical framework, our research was guided by three questions:

- 1) What was the variety of prior informal learning experiences that one family connected to the natural world in order to make meaning during their nature walk?
- 2) What personal, episodic memories from prior informal, interpretive learning settings, such as designed spaces and programs for science learning, were brought up in families' conversations during a nature walk as a means of connecting to the natural world? What sparked families to share these episodic memories during the nature walk?
- 3) What was the social dimension of sharing episodic memories from prior informal learning experiences during the nature trail experience for parents and children?

Setting and Participants

This research project took place in the mid-Atlantic region of the United States at an environmental center affiliated with a large research university. Shaver's Creek Environmental Center (SCEC) has a year-round staff that conducts community-based programs and teaches undergraduate and graduate courses for the university. The property of SCEC, where this study took place, includes an indoor exhibit room with environmental-themed displays and live amphibians and reptiles; an outdoor Raptor Center with over 20 non-releasable birds of prey on display; and many kilometers of hiking trails. The hiking trails are set within a mixed hardwood forest with a wetland and multiple streams.

We recruited 16 families, consisting of 54 individuals, to participate in our study. All families included at least one child between the ages of 3 and 15. Six families participated with one child, and ten families participated with multiple children; one grandmother and one aunt also participated. Parental occupations ranged from academic positions to stay-at-home parenting to service and restaurant jobs. Children attended public, private, and home-based schools.

Twelve different SCEC-hosted nature walks, which were led by seasonal interns (as trail guides) and ranging from 45 minutes to two hours in length, were included in our data; some families were grouped together. Eight of the 16 families participated in these group hikes with multiple families, while the remaining eight families participated in individual hikes where they were the only participating families. All of the consented families were similar in that they were moderately familiar with science, had a strong interest in the natural world, and all enjoyed being outside together, as described during their post-hike interviews with the researchers.

Methods

In our study, we leveraged ethnographic data collection and analysis methods in order to collect naturally occurring conversations. This type of naturalistic observation technique is used to provide researchers with a view into the meaning-making strategies families use in situ (e.g., Allen, 2002; Ash, 2003). In our study, episodes were selected for analysis when families spontaneously discussed previous informal learning experiences in order to make sense of the natural surroundings. Interpretation research methodologies have traditionally included post-program interviews and pre- and post-test surveys in order

to elucidate the episodic memories of program participants (e.g., Knapp, 2006; Waite, 2007); however, we were not assessing any particular program, nor were we explicitly asking the learners to share memories from previous interpretive programs. Instead, we analyzed if, how, and when family groups connected previous learning experiences to the out-of-doors in an unprompted manner.

Data Collection

The research team acted as participant-observers during the study with one researcher hiking alongside the families and the second researcher following the families at a distance with the video camera during the hike. A child from each of the 16 consented families wore a wireless microphone. In the event that the consented families encountered non-consented families during a hike, the researchers only videotaped the consented families and their resulting conversations. Audio from the microphones was wirelessly streamed into the video cameras and was subsequently monitored by the videographer to ensure sound clarity of the dialogue (Allen, 2002). In addition, field notes and photographs of the families' actions were taken by the research team to supplement the primary video data source.

Data Preparation

The families' video recordings were compressed for transcription. During transcription, the researchers retained the actual speech used by the family members, including "um," and slang terms, such as "cuz" and "yeah." We examined the families' conversations to better understand what types of episodic memories from informal learning settings were explicitly connected to the setting of the nature trail. Our work focused on the conversational processes (as a proxy for thinking) on the trail rather than on the learning outcomes in order to identify the types of prior informal learning experiences that were most salient, or enduring, for families. Additionally, we were not analyzing for scientific accuracy into the families' comments; instead, we were interested in what nature trail encounters sparked them to connect a memory from a previous informal learning experience. On the transcripts, overlapped (interrupted) talk between two individuals was marked with double slashes [//] for both speakers. **Bold font** indicates our application of our analysis to the transcripts with regard to our coding schemes.

Data Analysis

The first author led the coding and analysis efforts for this research study. When coding transcripts, conversational episodes (rather than individual utterances) related to episodic memories were the unit of analysis from which themes were developed (detailed in following sections). For example, when a family member brought up a prior experience that was subsequently discussed between the family members, that specific memory was only coded once. Additionally, memories expressed were analyzed within their full conversational context, rather than as isolated elements. To understand the social dynamics around the sharing of memories, it was noted what prompted the sharing of a memory and who recalled a previous experience; therefore, further coding for adult-prompted conversations and child-prompted conversations occurred.

Code Frameworks

Our overall coding and analysis work had two foci: (1) one case study family and their connections between previous learning experiences from a variety of informal science settings with observations made on the nature trail and (2) all 16 participant families and their episodic, or experiential-based memories from interpretive sites used to connect and make meaning with flora and fauna seen during the nature walk.

Coding the case study analysis of one family

We first developed a case study to provide an overall picture of the variety of informal learning settings that influence families' understandings of the world around them as evidenced by the conversations where those settings were referenced (McClain & Zimmerman, 2014). The Long family was selected from the 16 families in the overall study because of the frequency and diversity of prior informal learning experiences they discussed during their nature walk.

The Long family participated in a two-hour long nature walk at the environmental center. The family consisted of Allison (mother), Matt (9 years old, 3rd grade) and Kyle (6 years old, kindergarten) (names throughout are pseudonyms). At the time of the study, Allison was a pharmacist and her husband was a police officer. Matt and Kyle had extensive experience with the study's environmental center: the boys had attended the Center's summer camps, and their elementary school classes had participated in field trips to the Center. While the Long family frequently visited the Center, they were not heavy trail users for nature walks.

Case study code framework

Four broad categories of prior experiences emerged from the transcript data and were finalized based on previously defined settings for informal science learning (McClain & Zimmerman, 2014; NRC, 2009):

- 1) everyday experiences (e.g., gardening, activities within the families' home)
- 2) programs for science learning (e.g., Boy/Girl Scouts, summer camp programs)
- 3) designed spaces (e.g., museums, aquariums, nature centers)
- 4) science media (e.g., Internet, science-based television shows, books)

These four coding categories were used to analyze the Long family's conversations during their nature walk. As a result, this first, broader level of coding provided an overall sense of the diversity of resources that families tapped into and connected with during their nature walks; the application of this coding scheme across all 16 consented families is reported in a previous study (McClain & Zimmerman, 2014). Here, we use this coding framework to motivate a more detailed analysis into the role of out-of-school settings as episodic memories within meaning-making talk as described in the second level of analysis below.

Analyzing across the dataset of 16 families

The second level of analysis included all 16 families in order to focus specifically on memories gleaned from the informal learning sites related to the field of interpretation and how these sites emerged in the families' learning conversations as meaning-making tools and points of reference. During this deeper stage of analysis, the families'

Programs for science learning	<p>a) <i>community programs</i> (e.g., Girl or Boy Scouts, insect fairs, art programs),</p> <p>b) <i>summer camp programs</i>,</p>
Designed spaces	<p>a) <i>outdoor-based museums</i> (e.g., botanical gardens, nature preserves),</p> <p>b) <i>indoor-based museums</i>,</p> <p>c) <i>prior visits to SEC with family</i>.</p>

Table 1. Coding Framework Focusing on Five Subcategories within Interpretation-led Learning Settings

conversations were coded with a specific focus on two of the categories from the case study's coding scheme that related specifically to settings pertaining to the field of interpretation: programs for science learning and designed spaces.

Code framework across all families

Once we identified (a) programs for science learning and (b) designed spaces as the two learning settings that could also be considered to be interpretation-led sites, we further divided these two categories to include five subcategories as shown in Table 1.

Next, a second pass was made of the dataset from all 16 families after it was coded to better understand the value of out-of-school settings to new learning. Using a thematic analytic approach, each of the coded categories was iteratively read to develop themes related to sharing memories, family learning, and the role of interpretive sites on new informal learning experiences. The research team looked for confirming and disconfirming evidence, as well as for themes that were particular to individual families and were pervasive throughout our dataset.

Methodological Strengths and Weaknesses

Our goal for this study was to understand the kinds of experiences that were expressed aloud as personal memories, which were relevant to learners' meaning making during trail walks. As such, we employ conversational analysis (Allen, 2002; Ash, 2003) to understand how prior experiences mediate new learning about the natural world. Consequently, this study advances the interpretation research field's understanding of families' meaning-making processes with our approach to examining how families learn together as they recall prior informal learning experiences. While our work portrays the richness of family learning conversations as they occurred in situ, it is not our intention to generalize our findings to all families who attend interpretive-led learning sites. Rather, we (a) demonstrate how ethnographic research methods can be applied to the interpretation research field and (b) advance learning theory with regard to the role of prior experiences in shaping new science-related understandings among family groups.

Data from family conversations	Analysis		
	Spark of memory	Episodic memory setting	Coding category (broad level)
<p><i>Matt:</i> Sort of looks like, um, what's it called, Mom?</p> <p><i>Allison:</i> It looks//</p> <p><i>Matt:</i> //the stuff we made at the Smithsonian in that cranking machine</p> <p><i>Allison:</i> Ohh! It looks like cotton!</p> <p><i>Matt:</i> Yeah! It looks like cotton.</p> <p><i>Researcher:</i> Ohh- it does look like cotton.</p> <p><i>Matt:</i> With seeds in it.</p> <p><i>Allison:</i> Like cotton with seeds- yeah!</p> <p><i>Matt:</i> Yeah, people could make artificial cotton with this.</p>	<p>Matt stopped to examine a seed pod hanging on a stalk; he associated its physical features with something he had seen before.</p>	<p>“The stuff...in that cranking machine” from the Smithsonian National Museum of American History</p>	<p>Designed space</p>
<p><i>Matt:</i> Our cockroach did some- did something very disgusting</p> <p><i>Kyle:</i> // I like hissing cockroaches</p> <p><i>Matt:</i> //It was a female and it had like an- a thing coming out of its back that was gonna be its babies and it sucked it back in.</p> <p><i>Researcher:</i> Ew! Weird.</p> <p><i>Matt:</i> Uck!</p> <p><i>Kyle:</i> It had the babies and it sucked the babies right back in.</p> <p><i>Researcher:</i> Huh!</p> <p><i>Matt:</i> Uck!</p> <p><i>Allison:</i> We don't know if it was babies</p> <p><i>Matt:</i> No, we did! We looked it up on the computer and it said that's what they do.</p>	<p>Found a bug's shell on the trail; associated shape of the shell to pet cockroach at home.</p>	<p>Matt and Kyle compared the shell to the body of their pet cockroach at home and the associated research about cockroaches from they had gleaned from the Internet</p>	<p>Science media</p>
<p><i>Matt:</i> It's like- they have a ball and it's really- my dad showed me! They're about this color and they're... edible, they're like really --</p> <p><i>Female guide:</i> Oh! I don't- I don't know what that is</p> <p><i>Matt:</i> --spicy. I don't- I forget.</p> <p><i>Kyle:</i> //You mean the things dad ate at um//</p> <p><i>Matt:</i> //Oh, leeks!!</p> <p><i>Kyle:</i> //the farm?</p> <p><i>Female guide:</i> Oh, leeks?</p> <p><i>Matt:</i> Yeah.</p> <p><i>Kyle:</i> Yeah! I know those, Matt. I ate one at the farm.</p> <p><i>Matt:</i> Leeks. Yeah, these I think are leeks.</p>	<p>The family came across a grassy area during the nature walk and Matt associated the grass with a plant he had seen at his family's farm.</p>	<p>Eating a leek at the family farm</p>	<p>Everyday experience</p>
<p><i>Matt:</i> Leave no trace- oh yeah! We in- whoa- in boy scouts we have a "Leave No Trace" badge.</p> <p><i>Researcher:</i> Oh yeah? What do you learn about that?</p> <p><i>Matt:</i> Oh it's that, we have a camp called Webelos Point Camp, where they take us up to a place and they'll leave us there for a week and we're supposed to survive, and we get a badge if we, like, leave no trace by not, like, polluting and leaving footprints.</p>	<p>Matt came across dead leaves on the ground that reminded him about the concept of composting and “Leave No Trace”</p>	<p>Boy Scouts</p>	<p>Program for science learning</p>

Table 2. Long Family's Referenced Settings for Previous Informal Science Learning Shared as Episodic Memories

A limitation in studies of this kind is people's awareness of the researchers' cameras. While we acknowledge that the presence of the researchers and video cameras may have influenced the families' behavior, we posit that the public setting of the environmental center (and the presence of other visitors) also affected families' actions. The families had no pretense of privacy. Additionally, the families frequently engaged with "normal" family behavior throughout their hikes, such as temper tantrums, requesting snacks, or stopping for breaks.

In relation to interpretive information influences on the families' conversations, there was very little to sway the families' conversation topics. For example, at SCEC, there are five or fewer interpretive signs along the nature trails; additionally, these signs are out-of-date as they refer to a lake that has since been drained due to dam erosion. The researchers as participant observers only engaged in conversation with the family members if they were addressed directly by the family and did not take the lead on topics of conversation, nor did they ask probing questions to steer the conversation one way or another. We contend that the families' conversations during the nature walks were correspondingly unprompted by the research team.

Findings

The findings of this article begin with the Long family case study followed by an analysis of the entire 16 participant families. Three main findings arose from our two analyses:

- 1) An extensive repertoire of previously experienced informal learning activities contributed to the Long family's personal meaning making about the local environment during their nature walk.
- 2) Families tended to connect their observations of a certain area along the trail to a prior visit to SCEC while specific natural objects they encountered on the trail were often related to an object they may have seen in another location outside of SCEC.
- 3) Children displayed their SCEC-based expertise by most often recalling a memory from a SCEC learning event, while parents were more likely to make connections across settings by referencing memories from informal learning sites outside of SCEC.

In the following sections, we present conversational examples from the dataset in order to contextualize our findings.

Long Family Case Study

Throughout the nature walk, the Long family referred to a variety of prior experiences they had shared outside of SCEC as a family. In addition to connecting with previous informal learning experiences other than SCEC as demonstrated by the examples in Table 2, Matt frequently made references to his prior visits to the center either as a summer camper or a casual visitor.

While we were not analyzing for accuracy into Matt's comments, we focused our analysis on (a) the trail-based encounters that sparked him to connect a previous experience to the immediate activity and (b) the setting from which the episodic memories originated. In one example, the hiking group came across an area on the outskirts of SCEC and Matt noticed the landscape had shifted since he had last been there:

Matt: Oh yeah! This is where the bushes used to be all standing...really tall.

Seasonal intern guide: It's probably like that because, um, things aren't in bloom yet.

Matt: Yeah, **during camp when we were here**, we found a treasure chest there//

Seasonal intern guide: //really?//

Matt: //with all these notes, but one time when I tried to get there, there was a swarm of...wasps, so I got stung a bunch.

Matt cites his experience at the SCEC summer camp as being the basis for noticing a difference in the landscape where “the bushes used to be all standing...really tall.” He then uses the reference to camp as a jumping off point to tell the seasonal intern guide about an experience he had at camp where he and his camp group ran into a swarm of wasps. This previous wasp experience was a salient memory for Matt and he actively connected that memory to the current hike in order to make sense of the change in the local flora.

Through the wasp example and the excerpts displayed in Table 2, our case study analysis demonstrates how previous learning experiences from a myriad of settings lent themselves to the meaning-making activity the Longs engaged with during their nature walk. As the Longs encountered new information along the trail, they relied on a diverse array of previous informal learning experiences in order to make their current environmental learning more personal. Our claim about the role of episodic memories to support the Long's meaning-making talk on the trails coincides with what Ellenbogen (2002) has observed with indoor museum-going families:

Their social interactions are interconnected to a complex shared system of past experiences, beliefs, and values. Family members are accustomed to interacting and learning together, and they are equipped with an extensive array of personal and cooperative learning strategies that facilitate the museum learning experience. (p. 83)

Likewise, the Long family's extensive repertoire of experiences in both designed and everyday informal learning settings allowed them to work together to make meaning together as they encountered new environmental phenomena throughout the nature walk.

Families Connected Prior Interpretation-led, Informal Learning Experiences to the Nature Walk

Building from the case study analysis, we next examined the talk from the 16 families in our dataset to investigate how prior experiences originating from interpretive, informal learning settings connected to new learning on the SCEC nature trails (see Table 1). In Figure 1, the explicit verbal references to previously visited interpretive sites and programs are displayed. From the 16 families, 76 conversational episodes included references to prior informal learning experiences. Of these 76 conversations, episodic memories of previous visits to Shaver's Creek Environmental Center, where this study took place, ranked as most salient during the families' nature walks (61 references).

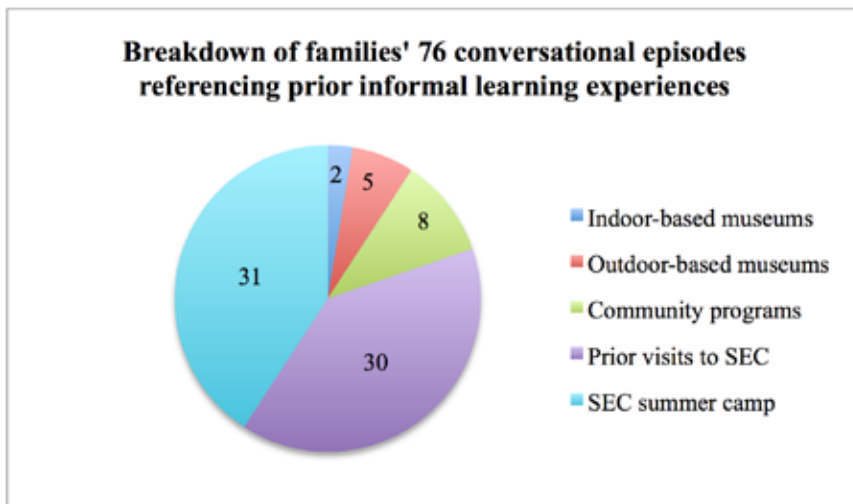


Figure 1. Families' prior informal learning experiences shared as episodic memories during trail-based conversations.

Data from family conversations	Analysis		
	Spark of memory	Episodic memory setting	Coding subcategory (refer to Table 1)
<i>Luke (12 years old):</i> We have to go over to the place where we found the blue-tailed skink!	Observing a familiar area on the nature trail where a reptile was previously seen.	Prior visit to hiking trails at SEC	Prior visit to SEC with family
<i>Sam (7 years old):</i> We come down here in the summer. And last summer camp, we went up there. It's actually a pretty nice view of down here if you're up there.	Observing a familiar area on the nature trail where previous observations of the scenery were noted.	SEC summer camp	Summer camp program
<i>Melanie (mother):</i> Oh! A grasshopper! Just don't eat them, like at the Bug Fair!	Encountering an insect (grasshopper) along the nature trail.	Eating an insect at a community program and university-sponsored Insect Fair	Community program
<i>Noah (father):</i> Boy, this is an awful lot like another boardwalk we know. Where's the boardwalk near our house?	Encountering the boardwalk section of nature trail at SEC.	Visiting a local, outdoor-based nature center	Outdoor-based museum
<i>Matt (9 years old):</i> Sort of looks like...the stuff we made at the Smithsonian in that cranking machine...	Encountering a seed pod from a plant during the nature walk.	Prior visit to an indoor-based museum	Indoor-based museum

Table 3. Families' Episodic Memories Expressed in Short Sentences During Nature Trail Walks

Mentions of other community programs and visits to different informal learning centers were connected to the nature walk experience in about a quarter (15 references) of these conversations (see Figure 1).

Prevalence of episodic memories

Many family members in our study recalled personal experiences that explicitly mentioned a previous visit to an informal learning setting (i.e., episodic memories). These episodic memories were shared in one to two sentences primarily, and secondarily, in longer stories that were co-told by multiple family members. Table 3 provides exemplars of the episodic memories shared during the families' nature walks.

These episodic memories were frequently brought up between parents and children during their nature walk. Sometimes, these recalls reminded other family members of a previous visit to SCEC, like in Luke's comment, or from an experience at a different informal function, such as Melanie's connection with the grasshopper. Other times, family members, particularly children who had attended summer camp, shared their memories from a certain part of SCEC with the group as Sam did with his family.

Observations of the landscape sparked memories of previous visits to Shaver's Creek Environmental Center and observations of natural objects sparked memories of other informal learning sites

When we looked more deeply at the dialogue surrounding these prior experiences, we noted that observations of certain areas of the landscape during the nature walks most often resulted in sharing a memory from previous visits to SCEC, while encounters with specific plants, animals, or other natural objects during the hikes were more often connected with informal learning settings other than SCEC.

Observations of the landscape

Commonly, observations of the overall landscape or certain areas along the nature trails were connected with episodic memories recalling previous observations or visits to that space. For example, Elizabeth (11 years old) and her parents came across an area along the trail that had changed since the lake at SCEC had been drained due to infrastructure issues with the dam:

Elizabeth: **This all used to be a marsh, this used to be like a little wetland.** So that painted turtles and all those little animals used to live in there. But now, they don't because it all dried up.

Coming across a familiar section of the trail sparked Elizabeth's recall of what the landscape had previously looked like, eliciting a memory connected with that same place along the nature trail and comparing her prior observations to her current view of the area.

Observations of specific natural objects

During their nature walks, the families encountered a variety of natural objects, such as plants, animals, rocks, and insects. While observing one of these items, it was more common for the resulting conversations to make an episodic memory connection to an informal learning experience outside of SCEC. In one instance, Chelsea is hiking with her two sons, Alec (10 years old) and Bennie (7 years old), when they encounter a walnut

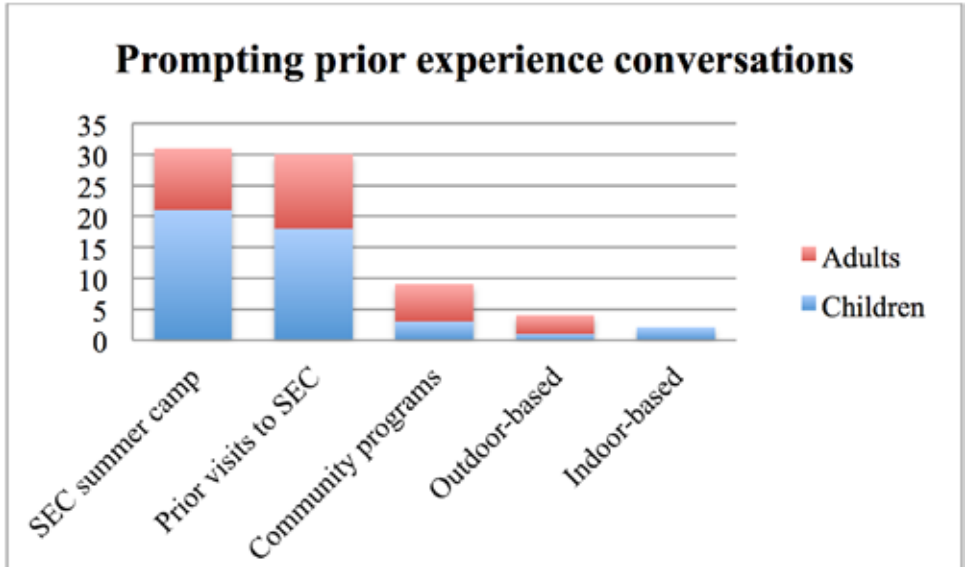


Figure 2. Comparison of the adults (red) and children (blue) who shared an episodic memory of a prior interpretation-led, informal learning experience in family conversations during a nature walk.

from a black walnut tree. Coming across this object sparks Chelsea to make a connection with an informal learning setting outside of SCEC:

Chelsea: Black walnut! Is that what that kid was showing at **your art class**, Bennie?

Bennie: No, it was an avocado.

When this family came upon a natural object along the hiking trail, the mom, Chelsea, identified it as being a walnut from a black walnut tree. She then attempted to make a connection between this object and an art program her son, Bennie, had previously attended. Bennie disagreed saying that it had been an avocado and not a black walnut shared by a peer in his art class, yet Chelsea used this experience in order to make a personal connection between the natural object found on the hiking trail and her family's previous learning experiences. Sharing memories from previous visits to interpretive, informal learning sites was a common occurrence for both parents and children as they helped forge connections between prior experiences and the current setting of the wooded trail.

Parent-child conversations and references to prior informal learning experiences

Our analysis focusing on who prompted a conversation that pertained to a prior interpretive, informal learning experience revealed that children were more likely to recall a memory as compared to the adults (Figure 2).

A common pattern among our participant families was the tendency for children to share an episodic memory from their previous experiences attending the SCEC's

summer camp, and often, parents prompted their children to share those memories. The parental prompting was interpreted to indicate that the children had previously shared that memory with the parent and the parents were encouraging the children to reconnect with the physical setting of the nature trail. In the science education literature about learning in indoor designed spaces (Kisiel et al., 2012; Zimmerman, Reeve & Bell 2010), families have been shown to make connections to other museum experiences. We found a similar pattern in our work with our participant families with regards to prior experiences at SCEC and making connections to the current nature walk at SCEC; however, we noted that it was the children that most often recalled these prior experiences to SCEC more so than the adults.

Children as SCEC-based experts

For the children in our study who had attended the SCEC summer camp, their episodic memories from camp were quite salient during the nature walks. During one nature walk, Justin (7 years old) identified the trail they were on with the same trail he had hiked with his camp group the week before, as he explained to his mother, Rene:

Justin: **This is the path we were on. Remember, this is the path we were on—on Tuesday. Mommy, this is the path we were on when we were with [counselor’s name].**

Rene: Oh yeah? Did he take you on a little journey?

Justin: Yeah.

In this example, Justin remembers and recognizes the trail he is walking on with his family and relates it to his previous hiking experience from summer camp. While most conversations about SCEC’s summer camp were sparked by the children in the family groups, the parents sometimes asked their children to describe what types of experiences they’ve had during the camp at SCEC. Within the same family from the scenario above, Justin’s younger sister, Kris (5 years old), had also attended the summer camp and their mother helped to facilitate Kris’s memory recollection from camp by asking her specific questions about the nature walk trail:

Rene: **When you guys were hiking out here** did you see any animals in the woods?

Kris: Um, those little like—they’re called newts—they’re kinda like lizards, like cousins of lizards. They’re newts.

Rene: How did you find them? Did you look under rocks?

Kris: Um, no.

Rene: How did you spot them?

Kris: On the ground!

Here, Rene asked her daughter, Kris, to explain what she had experienced during summer camp by asking her what animals she saw. When Kris responded that that her camp group found newts, Rene asked Kris to recall how they found the newts. This type of parent-facilitated conversation where a parent prompts a child to share a memory has been similarly observed in museum settings (Crowley et al., 2001; Crowley & Jacobs,

2002; Palmquist & Crowley, 2007), where parents act as learning partners with their children. In our study, we found that parents specifically prompted their children to share out-of-school experiences; having these episodic memories from camp leveraged the children's role in facilitating the family's learning experiences during their nature walk so that the learning was not just adult-to-child, but was more evenly distributed between the parents and children in the family groups.

Parents connect with informal learning settings outside of SCEC.

Connecting memories across settings, or from a previous informal learning site other than SCEC, to the current setting of the nature trail was more common among the adults in our study. In one example of a parent making a connection with a prior experience from another informal learning setting, Claire, a mother, and her daughter, Lilly (6), were walking over the boardwalk and stopped to observe the plants along the creek bed. Claire asked her daughter to remember back to another hike they had previously experienced at a different Nature Center:

Claire: You know what they [the plant's leaves] remind me of?

Lilly: What?

Mom: Cabbage. I wonder if they're...**what's that kind of cabbage that we saw at [Nature Center]?** Last summer?

Lilly: I don't—I forget.

Mom: Skunk cabbage?

Lilly: Yeah.

Mom: Do you remember that?

Lilly: Yeah, yeah! I wanna go back!

Here, Claire reminds her daughter about a different location where they had seen the same species of vegetation they were currently observing. Claire prompts her daughter to remember the name of the cabbage they had previously seen at a different nature center and reminds her that it was skunk cabbage. Similar to the interaction between Claire and her daughter, parent-child interactions in museum spaces have observed and documented parents providing analogical connections, or links between the current activity and something similar, in order to support their child's thinking about the topic (Crowley et al., 2001). Whether or not parents are more apt to "see" connections between the nature trail and other learning settings in comparison to their children is worth further exploration.

Discussion

Connecting prior experiences to the current context for learning is a well-known area of study for researchers examining family learning groups in informal spaces (e.g., Allen, 2002; Ellenbogen et al., 2004). We contribute to this line of work through our examination of the recalling and sharing of personal memories among family members during outdoor-based nature walks. The focus on episodic memories provided a unique avenue for analyzing the role of conversation-based personal connections between

learners' personal meaning and new content, through the recall of familiar concepts. As such, our research contributes three new implications for the field of informal science learning and interpretation research:

- 1) Sharing *episodic memories* from prior informal learning experiences was prevalent in family conversations as a means for making personal connections with the natural world during their nature walks;
- 2) Certain *observations and encounters* experienced during the nature walk often *determined the source* of a shared memory;
- 3) *Children took lead roles* during the family's nature walks through their sharing of personal, episodic memories of prior informal learning experiences from SCEC.

Episodic Memories are Important Meaning-Making Tools During Family Conversations

In our study that looked at in situ family conversations during nature walks, specific references to previous informal learning experiences emerged in the families' dialogue as episodic memories (Tulving, 1972). Tulving argues that episodic memories "allow people to consciously re-experience past experiences" (2002, p. 6). During their nature walks, the families involved in our study most often projected vivid memories from previous informal learning experiences to the outdoor space they were walking through. When applying this to practice, making room for learners of all ages at informal learning settings to make personal connections and meaning with the resources, while also giving them an opportunity to develop new memories are important considerations for interpretive sites. Bamberger & Tal (2006) alluded to this notion when they researched 750 school children from 29 classrooms during science learning fieldtrips. They found that the level of choice that informal institutions offered to learners impacted the types of connections learners made between prior experiences and the new science and environmental content. Programs involving high levels of freedom and choice resulted in stronger connections to everyday life amongst the learners while constrained programs resulted in naturalist-led programs that connected strongly to school. We posit that our families' visits to SCEC were similar to the high-choice, high-freedom experiences found in the Bamberger and Tal study, which explains the families' frequent connections to prior informal learning experiences as a meaning-making strategy in conversation with one another.

Understanding how one family made meaning together during a nature walk

The Long family is just one family, yet across the globe, millions of families actively seek out informal learning venues like the environmental center that was central to this research study. Evidently, Allison, Matt, and Kyle had all experienced and retained information from their prior visits to this environmental center, but also from their visits to other informal science learning settings, like museums, Boy Scouts, and everyday family activities. The Long family, particularly Matt, had many past events that they could draw from when helping each other to learn about or make meaning with their surroundings during a novel outdoor learning experience. Museum researchers suggest that, "learning involves making links to, or between, previously separate ideas, or the potential to make new links in the future" (Rennie & Johnston, 2004, p. S7). In alignment with this notion, the Long family's partaking in a variety of activities in both

designed and everyday informal learning settings allowed them to more easily make meaning together by linking such previous ideas and experiences to new encounters during their nature hike. Given that learning depends on social interactions and the conversations that shape conceptual understandings (Roschelle, 1995), we suggest that providing learning spaces with family groups in mind is important for those who design interpretive experiences.

Happenings Along the Nature Trail Determined Source of Memory

Prior work has shown that, in general, memories support learning. For example, after interviewing 36 individuals six months after they attended an interpretive program at a national historic park, Knapp (2006) concluded that personal experiences and familiarity with a place predominate long-term memories more than any other aspect of the program. Our work extends Knapp's research on long-term memories by identifying a pattern related to the application of the memories as learning tools. From our analysis, we found that observations of the landscape were linked with onsite memory recall, or referencing memories from the current learning setting (in this case, SCEC). Observations of specific natural objects, such as plants and animals, most often led to a family member sharing an offsite memory recall, or sharing a memory about seeing a similar object in a different location (i.e., not SCEC). Having personal familiarity with an outdoor space would certainly trigger vivid memories of previous experiences within that setting; however, we found that encounters with natural phenomena such as leaves, seeds, and animals tended to spark memories that originated in learning spaces outside of SCEC. Perhaps because these natural objects are pervasive beyond the property of SCEC, it is easier to connect them with memories gleaned from alternative learning sites. Future research investigating this episodic recall pattern offers a fruitful area of inquiry.

Our work suggests that interpretation-led, informal learning spaces and programs have a long-term impact on families' learning via supporting social meaning-making talk about the natural world. Through the conversations we analyzed, we found that families' personal memories were salient months and years later as families encountered new objects and experiences on the trail. Knapp suggests that, "for most interpreters, a successful outcome should be seen long after the program has ended" (2007, p. 9). Even though we cannot make claims about the success of any one particular program, we found that salient episodic memories from previous visits to SCEC and to other informal learning sites were successful connecting points for further learning. Given these findings, our work reinforces Bamberger and Tal's (2006) recommendations for youth-based programs in that family-focused programs should also include flexibility for making connections to previous life experiences. Including purposeful opportunities for audiences to make links to prior learning activities either through verbal prompts by interpreters or text on non-personal interpretive exhibits can also provide pathways to foster meaning-making dialogue between family members and peers.

Children Most Often Contributed to Families' Episodic Memory Recall

A significant contribution of our study revealed that children in the participating families were the primary memory-sharers during the nature walks. In particular, those children who attended SCEC's summer camp in previous years were apt to share their camp experiences during the nature walks. Because of their experiences during camp, the children acted as experts of the trail, in their own way. For example, the children

who had attended SCEC's summer camp identified certain plants for their parents and siblings. The children also discussed anomalies to the landscape and recounted activities they had been part of on the nature trail. Related research examining youth during summer camps (Riedinger & McGinnis, 2016) has suggested that the "freedom" of learning in the outdoors is an important contributor to empowering children. When we observed the families hiking on the trails at SCEC, the children's references to camp were often used to bolster their observations related to nature, thereby supporting their role as the experts during the family hikes.

Episodic memories were often used by the children in our study to display their individual expertise on the local environment and associated plants and animals. In museum settings, children have also been documented as being experts on specific topics of interest (Crowley & Jacobs, 2002; Palmquist & Crowley, 2007); in our study setting of a nature trail, we found children had both content expertise, as well as place expertise. Additionally, Palmquist and Crowley's (2007) video-based study of 42 families visiting a dinosaur exhibit at a natural history museum, revealed that, among other outcomes, children who were "dinosaur experts" most often led the conversations during their visit to the museum, while the children who were "dinosaur novices" talked less than their parents. While our study was not designed to explore domain or content-specific knowledge, such as dinosaurs, we did notice a pattern similar to that of Palmquist and Crowley's where the summer camp children were most often the conversation catalysts through their sharing of camp memories.

Our research demonstrates that children carry memories of informal learning experiences and use them as points of comparison in future learning experiences. The episodic memories served the role in family conversation as evidence to the children's claims about the world around them. Waite (2007) argues that children remember specific outdoor learning events when the activities are authentic, social, and multi-sensory. With this in mind, encouraging family collaboration during outdoor-based, interpretive programs can provide children with opportunities to demonstrate their science-related expertise, while also co-constructing new knowledge with family members.

Conclusion

Our study demonstrated that visits to informal learning settings can provide experiences for family groups that promote the development of rich episodic memories, which can be tools for learning in new informal settings. Because family groups are the most common social group to visit informal, interpretive learning sites, it behooves interpreters to better understand the role of memories in families' learning processes as they design programs for parents and children.

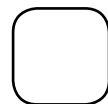
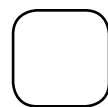
Additionally, we provided an example of how video-based methodologies can capture learners' conversations during visits to informal spaces to better understand how families learn. Analyzing visitors' conversations and gestures in an informal learning setting offer rich, nuanced insights into learning processes in ways that surveys, interviews, and pre- and post-test methods cannot provide. As such, we suggest that further ethnographic work in the field of interpretation research is needed to explore the learning practices and processes used by people as they engage in informal learning settings. We argue that in order for interpretation researchers to forward their understandings of how people learn in outdoor sites, naturalistic observations and dialogical analysis of visitors during programs should be leveraged more fully.

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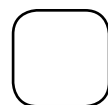
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IN SHORT



Hot Interpretation of Controversial Topics at Batoche National Historic Site, Saskatchewan, Canada

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Abstract

Historic sites can facilitate public interaction with controversial topics through “hot interpretation” that promotes affective responses. The goal of this article is to critically analyze the evolution of interpretive messaging of the armed resistance of 1885 at Batoche National Historic Site, Canada, through the lens of hot interpretation. Based on a literature review, interpretation evaluations, and site visits, the authors examine how collaborative management approaches have fostered an evolution in interpretation from the one-truth, to parallel narratives, and finally to the “many voices” approach within the hot interpretation framework. This overview suggests how collaborative management approaches and progressive interpretation strategies can heal the hurt of the past, validate various depictions of history, provide venues for democratic discourse about contested issues, generate new thinking, and support resilient communities.

Keywords

hot interpretation, controversial topics, collaborative management, many voices approach, Batoche, 1885 resistance

Introduction

Hot interpretation was introduced by environmental psychologist David Uzzell (1989) as a backlash to heritage and scientific interpretation as a purely objective and cognitive experience. Hot interpretation seeks to reintegrate the human and personal aspects of the events, people, places, and artifacts that shape both historical and natural sites.

Uzzell and Ballantyne (1998) define hot interpretation as “interpretation that appreciates the need for and injects an affective component into its subject matter” (p. 154), and is especially relevant to sites that interpret emotive, challenging, or controversial content. This type of interpretation “prompts visitors to re-examine their own previously held beliefs and perceptions regarding specific social, environmental, or moral issues (Ballantyne, Packer, & Bond, 2012).

Uzzell and Ballantyne (1998) suggest that “issues which involve personal values, beliefs, interests, and memories will excite a degree of emotional arousal which needs to be recognised and addressed in interpretation” (p. 152). These emotional dimensions are often excluded from interpretation, but emotional engagement is influenced by many factors, such as time, place, abstraction, distance, and management (Uzzell & Ballantyne, 1998). Hot interpretation has a role to play in conveying the meaning and significance of heritage to visitors and in developing community among people affected by the issues being interpreted.

Issues that deal with personal values, beliefs, interests, and memories can be considered controversial. Several authors have written about interpretation at natural or historic sites dealing with topics that are controversial in nature (Cameron & Kelly, 2010). For example, interpretation of controversial topics occurs with a variety of events and locations, such as sites of conscience (e.g., jails, sites of critical protest events, internment camps; Kennedy, Ketz, & Dirtzu, 2014); Jewish ghettos (Uzzell & Ballantyne, 1998); battlefields (Winks, 1994; Pitcaithley, 2004; Hannam, 2006; Dinkelaker, 2011; Hayes, 2012; Rudy, 2011; Lemelin, Powys Whyte, Johansen, Higgins Desboilles, Wilson, & Hemmings, 2013); slavery (Aden, 2010; Kutzler, 2013); civil rights movements (Pitcaithley, 2005); forced relocation among Australian aborigines (Ballantyne et al., 2012); and apartheid in South Africa (Ballantyne & Uzzell 1993; Ballantyne, 2003).

In addition, social memory, personal values, and beliefs are involved in the interpretation of controversial resource management topics, and thus can be considered in the context of hot interpretation (Uzzell & Ballantyne, 1998). These topics include species introductions (Chlebnik & Redfield, 2014); sources of knowledge about rainforest ecology (Staiff et al., 2002); climate change (Burr, 2014; Melena 2014); industrial agriculture (Long, 2014); pest control (McEntee & Mortimer, 2013); and air quality (McEntee & Mortimer, 2013).

In designing programs and exhibitions that embrace hot interpretation, Ballantyne et al. (2012) suggest several strategies to improve effectiveness, including (p. 164):

- Narrative and personal storytelling should occupy a central place in hot interpretation and should provide multiple points of personal connection with visitors.
- Despair should be balanced with hope, providing visitors with a way to deal with their feelings and move forward.
- Presentation of historical evidence and balanced interpretation should leave visitors feeling educated, rather than persuaded.
- Providing a place or space for reflection should encourage visitors to personalize and internalize their learning.
- Focusing on the past to inform the future should provide visitors with a way of learning from the mistakes of others and contribute to building a better future for all.

In addition, other authors provide principles related to the interpretation of controversial topics. For example, Martin (2003) encourages interpreters to be careful of language use, to remember the authority of the sponsoring agency (but not to sacrifice one's own integrity), to inform and inspire people to act, and to be prepared. Specific to interpreting climate change, Melena (2014) recommends that interpreters undertake a slow but determined start, know the resource, deal with tough questions, know the audience, meet visitors where they are, provide a safe environment, know how to disengage with difficult audience members, be prepared to share why there is hope, and use the relevance, passion, and energy of the controversy. Regarding controversial species introductions (e.g., wolf reintroduction to Yellowstone National Park), Chlebnik and Redfield (2014) suggest that interpreters acknowledge the emotion, avoid being confrontational, know the facts, invite provocation, and be ready to back out. Last, Pitcaithley (2004) encourages interpreters to not shy away from controversial issues, but embrace them as opportunities for cognitive and emotional growth. More generally, Burr (2014) recommends that interpretive planners understand sociological attitudes and behaviors in planning interpretation for controversial topics. Overall, the hot interpretation approach deserves further implementation and subsequent scrutiny across a variety of settings, contexts, and delivery strategies. In short, Staiff et al. (2002) suggest that museums (and park nature centers) should be "places of confrontation, exploration, and debate" (p. 104).

This article summarizes the contested representation of a controversial historical event and examines how hot interpretation and a multiple voices approaches to history can give a more historically accurate picture of the 1885 Resistance at Batoche National Historic Site (NHS), Saskatchewan, Canada. To achieve this objective, the authors comprehensively assessed the concept of interpreting controversial topics through hot interpretation and principles for implementation. We describe the history, evolution, and criticisms of interpretation at Batoche NHS. Next we critique these efforts and changes in interpretation and offer new on-site strategies, both conceptual and practical, for interpretation at Batoche. We gathered information through a thorough literature review, conducted two on-site visits, documented current and past interpretation, and analyzed these interpretive efforts through the lens of hot interpretation.

This type of interpretive analysis is important today for a few reasons. First, park and historical interpretation needs to respond to societal changes in terms of contemporary historical understandings and delivery strategies, especially related to a multiple voices approach (Staiff et al., 2002). Second, interpretation of Canadian culture and controversial historical events continue to be influenced by the contributions and needs of both long-time Canadians and new Canadians, as mirrored in the parallel processes of settlement and immigration of the 1880s and today. Last, since Batoche NHS interprets an event that is commemorated in many other locations across Canada, it is valuable to examine how an approach embracing hot interpretation and multiple voices can be expanded to other similar sites or controversial parts of Canadian history.

Resistance History at Batoche

Before describing the events of the Batoche resistance, some broader national context is necessary (Bumsted, 2006). Following the Rupert's Land Act of 1868, the Hudson's Bay Company was preparing to transfer to the Dominion of Canada an area of land about one-third the size of the country. Many residents of the Red River Colony, including

many Métis affected by past conflicts with the Hudson's Bay Company over trading rights, were now concerned about their future under Canadian control. In particular, Métis worried about the influx of settlers from eastern Canada, previously unsuccessful negotiations with the Canadian government, and the potential that land surveys might result in the removal of their land rights (Redbird, 1980). In late 1869, Métis opposition groups halted the land surveyors and later proclaimed a provisional government, headed by Louis Riel. Following some armed conflict and the execution of an English-speaking settler from Ontario, the provisional government organized the territory of Assiniboia in March 1870 (Bumsted, 2006). Anxious to proceed with western settlement, the federal government negotiated with this Métis-led government, incorporating many of its demands when it formally created the province of Manitoba in May, 1870. However, in July-August, 1870, the Canadian government engaged the military to oversee the transition, forcing Louis Riel and his lieutenants to flee. Even though Métis land titles were guaranteed in the transition, later government mismanagement forced many Métis to move west (Bumsted, 2006).

By 1872, many Métis settled in the Batoche area, with the population growing to about 1,200 by 1885 (Parks Canada, 2015). Like their earlier history, there were many reasons for Métis unrest, including debate about the river-lot settlement pattern, difficulties in gaining legal land titles, and poor representation in territorial and federal politics (McCullough, 2002; Hildebrandt, 2012). In addition, the federal government's unwillingness to recognize treaty promises with First Nations and provide adequate support to farmers in western Canada further compounded these east-west tensions (Parks Canada, 2009a; Hildebrandt, 2012) and precipitated the establishment of a provisional Métis government in Saskatchewan. Tensions between the Métis and the Dominion government led to an armed uprising in 1885, involving Métis, Cree, and some Dakota. Louis Riel, who led the 1870 resistance, was invited to assist in the struggle by leading the provisional government of Saskatchewan (McCullough, 2002).

Beginning on March 26, 1885 at Duck Lake, and featuring armed confrontations at Cut Knife Hill and Tourond's Coulee/Fish Creek, the event culminated with the siege of Batoche (May 9–12) by the federal government's North West Field Force (led by Major General Middleton), where the Métis and First Nation allies (led by Cree Chiefs Big Bear and Poundmaker) were subsequently defeated. The surrender of Big Bear in July 1885 concluded the conflict (Hutton, 1996; Foster, 2013), which claimed the lives of more than 25 members of the militia, Cree and Métis forces, and Canadian citizens (Parks Canada, 2009a).

Chiefs Poundmaker and Big Bear along with the Métis leader, Louis Riel, were incarcerated. Riel, who had been exiled following the Manitoba resistance, was later convicted of treason and hanged along with eight First Nation allies in Regina on November 16, 1885 (Osborne, 2002). Gabriel Dumont, the Métis military leader, who, after the battle of Batoche, had taken the women and children to safety in the USA, later received amnesty and was permitted to return to Batoche where he is now buried (Hutton, 1996; Préfontaine, 2011).

Many names are given to this event, including the Second Riel Rebellion, the North-West Rebellion, the North-West Uprising, and the North-West Resistance. Others use more biased terms, such as a blunder-filled event, an armed conflict, or an efficient military campaign (Foster, 2013). Regardless of the term used, the event conveys varying interpretations and emotional responses (Foster, 2013). Since the "resistance" is the

preferred term used by the Métis and most governments in western Canada, it will be used here (Foster, 2013; Parks Canada, 2015).

Batoche National Historic Site

Parks Canada, the agency responsible for NHSs in Canada, protects the nationally significant examples of Canada's natural and cultural heritage in national parks, national historic sites, national marine conservation areas, and related heritage areas in view of their special role in the lives of Canadians and the fabric of the nation (Government of Canada, 2000). Even though the Batoche site was abandoned by the Métis in the early 20th century, it was declared a NHS in 1923 because of its significance in the resistance of 1885. In addition to Batoche NHS, Parks Canada also designated other NHSs of the same time period connected with the resistance events, including Cut Knife (1923), the Battle of Tourond's Coulee/Fish Creek (1923), Duck Lake (1924), and Frenchman Butte (1929). Many authors have examined the politics pertaining to the designation of Batoche as a NHS in Canada (Payment, 1983; Taylor, 1983; Hutton, 1996; Pelletier, 2006; Pannekoek, 2000, 2009; McCullough, 2002; Osborne 2001, 2002). Other authors have examined Batoche as tourism site (Ryan, 2007; Lemelin, Thompson-Carr, Johnston, Stewart, & Dawson, 2013).

The Batoche rectory was acquired by Parks Canada in 1955, a museum was opened in 1961, and the remains of the St. Antoine de Padouche Church were purchased in 1970 (McCullough, 2002). The designation of the Batoche NHS created some tension between Parks Canada, the federal agency mandated to manage the site, and the Métis Nation, especially since the Métis claimed ownership of Batoche as their ancestral capital. For example, Métis have gathered on an adjacent site each summer since 1971 in substantial numbers to celebrate "Back to Batoche Days" (Hutton, 1996). By 1976, Parks Canada had acquired land consisting of the village of Batoche, the shallow rifle depressions, the zareba and camp of General Middleton, Caron Sr. House, the Métis Mass Grave, and the tomb of Gabriel Dumont (Parks Canada, 2012). A visitor reception center featuring an exhibit hall, book store, cafeteria, and other sites (e.g., St. Antoine de Padouche church and its rectory, and graves of the Canadian militia) were added later. The site is now approximately 955 hectares in size (Parks Canada, 2015).

Among the employees working at Batoche NHS, four to six Métis work at the site in several seasonal and permanent positions (management, interpretation, maintenance), which includes costumed personnel re-enacting Métis life at Batoche. From visitation highs of approximately 20,000, the site is now visited by approximately 14,000 people annually (Parks Canada, 2015). The site is open from the middle of May to early October (Parks Canada, 2015).

The first management plan for Batoche NHS, developed in 1972, included an interpretive emphasis on lifestyles and struggles of the Métis at the time (McCullough, 2002). However, the second management plan in 1982 proposed the construction of a modern visitor reception centre, presenting the opportunity to feature various interpretations of the events. The new interpretive center was completed for the Centennial of the Battle in 1985 (McCullough, 2002). In 1998, a management approach recognizing the role of the Métis Nation-Saskatchewan began, and was formalized in the most recent management plans of 2000 and 2015 (Parks Canada, 2000, 2015). As a result, Batoche NHS has undertaken a shared management approach, meaning that both Parks Canada and the Métis Nation-Saskatchewan are responsible for ensuring

the commemorative integrity of the NHS (Parks Canada, 2009b). A site possesses commemorative integrity when the resources related to site designation are not impaired or under threat, when the reasons for designation as a NHS are effectively communicated to the public, and when the site's heritage values are fully respected (Parks Canada, 2013).

In addition, Batoche NHS (along with Battle of Tourond's Coulee/Fish Creek NHS) and its resources are protected through adaptive management strategies (Parks Canada, 2009b). Adaptive management refers to a process by which institutional arrangements and various knowledge types "are tested and revised in a dynamic, ongoing, self-organised process of trial and error; adaptive co-management by definition is an inclusive and collaborative process in which stakeholders share management power and responsibility" (Carlsson & Berkes, 2005, p. 73). In the case of Batoche NHS and the Tourond's Coulee/Fish Creek NHS, shared management approaches have been used to diversify interpretation strategies and integrate the Métis Nation into the management of these battlefields. These approaches have also permitted such rapprochements as the 1985 and 2010 ceremonies honouring all the soldiers and victims of the conflict. There is also a proposal to erect a Métis Veterans Memorial Monument at Batoche, honoring Métis servicemen and servicewomen.

Changing Interpretation at Batoche NHS

Parks Canada presents cultural heritage "through interpretive and educational programs for public understanding, appreciation and enjoyment, both for international visitors and the Canadian public, thereby enhancing pride, encouraging stewardship and giving expression to our identity as Canadians" (Government of Canada, 2000, p. 1). After more than a century of debate, the conflict between the Métis Provisional Government and the Canadian government remains a controversial topic and a place of contested history. Like interpretation at other sites with constructed values of natural or cultural features (Hvenegaard & Shultis, 2016), the content and approach to interpretation about Batoche has changed dramatically since the resistance, reflecting new understandings and shifts in cultural sensitivities. In particular, the reconstruction of Batoche "opened the possibility of broader social and economic interpretations of historic events, as opposed to the political and military interpretation which had been current in the pre-war period" (McCullough, 2002, p. 180). The interpretation at Batoche NHS, as we discuss next, shifted from a celebration of a military conquest to a recognition of the unique Métis history and culture (McCullough, 2002).

The Canadian government was quick to celebrate its victories in the resistance by unveiling in Ottawa on November 1, 1888, a monument to commemorate Privates Osgoode and Rogers, two Foot Guards killed in the battle of Cut Knife Hill, (Sibley, 2009). In addition, soon after establishment, each site was commemorated with a plaque, glorifying the exploits of the Canadian militia and the imperialistic western march of a young nation (McCullough 2002).

The Historic Sites and Monuments Board of Canada (HSBMBC), established in 1919 to commemorate key events, people, and places in Canadian history, played a role in interpreting the 1885 events. While 16 different sites are associated with the 1885 events, three key sites were highlighted. Batoche centers on the Métis role in the resistance, Cut Knife Hill focuses on the Native role, and Fort Battleford features the Euro-Canadian role (McCullough, 2002). The 1885 sites were initially interpreted in the

1920s as a product of expansionism in which Canada's desire to form a transcontinental nation drove development westward. Part of the problem with the original Board was a belief in a "common national history" (2002, p. 163), seen from the point of view of the Canadian government and its military forces. Erroneous details, like the so-called Canadian victory at Cut Knife Hill, lack of mention of Riel and Dumont, the vilification of Poundmaker, and the absence of French translations, drew immediate criticism. The unveiling of the plaques caused a boycott by the Quebec delegation, and was denounced by a Prince Albert vicar as a "gross insult to the men who fought under Riel" (2002, p. 166). No initial consultation had been given to Métis veterans or white settlers who were still living in the area and had been present at the events. A combination of the ensuing Depression and the site's contentious and troublesome nature delayed discussions for over a decade (McCullough 2002).

Until 1937, the HSBMBC was filled with English-speaking professionals from the Central Provinces with an expansionist viewpoint. However, while English historiography held to a Loyalist view that ignored the legitimacy of the Métis and Native people's claims, French historiography saw the 1885 events as one of many confrontations between French and English (McCullough, 2002).

When Parks Canada bought the property and buildings at Batoche, there was no existing exhibit. Content for the exhibits was created over several years, and the museum officially opened in 1961. The main exhibit was titled "Conflict of Cultures" and traced the history of the Indigenous peoples, the Métis, and the European expansion. Métis people were presented as "children of the fur trade," with no legal right to the land, just a historic claim "to their share of the plains" (McCullough, 2002, p. 184). The struggle presented was consistent with Stanley's (1961) influential views on the resistance events, that they were clashes between primitive and civilized cultures, and a regional resistance to distant and apathetic governmental control (McCullough, 2002). The opening of the Batoche museum by then Prime Minister John Diefenbaker was a high-profile event, giving recognition to increasing Indigenous rights (having been given the right to vote two years prior) and the importance of valuing minority cultures. A year later, at a gathering of the Royal Regiment of Canada and Aboriginal leaders at Batoche, a representative of the Saskatchewan Métis recognized the men on both sides, but added that the issue of land rights was not yet satisfactory or settled (McCullough, 2002).

The 1972 management plan took greater strides towards understanding the Aboriginal stance by emphasizing the Métis perspective on actions and beliefs that created the events at Batoche. Period restoration, revised interpretation, and new facilities enabled this more holistic approach. Extensive recording of the oral history of the local Métis people, along with the Aboriginal activism of the late 1970s and early 1980s, converged to make Batoche a focal point of Métis culture (McCullough, 2002).

The statement of commemorative integrity for Batoche NHS was published in 1997 by Parks Canada (and reinforced in the 2015 draft management plan). In that statement, Batoche NHS is intended to commemorate the site of the armed conflict, the Métis community of the area, the Métis river lot land use patterns, and the national importance of the site to Canada's history. The statement also summarized some of the historic values of importance to Canadian history (e.g., control of Western Canada, contributed to Quebec nationalism, clash of aspirations in the west) and Métis history (e.g., aspirations then and now, dispersal, politics, traditions of land tenure, self-government). Last, the statement indicated messages of national significance, including

the military conflict, importance of the community of Batoche, the Métis provisional government, and the impact of the resistance on local, regional, and national history.

Batoche's Management plan was revised in 2000 because the Métis Society of Saskatchewan (now the Métis Nation–Saskatchewan) wished to have more influence and a greater role at Batoche. A discussion forum led to a more formal agreement for the shared management of Batoche between Parks Canada and the Métis Nation. This generated funding for research, presentations of “alternative viewpoints” on the events that occurred at Batoche, and a mutual commitment to maintain the site's commemorative integrity (Parks Canada, 2000). The Batoche management plan suggests that the visitor experience will range from general “awareness” to deeper “understanding” of the material, by using both “personal and non-personal means of communication along trails” between “interpretive nodes, and providing different messages” (Parks, 2000, p. 8). It also advocates the importance of “the cultural landscape and in situ cultural resources” as being “integral to the heritage presentation” (Parks 2000, p. 8).

Commemorative integrity includes the presentation of multiple viewpoints and perspectives, “informed by traditional knowledge, and later interpretations” (Parks Canada, 2000, p. 8) known to current Indigenous peoples. The presentation of these events as acts of rebellion against the Canadian government were balanced by the Métis view of the events as a desire to secure livelihood, own land, and receive respect for their cultural traditions. Batoche NHS seeks to give continuity and context for the social fabric and identity of the Métis people of Batoche. Social, religious, artistic, and commercial activity, along with Métis governance from the late 19th century to the early 20th century, are explored in conjunction with the associated landscape, patterns of land use, and transportation (Parks Canada, 2000).

The audio-visual presentation created for the centennial events is viewed by the NHS as the “core orientation to the site” (Parks Canada, 2000, p. 27). A collage of vivid stories and images, rather than “one authoritative description and explanation of an event (McCullough, 2002, p. 187), it incorporates multiple perspectives of various key leaders. In order to paint a broader expression of meaning, memory, and commemoration, it also brings to light how the resistance impacted the surrounding environment and the people involved (McCullough, 2002). Since the original projections, diorama, and scrim were too costly to update, this audio-visual presentation switched to a dual screen video in 2011 (Tracey Verishine, personal communication). The presentation still employs many characters voices and perspectives with similar content as the original.

Criticisms

In her critique of living history, Wall (2011) notes that a challenge often arises when historic sites and parks engage in the re-enactment of living histories by “celebrating Euro-American enterprise while relegating other people to supporting roles... reflecting contemporary social power relations... [and modelling]... ongoing tension between historical accuracy and mass entertainment” (p. 115). As explanation, living museums have a tendency to “stabilize dominant cultural identities and institutions rather than expanding [a] critical understanding of history” (p. 110). By contrast, this concern was not noted during the field observations at Batoche NHS. Indeed, most costumed interpreters were proud of their Métis ancestry and conveyed this information to visitors in both French and English.

As the Métis were deemed to be the focus of this particular site, First Nations'

perspectives were not consulted here, but are explored in greater detail elsewhere. Criticism surrounding Batoche is usually voiced by those who feel that Riel is being cast as a hero, while caricaturizing Sir John A. Macdonald and downplaying the general public support at the time for the military's role in suppressing the uprising (McCullough, 2002). There seems to be little contention that MacDonalld was willing to do anything to continue his vision of expansionism, and had little empathy for the Métis or Riel. Another criticism of interpretation at the site is that the backstory of the Métis and Riel (previous to 1885) is not talked about at Batoche; such interpretation is told primarily in Manitoba, in places such as the Saint-Boniface Museum and the Riel House and Lower Fort Garry National Historic Sites. A more complete account of the story should address the eastern perspectives and 1870 events in Manitoba that led to the 1885 resistance.

For Parks Canada dealing with issues of cultural heritage on which there is no agreed interpretation, “a balanced or ‘many voices’ approach may be the wisest course” (McCullough, 2002, p. 188). A many voices approach recognizes multiple perspectives in interpreting historical events, capitalizing on visitors’ willingness to engage in narratives and storytelling of people with direct experiences (Heyward, 2012). The evolution of the interpretation strategies at Batoche suggests that the contemporary many voices approach, through in-situ history, arts, and audiovisual programmes, provides an opportunity for numerous perspectives to be heard, thereby providing visitors with insight into “the Métis community through the one site that has come to symbolize so much to them” (Pannekoek, 2000, p. 214). This approach also favors dissonant heritage where discussions pertaining to heritage encourage multiple narratives so that visitors can be educated, challenged, and given the opportunity to select “those that resonate with their experiences” (Pannekoek, 2000, p. 208–209).

The Historic Sites and Monuments Board of Canada had a primary role in much of the formal commemoration of Canadian history, and therefore, its collective memory. One of the issues is the ongoing politicking that vies for control of what those collective memories are, and what they say about Canada as a nation (McCullough, 2002). Alongside the dominant narrative run parallel narratives, or sub narratives that tell the story of minorities and marginalized characters of the story (Pannekoek, 2000). According to Pannekoek (2009), history has been shaped by a primarily “Canadian male-dominated narrative” and “has been managed and manipulated by Canada’s social elites, intellectual elites, and public institutions such as museums and heritage agencies” (p. 206). Reinforcing the ideals of the eastern establishment, these elites extricate “the threads of its ‘usable’ past to justify a culture of progress that masks Canada’s capitalist and imperialist system of inequity” (2009, p. 206). Pannekoek asks whether Canada is socially constructing a “useful past” (2009, p. 206) in the face of a fragile and multicultural society.

Another shortcoming of the NHS Boards, in Pannekoek’s view, is the general lack of self-reflection. The Boards fail to consider how the state impacts the commemorative memory, as well as the ways that such sites have impacted the local people and culture. Former NHS historian Walter Hildebrandt says that there is a tendency to propagate the myth that best captures the ideals or philosophies of the current nation. He advocates the many voices approach for a more dynamic and personalized view of history, as told from many angles and perspectives (Pannekoek, 2000).

Pannekoek also criticizes the lack of female perspective and voices in Canadian national history. He points to the perspective that the two captured, but unharmed white

women involved in the resistance could contribute to the 1885 story. False accounts of their being molested during captivity has served to vilify and marginalize indigenous women, who were painted as threatening to white civilization. Such untruths should be part of the interpretation to demonstrate how issues of race and gender can be used for political gain. Another angle might be that of the Métis merchants, rather than solely presenting the professions of the whites surrounding Batoche (Pannekoek, 2000).

Reid (2008) says that Riel is a symbol of the binaries and dualities that exist within the Canadian identity amidst attempts to form a single discourse. As such, Riel represents in the Canadian imagination a hero “whose story is complex enough to appeal to the kind of fragmented society Canada has become”—a country of “subnationalisms, ethnic oppression, separatist movements” (p. 241). Although the creation of Canada is often believed to be rooted in compromise and peace, the Resistance of 1885 points to a contrasting aspect of Canadian heritage. While Riel was acknowledged as a Father of Confederation in 1996 by then Minister of Foreign Affairs, Lloyd Axworthy, the promises made to the Métis that affirmed their full and equal right to participate in this country have only been partially realized (Reid, 2008). Even though Métis are considered as one of three Aboriginal Peoples in the Canadian Constitution, and the 2016 Supreme Court of Canada decision recognizes Métis as “Indians” under the Constitution Act of 1867, Métis still don’t have rights equal to Status Indians in Canada (Indian and Northern Affairs Canada, 2016).

Complexity of Collective Memory

Cutler (2000) says that the past is foundational for cultural literacy, but advises that historians look closely at the message being conveyed through various artifacts and site commemoration. Are they creating a collective memory that gives new insights and multiple perspectives, or are they only serving to reinforce tradition and assimilation? Much previous historic understanding was based primarily on documents, rather than the narratives; archaeological and material evidence have fleshed out the story of cultures and their interactions in more recent historiography. Cutler advocates a means of scrutinizing whether the message remains elitist, univocal, or subject to the times from which it now speaks. As historian David Hamer noted, “the cultural bias in place at the time of preservation determines what is judged to be significant, often to the detriment of alternative versions of a district’s history. Lost in the shuffle are the years of survival which fall between the era of original significance and the time of preservation” (Cutler, 2000, p. 481). As Staiff et al. (2002) note, objects and events carry multiple meanings that are culturally constructed. Nevertheless, presenting too many details of the history can also be ambiguous and confusing. Still, Cutler (2000) concludes that some form of conversation can emerge between past and present people of an area. Ashley (2013) suggests that engagement with civic activities is much needed in this time of declining trust and reciprocity in order to build greater social capital. For example, the Truth and Reconciliation Commission of Canada (2015) calls for museum policies to comply with the United Nations (2008) Declaration on the Rights of Indigenous Peoples, in which Article 31 states that “Indigenous peoples have the right to maintain, control, protect and develop their cultural heritage, traditional knowledge and traditional cultural expressions” (p. 11).

In addressing the difficulty of truly understanding another culture, Shryock (2004) believes that there is an ethnographic refusal that dissociates the public with

the “particulars of everyday life and an eagerness to engage, simultaneously and as a substitute, in critiques of an external, impinging power (the state, the empire, the West) and its gaze” (p. 13). This shift in cultural views has occurred in part because of the transnational communication and the interpretation that occurs with a “spatially dislocated audience” (Shryock, 2004, p. 14).

Butler (2008) says that the manner in which information is collected, artifacts are gathered, and how much collaboration and input is welcome, will all have an effect on the message that is conveyed. This is known as *reflexive museology*, which incorporates both the process and the methodology as having a significant impact on the outcome of the exhibit. For example, Batoche is seen as progressive because it involves the local community in both consultation and shared management. According to Verishine (personal communication) and the 2015 draft management plan, while Batoche doesn't specifically speak to the current day thinking of Métis people, it does however, work closely with the local elders and community, as well as partnering with the Gabriel Dumont Institute, which promotes the renewal and development of Métis culture. The NHS seeks to complement the activities of Batoche Days—a large annual celebration of Métis culture—rather than being directly affiliated with the event.

Lynch and Alberti (2010) point out how museums must be aware of their subjective viewpoint. Often they can subtly delineate and reproduce the impacts of colonizer encountering colonized. Looking at the UK's staffing of museum and libraries, a 2007 study “found them to be primarily ‘pale, male, and stale’, with more than ‘a whiff of institutional racism’” (2010, p. 15). Lynch and Alberti (2010) propose that staff see themselves as fellow citizens who interact with locals and minority groups through various “contact zones” that would allow for both collaborative and contested interpretation of ongoing exhibits.

Cameron (2011) proposed the idea of “liquid museums,” where numerous voices are deemed to be authoritative and multiple or even conflicting rationalities and techniques are employed. In short, Cameron suggests that the irreconcilable differences and messiness of pluralism should be allowed to co-exist, rather than trying to create a neat and tidy sense of collaboration. Even amongst Métis people around Batoche, there have always been mixed views on Riel and the events of 1885. Originally cast at the Batoche NHS as a hero, evidence of Riel's instability when he returned to Canada shifted the focus away from Riel and onto the Métis culture (McCullough, 2002). Others support or question the role of Riel as the figurehead of Métis people or political movement. As Cameron proposes, there can and should be room for these conflicting views to exist, inter-culturally and individually.

Some of the more effective ways of engendering empathy toward another person's story is through the use of personal accounts, diaries, and narrative storytelling to help visitors to identify with and re-examine their own beliefs. Ballantyne and others (2012) examined how the State Library of Queensland interpreted the forced removal of the “Stolen Generations” of Aboriginal children. While government documentation validated the pain experienced by the disrupted families, themes of despair were balanced with hope and resilience. Giving visitors a place to deal with the feelings of guilt, shame, and sadness that may be aroused through the exhibition process was also vital. One of the means of doing this was to create a “Visitor Response Wall,” where people could voice some of their reactions and responses, and allow visitors to become an active contributor to the exhibit (Ballantyne et al., 2012).

Connecting the Past and Present

The current Management Plan for Batoche NHS makes it clear that Parks Canada does not wish to be “the arbiter of Canadian history” (Parks Canada, 2000, p. 9), but offers a many voices approach which allows visitors to form their own opinions, based on what is presented. Pannekoek (2000) recognizes that conversations must emerge between past and present, but the process is still developing. For example, former Director General of Canadian NHSs, Christina Cameron, criticized Batoche for putting too much emphasis on the current Métis settlement there. While Cameron considers the battle, and the events leading up to it, as the theme of the site, Pannekoek (2000) submits that the resilience and survival of the Métis of Batoche are equally integral to the broader consequences of the battle and the continuing Métis story.

Pannekoek (2000) postulates that the 1885 resistance at Batoche may have been the inciting event in what he calls the criminalization of the Métis people. Following the 1885 resistance, and indeed after the 1870 Red River resistance, many Métis scattered due to a lack of food and, while some were able to find seasonal work, others lived as squatters in areas that had been purchased by the Crown, but not yet developed for roads. Métis people were never given a land base in the way that the First Nations were given reserve land. Although French, English, and Aboriginal people were recognized by the 1982 Constitution Act to have distinct rights, Métis rights have not had similar rights until the recent 2016 decision in *Daniels v. Canada*, where the Supreme Court of Canada found that the Métis were indeed entitled to the same benefits through Canadian Law as “Status Indians” (Adams, 2016; Indian and Northern Affairs Canada, 2016).

Rather than glossing over the events of 1885, there should be room at the Batoche NHS for “the emergent possibilities” of democratic dialogue, where conflict about “knowledge can be divisive, conflict-ridden, and unruly” (Ashley, 2013, p. 4). There should also be room for the history that followed the 1885 Resistance to cast an honest light on the current Métis community around Batoche. This is particularly vital now, as the Métis seek greater distinction from other Aboriginal peoples, and lay hold of their own unique identity.

Conclusions

The purpose of this article was to analyze how hot interpretation and a multiple voices approaches to history can give a more historically accurate picture of the 1885 Resistance at Batoche NHS. Parks Canada has a unique opportunity to position itself as a forum for discourse about broader topics of controversy and socially impactful issues through a hot interpretation approach. Fostering new kinds of citizen participation and honest dialogue about contested issues will facilitate the sustainability of the historical resources, local communities, and ecosystems. One of Uzzell and Ballantyne’s (1998) five components that impact a person’s emotional connection with an exhibit is time. On the one hand, the more time that has elapsed, the more difficult it is to connect with the issue or events. Events of the more distant past, with no living voice, can cause people to view them, and the suffering they may have caused, as distinctly foreign (Uzzell & Ballantyne, 1998). On the other hand, the same temporal distancing can also provide an opportunity to re-examine these issues from less culturally-loaded perspectives.

As a result, Batoche is moving towards an evolving and many voices approach that gives place to the multiple perspectives that can speak into and about history. Parks Canada could go a step further by giving voice to the continuing struggle of the Métis

people of Batoché, bridging the gap between the past and an authentic, unidealized present. While there is evidence of interpretation shifts within the Parks Canada approach to the Batoché NHS, there is still room for improvement in interpreting a controversial past.

Ballantyne et al. (2012) suggest narratives and personal storytelling to promote many ways to personally connect to visitors. A multiple voices approach should continue to present historical evidence in a balanced fashion so that visitors gain insights on their own, rather than feeling persuaded. Batoché can provide unique opportunities of time or space to reflect on events of the past and their current and personal relevance. Similarly, by critically analyzing causes of the 1885 resistance, visitors can gain insights about historical complexities, but also learn how past actions influence the future. As Staiff et al. (2002) suggested for rainforest interpretation in Australia, Batoché NHS is a place of “contested and multiple meanings.”

Parks Canada has recognized how the language and content of interpretive exhibits at Batoché NHS can generate emotional responses, both positive and negative. Interpretive staff should constantly scrutinize their interpretation in light of new historical evidence and changing perspectives. Hot interpretation at Batoché can also make connections with present day events and issues, such as the “Back to Batoché Days” or the role of Métis veterans during the First World War Centenary. Such strategies will promote intergenerational interactions among Métis, promote deeper understanding of Métis history and culture, and commemorate the 1885 resistance (Métis Nation, 2015). Pitcaithley (2004) promotes a direct approach to controversial topics; future interpretive efforts could address the changing perceptions of the 1885 resistance in Canadian history. Batoché NHS offers many ways of interacting with hot topics beyond intellectual means. These interactions provide exciting possibilities for engagement with the emotional and human components of Canadian history, places, and people that have shaped—and will continue to shape—the social and cultural fabric of Canada. In the case of Batoché, hot interpretation can strengthen and re-define Métis culture in Canadian society (Redbird, 1980).

With respect to interpretive efforts and management, the current relationship between Parks Canada and the Métis Nation is good (Parks Canada, 2015), but Batoché NHS should continue to nurture and improve relationships with relevant Métis organizations such as Métis Nation–Saskatchewan and the Métis National Council. Batoché staff should also seek out insights from other parks implementing hot interpretation and, in turn, share insights with them about techniques employed and lessons learned. There are many valuable insights for other sites related to the 1885 resistance (eg. Hildebrandt, 1994) or that have adopted, or want to adopt, a hot interpretation approach. Last, Batoché should solicit feedback from visitors and Métis organizations about how efforts at hot interpretation support multiple perspectives, emotional responses, and respect for challenging stories.

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IN MY OPINION

On the Need to Interpret Insects: An Always Small but Gargantuan Opportunity

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Abstract

This position paper makes explicit what can be gained by increasing interpretive naturalists' focus on interpreting insects and their close relatives, particularly in local and regional settings. Insects are widely loathed because a few species are highly irritating. Helping people become aware and observant of the overwhelming percentage of insects that stay hidden and are not bothersome, yet exhibit a wide range of intriguing shapes, adaptations, and behaviors can increase people's comfort in the outdoors. Environmental benefits include increased informal monitoring for invasive species and reduced irrational pesticide use. Understanding of how people are socialized into an interest in nature and natural history suggests a need for frequent and recurring experiences with nature over many years. Engaging with insects costs little and their ever-presence makes seeking these frequent formative experiences with nature readily available. Because interpretive naturalists interpret nature in situ, they are ideally skilled to facilitate human-insect experiences.

Keywords

interpretive naturalist, insects, bugs, invertebrates, affective experiences, fear, disgust

On the Need to Interpret Insects: An Always Small but Gargantuan Opportunity

Unlike exhibit-oriented facilities, where the resources that people come to experience are collected and presented in reliable and predictable locations, interpretive naturalists interpret nature where and if it is present. Mastering the natural history of an area is an immense challenge (Weilbacher, 1993). Even in biological deserts, where the number of perceived organisms is low, there exists a plethora of common, diverse, and little-seen

creatures. While anyone can readily appreciate the perceptual novelty of snow-covered mountains or the allure of charismatic tigers, careful and intentional effort is often needed to appreciate the nuance of the insect world. Between camouflage, outlandish appearance, and novel behavior, insects are a resource that are an ideal challenge for the skill sets of interpretive naturalists.

The only insects that regularly seek people out are the few species seeking to bite us, defensively sting us, eat our food, or invade our personal space. While phenomenally diverse in number of species (Black, Shepard, & Allen, 2001) insects are also the most disliked (Byrne, Carpenter, Thoms, & Cotty, 1984; Kellert 1993). The tiny percentage of insect species that persistently annoy us reduce our desire to even consider experiencing the vast majority of insects that stay hidden. This silent unseen majority can provide people with involvement with varied hobbies, opportunities for observation, intrigue, exploration, and abilities to address several natural resource issues. This paper provides an explicit rationale for why interpretive naturalists benefit parks and surrounding communities by focusing more attention on providing people with direct experiences with insects.

To the general public “bug” means small, creepy and disgusting which is reflected in how people tend to use the words “insect” and “bug”: Spiders are insects (Kellert, 1993) and butterflies are not Schnabel (2004). Common folk taxonomies include spiders, millipedes, centipedes, slugs, snails, and/or worms into a “bugs” classification (Hunn, 2003; Shepardson, 2002). In this paper we use “bugs” in this informal manner to include any small invertebrates with more than four legs or no legs at all.

Valued Outcomes from Increased Human Interest in Bugs

The general public has little interest in bugs or more accurately is hostile towards them. Regardless, there are a variety of strategic reasons to integrate bugs into interpretive experiences, particularly in local and regional parks and special places:

More people comfortable in wild places

Mosquitoes and other bugs that hang around us because we are their food source are a constraint to participating in outdoor and wildland recreation activities (Bixler, Carlisle, Hammitt, & Floyd, 1994; Bixler & Floyd, 1997). Some people avoid wildland areas because of bugs just on principle, even when pest insects are not common. A glaring example of this comes from a study by Bixler and Floyd (1997) who found that high school students chose manicured areas to visit over weedier areas when deciding where to go to make an insect collection. With a generational decline occurring in interest in natural history and just being outdoors (Bixler et al, 2011), developing comfort with insects seems a sensible goal.

More people aware and attentive to invasive pests

The geographic expansion of invasive and pest species of insects is an immediate threat. The United States is currently combatting dozens of introduced insect pests. Invasive crop pests accrue over \$14.4 billion dollars in total losses and control costs annually (Pimentel, Lacz, Zungia, & Morrison, 2000). Other species of insects are amassing at southern latitudes waiting for a warmer climate. Increasing the number of people who are informally observant of bugs should increase the informal monitoring for these threats.

Experiences with native insects provides for immediacy

Immediacy is the quality of being able to translate new experiences immediately to a person's home environment. While there is much prestige in going to the Antarctic, well-heeled ecotourists are unlikely to start a penguin rookery in their backyard. Learning about local fauna and flora instills involvement and ownership in a person's local community and is a rationale for place-based education (Sobel, 2005). Additionally, when local fauna become known and valued, conservation everywhere or re-wilding initiatives follow in the form of replacing "the Great American Lawn" with a butterfly garden or other pro-insect projects (PIP) (Marris, 2013; Rainer & West, 2015). Interpretive naturalists can provide a wide array of programs and workshops about local insects that can be translated into activities implemented at participants' homes.

Socialization through frequent and direct experiences with nature

Related to immediacy, the need for frequent and recurring experiences with nature is the fundamental vehicle for socializing lifelong interests in natural resources. A single experience with nature, no matter how dramatic, is insufficient (Bixler, James, & Vadala, 2011; Chawla, 1998). Unfortunately, most people's experiences with insects come through media with children knowing more about exotic species than local ones (Genovart, Tavecchia, Enseñat, & Laiolo, 2012). Tragically, people who learn about nature exclusively from media are often scared or bored in real nature (Bixler et al. 1994; Bixler et al. 2011). The outcome is a population oblivious of their own backyards, but vaguely concerned about distant exotic places. Insect activities can be participated in repeatedly year round, at almost no cost and in almost any location.

Decreased irrational pesticide use

Of the million species of insects, a few have been sources of disease, starvation, and death. (Gottfried, 2010). While there are valid reasons to target destructive pests, the irrational application of pesticides is dangerous. Baldwin et al. (2008) found a majority of homeowners acknowledging that just the visual presence of any insects was motivation to apply pesticides. Application of modern organophosphate-based insecticides have been linked to a significant increase in cancer (Bailey et al., 2011), Parkinson's disease (Narayan et al. 2013), respiratory disease (Eskenazi, Bradman, & Castorina, 1999), and central nervous system complications (Rosenstock et al., 1991). Since people are treating their fear and/or disgust of bugs through pesticide applications, any opportunities for people to become more comfortable around bugs should reduce negative health outcomes related to pesticides.

Bugs are everywhere even when nothing else is stirring

Their ever-presence makes bugs invaluable to interpretive (park) naturalists. With their wild colors, camouflage, mimicry, and behaviors, insects provide readily available novel experiences. Anyone can afford to go on an "Insect Safari." Insects occupy all terrestrial ecological habitats and our homes (Bertone et al., 2016; Turnbull, 1973). An interpretive naturalist leading a program in a park can always find insects when vertebrates are nowhere to be seen.

Rationalizations or Intrinsic Interest?

With an insect-hostile public, there is a temptation to interpret, not the intrinsic qualities of insects, but rationalize the functional and economic benefits of a few species (Waldbauer & Waldbauer, 2003). For instance, production of many fruits and vegetables would halt without pollination. Bugs have provided for advances in medicine (Bowman, Gottlieb, Suchyna, Murphy, & Sachs 2007; Ratcliffe, Azambuja, & Mello, 2013), engineering, and robotics (Lambrecht, 2005; Lewinger, 2005; Srinivasan, Zhang, Chahl, Stange, & Garratt 2004). The threat of colony collapse disorder in honey bees is a common message discussed by interpretive naturalists. This approach is the standard “through understanding comes appreciation” rationale that is the mainstay of traditional resource interpretation (Ham, 2007).

The alternative to the rationalizing insects approach

Entomologists did not choose their profession because of concern about declines in broccoli pollination, so why interpret honey bee colony collapse disorder? Quoted in Berenbaum (2000) are the results of a study by James Nitao of the childhood experiences of faculty and graduate students at the University of Illinois. These entomologists reported many childhood play behaviors with insects, including ant farms and experiments on bugs. E.O. Wilson, prominent Harvard entomologist, stated in his autobiography that “Every kid has a bug period... I never grew out of mine.” Wilson acknowledges that he developed a lifelong sense of appreciation for bugs, particularly ants through similar childhood experiences (Wilson, 1994). This feeling of connectedness with nature through childhood experiences is a unifying principle for many environmental educators and natural history professionals (Chawla, 2007). Despite the obvious implications of these studies, these same natural resource professionals turn to “rational actor” educational strategies, believing that the key to caring about nature is dispensing more information. Typically, a “through understanding comes appreciation” motto is adopted rather than “through appreciation a persistent desire for understanding is motivated.” *This directionality is a critically important difference in establishing priorities for interpreting local natural history.* Intellectual messages detached from direct experience are often impotent. Most public park lands outlaw just the types of childhood play activities that are just the experiences that provide an emotional and experiential foundation for later paying attention to and caring about bugs and nearby nature (Finch, 2008). Likewise, insect collecting is often criticized by environmentalists (see Pyle, 2009), reducing opportunities for children to search for and have direct contact with insects. With any object or stimulus, direct experiences are critical in reducing extreme novelty and motivating recurring exploration (Acredola, 1982; Berlyne, 1966). With an estimated 97 billion bugs being killed by bug zappers every year in North America (Berenbaum, 2009), it seems insane to worry about a child harming a bug in a park setting.

Childhood experiences, combining unstructured play and guided adult experiences with insects is a *fascination before fear emerges* (FBFE) strategy. Children who get to see, play with, catch, trap, manipulate, and observe a variety of insects, implicitly know not to join their friends and family on the “scary bug bandwagon.” A reading of a major text on creating appealing products for middle childhood leaves us wondering why insects are not more popular. Acuff and Reiher (2008) identify disgust evoking characteristics, catching/trapping/chasing, control/manipulation, using equipment/technology, and edginess as some of the characteristics of successful products for middle childhood. Pyle

(2009) argues that the butterfly net is perhaps “the cheapest, simplest, and most effective environmental education tool ever invented.” These same children, later as adults, will be more motivated to pay attention to those public relation messages about colony collapse in honey bees. This is what we mean by “through appreciation a persistent desire for understanding is motivated.”

In Conclusion and a Call to Action

The ever presence of annoying bugs, combined with the negativity fostered in our culture through the media has alienated us from having experiences with the 98% of bugs that are not a bother. We have argued that interest in insects will not be developed through isolated “rational actor” interpretation, but from frequent, pleasurable play, and informal programming experiences with bugs starting in childhood. Interpretive naturalists, with a rich understanding of local nature and fostering experiences with people are well suited to orchestrating these experiences on an ongoing basis. Frequent, ongoing, and strongly affective/emotional experiences prepare our nervous system to attend to and value further information about insects. People with lots of bug experiences will pay attention to colony collapse syndrome when it is reported in the news, much the same way that adults who rabidly pay attention to sports grew up in youth sports programs.

The possibilities for getting children and youth involved with bugs is endless. Our one caveat is that insect experiences should be direct experiences with native bugs. Simulation games, the mainstay of environmental education, do not help people become more comfortable finding and being around insects. Along with insect collecting, there are numerous catching, trapping, and behavioral demonstrations that interpretive naturalists can deploy. Our initial discussions with field entomologists suggest that they use many field research methods that could be turned into activities and demonstrations. While this paper has focused on children, there are many opportunities for adult programming along the lines of gardening for insects and insect biology for nature photographers (Lemelin, 2009). Essential to this initiative is providing professional development opportunities for interpretive naturalists to increase their knowledge base about insects through workshops, classes, and field research. What is increasingly clear based on nature socialization research, is that a single experience with bugs is not enough. Interpretive naturalists have their crawling orders.

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Appendix: Manuscript Submission

Instructions to Authors

Purpose

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

General Information

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

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

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

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

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

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

Titles

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

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

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

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

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

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

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