

EFFECTS OF THEMATIC INTERPRETIVE SUMMER DAY CAMP
PROGRAMMING ON CHILDREN'S ENVIRONMENTAL
ATTITUDES

By

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Abstract

Childhood connection to nature is essential for developing environmental attitudes that are necessary to create environmental stewards. Heritage interpretation programs have shown promise as an effective means to create this connection, but evaluations of the effects of these programs have been limited. This thesis examines the self-reported effects of thematic interpretive programming on environmental attitudes in children attending a summer day camp program, and which elements of the program have the greatest impact on these attitudes. To assess this, a day camp program was held in June and July 2023 for children entering 3rd through 6th grades. The program was designed using the Elaboration Likelihood Model (ELM) and research-supported best practices for interpretation. Participant environmental attitudes were assessed using a pre- and post-survey (the Children's Environmental Perceptions Scale [CEPS]) and post-program interviews. Program educators wrote daily analytical memos with their observations and assessments of child engagement/elaboration. Participant ($n = 22$) CEPS scores increased after the program, with significant increases in overall environmental attitudes (Wilcoxon signed-ranks test, $z = -2.138$, $p = .031$) and feelings of eco-affinity (interest in nature; $z = -2.640$, $p = .005$). Interview results indicate that most participants did not report a change in their feelings towards nature with exceptions relating to specific aspects of nature (e.g., spiders, snakes) or feelings that nature should be protected more than it currently is. Analysis of participant interviews and educator memos revealed several positive (novelty, hands-on experiences, exploration, closer look, animals) and negative (excessive heat, biting insects, tiredness) themes that affected the participants' experiences. These results indicate that heritage interpreters may wish to embrace novel experiences and utilize frameworks like the ELM to increase their potential impact on attitudes.

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Chapter 1: Introduction

Over the past several generations, society has grown increasingly disconnected from the natural world. This disconnect is especially strong among children, leading to the coining of the term “Nature-deficit Disorder” (Louv, 2005). However, exposure to nature, especially in childhood, can be an essential tool to develop environmental literacy and environmental attitudes necessary to combat some of our most pressing environmental issues (Broom, 2017; Louv, 2005; Rosa et al., 2018; Sachs et al., 2020). Environmental experiences like interpretive programming may be an effective means to provide this exposure. Using the Elaboration Likelihood Model as a framework, this study examined the impacts of a thematic interpretive summer day camp experience on the environmental attitudes of children.

Statement of the Problem and Significance of the Study

As environmental issues worsen, it is necessary to ensure that children develop environmental attitudes that will allow them to combat these issues. While there are studies on the effects of formal and non-formal environmental education on increasing environmental literacy (described in Chapter 2), they often focus more on changes in environmental knowledge (instead of environmental attitudes) or are limited to environments like school field trips or ecotourism. Additionally, few studies examine the impacts of thematic interpretive programming on these attitudes, with even fewer looking at interpretive day camp programming.

At the local level, although there are options for nature-based summer programming, these programs are often full-day, week-long programs. This leaves a void for parents who are looking for half-day opportunities for their children to explore nature in a structured, social setting. Swatek (2015) identified summer as a time when there was community interest in programming for children at Schmeckle Reserve, a 280-acre natural area on the campus of the

University of Wisconsin-Stevens Point. Implementing a summer after-school day camp program was an ideal way to meet the desire for summer nature-based programming, as well as increasing Schmeckle Reserve's community programming.

The purpose of this study is to evaluate the effectiveness of a thematic interpretive approach to summer day camp programming on the environmental attitudes of children using the Elaboration Likelihood Model as a theoretical framework. Additionally, the study aimed to identify which elements of the program had the greatest perceived impact on participants' environmental attitudes.

Research Questions

The research problem has two specific areas of focus:

1. What are the self-reported effects of a thematic interpretive approach to programming on environmental attitudes in children attending a summer day camp program?
2. What elements of the program have the greatest perceived impact on participants' environmental attitudes?

Research Objectives

Objective 1: Develop and deliver a thematic interpretive day camp program at Schmeckle Reserve for children in the Stevens Point area entering 3rd through 6th grade.

Objective 2: Determine the effects of the program on participant environmental attitudes and identify which elements were perceived to be most impactful by participants.

Assumptions

1. The community was interested in participating in summer day camp programming at Schmeckle Reserve.
2. Program educators delivered the interpretive program as trained.

3. Participants in the program were honest when completing the survey and during their interviews.

Definitions

Elaboration Likelihood Model: A theory of attitude change that identifies two routes for impacting attitudes: a central route that targets more knowledgeable individuals through strong arguments and creates a stronger lasting impact, and a peripheral route that focuses on providing affective cues to influence participants that generally creates weaker impacts on attitudes (Petty & Cacioppo, 1986)

Heritage interpretation: “Heritage interpretation is a communication process that guides visitors to discover meanings in objects, places, and landscapes” (Buchholz et al., 2015, p. 31).

Interpretive theme: The “central message” for an interpretive program; interpretive themes are usually a written as single sentence that connects a tangible resource to intangible meanings, provokes the participants to think about the theme, and generally organizes the interpretive program (Buchholz et al., 2015; Ham, 2013).

Nature-deficit Disorder: The decrease in exposure to nature, especially in children, between generations which may decrease connection to nature and how one perceives the natural world (Louv, 2005).

TORÉ Model of Thematic Interpretation: A communication model stating that the most effective communication/interpretation has a clear interpretive theme, is well organized, is relevant to the audience, and is presented in an engaging way to provoke people to think and process the theme (Ham 2007; Ham, 2013)

Summary

This study aimed to identify the self-reported effects of thematic interpretive programming on participants' environmental attitudes and to evaluate which programming techniques have the greatest impact. To answer these questions, a thematic interpretive day camp program for children entering 3rd through 6th grade was hosted at Schmeckle Reserve, a natural area on the campus of the University of Wisconsin-Stevens Point. The results of this research can be used to help inform the development of future programs aimed at influencing participants' environmental attitudes.

Chapter 2: Literature Review

This study evaluates the effectiveness of thematic interpretive programming on influencing the environmental attitudes of children using an Elaboration Likelihood Model (ELM) framework. To achieve this, a thematic interpretive day camp program for children in the Stevens Point area was developed and delivered at Schmeeckle Reserve, and its impact on participants' environmental attitudes was assessed. In a survey of community members including teachers ($n = 87$), non-formal educators ($n = 23$), and homeowners ($n = 184$), Swatek (2015) identified summer as a time of potential interest in programming at Schmeeckle, especially for children and families. While intergenerational family programming was offered at Schmeeckle during the summer of 2016 (e.g., Alexander, 2017), summer day camp programming has not. Offering this type of programming not only meets an identified community need, but also allows for research into the effects of an interpretive approach on participants' environmental attitudes.

This chapter reviews available literature on the importance of environmental attitudes, the effects of environmental education and interpretation on influencing environmental attitudes, effective techniques used in environmental education and interpretation programs, and evaluation of interpretive programming. This information was used to identify best practices for interpretive programming with a focus on ELM variables and attitude change that were implemented in this study, as well as to establish a theoretical framework from which to evaluate the program.

Childhood Nature Experiences and Environmental Attitudes

As the world becomes more urban, children are becoming increasingly disconnected from the natural world, a "condition" often termed Nature-deficit Disorder (Louv, 2005). This is concerning, as a connection to nature has been directly associated with positive social-emotional

development and better health (e.g., Chawla, 2020; Louv, 2005). Additionally, connection to nature has been linked to an increase in environmental attitudes in children, with these feelings carrying over into adulthood as well (Broom, 2017; Chawla, 2020; Rosa et al., 2018; Sachs et al., 2020). Having a more positive environmental attitude is as a major driver of developing environmentally responsible behaviors which are necessary to combat our most pressing environmental crises (Chawla, 2020).

Psychological research supports these claims. In a study on connectedness to nature in children ages 6 to 15 ($n = 24$) attending two natural history museums, researchers found that the children demonstrated higher levels of implicit connectedness to nature after their visit than before (Bruni et al., 2018). While both museums prompted increases in scores, only one was significant ($p < .05$) with researchers hypothesizing that this could be due to the higher pre-test scores present in the other museum group, limiting the potential amount of increase. These results indicate that curated nature experiences like those offered in museums, zoos, and other heavily managed environments can still impact participants' connection to nature, which may impact their attitudes (Bruni et al., 2018). Zhang et al. (2014) found similar effects in school children in China. The researchers allowed 1,119 school children to examine 12 preserved animal specimens and fill out a questionnaire about their feelings towards each specimen and whether they would be willing to help protect the animals. Children who had greater contact with nature (e.g., those living in rural areas) were more willing to conserve the animals in question, indicating that greater contact with nature can help promote environmental attitudes.

Contact with nature alone, however, is not a cure-all for inspiring environmental attitudes. A 2015 study of 832 children ages 6 to 12 living in urban, rural, and mountain areas in Spain found that frequent daily contact with nature improved environmental attitudes and

environmentally-friendly behavioral intentions of urban children who generally had much less contact with nature than other children (Collado et al., 2015). For children living in the mountain areas, contact with nature also improved their environmental behavioral intentions, although it did so only through the intermediary of environmental attitudes. However, in rural areas, where children had high amounts of daily contact with nature, the researchers found weaker environmentally responsible behavioral intentions, although the contact with nature did still improve the participants' environmental attitudes to an extent. The researchers speculate that this mismatch could be due to the different interactions that the rural children have with nature (i.e., more outdoor work on farms) than the children in the other groups who mostly used nature for leisure and recreation activities. As such, the researchers caution that while contact with nature may be a useful tool for creating and promoting environmental attitudes, it is not enough on its own and should be paired with positive experiences for the greatest impact.

Richardson et al. (2020) agree that not all nature experiences are created equal. In their survey of 1,298 individuals ages 16 to 55+ in the United Kingdom, they found that indirect and inactive engagement with nature, such as simply observing natural scenery or spending time aimlessly in nature, were not significant predictors of environmental attitudes and behaviors. More active engagement that stimulated people emotionally, intellectually, socially, and effortfully (e.g., close observation, sharing nature with others, multi-sensory engagement), however, was much more impactful increasing nature connectedness and environmental attitudes that the authors claim to be foundational to positive environmental behaviors.

Other studies suggest that the impacts of childhood nature experiences influence attitudes into adulthood. A 2018 paper on adult experiences in nature and their impacts on pro-environmentalism in Brazil found that current experiences in nature as an adult were a factor that

increased their connectedness to nature ($n = 224$; Rosa et al.). Current experiences in nature also impacted participants' environmental attitudes and behaviors. Childhood experiences in nature had an indirect effect on the environmental attitudes and behaviors of the adults in the study. While the participants' environmental attitudes were not directly influenced by their childhood attitudes, participants that reported spending more time outdoors as children were more likely to continue to have positive experiences in nature, which impacted their environmental attitudes to a greater extent (Rosa et al., 2018).

A survey of undergraduate students ($n = 308$) at a university in the United States also showed lasting effects from childhood nature engagement (e.g., taking walks, outdoor leisure activities; Sachs et al., 2020). Researchers found a strong positive correlation between childhood nature engagement and the frequency of which they currently participated in outdoor experiences, although, as a whole, the students participated in these experiences much less than they did as children. Additionally, more frequent nature engagement in childhood was positively correlated with pro-environmental attitudes, as was more frequent nature engagement as an undergraduate student. The researchers also noted that the input of parents, guardians, and other respected adults influenced the amount of nature engagement and the environmental attitudes of the students, indicating that having positive adult influences as a child impacted their environmental outlook as an adult.

Similarly, a study of young adults' environmental attitudes and behaviors in relation to their childhood nature experiences conducted on undergraduate students at a Canadian university found that time spent playing outdoors was positively correlated with more positive feelings towards nature (Broom, 2017). However, similarly to Collado et al. (2015), Broom found that there was a difference in the "love of nature" between urban and rural dwellers, with over 85%

of urban dwellers reporting to love or somewhat love nature while only 67% of rural dwellers felt that way. Broom speculated that these differences may be due to the nature of the respondents' relationship with nature as a child (e.g., seeing extractive uses of nature, seeing a greater number of environmental issues), indicating that the impact of active engagement with nature may vary based on demographics and preexisting relationships with nature.

Research from Australia shows similar effects on adult environmental attitudes resulting from childhood nature experiences (Laird et al., 2014). Thirty-two respondents to a survey sent to parents and educators at an early childhood center in New South Wales indicated that they had high connection to nature (3.99 out of 5 on Nature Relatedness Scale, 4.5 out of 7 on Inclusion of Nature in Self Scale). The respondents also indicated that they had participated in and enjoyed activities in nature as children, especially unstructured/unsupervised play/exploration, interactions with animals, and constructive and destructive play. Interestingly, when asked about the experiences that they provide for their children, few respondents indicated that they encourage unstructured exploratory experiences. This concerned the researchers as unstructured outdoor experiences have been linked to greater risk taking behavior, which can help develop social competence, and children learning to manage themselves.

Farmer et al. (2011) also noted that unstructured free play and individual experiences contributed a major role in influencing adults to establish a conservation easement on their properties. In interviews with 19 landowners with conservation easements (ages 28 to 94), family experiences in nature, unstructured time in the outdoors, exposure to the outdoors from farms, and structured activities led by non-related adults were the most common themes. Despite being the second most common theme from the interviews, results from a questionnaire sent to other landowners with a conservation easement ($n = 64$) showed the most significant life experiences

that influenced people to create a conservation easement were individual experiences in nature, followed closely by free play outdoors. The results of these studies (Farmer et al., 2011; Laird et al., 2014) indicate that allowing children the opportunity to participate in unstructured outdoor activities can help strengthen their connection to nature and environmental attitudes, which may later influence their environmental behaviors.

Impacts of Environmental Education on Environmental Attitudes and Literacy

Because of the benefits of childhood nature experiences on environmental attitudes, there has been a push to get children outdoors, often through environmental education (EE) experiences (Dickinson, 2013). These EE experiences are usually designed to increase the participants' environmental literacy, help them understand environmental issues, and/or empower them to make change in the hope that once the children grow up, they will still have those same environmental values (United Nations Environment Programme, 1978).

Environmental literacy (EL), as defined by Roth (1992), is achieved when participants gain the knowledge, skills, attitudes, and drive to act in environmentally, socially, and economically sustainable ways both as individuals and as part of society at large. EE experiences appear to be effective at increasing these measures. A meta-analysis of 169 papers from 43 countries published across a fifty-year period found that environmental education programs are effective at their goals of increasing environmental knowledge, attitudes, behavioral intentions, and behaviors, with the analysis showing significant increases in all variables (van de Wetering et al., 2022). The effect was greatest for knowledge, with attitudes and behaviors having a small to medium change, and intentions showing a small change. The difference in the size of these effects could be due to the greater number of EE programs focused on increasing environmental knowledge, but the researchers were encouraged by the fact that all relationships were

significant, indicating that EE programs can be effective at influencing all target areas (van de Wetering et al., 2022).

Another study of 247 school children in Arizona looked at the effects of a three-day informal, outdoor-based earth education program on the children's environmental knowledge and attitudes (Baierl et al., 2022). The children were given pre-test surveys 1-2 weeks before the program and post-test surveys 4-6 weeks after the program. The researchers found that both knowledge and attitudes increased significantly ($p < .001$ and $p = .001$, respectively) after the program. Additionally, the researchers found that prior attitudes were positively correlated with increases in participant knowledge from the program. This further indicates that effective EE programming should be designed to address participants' environmental attitudes as well as trying to increase environmental knowledge.

Duerden and Witt (2010) examined the impact of direct and indirect nature experiences on knowledge, attitude, and behavioral learning outcomes using a Global Explorers program for middle and high school students. The participants ($n = 108$) took part in an indirect nature experience (a preparatory program for a trip to South America) and a direct nature experience (attending an international workshop in the rain forest), then provided input via surveys and interviews on the program's effects. Participants perceived the indirect experience as more impactful on their knowledge and the direct experience as more impactful on their attitudes, although survey data indicated that the direct experience had a slightly greater effect on their knowledge compared to their attitudes. Interestingly, direct experiences that were perceived to have greater individual freedom for exploration had greater impacts on participant attitudes. Both knowledge and attitudes influenced the participants' behavioral intentions, with the attitudes having a slightly greater influence (Duerden & Witt, 2010). As such, the authors recommended

incorporating a mix of direct and indirect EE experiences that offer some degree of perceived freedom to best promote pro-environmental behaviors.

After-school EE programs have shown correlation with changes in EL in the children who attend them (Goldman et al., 2013; Scala, 2015). In an analysis of the Art in the Afternoon program – an after-school program in Black Mountain, NC, with a focus on combining art with environmentally responsible behaviors –Scala (2015) found that EL increased in the 60 students surveyed, with EL scores increasing alongside the increased length of time spent attending the program (up to 6 years). Additionally, in interviews with parents of the children ($n = 27$), many discussed environmental attitudes and behaviors (e.g., recycling, picking up litter, outside play) that they attributed to the program. A mixed-methods study of 50 junior high school students in Israel showed that their participation in a weekly after-school EE program over the school year resulted in an overall higher EL based on the results of drawings of the environment, word associations, questionnaire responses, and repertory grid interviews (interviews conducted using participant-generated elements to focus the interview; Goldman et al., 2013). The increases were predominantly related to students' conceptions of the environment as well as to concepts related to self-efficacy, with participants feeling more empowered to make positive environmental changes.

Environmentally inclined summer camps show similar promise. A study of one urban and three nature-based sleepover summer camps in Spain found that, from a sample of 397 children, those in the nature-based camps scored higher on the Emotional Affinity Toward Nature and New Environmental Paradigm for children Scales and showed a greater willingness to carry out daily conservation actions and environmental citizenship behaviors than those in the urban camp (Collado et al., 2013). Interestingly, when comparing nature-based camps with and without EE

programming, there was no difference between their scores. The authors were unable to explain this result but speculated that either the effects of the exposure to nature was intrinsically greater than the effects of the EE programming or that the EE programming was not a large enough part of the total day camp program to have an effect.

Cincera et al. (2015) examined the effects of a two-and-a-half-day residential EE camp in the Czech Republic on participants' ($n = 158$) connection to place and general reactions to the program using interviews, focus groups, and pre- and post-surveys. Their results showed that the participants recalled positive experiences in nature, with the most impactful experiences being hands-on, emotionally engaging activities (e.g., touching animals, walking barefoot in a wetland, participating in an interpretive walk "following" an 18th century figure's path) and this created an increased connection to place. Negative feelings were most strongly tied to physical discomfort such as hiking for too long and the apprehension of being in a new place, as well as a lack of access to technology.

In North America, Cheeseman and Wright (2019) explored the impacts of a five-day overnight *Sunship Earth*TM camp in Nova Scotia, Canada, on environmental learning experiences. Twenty-three campers who attended the camp in 2015 completed pre- and post-surveys measuring their cognitive, affective, and behavioral environmental learning experiences on the first and final day of the camp. Results of the post-test showed that environmental knowledge increased over the course of the camp and that participants were empowered to adopt more environmentally responsible behaviors, with slight increases in both variables. Additionally, students showed overwhelming preferences for learning about nature *in nature*, with hands-on activities and demonstrations being most impactful. To determine longer-term impacts of the program, Cheeseman and Wright (2020) interviewed seven parents/guardians of

children who had completed a *Sunship Earth*TM camp. All parents/guardians interviewed expressed the opinion that the camp increased their children's environmental curiosity and reinforced their environmental attitudes, and five of the seven believed that the camp influenced their children to adopt new responsible environmental behaviors. This seems to indicate that the camp itself was effective at creating lasting change in the participants, although which aspects were the most impactful was unclear.

Cheeseman and Wright's (2019; 2020) results were similar to those obtained from research on the Central Wisconsin Environmental Station (CWES) (Krieger, 2010). Using pre- and post-surveys issued to both campers ($n = 161$) and parents/guardians ($n = 166$), Krieger measured responsible environmental behaviors in campers to determine whether their experience at CWES had an impact on their behaviors. While parent/guardian surveys showed a perceived increase in campers' responsible environmental behaviors, the camper surveys did not show any differences. Despite this discrepancy, the results indicated that experiences like those offered at CWES could have an impact on the behaviors of children, as focus group interviews with the campers showed that they had a strong desire to engage in new responsible environmental behaviors (Krieger, 2010).

Larson et al. (2010) examined the impacts of six one-week summer EE day camps sponsored by the State Botanical Garden of Georgia on EL in 6-13 year-olds of various genders and racial/ethnic backgrounds ($n = 64$). These children were compared to a similar group of children ($n = 69$) enrolled in non-EE after-school programming. Both groups were surveyed before and after the programs using the Children's Environmental Perceptions Scale (CEPS), a survey instrument designed to measure eco-affinity (interest) and eco-awareness (concern) elements of EL shown to be a reliable (eco-affinity: pre-test $\alpha = 0.852$, post-test $\alpha = 0.877$; eco-

awareness: pre-test $\alpha = 0.720$, post-test $\alpha = 0.760$) and valid instrument for the age group (Larson et al., 2011). The researchers found that all participants in the EE programs showed significant increases in their CEPS scores while no significant changes were found for the non-EE group. This suggests that mid-length, informal EE experiences can generate significant positive outcomes on environmental literacy and attitudes in participants from a wide variety of backgrounds (Larson et al., 2010).

Comparison of EE and Interpretation

While the existing research provides examples of effective EE, several researchers have criticized the current approach to changing attitudes through this type of programming. In a critique of the response to Nature-deficit Disorder, Dickinson (2013) explained her feelings on how EE programs have been failing to reconnect children to the natural world, citing criticisms including teaching nature exclusively through a natural science lens and a strong focus on naming species, as opposed providing exploratory and meaning-centered experiences in nature. Dickinson argued that these foci are limiting and reduce the potential for children to establish an emotional connection to the natural world. While she recognized that these natural science aspects are important parts of EE, she asserted that there should be a broader focus on facilitating experiences and nurturing emotional connections before providing scientific facts.

Knapp (2006) shared other concerns about EE. In an opinion piece for the *Journal of Interpretation Research*, Knapp discussed the apparent “activity guide mentality” that he was seeing in EE where lessons were set up as either stand-alone activities or short modules, limiting the exposure to a gamified version of the content instead of presenting a holistic view. This reduced the potential impact of the lessons. Additionally, he noted a growing concern among the public and practitioners that EE was using its position to encourage certain outcomes or

opinions, as opposed to exposing students to different opinions and letting them decide for themselves what to do and think.

EE can, of course, be done well. A systematic review of peer-reviewed studies published between 1999 and 2010 that focused on evaluating EE programs found that effective programs contained several key elements (Stern et al., 2014). Several elements that were strongly represented in effective programming included taking a holistic approach, creating a concrete experience, messaging that appeals to and engages with participants' emotions, and a passionate delivery, which are all techniques strongly associated with the related field of heritage interpretation.

Heritage interpretation has many definitions. For example, Tilden (2007) defines interpretation as “[a]n educational activity which aims to reveal meanings and relationships through the use of original objects, by firsthand experience, and by illustrative media, rather than simply to communicate factual information” (p. 33); Ham (2013) says interpretation is “...a mission-based approach to communication aimed at provoking in an audience the discovery of personal meaning and the forging of personal connections with things, places, people, and concepts” (p. 8), and Buchholz et al. (2015) define it as “...a communication process that guides visitors to discover meanings in objects, places, and landscapes” (p. 31). However all these definitions contain a few key parts: (1) interpretation is a form of **communication**, (2) interpretation deals with **people** who are participating as part of a recreational/leisure experience (i.e., park visitors, tourists, school groups), and (3) interpretation is concerned not only with facts but also with instilling **meaning** and making personal **connections** between the participants and whatever is being interpreted. To guide interpretive program development, several sets of principles for interpretation have been developed. The best known set, developed by Tilden in

1957, states that interpretation should: (1) relate the topic to the participant's experience, (2) go beyond information and reveal deeper truths about the topic, (3) be presented artfully, (4) provoke participants to want to learn or do more, (5) present a holistic view of the topic, and (6) use appropriate techniques depending on the age or other conditions of the participants (Tilden, 2007). Even now, over 60 years after the principles were first set forth, they still serve as a guide for developing effective interpretive programming (Buchholz et al., 2015; Ham, 2009; Ham, 2013). This focus on creating an experience instead of teaching facts is also in line with the ideas that Stern et al. (2014) found to be most effective for EE experiences.

For this study, the program will be designed using an interpretive approach. This approach meets many of the criteria for effective environmental education described by Stern et al. (2014). Additionally, an interpretive approach could help address the concerns raised by Knapp (2006) and Dickinson (2013) by providing a holistic experience and focusing on affective components other than purely scientific aspects.

Creating Effective Interpretation

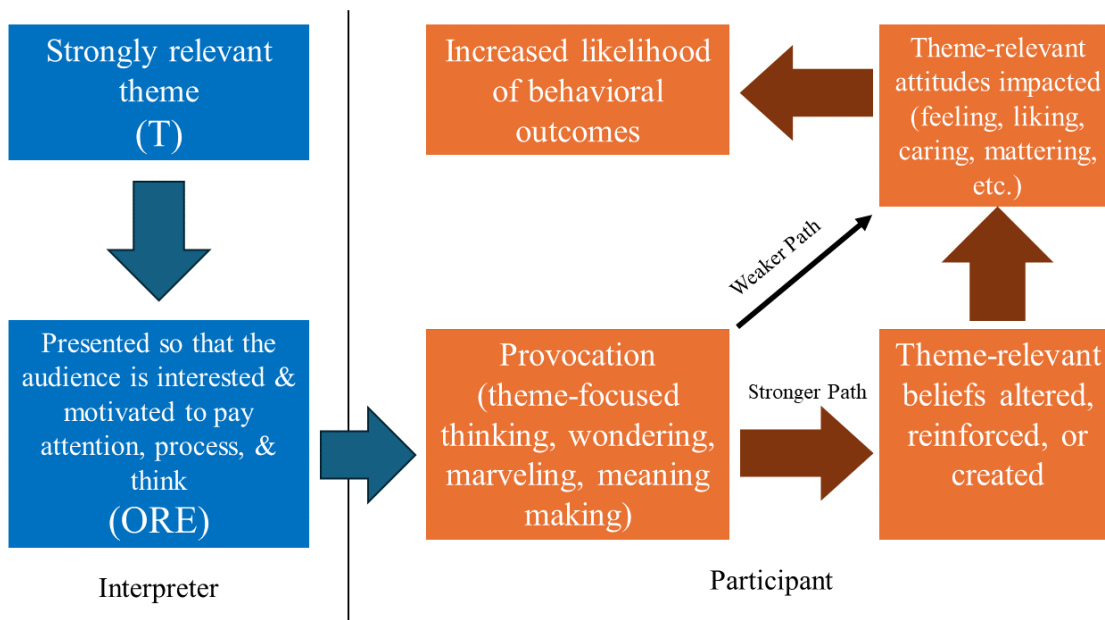
Interpretation mostly addresses non-captive audiences, or people who are free to come and go as they wish. As such, it is often difficult to assess whether the goals of creating meaningful connections and experiences were achieved. However, research on this topic has shown that some methods of developing and delivering interpretive programming appear to be effective at achieving these goals.

Ham (2007) examined whether interpretation can actually influence participants' attitudes and behaviors by collecting and evaluating research published on interpretation. He found that by employing what he termed the TORE model (TORE = Thematic, Organized,

Relevant, and Enjoyable) for program development, a program may have a greater impact on participants' attitudes (Figure 1).

Figure 1

The TORE Model of Thematic Interpretation (Ham, 2007; Ham, 2013)



Of these elements, Ham found a strongly relevant interpretive theme, or central message, to be the most important element for increasing the likelihood of affecting participants' attitudes and behaviors. This interpretive theme is represented by a single sentence that connects the tangible resource being interpreted to intangible meanings, feelings, and concepts that help the participants form intellectual and emotional connections with the topic of interpretation (Buchholz et al., 2015; Ham, 2013; Stern & Powell, 2013). Although these interpretive themes guide the development of the interpretive program, the participants are not necessarily expected

to be able to recite them word-for-word; instead, the interpretive theme serves as an overarching message that conveys the significance of the topic while allowing for participants to find their own personal meanings in the resource (Buchholz et al., 2015; Ham, 2013). Expanding on this, Ham (2013) asserts that while a strong interpretive theme is vitally important for effective interpretation, the ORE elements must also be done well for participants to have a truly memorable, impactful experience. Ham theorized that if these items are presented strongly, they can provoke the participants to think critically about the interpretive theme which may then either impact their theme-related beliefs and, through these beliefs, their attitudes (a central route for change), or directly impact their theme-related attitudes (a peripheral route). A study of 312 interpretive programs by Stern and Powell (2013) supported these assertions, finding that positive participant outcomes were strongly associated with the organization and theme of a program, as well as the presence and confidence of the interpreter.

To determine the most effective interpretive practices, Martin (2012) analyzed the effects of 20 interpretive best practices identified through a review of relevant literature on desired visitor outcomes (satisfaction, visitor experience, and behavioral intentions) in 376 National Park Service interpretive programs during the summer of 2011. Attendees at the programs ($n = 3,427$) completed a post-program survey on the outcomes of the interpretive programming. In these programs, the most implemented best practices were “appropriateness for the audience,” “organization of the program” (i.e., clearly thematic, appropriate sequence and transitions, connection between introduction and conclusion, holistic, strong introduction), and “multisensory engagement” (tactile, visual, and auditory; Martin, 2012). Best practices with a high degree of correlation with all desired outcomes were “appropriateness for the audience,” “quality of organization,” “consistency,” “appropriate logistics,” “connection to audience,”

“clarity of the central message,” and “verbal engagement,” while variables that were positively correlated with fewer desired outcomes include “multisensory engagement” (satisfaction, behavior change), “surprise” (enjoyment, behavior change), and “physical engagement” (enjoyment). Fact-based messaging was negatively correlated with both satisfaction and behavior change, indicating that interpretive programming must do more than just share facts. Based on these results, Martin recommended that interpretive programs be well-organized, appropriate for the participants, designed to connect to the participants emotionally and intellectually, and include experiences that capitalize on surprise and participant engagement.

A study of effective interpretive approaches used in environmental education field trips showed similar results (Powell et al., 2023). Across the 299 5th-8th grade field trips in the study, five variables were most impactful. These elements were having smaller group sizes (the researchers did not find an optimal group size but noted that smaller groups had more positive outcomes than larger groups), embracing natural environments and novel experiences (e.g., exploring unique events, unplanned interactions with animals), focusing on the unique aspects of the site, and having an educator who clearly communicates information, was confident and knew their site well, and provided a safe and supportive learning environment. Additionally, the researchers found that structural elements like including high-quality transitions and a strong conclusion as well as techniques like asking open-ended questions increased students’ cognitive engagement throughout the program. These techniques are consistent with other research on effective approaches, indicating that programs designed to have a positive impact may wish to incorporate these techniques.

One effective technique mentioned in both studies is the use of surprise/novelty in interpretive programs. For the purposes of this thesis, “novelty” is defined as an aspect of a

program, including environment, events, experiences, and/or techniques, that is new or unfamiliar to participants. These unfamiliar techniques and experiences can lead to greater engagement and increase the effectiveness of a program (Boeve-de Pauw et al., 2019; Liddicoat, 2013; Martin, 2012; Powell et al., 2023; Ruck, 2022). For example, in a 2022 paper summarizing his doctoral research on an EE program in the UK, Ruck noted three common themes from observations ($n = 30$) and focus group interviews ($n = 20$). First and foremost were “close-up encounters with other species,” primarily small insects. These encounters captured the participants’ attention effectively, creating lasting, affective experiences with the students. Ruck speculated that the novelty of the unplanned and unpredictable nature of these encounters was a strong contributor to their effectiveness (2022). Additionally, working with outside experts not connected to the school stuck out to the students, which Ruck again attributed at least in part to the perceived novelty of working with and learning from someone who the students had never met before. Finally, students responded strongly to the more “relaxed atmosphere” of the experience, which allowed for the students to mentally relax in addition to providing opportunities for the serendipitous encounters with wildlife that the students enjoyed so much.

Novel experiences have also been connected to long-term impacts by increasing the creation of lasting memories. In a retrospective analysis of participants in a residential EE program (Liddicoat, 2013), participants recalled experiences they had and emotions they felt at the camp, particularly those experiences that were “firsts” for the interviewees, even as long as 45 years after their initial experience. The EE experience provided a unique and novel episode in the interviewees’ lives, including actively engaging them physically and emotionally throughout the program. Participants also brought the knowledge, attitudes, and experiences “home,” engaging in activities that helped to further reinforce the effects of the EE experience. Based on

these recollections, Liddicoat (2013) advises EE practitioners to employ techniques to increase the personal relevance of the program, encourage positive emotional connections both with the resource and with other participants, and provide opportunities for participants to actively engage with the content. These techniques – all characteristics often associated with interpretive programs – can help practitioners enhance the novelty of an experience and relate it to the participants' lives to create potentially long-lasting and impactful memories of the program.

However, novelty is not always effective; too much or too little novelty can reduce the impact of a program (Boeve-de Pauw et al., 2019; Knapp, 2007). A study on the effects of 5th and 6th grade field trips in Flanders, Belgium ($n = 484$ children, 24 teachers) found that moderate amounts of novelty in the field trips, measured via prior preparation in the classroom and/or prior visits to the site, increased knowledge retention and the overall impact of the field trip (Boeve-de Pauw et al., 2019). However, too much novelty (i.e., the students were completely unfamiliar with the field trip site) resulted in children who were distracted by the novel aspects of the site, decreasing the impact of the field trip. On the other hand, too much familiarity with the site (i.e., more than one prior visit and/or more than half a lesson of preparation) reduced the level of novelty and similarly reduced the impact of the field trip. These results suggest that while novelty can be a useful tool to increase the effectiveness of a program, the novelty must be kept to an appropriate level so as not to overwhelm or underwhelm participants.

Effects of Interpretation on Environmental Attitudes

Field research has provided evidence to support the importance of the previously described approach to interpretive program development in impacting environmental attitudes. A study at Lulworth coastal area in southwest England surveyed visitors and examined their attitudes and behavioral intentions both in general and site-specifically before ($n = 216$) and after

($n = 205$) their visit (Kim et al., 2011). The researchers found that the thematic interpretive experiences offered at Lulworth coastal area (i.e., a visitor center, interpretive signage, personal interpretive experiences) resulted in significant increases in several site-specific positive attitudes and behaviors. Other studies have shown similar results. For example, surveys of over 2,000 participants in whale watching tours and other marine mammal experiences in the US, Australia, and New Zealand showed significantly stronger positive environmental attitudes related to the conservation of marine animals and environments as a result of the educative/interpretive experiences provided on these tours (Zeppel & Muloin, 2008). Participants on an eco-tourism experience in the Galapagos Islands ($n = 57$) showed similar increases in their positive attitudes towards participating in positive behaviors related to conserving the Galapagos and donating to conservation organizations (Powell & Ham, 2008).

Longer-term impacts of interpretive experiences are also possible. Ballantyne et al. (2010) showed that individuals ($n = 240$) surveyed about their participation in an interpretive wildlife tourism experience still vividly recalled the experience four months later, including the information and emotions that were tied to it. The emotional connections helped create a transformative experience for the participants, making the experience memorable and increasing the likelihood that the participants would act in environmentally conscious ways.

There are limits to the impacts that interpretive programs can have on environmental attitudes. A 2012 study on the effects of interpretive media and programming on perceptions of invasive species in the Cumberland Island National Seashore found that, although the interpretive products increased participants' ($n = 664$) support for different invasive management approaches, their overall attitudes were relatively unchanged (Sharp et al., 2012). The researchers believed that this could be due to the relatively short duration (five to seven minutes

for the talk) of the interpretive experience, and speculated that a longer, more intense experience may be necessary to influence participants' general attitudes. Additionally, since people typically attend interpretive programs of their own free will (e.g., ecotourists, park visitors), many are already interested in or concerned about a topic, and they may already have strong preexisting attitudes (Beaumont, 2001). As such, there may be a "ceiling effect," where participants' environmental attitudes are already past the point that a short-term, relatively low-intensity program would affect them (Beaumont, 2001). However, when participants come in with weaker preexisting attitudes, impacts may still be possible.

Studies of the effectiveness of environmental interpretation specifically on children have also been conducted. Powell et al. (2018) used the Elaboration Likelihood Model (ELM) to evaluate the influence of a Junior Ranger program at Great Smoky Mountains National Park on participant attitudes and behaviors. Using a pre- ($n = 164$) and post-survey ($n = 185$), the researchers measured Junior Ranger participants' environmental awareness, as well as positive environmental behaviors both in the park and at home. Analysis of the survey results showed statistically significant increases in all areas. The researchers attributed this to the ELM framework used to develop the program, which built knowledge and awareness to influence attitudes and behaviors.

In another study, Knapp and Poff (2001) interviewed twenty-four 4th-graders from southern Indiana about their experiences on a field trip to a U.S. Forest Service site immediately after the experience, and then again four months later. After four months, the researchers found that program participants remembered engaging, thematic activities, especially games, and the information associated with them. Information presented without an activity, on the other hand, was barely recollected and often misremembered, indicating that thematic activities were

connected to information retention. A retrospective study conducted by Farmer et al. (2007) showed similar trends. When 30 participants from a field trip to Great Smoky Mountains National Park were interviewed about their experience one year after the fact, all interviewees described thematic activities that they participated in, and the greatest areas of retained knowledge occurred within the context of those activities, supporting the idea that active participation helps facilitate meaningful interpretive experiences.

Several interpretive best practices were identified from the literature review and applied in the design of the program for this study. Chief among these is the TORE model of program development, which was used to guide the development of the program. Additionally, the program embraced novel experiences to further engage and provoke participants (Boeve-de Pauw et al., 2019; Liddicoat, 2013; Powell et al., 2023; Ruck, 2022). Finally, engaging thematic activities as described by Knapp and Poff (2001) and Farmer et al. (2007) were incorporated to increase the likelihood of lasting impacts resulting from the program.

Evaluation of Interpretive Programs

Even when using research-supported best practices for programming, it is impossible to determine the impact of a program without conducting a thorough evaluation. Although often overlooked, this step is important to determine whether a program has met its objectives, why it is effective (or not), and to find ways to improve it (Ham & Weiler, 2006; Pendergrast, 1998; Thomson et al., 2010).

Specific tools and methods are required for meaningful evaluations. Generally, these tools are either quantitative (i.e., surveys, questionnaires) or qualitative (e.g., observations, interviews). Quantitative tools are often utilized for summative or outcome evaluations to explore visitor experience or the impacts of a program due to their relatively high ease of use

(Ham & Weiler, 2005; Ham & Weiler, 2006; Knapp, 2007). However, they are only able to show what effect a program has had and do not explain *why* that effect was achieved (Ham & Weiler, 2006; Knapp, 2007; O’Leary, 2021).

On the other hand, qualitative techniques like interviews and focus groups allow researchers and evaluators to explore those areas (Ham & Weiler, 2006; Knapp, 2007; Pendergrast, 1998; Thomson et al., 2010). Because qualitative methods are built around words, the results they yield are often much more informative than those gathered using quantitative methods. However, this also means that they take more work to administer and analyze, and the interviewer may bring their personal biases into the interview, which can inform the results of the interview (Ham & Weiler, 2006; Knapp, 2007; Pendergrast, 1998). As such, it is important for one to understand exactly what they hope to measure before they choose an evaluation tool.

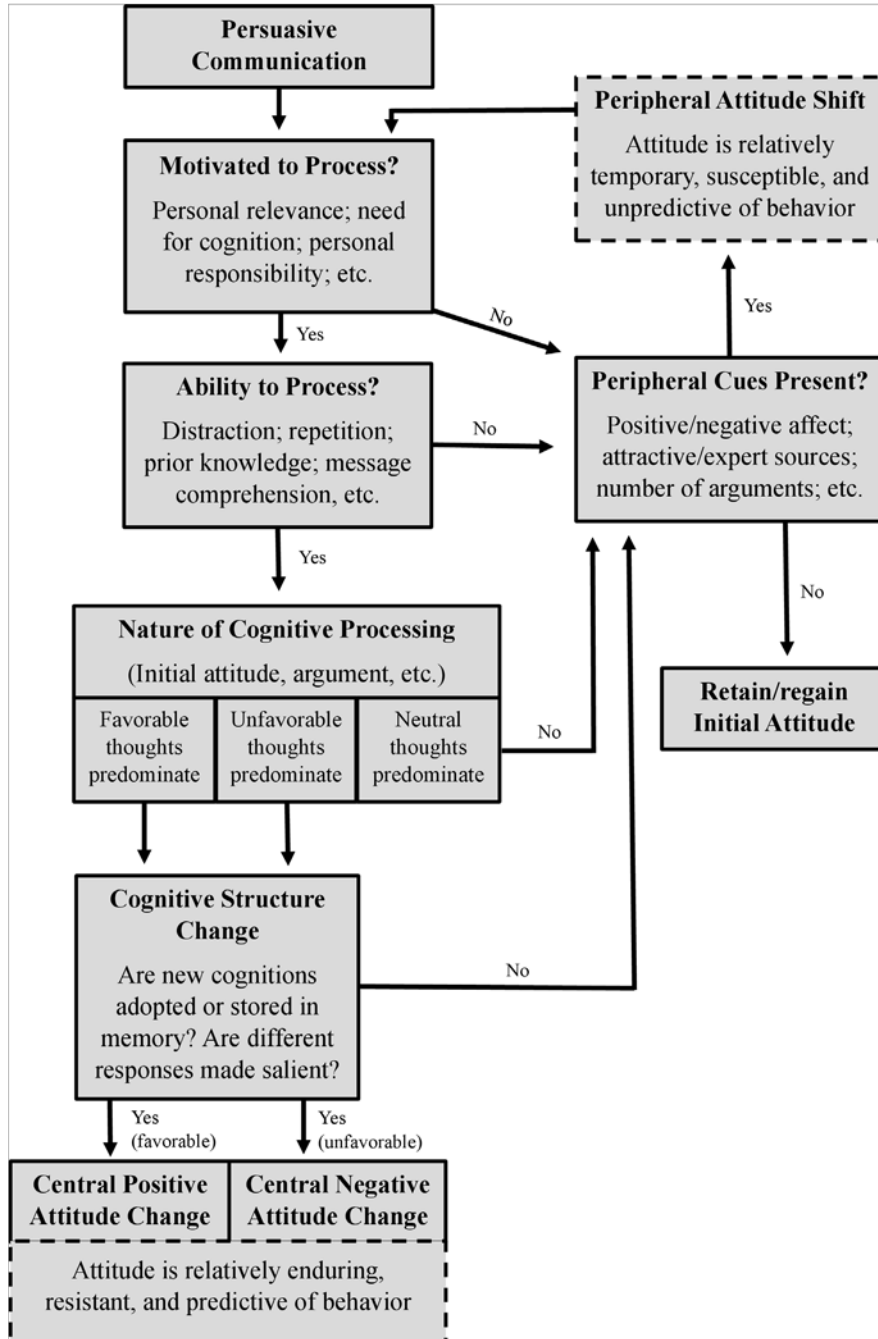
Theoretical Framework

To create lasting attitudes, it is crucial to understand the mechanisms by which they are created. For this thesis, the Elaboration Likelihood Model of persuasion (ELM) was used as a theoretical framework. The ELM suggests that changes in attitudes from persuasive communications (i.e., environmental education/interpretive programming) can happen via two routes: the central and peripheral routes (Figure 2; Petty & Cacioppo, 1986).

The central route to persuasion is the process by which individuals are affected by persuasive messaging and use prior knowledge and experiences to evaluate the message. To achieve this, the messaging must be strongly present and personally relevant, and the individual must have the ability and desire to think critically about it (i.e., elaborate). If these conditions are met, then the individual forms arguments for and against the message in their head. If there are more favorable arguments than unfavorable arguments, positive attitude changes will occur; if unfavorable

Figure 2

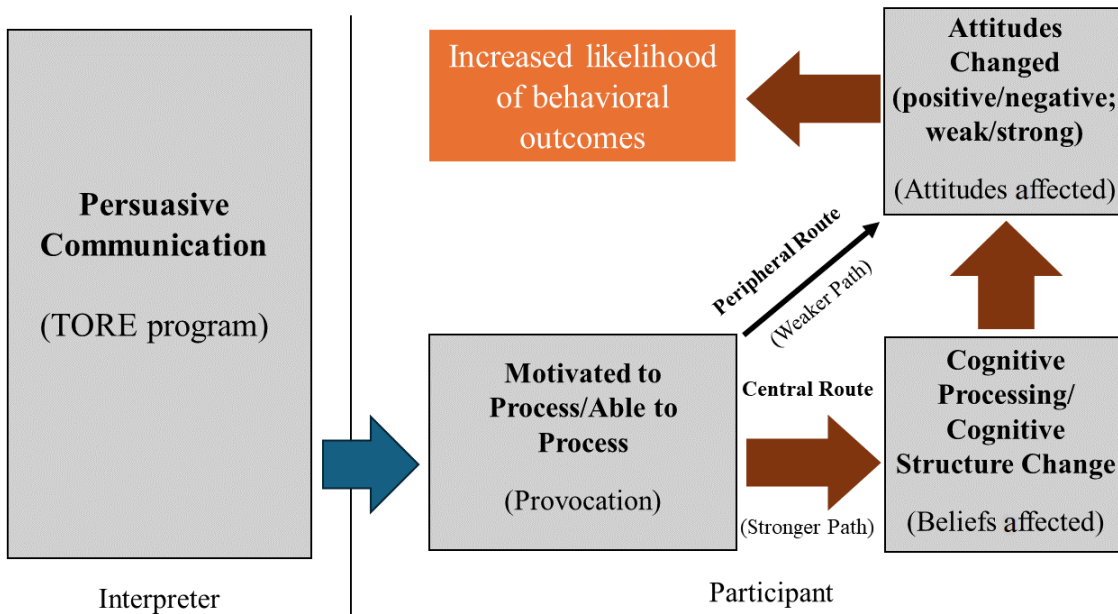
The Elaboration Likelihood Model of Persuasion (Petty & Cacioppo, 1986)



arguments outweigh favorable ones, the attitude changes will be negative. These attitude changes are generally strong, resistant to change, and predictive of behavior (Petty & Cacioppo, 1986). The more relevant and appealing a message is, the more likely it is to provoke elaboration and modify, reinforce, or create attitudes (Ham, 2009; Petty & Cacioppo, 1986).

If the messaging is weak, not relevant, or the individual lacks the desire or ability to elaborate, then attitudes may still be impacted via the peripheral route. This route relies not on the content of the message, but on peripheral cues. These cues include a variety of factors, such as the method of message delivery, the credibility of the presenter, the reactions of others, and other environmental cues. When present, these cues may alter attitudes; however, these attitudes will be generally temporary, susceptible to change, and unpredictable of behaviors (Petty & Cacioppo, 1986).

The process described in the ELM is closely matched by the TORE model for interpretive program development described earlier in the chapter (Ham, 2007; Ham, 2013). In fact, many of the elements identified in the TORE model directly correspond with aspects of the ELM (Figure 3). The TORE model identifies a strong route that modifies attitudes and behaviors through processing a program's theme and its relevance to the individual. This correlates well with the ELM's central route of persuasion by which a relevant message causes an individual to consider the message's implications and creates attitude change based on that elaboration. Additionally, in the absence of this stronger route, both models also identify a weaker peripheral route that can influence attitudes in a less permanent, less rigorous way. As such, the ELM framework and TORE model are highly compatible for program development.

Figure 3*Commonalities Between the ELM and TORE Model*

Note: Bolded text in the figure indicates elements from the ELM, and parentheses indicate associated elements from the TORE model.

Summary

Research on EE and interpretation shows that these kinds of programs can be an effective way to influence participants' environmental attitudes and inspire them to engage in more environmentally responsible behaviors. From this research, the best practices to increase the likelihood of creating a lasting impact include: applying structural components including a strong interpretive theme, clear transitions, and an inspiring conclusion; making content relevant to the participants; incorporating multisensory, hands-on activities; embracing novel experiences and

techniques; and engaging participants physically, intellectually, and emotionally with the content and environment. This study incorporated the identified best practices to create a day camp program that has the highest potential of impacting participants' environmental attitudes.

Chapter 3: Method

This chapter explains the method used in this study to develop, implement, and assess the impacts of thematic interpretive programming on children's environmental attitudes. To conduct this research, two sessions of a summer day camp program were hosted at Schmeeckle Reserve, a 280-acre field station of the University of Wisconsin-Stevens Point, in June and July 2023. The day camp program was designed for children entering 3rd through 6th grade and was developed using appropriate, research-based interpretive techniques to increase the potential impact of the programs. The impacts on participant attitudes were assessed using mixed quantitative and qualitative instruments.

Methodology

This study applied a descriptive correlational methodology with a question-driven approach to data collection, using surveys, interviews, and analytical memos to determine if any attitudinal changes occurred and what factors were correlated with these changes (Knapp, 2007; O'Leary, 2021). This approach was chosen since the two research questions for this study could best be answered using a variety of quantitative and qualitative data collection methods. The first question, "What are the self-reported effects of a thematic interpretive approach to programming on environmental attitudes in children attending a summer day camp program?" was best suited to a quantitative survey (the Children's Environmental Perceptions Scale), which was used to evaluate if any changes in attitudes were self-identified by the participants through pre- and post-testing. The second research question, "What elements of the program have the greatest perceived impact on participants' environmental attitudes?" was better suited to qualitative data collection. Participant interviews allowed for a better understanding of the mechanics behind any changes in attitudes from the program (Knapp, 2007; Pendergrast, 1998). The interviews allowed

participants to describe the most effective elements of the program in their own words, creating a more nuanced and encompassing picture of program impact. Additionally, a mixed-methods approach allowed for the collection of data from several viewpoints (e.g., children's perceptions, educator perceptions), helping to show if the results obtained through the survey are the result of the program instead of other outside factors (Ham & Weiler, 2006; O'Leary, 2021).

Program Design

For Objective 1, "Develop and deliver a thematic interpretive day camp program at Schmeckle Reserve for children entering 3rd through 6th grade in the Stevens Point area," the researcher and Schmeckle Reserve staff collaborated to create a summer day camp program using a thematic interpretive approach. The program had two sessions that ran concurrent with the Stevens Point Area school district's summer school – one session from June 12-22 and one from July 10-20, 2023. To ensure the program was meeting a community need, a call for community input was issued using various channels to increase its reach, including Schmeckle Reserve's Facebook and Instagram pages ($n = 5,419$), a direct email to Stevens Point Area School District parent-teacher organizations ($n = 10$), and a targeted email to Friends of Schmeckle Reserve members ($n = 412$). This served two purposes. First, although Swatek (2015) indicated that there was interest in summer programming for children, seven years had passed since that study, so the call for input was used to determine the level of community interest in the program. Second, collecting input from community members allowed the program to be designed to meet the needs of parents in the area and encourage attendance.

Twenty-eight individuals responded to the solicitations via email and Facebook Messenger to ask for information about the program. Nine of these individuals provided input on the program at two focus group meetings ($n = 7$) and through individual interviews ($n = 2$). From

their responses, it was determined that two, two-week, Monday through Thursday programs held in the afternoons after summer school would be best suited for this audience. During these meetings, participants indicated several desires for the program: 1) that the program have a strong exploratory, play-based, and/or student-led component, 2) that the program offer direct exposure to nature and learning in nature, and 3) that the program serve as a social setting for their children to interact with others their age. Based on this information, an interpretive approach to programming was deemed appropriate, as the non-formal structure of interpretive programs allowed for more exploratory, serendipitous learning and peer interaction while exploring the resource first-hand. Additionally, parent desires closely matched the descriptions of affective programming present in the literature, indicating that a program designed to meet these desires could also be effective at influencing attitudes.

The program itself was designed using an ELM framework and research-based best practices for interpretation to maximize the potential for attitudinal changes in the participants. Firstly, the program used the TORE model of interpretive program development for its primary structure (Ham, 2007; Ham, 2013). The focus on a central interpretive theme and relevant, organized, and enjoyable presentation to affect beliefs and attitudes is consistent with the ELM's focus on using strongly relevant messaging to alter participant attitudes, as described in the previous section (Ham, 2009; Petty & Cacioppo, 1986). Educators were also expected to be friendly role models for the participants to address the ELM's peripheral cues for affecting attitude change if the messaging is not relevant to a participant (Ham, 2013; Petty & Cacioppo, 1986).

In addition to relevant thematic messaging, the program purposely incorporated multisensory, engaging thematic activities with at least one major hands-on activity per day. Not

only were these techniques appropriate for the age range chosen for program participation, engaging thematic activities have been shown to increase retention of concepts and facilitation of meaningful interpretive experiences (Buchholz et al., 2015; Farmer et al., 2007; Knapp, 2007; Knapp & Poff, 2001; Liddicoat, 2013). Incorporating multisensory activities is also another technique to strengthen the likelihood of elaboration in participants and increase the long-term impacts from it by creating stronger personal relevance of the message and introducing additional peripheral cues (Petty & Cacioppo, 1986; Powell et al., 2018).

The day camp program was also designed to leverage creative, novel techniques to relate information to the participants. These include giving participants the opportunity to explore new environments through a combination of unstructured exploration and facilitated activities (Farmer et al., 2011; Laird et al., 2014; Powell et al., 2023), presenting information in unique and creative ways (Buchholz et al., 2015; Martin, 2012), and allowing for serendipitous encounters with animals (Ruck, 2022). Additional elements of interpretive and EE programs identified in research (e.g., Dickinson, 2013; Martin, 2012; Powell et al., 2023; Stern et al., 2014) were incorporated into the program as appropriate.

The eight-day program covered three habitats in Schmeekle Reserve (forests, grasslands, and wetlands) for two days each with the remaining days used for an introduction and conclusion to the program. Each day was developed around its own interpretive theme written using the guidelines for interpretive themes presented in Ham (2013) and Buchholz et al. (2015) with several subthemes to guide the development of activities and content (Appendix A). The final day of the program was not outlined; as this day was reserved for participant interviews, the content and activities presented on this day were not connected to the research to ensure that participants did not miss any crucial activities during the interviews. Instead, programming for

the final day was developed and planned based on the participant's interests, with participants telling the educators what topic they would like to focus on. From this information, the educators created individualized theme sheet outlines for the final day of each session. The outlines for the day camp series were reviewed by Schmeckle Reserve staff and the researchers to ensure that the interpretive program was of professional quality. In order for participants in both sessions of the day camp to have comparable experiences, each session used the same outlines with the exception of the final day. Slight modifications were made after the first session of the program based on participant feedback. No changes were made to the interpretive themes or program structure, but activities were occasionally modified to make them more engaging to keep the participants interested in the program.

Once the programs were created, the day camps were advertised to the public via social media, the Friends of Schmeckle Reserve website, emails to Friends of Schmeckle Reserve members, and through word of mouth. Registrations were taken using CampDoc, a camp management software used by the University of Wisconsin-Stevens Point. In total, 25 children ($n = 8$ for June, $n = 17$ for July) completed the program. Parents/guardians were asked to consent to allow their children to participate in the research; participation in the research was not a requirement to participate in the program itself. Twenty-two of the 25 children ($n = 6$ for June, $n = 16$ for July) participated fully in the research. Results were calculated for both sessions individually and for the combination of both sessions to increase effect size sensitivity (June effect size $r = .631$; July effect size $r = .378$; combined effect size $r = .322$).

Staff Training

The author served as the primary educator for the day camp programming. To help lead the programs and maintain university-mandated staff-participant ratios, an undergraduate student

from the College of Natural Resources was hired as an educator in summer 2023 to assist the student researcher in leading the day camp programs. To ensure that the undergraduate educator was knowledgeable about interpretation and prepared to help lead the program, training was provided in May and June 2023, which included an in-depth introduction to Schmeeckle Reserve, a brief introduction/review of thematic interpretation and environmental education, and a review of the summer day camp programming. The undergraduate educator also received copies of the outlines for the program to review and become familiar with the interpretive themes, content, and activities.

Assessing Participant Environmental Attitudes

Data for Objective 2, “Determine the self-reported effects of the program on participant environmental attitudes and identify which elements were perceived to be most impactful by participants,” were collected directly from program participants using a mix of quantitative and qualitative methods. To collect these data, the methods and materials for this study were reviewed and approved by the University of Wisconsin-Stevens Point Institutional Review Board on April 27, 2023. Upon registering their children for the camp, parents/guardians were requested to sign an informed consent form to allow their child to participate in the research; however, participation in the research was not a requirement to participate in the day camp. All but one parent/guardian of the program participants completed the informed consent form to allow their children to participate in the research ($n = 24$), and each child was asked to complete an additional minor assent form to participate in the research (Appendix B). The minor assent form was modified in July 2023 to remove the option for children who signed the assent form to opt out of being audio recorded due to the difficulty of capturing participant answers in sufficient

detail for analysis without audio recordings. As with the informed consent, minor assent to participate in the research was not a requirement to participate in the day camp activities.

Children's Environmental Perceptions Scale

Quantitative assessments of participant environmental attitudes were conducted at the beginning and end of the program using the Children's Environmental Perceptions Scale (CEPS; Appendix C), which has proven to be a reliable measure of environmental attitudes (pre-test $\alpha = 0.75$; post-test $\alpha = 0.80$; Larson et al., 2011). The CEPS was developed to assess perceptions of nature, specifically eco-affinity (interest in nature) and eco-awareness (attitudes towards nature), using sixteen statements scored on a five-point Likert scale (1 = strongly disagree/two thumbs down; 5 = strongly agree/two thumbs up). The CEPS was administered to all willing participants on the first day of the program, and then again on the final day of the program. Each statement on the scale was read twice, allowing 20-30 seconds for participants to record their response by circling the symbol on their sheet that best describes how they feel about the statement. After both sessions of the camp were over, the data collected from the CEPS tests were entered into Statistical Package for the Social Sciences (SPSS) software for analysis, and CEPS scores were calculated for pre- and post-program surveys for each session and with both sessions combined. Data from the surveys for each session and the combination of both sessions were compared using the Wilcoxon signed-ranks test to determine the significance (exact test $p \leq .05$) of any changes. The Wilcoxon signed-ranks test was chosen due to the non-normal distribution of the survey data. Scores for the eco-awareness and eco-affinity sub-dimensions were also calculated and analyzed the same way.

Participant Interviews

At the end of the program, participants were interviewed using semi-structured interviews to collect qualitative information on their perceptions on the effects of the program on their environmental attitudes. Questions were written to ask broadly about the participants' experience in the program, its impacts on their general and site-specific attitudes, and which elements of the program the children perceived positively and negatively (Appendix D). Several questions were modified from interview questions presented in Knapp (2007) to assess interpretive programming. All interview questions were reviewed by a committee of researchers, environmental educators, and interpreters to ensure that they were appropriate for the study and target audience.

The interviews provided qualitative data that were used to address both primary research questions. First, the interview data were compared to results from the CEPS to help verify the results as well as to identify if any changes in attitudes occurred (O'Leary, 2021). Second, participants' responses and recollections about their experiences were used to identify experiences and messages that had the greatest impact on their attitudes (Ham & Weiler, 2006; Knapp, 2007). Finally, by gathering richer information about the participants' experiences, the interview data were useful for identifying whether any attitudinal changes from the program were due to elaboration or peripheral cues, which may indicate whether an attitude will be held long-term or not (Ham, 2013; Petty & Cacioppo, 1986).

Participants were interviewed on the final day of the program. Interviews were conducted by both the author ($n = 7$) and another researcher ($n = 15$). All interviews used the same interview guide, and participants were asked follow-up and clarifying questions as necessary. Interviews were audio recorded for all consenting participants to aid in transcription and to

ensure that all ideas and comments were captured for analysis. All recordings were transcribed following the July session of the program.

Interview data were coded using open coding to identify common themes from the interviews. This was done using a three-step coding process similar to the ones employed in Farmer et al. (2007) and Knapp and Poff (2001). In the first stage, full transcriptions of the interviews were coded using NVivo software to identify individual words or phrases that related to the research questions. Secondly, similar codes were collected into groups to identify common themes across the interviews. These groups were compared to interview transcripts to check for validity. Finally, the themes identified in step two were compared to each other to identify broader themes across the interviews. The results from this step were verified by comparing them to interview transcripts and by performing intercoder reliability checks (O’Leary, 2021). Additionally, intercoder reliability checks were used to verify the codes (O’Leary, 2021). The author and an additional researcher independently coded an interview and compared the codes used to determine if there were any major discrepancies. Both coders arrived at the same base codes, so the codes were considered valid.

Educator Memos

Throughout the program, the educators wrote daily analytical memos to capture their thoughts about the program, including effective techniques, participant responses to the interpretive themes, activities, and content, and connections to the theoretical framework (O’Leary, 2021). Memos were based on observations of the children, especially visual cues such as facial expressions, nodding heads, and attentiveness (Buchholz et al., 2015) and auditory cues of engagement, such as participant answers to questions or verbal observations. Additionally, these memos captured the educators’ perceptions of participant-educator and participant-

participant interactions. These interactions and overt physical responses can be telling of how a participant is reacting to and thinking about relevant messaging and content as they are generally unconscious and organic; these reactions and thoughts often inform the extent and impact of elaboration, with more thought-provoking and engaging experiences creating higher elaboration likelihood (Ham & Weiler, 2005; Petty & Cacioppo, 1983; Petty & Cacioppo, 1986). Additional notes and observations (e.g., behavioral issues, potential modifications to increase engagement, notes about potential barriers to elaboration) were recorded as appropriate.

The memos were used in conjunction with the interview data to identify potential techniques and best practices that increased engagement and potential elaboration. Memos were coded using the same process used for the interviews to identify themes noted by the educators. Additional notes relating to participant involvement (i.e., cues of interest/elaboration) and techniques and/or messaging that resulted in engagement or disengagement were used to identify potentially effective techniques and moments that create higher elaboration likelihood. These data were compared to information on participants' perceptions of changes identified through interviews to assess validity (O'Leary, 2021).

Summary

To answer the research questions posed in this thesis, two sessions of an interpretive day camp were developed, implemented, and assessed. Programs were developed based on input from the community and incorporated research-based best practices for interpretation (e.g., TORE model approach, hands-on activities, novel experiences). Impacts of the program on participant environmental attitudes were assessed using multiple methods, including a pre- and post-test survey (CEPS), individual interviews, and educator memos, to determine the overall effects of the program and which elements were perceived to be most impactful.

Chapter 4: Results

The purpose of this study was to determine the effects of a thematic interpretive day camp program on participant environmental attitudes and to identify effective techniques for influencing attitudes. This chapter reports the results from this study as they relate to each research question.

Research Question 1

To answer the first research question (“What are the self-reported effects of a thematic interpretive approach to programming on environmental attitudes in children attending a summer day camp program?”), a combination of the CEPS survey and interview results were used. This allowed for both statistical analysis as well as qualitative data to be used to determine the program’s effects on participant attitudes.

Mean scores for the pre- and post-test CEPS surveys were calculated for each session individually, and a combined score for both sessions was also calculated. Means were compared using a non-parametric test (Wilcoxon signed-ranks test) due to the non-normal distribution of the data. Pre-test scores were quite high, with means greater than four out of five (Table 1; Figure 4). Post-test CEPS scores were slightly higher than the pre-test scores (Table 1; Figure 4). While post-test scores were higher for both sessions and the combined sessions, only the combined sessions showed a significant change ($z = -2.138$, $p = .031$) with a moderate effect size ($r = .46$). Scores for the eco-affinity (interest in nature) and eco-awareness (concern for nature) subdomains were similar, with post-test means being higher than pre-test means in most situations. The only exception was eco-awareness for the July session, which saw a decrease of .0134 from 4.4241 to 4.4107. Despite this, the differences between means were nonsignificant in most cases ($p > .05$). Significant increases for the subdomains were found for the eco-affinity

subdomain for the July session ($z = -2.424$, $p = .012$) and the combined sessions ($z = -2.640$, $p = .005$), both with large effect sizes ($r = .61$ and $r = .56$, respectively). All scales were significantly correlated (Table 2; $p < .01$)

Table 1

Mean CEPS Scores and p-values for Each Session and Analysis Grouping

	June ($n = 6$)	July ($n = 16$)	Combined ($n = 22$)
Overall M (pre)	4.1979	4.2324	4.2228
SD (pre)	0.69419	0.67063	0.66048
Overall M (post)	4.3958	4.3478	4.3609
SD (post)	0.65032	0.82574	0.76694
p-value	0.188	0.139	.031*
Eco-affinity M (pre)	3.9792	4.0402	4.0235
SD (pre)	1.06483	0.88014	0.90777
Eco-affinity M (post)	4.0833	4.2879	4.2321
SD (post)	1.15289	0.98113	1.00636
p-value	0.5	.012*	.005*
Eco-awareness M (pre)	4.4167	4.4241	4.4221
SD (pre)	0.59512	0.55812	0.55393
Eco-awareness M (post)	4.7083	4.4107	4.4919
SD (post)	0.40825	0.73947	0.66983
p-value	0.188	0.861	0.281

Note: Pre-test scores for both sessions and all dimensions were already quite high. Significant differences ($p < .05$) from Wilcoxon signed-ranks test are indicated with an asterisk (*).

Figure 4

Graphical Comparison of Pre- and Post-test Means from CEPS Analysis for Each Session and Analysis Grouping

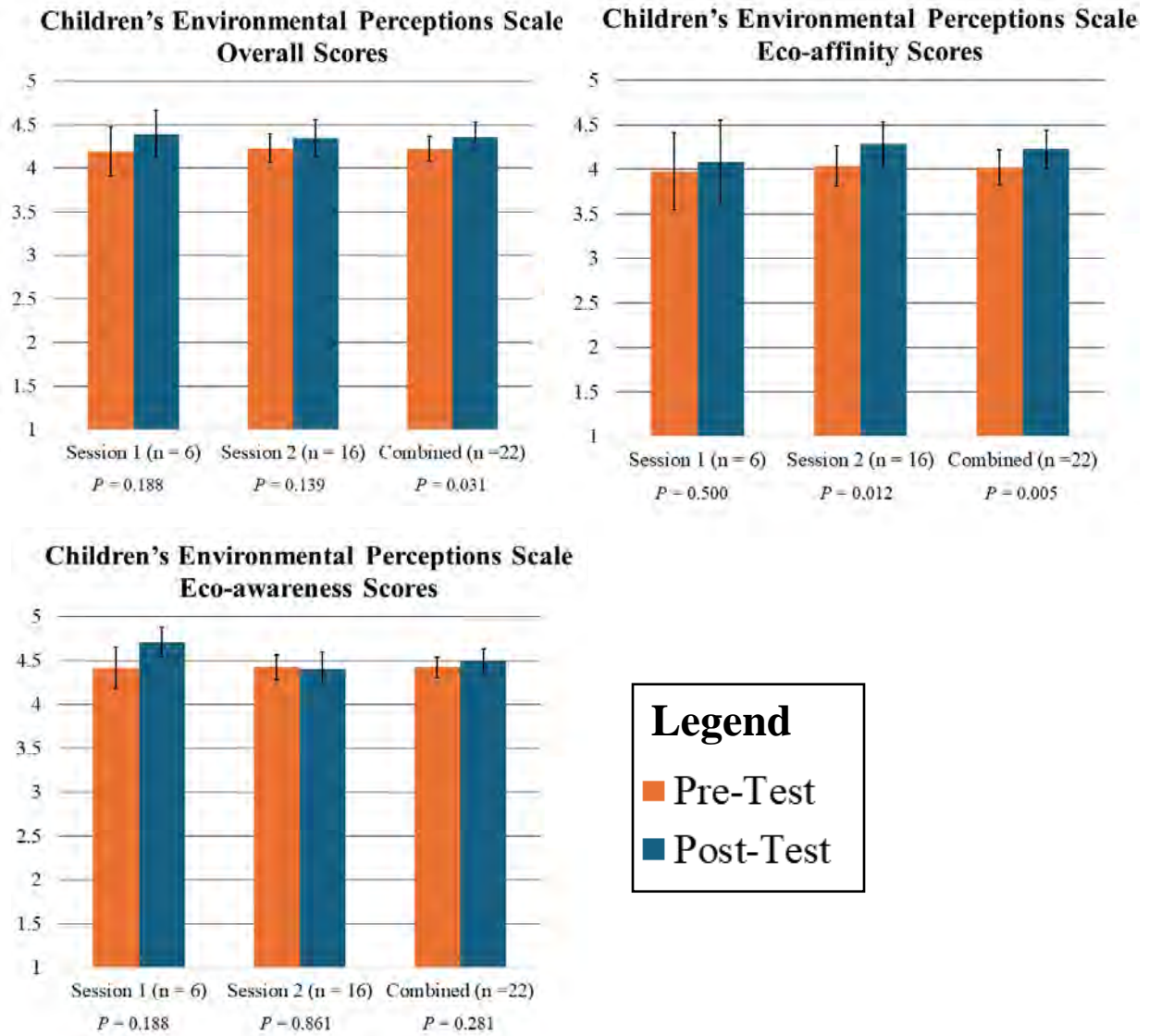


Table 2*Correlations Between CEPS Scales*

Scales	<i>M</i>	<i>SD</i>	1	1a	1b	2	2a	2b	3	3a	3b
1. Overall CEPS	4.2919	.69925	—								
1a. Pre-test	4.2228	.66048	.976	—							
1b. Post-test	4.3609	.76694	.983	.919	—						
2. Eco-affinity	4.1278	.94293	.950	.913	.945	—					
2a. Pre-test	4.0235	.90777	.948	.943	.916	.984	—				
2b. Post-test	4.2321	1.00636	.925	.861	.945	.987	.941	—			
3. Eco-awareness	4.4570	.58368	.862	.865	.828	.661	.682	.623	—		
3a. Pre-test	4.4221	.55393	.775	.839	.691	.566	.611	.510	.944	—	
3b. Post-test	4.4919	.66983	.862	.813	.871	.683	.684	.663	.962	.818	—

Note: Means were calculated using results from all completed CEPS surveys ($n = 22$). All correlations are significant ($p < .01$).

During the interviews, the participants were asked directly how they felt about nature after the program to get a richer understanding of their perspectives. Most participants across both sessions reported that their feelings towards nature did not change during the program. However, many did indicate that they already had strong positive feelings about nature before participating in the program, telling the interviewer that nature was relaxing and calming.

While overall attitudes appeared to be the same for most participants, several did mention having more positive feelings towards certain aspects of the natural world than they did at the beginning of the program. As one participant told the interviewer: “I liked nature before, and I still like it after. But I like spiders a little bit better. I like Daddy-long-legs a bit better. I like snakes even better, even though I already loved snakes.”

Additionally, about one-third of the children participating in the July session mentioned feeling that nature needs to be protected and respected more after participating in the program. During the interviews, these children made comments like, “I feel like we’re hurting plants and animals too much. We’ve been building, like, parking lots and buildings and houses where nature – where all, like, animals and nature used to live and I feel really bad for nature,” “Nature’s really cool and you sometimes really need nature. Also, not – there’s always buildings where there used to be nature,” and “I like [nature] more... And the reason I like it more is because, like, I know more that we need it. I didn’t know we needed everything in nature.” Interestingly, several of these participants told the interviewer that their overall feelings about nature did not change despite these strengthened attitudes about protecting nature. Likewise, the results from the CEPS survey showed no meaningful increase in eco-awareness for these participants.

When asked about their feelings about the site (Schmeeckle Reserve), many participants told interviewers that they felt more positively about it, saying that they found it more interesting or more fun after the day camp. Prior to the program, most participants visited Schmeeckle once a month or less ($n = 14$) and were relatively unfamiliar with the history of the site or its habitats. During the interview at the end of the camp, participants mentioned specific aspects of the site like abandoned farm equipment along the trail, the variety of habitats present in the Reserve, and that there was more to Schmeeckle than they originally thought. Participants also frequently mentioned that they perceived a “message” in the Reserve throughout the program, with one participant telling the interviewer:

I feel like I have a different personality on it and I think I like it a little better actually. I think for a while I thought it was a forest that you could bike, walk, and visit... but then I

realized it's not just that. It's kind of a message that you should respect animals and nature and that kind of stuff. I knew there was a message that, you know, it's a forest, and, you know, all that. I knew there was a real message, but that's kind of a big message.

Research Question 2

For the second research question (“What elements of the program have the greatest perceived impact on participants’ environmental attitudes?”), interview data and educator memos were used to determine effective techniques. From the interviews and memos, four common themes related to participant engagement and elaboration, as well as several elements that hindered participant enjoyment and likely elaboration, were identified (Table 2).

Table 3

Codes, Subthemes, and Themes From Participant Interviews and Educator Memos

Themes	Subthemes	Codes
Hands-on experiences (23)		Canoeing Catching insects Pond dipping Tree measuring
Exploration (15)		Off-trail New places New experiences
Closer look (15)		Microscopes Grasses (diversity) Flipping logs Insects Galls
Animals (22)		Snakes Frogs Toads Deer Birds Aquatic macroinvertebrates Insects
Barriers to elaboration	Physical barriers (15)	Heat Rain (negative)

Themes	Subthemes	Codes
Barriers to elaboration	Physical barriers (15)	Insects (negative) Walking (negative) Tired
	Mental barriers (9)	Distractions from peers Boring Frustration
Environmental attitudes	Attitudes unchanged (17)	Same feelings as before Like nature
	Attitudes increased (9)	Like more (specific animals) Protect nature Respect nature
Site-specific attitudes	Attitudes unchanged (9)	Schmeeckle "okay" Schmeeckle the same
	Attitudes increased (13)	Schmeeckle more fun Schmeeckle more interesting Like Schmeeckle more Know Schmeeckle better

Note: Interview data were coded using a three-step coding process. Full interview transcriptions were coded using NVivo software to identify individual words or phrases that related to the research questions. Similar codes were then collected into groups to identify common themes across the interviews (“subthemes” in the table above). Finally, the themes identified in Step 2 were compared to each other to identify broader themes across the interviews. The themes above are reported by number of mentions in the interviews and memos, as well as by the length and detail of the descriptions provided by the participants.

The most prevalent theme from the interviews was “hands-on experiences.” Almost every child ($n = 21$) discussed at least one hands-on activity in detail during the interviews (i.e., more than three sentences about an activity), indicating that these experiences were highly memorable for the children. Experiences and activities that engaged the entire child physically and mentally, such as canoeing ($n = 18$), catching insects ($n = 14$), and collecting macroinvertebrates from a pond ($n = 13$), were the most mentioned in both the interviews and the staff memos. When describing these hands-on experiences, children provided comments like, “[I liked] that those

were more hands-on, like we got to catch things and look at the things we caught,” “The canoeing was fun because we could do more than I thought we could,” and “I liked it because we did a lot of extra activities that I don’t usually do. Like, we never come here and catch bugs. We’ve never canoed here.” Another trend in the interviews was that information presented with hands-on activities (e.g., using hand gestures to describe the leaflet pattern of poison ivy) was recalled in greater detail than information presented without an engaging activity or experience (e.g., naturalist-presented information about wetland plants).

A second common theme was “exploration.” Many children ($n = 13$) in the program enjoyed getting to go off-trail and explore Schmeckle Reserve with little direction from the educators. Participants described these experiences in-depth during the interviews: “I really liked going off the trails. We looked at plants and trees one day. One of the times we were finding big stumps that day,” “Well, I enjoyed how... once they set boundaries, they didn’t really tell us that, like – they set a couple rules, but we could basically – we could just explore wherever,” and “I went on like two new trails actually... [I liked the program] because I get to explore new trails or new things like Lake Joanis. I’d never been to Lake Joanis.” Getting to explore the site in an unstructured way was new to most of the participants, and they reported that getting to go exploring off-trail, an activity usually discouraged for visitors, made them feel special, with one child telling the interviewer, “You never catch bugs. You never go off-trail. You never go kayaking... because you’re a visitor, you can’t go in that stuff.”

Participants ($n = 14$) also reported enjoying to opportunity to take a “closer look” at the natural world during the program and , as one participant put it, “... [look] at little things that I didn’t know are hidden there.” The experiences discussed under this theme generally related to examining the organisms that live in the Reserve more closely, including activities like flipping

logs to look for invertebrates. As with the subthemes found under the “exploration” theme, these “closer look” experiences were new for many of the children. Although most reported visiting Schmeeckle Reserve at least once in the past year, they also reported that these visits were primarily recreational and that they did not spend a great deal of time closely observing their surroundings. After the program, however, several children mentioned intentions to slow down and look more closely at the natural world around them in future visits, with one participant telling the interviewer, “We looked at each thing closely. I guess I didn’t do that much. [I will be] paying more attention to nature, probably. I will see things I didn’t see before.”

The fourth common theme identified, “animals,” focused on the participants’ interactions with and perceptions of animals throughout the program. During the program, participants had the opportunity to engage with snakes, deer, insects, birds, frogs, and other wildlife in an unplanned, serendipitous manner, and many participants ($n = 20$) mentioned enjoying these encounters in the interviews. However, despite the number of times animals were mentioned, the children did not often describe the encounters in much detail (i.e., spent less than three sentences describing an encounter). More novel encounters seemed to be remembered most. As one participant told the interviewers, “I was really excited when we found our first snake, because I actually never seen [sic] a snake here. And it was a garter snake, and I got to hold it.”

Participants also identified several memorable but negative experiences. The most mentioned negative factor was the heat. During the June session especially, participants talked about the overwhelming heat (temperatures were in the mid to high 80s [°F] with relative humidity over 60% for most of the program) and how it prevented them from focusing on almost anything else. Another negative aspect was the presence of biting insects like mosquitoes and horseflies. The first session again saw more complaints about these distractions. One item that

participants in both sessions mentioned equally was a feeling of tiredness both from the amount of physical exertion in the camp (e.g., walking to locations around the Reserve, strenuous activities like canoeing) as well as from participating in other activities earlier in the day (e.g., summer school, sports camps, other day camps). The participants also mentioned negative aspects such as distractions from other program participants (e.g., talking over the educators, teasing) and inclement weather like rain as parts of the program that they disliked and that limited their ability to pay attention. Although every interviewee mentioned at least one of these negative aspects when prompted, they provided much less detail than they did for the positive themes mentioned previously.

When asked if they noticed any main ideas during the program (i.e., if they could recall the interpretive themes from the days), most participants stated that they did not find any main ideas other than exploring the natural world. Occasionally, participants would discuss the topics and/or activities from each day, but they were overall unable to identify the interpretive themes from the program. In the July session, participants mentioned the prairie and oak savanna days more often than other topics. Educator memos for the second session mention that the interpretive themes on these days were emphasized more than on other days, indicating that this added emphasis may have increased participant recall of thematic information.

Summary

Overall, participant CEPS scores showed slight increases between the pre- and post-program surveys, with significant differences in overall scores and eco-affinity for the combination of both sessions and eco-affinity for the July session. Results from the interviews indicate that most participants reported feeling the same about nature after the program as they did before, with some exceptions relating to specific aspects of the natural world or feelings that

nature should be protected. Connection to the site appeared to increase for many participants, with the site seeming more interesting and fun after the program. Effective techniques for engaging participants and provoking elaboration seemed to be providing “hands-on experiences,” opportunities for unstructured “exploration” of the environment, taking a “closer look” at the natural environment, and interacting with “animals” in serendipitous ways. Negative aspects of the program were primarily related to physical challenges such as heat, biting insects, tiredness, and inclement weather, or social aspects like distraction from peers.

Chapter 5: Discussion

The goals of this study were to assess the impacts of a thematic interpretive approach to nature-based programming on children's environmental attitudes and to identify effective techniques for influencing these attitudes. Chapter 4 presents the results of the research, and this chapter interprets the data to draw conclusions. Additionally, this chapter discusses limitations of the current study and potential avenues for future research.

Research Question 1

The goal of this study was to examine the self-reported effects of a thematic interpretive approach to day camp programming on the environmental attitudes of the children attending the program. These effects were assessed using pre- and post-test surveys (CEPS) and participant interviews. Scores for the overall CEPS and its subdomains appeared to increase between the pre- and post-tests for each session, except for eco-awareness for the July session which decreased slightly. However, the only significant increases were for the overall CEPS scores for the combination of both sessions, and for eco-affinity for the July session and the combined scores of both sessions. From these results, it appears that the program did have an impact on the environmental attitudes of program participants. Although neither of the sessions on their own showed significant changes in overall CEPS scores, this could potentially be due to the small sample sizes of the individual sessions which may have limited the ability to detect significance. For example, with only six children from the June session participating in the research, the chances of detecting a significant change from the survey data, even if one is present, was quite low.

Additionally, the CEPS showed that most participants came into the program with high pre-existing environmental attitudes. This correlates well with the staff observations of

participants and the results from the interviews; most participants were very interested in nature at the start of the program and quite a few came in with high reported and observed levels of knowledge about nature and/or the site itself. These preexisting attitudes likely limited the potential for increasing participant attitudes through the day camp programs. Although the day camps were planned using best practices related to creating attitudinal changes, these methods are only so effective when participants are already environmentally conscious individuals (Beaumont, 2001; Bruni et al., 2018). This “ceiling effect” is a potential reason that some of the scores did not display significant changes (Beaumont, 2001). This could explain why measures like eco-awareness, which had the highest pre-test means (> 4.4 out of 5) for all sessions, did not increase as much between the pre- and post-tests as the other scores for session 2 and the combined sessions which both started with slightly lower means. The significant increase in eco-affinity for the July session seems to indicate that the children in that session increased their interest in nature between the pre- and post-test. This is corroborated by interview responses from several children in that session describing an increased interest in and appreciation for some aspects of nature (e.g., the diversity of animals in Schmeckle Reserve, an increased awareness of plants).

From the interviews, it did not appear that there were many strong effects on the participants’ environmental attitudes. Generally, the children reported that they were already highly interested in nature before entering the program, corroborating the high pre-test CEPS scores, and most told the interviewer that their feelings toward nature had stayed the same. However, this does not seem to be represented in the data from the CEPS surveys, which showed a significant increase in post-test means when the scores for all participants were analyzed. This discrepancy could be a result of the wording of the questions from the different measures. The

CEPS survey asked specific questions relating to different aspects of environmental attitudes, while the interviews only asked the broad question, “How do you feel about nature in general after the program?” Because of these different scales, it is possible that children may have felt more strongly about the items on the CEPS but did not attribute these feelings to an increase in their overall environmental attitudes during the interviews.

While most participants may not have expressed a notable change in their attitudes, several children in the July session mentioned that they felt there was a stronger need to protect and respect nature after the program. As both sessions of the day camp were delivered in the same way using the same outlines, this is an interesting finding. All participants who mentioned these feelings of concern came into the program with high environmental attitudes (≥ 4 out of 5 for CEPS overall and eco-awareness scores), indicating that they already cared deeply about the natural world before the program, and their individual eco-awareness scores did not increase meaningfully. It is a possibility that the educators put more emphasis on the idea that nature needs to be protected in this session compared to the first session. However, the interpretive themes and content for the program remained unchanged between sessions, and the educator memos do not mention reinforcing the need to respect and protect nature.

Another possibility is that participant answers during the interviews were influenced by the CEPS survey. Three of the last seven items on the CEPS refer directly to human impacts on nature (“We need to take better care of plants and animals,” “It makes me sad to see homes built where plants and animals used to be,” and “Nature is easily harmed or hurt by people.”), which may have cued participants to mention feelings of concern about the natural world and our impacts on it when asked about their feelings about nature. However, the children gave a more nuanced picture than merely stating that we were hurting nature. Multiple children expressed

concern for the natural world, then mentioned how humans did things to help nature like planting trees, removing invasive species, and participating in other respectful acts towards the natural world. Many of these actions were discussed or demonstrated during the program (e.g., showing children invasive species like reed canary grass and *Phragmites* and discussing their impacts on natural areas, taking the participants to multiple restored sites including a young forest planting and grasslands in the process of being restored), which may have increased their salience for the participants as potential ways to help the natural world and influenced participants responses to the interview question. This suggests that even if the CEPS cued them to think about human impacts, they were synthesizing information about the impacts, both positive and negative, of people on the environment. Additionally, no other answers during the interviews seemed to be affected by the CEPS questions. This could be due to the less direct correlation between other items on the CEPS and the interview questions, but this lack of influence from the CEPS on other responses indicates that the role of the CEPS as a cue was likely negligible.

Although the participants did not report a major difference in their overall feelings towards nature, their feelings of connection towards the site did appear to increase based on their responses during the interviews. Changes in feeling towards the site appeared to be greatest for children who were less familiar with the Reserve and visited the Reserve no more than once per month, usually for recreational activities like biking or hiking. These results are likely due to the greater novelty for the children who were less familiar with the Reserve. Moderate levels of novelty have been correlated with the greatest impacts on participants (Boeve-de Pauw et al., 2019). By having some unfamiliarity, the site retained the participants' interest and offered surprises like the abandoned farm equipment. Novelty was generally lower for the participants who said their feelings towards the site were unchanged. Many of these children visited the

Reserve multiple times per month, and as such were familiar with many of the environments that they explored during the program. This limited the potential for increasing their site-specific attitudes due to their strong familiarity with the site and the reduced sense of novelty (Boeve-de Pauw et al., 2019).

The greater influence of this program on its participants' site-specific attitudes than their general ones is not unexpected. As mentioned previously, although most children entered the program with high preexisting environmental attitudes, few had explored the site as intimately as they did during these programs; as such, there seemed to be a greater potential to connect them to the site compared to the potential to increase their general environmental attitudes. Additionally, considerable research indicates that it is often easier to affect people's site-specific attitudes through interpretive programming than it is to influence their general attitudes (Kim et al., 2011; Powell & Ham, 2008; Sharp et al., 2012). The relatively short and informal nature of EE/interpretation programs like this camp makes them less conducive to creating a major change in participants' general or long-term attitudes, but they can still be effective at increasing site-specific attitudes by providing novel and unique perspectives on and experiences with the site (Kim et al., 2011; Sharp et al., 2012).

Research Question 2

The second goal of this study was to determine what interpretive techniques used in the day camp program had the greatest effect on the participants' environmental attitudes. These "effective techniques" were determined to be the ones that seemed to provoke the most elaboration in the children, which were identified by analyzing what the children talked about during the interviews most frequently and with the greatest amount of detail. This approach was based on the assumption that the things the children remembered best were those that had

engaged and related to them most, making the experiences more likely to be processed and have a lasting impact on the participants (Farmer et al., 2007; Knapp & Poff, 2001; Liddicoat, 2013; Petty & Cacioppo, 1986). Using these criteria, the four main themes emerged from the interview data as drivers for engagement and elaboration (Table 2).

Effective Interpretive Techniques

The most effective technique for engaging participants appeared to be participation in “hands-on experiences” during the day camp programs, with every child discussing at least one hands-on activity in detail during the interviews. This strong preference for hands-on learning is well-represented in the literature (e.g., Buchholz et al., 2015; Farmer et al., 2007; Ham, 2013; Knapp, 2007; Knapp & Poff, 2001; Liddicoat, 2013; Martin, 2012; Powell et al., 2023; Stern et al., 2014), so much so that the programs were purposely designed to incorporate this technique. Much of the research on hands-on activities describes how they can help increase the impact of the activities and the long-term retention of concepts (Farmer et al., 2007; Knapp & Poff, 2001), something that appeared to happen in these day camps as well. In the interviews, children provided a wealth of detail about the hands-on activities that they participated in, usually with little prompting. This indicates that these activities not only engaged the children in the moment, but also resulted in the creation of short-term episodic memories, which may lead to longer-term memories being formed (Farmer et al., 2007; Knapp & Poff, 2001; Liddicoat, 2013). If these long-term memories are created, then the hands-on experiences that the children participated in could result in a stronger, more lasting impact on participants’ attitudes and behaviors even years after the initial program (Knapp, 2007; Liddicoat, 2013).

The second theme of “exploration” was also well represented across the participant interviews. This theme is well represented in literature on childhood nature experiences.

Researchers have correlated childhood unstructured free time in nature with stronger positive environmental attitudes and behavioral intentions into adulthood (Farmer et al., 2011; Laird et al., 2014), indicating that these experiences can be quite impactful. However, there is much less written on how these types of unstructured nature experiences fit into more traditional EE and interpretation programs, especially those for older children and adults. From the interviews, there did not appear to be any differences in the enjoyment and impacts of unstructured exploration between the different ages of children; regardless of age (children in the program were ages 7 through 11), there was an aspect of these unstructured explorations that created a positive memorable experience. As such, it appears that incorporating unstructured time for children to explore the environment can be an ideal activity to include in nature-based EE/interpretation experiences to facilitate a more meaningful and impactful experience.

Closely related to the “exploration” theme is the third theme: getting a “closer look” at nature. Both themes revolve around the children having new experiences in nature, and they often feed into each other to reinforce the impacts of these experiences. However, even when there were no elements of exploration attached, the participants in the day camp program recalled examining the natural world more closely. For example, one day of the program had an activity in which children could catch insects in a prairie, then look at them using digital microscopes to observe them up close. The children were enthralled by this activity, and many mentioned getting to use the microscopes to look at insects up close during the interviews, with one sharing, “I guess with all the stuff we did, nature got, like, cooler because of all the new stuff that we got to see, like I didn’t know that some bugs had hair on their stomachs.” Similarly, being able to net frogs and macroinvertebrates in the pond and see them up close was another memorable experience, with many participants describing the creatures that they caught (some

examples from the interviews were water scorpions, snails, water beetles, and green frogs) and a sense of awe that, "...if you dip a net in there, there's a lot of other stuff to see."

Experiences that involved animals were generally quite memorable, indicating that there is likely at least some intersectionality between the "closer look" and "animals" themes.

However, some participants focused more on other aspects of the natural world, like one child who told the interviewer, "[I didn't know] that there was not just one kind of, like, grass, which was just grass. I didn't know that those things were grasses. ...I never knew that there was [sic.] the many different kinds of grasses" in reference to the plants that they examined while exploring the prairie and oak savanna. Getting a closer look at historical objects, like abandoned farming equipment left in the Reserve, also engaged participants with the site in a meaningful way. In fact, these "closer look" experiences seemed to be closely related to some of the changes in site-specific attitudes, as elements like the farm equipment were referenced by several participants during the interviews as reasons that the site was more interesting. Still, most experiences related to the "closer look" theme were related to animal encounters like flipping logs, pond dipping, and insect collecting.

Additionally, the experiences did not need to last a long time to be memorable. On the first day of the June session, the educators showed the participants a maple leaf with red insect galls on it. This interpretive experience lasted about a minute and was not discussed again throughout the rest of the program. However, during the interviews on the last day of the program, eleven days later, four of the six participants described this experience as memorable. They could generally not remember the term "galls," but they could describe the "leaf with red dots" and about half told the interviewer that they were caused by insects, information given by

the naturalist in that moment. The serendipity combined with the “closer look” aspect of the experience seemed to make the leaf more memorable than was anticipated.

The idea of getting a “closer look” at nature as being an impactful experience is also consistent with research like Ruck’s (2022) work in the UK on school programming about insects, indicating that these experiences can be quite effective when used in programs, especially when they are highly novel or are connected to another area of interest such as animals. As mentioned previously, many children do not generally examine the natural world very closely in their everyday lives, which makes the times that they do rather novel and impactful (Powell et al., 2023; Ruck, 2022). The type of examination also seemed to make a difference, as encounters with animals seemed to be more memorable than experiences that focused more on plants. For example, many children mentioned looking for and catching insects in the prairie. However, only a few talked about looking at the diversity of prairie plants, which was another activity from the same day. This dichotomy seems to be related to the novelty of the experiences, with encounters with animals seeming to be perceived as more unique, interesting, and generative of awe than looking more closely at static plants (Powell et al., 2023; Ruck, 2022). However, this is just a general statement; certain experiences related to plants such as finding large stumps or examining leaf galls appeared to be as impactful as animal encounters, potentially due to their increased novelty (i.e., many children had never heard of galls before and were fascinated by the idea that insects were living in the leaves).

The allure of “animals” is another well-documented aspect of EE and interpretation programs (Ballantyne et al., 2010; Cincera et al., 2015; Ruck, 2022). Often these wildlife experiences can help draw in and engage participants, and this program was no different. Across the interviews for both sessions, the participants told interviewers about the various animal

encounters that they had during the program, such as touching and holding snakes, seeing deer, catching frogs and toads, interacting with the insects and arachnids they found in the prairie and pond, watching birds, and seeing a mink in the woods. These encounters were largely unplanned and serendipitous; in some cases, the educators facilitated these experiences by planning activities like pond dipping or sweep netting for insects, but the majority happened by random chance while out on the trails or exploring off-trail. The novelty of the encounters seemed to increase their effect, with children remembering unique experiences like seeing their first snake at the site ever, holding or touching a snake for the first time, or getting “peed on” by a toad. This is consistent with current research. Research on affective experiences with animals generally agree that more novel experiences have more impact (Ballantyne et al., 2010; Ruck, 2022), indicating that serendipitous encounters have a place as an effective means of provoking participants, even without being part of the “planned” activities for a program.

Comparing these four themes to current literature, an interesting commonality emerges. All four themes fall under the definitions of “novelty” currently present in the literature. In this study, novelty was defined as new, unusual, or unique environments, experiences, or methods, a broad definition that encompasses a variety of different techniques but is consistent with the various definitions in the research (Boeve-de Pauw et al., 2019; Liddicoat, 2013; Martin, 2012; Powell et al., 2023; Ruck, 2022). This diversity of what counts as “novel” means that almost every technique and experience in the program could be considered novel to at least some degree. For example, Ruck (2022) describes children getting to have close encounters with insects during his programs as an impactful novel experience, much the same as this study’s theme of “closer look,” which could mean that the “closer look” theme falls under the umbrella of “novelty.” Other research supports the idea that encounters with animals are novel

experiences, but some claim that the truly novel experiences are those where the encounters are unplanned, much like those in the day camp programs (Powell et al., 2023). Still other papers contend that novelty is a function of the environment, with new places being seen as more novel and interesting as was observed with the “exploration” theme (Boeve-de Pauw et al., 2019; Liddicoat, 2013), or that novelty refers to new experiences or ways of presenting information (Martin, 2012). Based on these varied definitions, it appears that the meaningful and memorable experiences the children described in the interviews were novel to at least some degree. This heightened novelty increased the impact of sensorially engaging activities like participating in hands-on activities or exploring off-trail, increasing the likelihood these activities would create an emotional response and lead to making memories (Boeve-de Pauw et al., 2019; Liddicoat, 2013).

The level of detail that participants provided about the four themes during the interviews indicates that they likely provoked some degree of elaboration. As such, these activities could impact the participants’ relevant beliefs and their attitudes as they process the experiences and information (Ham, 2013; Petty & Cacioppo, 1986). Most participants recalled activities that they found to be most enjoyable, an element of the TORE (Thematic, Organized, Relevant, Enjoyable) model (Ham, 2013). Generally, it appeared that the enjoyable experiences that were most relevant to the participants (i.e., those that were most in line with their interests or most novel) were the best remembered. However, the enjoyable aspects of these experiences seemed to overshadow their thematic and organizational aspects in relation to the program, as participants discussed many of their most affective experiences separately from the context of the program. This appears to indicate that these experiences may have affected participants primarily through peripheral cues instead of through the central “argument,” or interpretive

theme, of the program (Ham, 2013; Petty & Cacioppo, 1986). Despite this peripheral method of influencing attitudes, participants, especially from the July session of the program, mentioned that these activities influenced their attitudes in at least some way, with multiple participants discussing how their experiences connected to their attitudes towards respecting nature and their interest in the natural world. This indicates that even with the peripheral route of persuasion, there was some impact on the participants' attitudes, although due to the immediate collection of data, it is impossible to determine whether these impacts were immediate, short-term changes or if they will have long-term impacts.

As mentioned previously, although each day was developed using its own interpretive theme to guide the activities and content (see outlines in Appendix A), children were generally unable to identify the interpretive themes from the program, instead identifying each days' topic or major activity when asked for main ideas (e.g., "I remember when we went outside in the rain and lifted up logs." "I think we did two or three days on trees, and we went out to that big tree to count it..." "We seemed to talk a lot about, like, invasive things."). However, this was not completely unexpected. The programs were envisioned with a wide zone of tolerance for the interpretive themes, meaning that participants were not expected to come away with the exact interpretive theme that was written and presented (Ham, 2013). This did appear to be the case, with participants generally being able to identify the main idea for each day, but not restate the interpretive theme. However, in their responses, some participants did mention theme-related activities and concepts, like describing the layers of a forest using apartment floors or talking about the effects of prairie burns, indicating that employing interpretive themes did impact participant perceptions of the program to some extent.

Furthermore, the educators noted that they emphasized the interpretive themes for the grassland days in the July session more strongly than some of the previous days. In the participant interviews from this session, more participants discussed the grassland days and the concepts, information, and experiences related to them than the participants in the June session did. This reinforces the notion that having a strong interpretive theme increases the likelihood that program participants will be able to follow along and be provoked to elaborate whether through a stronger connection to the message or greater repetition of thematic content even if they are unable to recall the interpretive theme word for word (Buchholz et al., 2015; Ham, 2013; Petty & Cacioppo, 1986; Powell et al., 2023; Stern et al., 2014; Tilden, 2007). Additionally, this may indicate that the participants' general inability to remember interpretive themes could be due to the program delivery (i.e., educators were not emphasizing the interpretive themes strongly enough, the interpretive themes were not repeated throughout the program) and not due to the themes themselves. However, the fact that participants were recalling thematic topics and information indicates that there may have been some thematic thinking, and potentially provocation/cognitive processing.

Additionally, employing a thematic interpretive approach helped create a more holistic program during development and allowed the educators to deliver a more cohesive program (Buchholz et al., 2015; Ham, 2013). Knowing that each day had a message to convey instead of just being broadly about a topic helped the educators to connect any unplanned experiences back to the interpretive theme of the program more easily. As such, having interpretive themes helped maintain the organization of the program and allowed the educators to weave the serendipitous encounters into the program more seamlessly, creating a more cohesive experience for the participants, although it did not appear that the participants took much notice of this. A few

mentioned how the educators would focus on serendipitous encounters during the program, with one telling the interviewer, "...we would find animals and stuff and talk about that, unless there was an animal that we found before ... and then ... we would go back to the oak savannas," but overall, the participants seemed unaware of most thematic connections made during the program, especially for the serendipitous encounters.

It is unclear whether stronger interpretive themes would have increased the participants' recollections of the theme. For this study, the interpretive themes seemed to be most beneficial to the educators as an overarching message by which they could organize each day and least impactful to the participants as a central take-home message. However, participants did seem to be engaged with the themes to at least some degree, recalling general concepts related to the themes especially when the themes were emphasized, indicating that interpretive themes can be a useful part of programming for a day camp.

Barriers to Elaboration

During the interviews, participants mentioned several conditions that prevented them from fully engaging with the program. These conditions served as "barriers to elaboration," hindering the participants' ability to process the program's messaging by creating mental and physical barriers and/or distractions (Petty & Cacioppo, 1986). Foremost among these barriers were environmental factors: primarily heat, biting insects, and inclement weather. As both sessions of the day camp were held in summer, it did get quite hot, especially during the June session of the program. Educators noted in their memos that the heat was oppressive for a good portion of the June session, and although the educators attempted to adapt by moving programming into the shade/indoors, providing ample water, and giving added opportunities to rest, the participants were still heavily impacted by the heat. In the interviews, participants

shared that the heat was a major negative part of their experience and prevented them from having as much fun as they had hoped. Similarly, the presence of mosquitoes, ticks, and horseflies was greater in the June session of the program, and several children were similarly bothered by their abundance. There was one day in each session that was moved indoors due to rain, and the children in both sessions mentioned that they wished these days had been outdoors, saying that they were less interested and engaged during the indoor experiences.

Several participants also mentioned other barriers, such as being tired. The camp admittedly included a lot of walking (up to a mile and a half per day), and several of the participants told the interviewers that they quickly got tired of walking. Additionally, since the camp was in the afternoon, most of the participants had done activities earlier in the day (e.g., summer school, sports programs, other day camps), and several reported that they were physically and mentally tired from these previous activities by the time that they arrived at the day camps, further compounding the effects of activities like hiking and canoeing. Some children also told the interviewer that they were distracted by their peers, preventing them from focusing on the program. These distractions varied from mild annoyance that other participants were talking over the educators to participants being teased, but they all took the participants mentally out of the program.

Overall, these barriers could have prevented the participants from elaborating fully on their experiences in the day camp, which may limit the impact of the program on their environmental attitudes (Petty & Cacioppo, 1986). However, since the day camp appeared to primarily impact participants through peripheral cues as opposed to the central cognitive processing route, the effects of these barriers to elaboration are lessened; the peripheral cues require less ability and motivation to process which reduces the potential impact of these barriers

(Petty & Cacioppo, 1986). These barriers could have impacted participants' ability to process the interpretive themes presented throughout the program, which could be a potential reason that the themes did not seem to stick with participants.

Limitations

The current study had a few limitations that may influence the data and the interpretations of it. One of these was the short time scale of the program and data collection. For ease of data collection and to ensure maximum participation, data collection was included in the program, with pre-test surveys being administered on the first day and post-test surveys and interviews occurring on the final day of the program. As such, the data indicates only the immediate effects of the program on participant attitudes, and any observed changes in attitudes may not be indicative of the children's longer-term attitudes.

The instruments used in the study may have provided another limitation. While the CEPS has been validated in programs similar to the Nature Explorers Day Camp, there was the potential for a mismatch between the items on the scale and the content covered in the program. The statements on the CEPS are quite specific and focused on broad concern for the natural world while the content discussed in the day camp was general and focused on the site. This potential mismatch could have impacted the results of analysis (i.e., the lack of change in the eco-awareness subdomain) as some elements of the CEPS may not have been addressed appropriately. The educator memos were also limited in their usefulness as an instrument. These memos relied on educator perceptions of the children's engagement and feelings, and as a result, may not have represented the true conditions experienced by the children.

The small sample size was another limitation of the study. Having a sample size of only 22 children limits the ability to generalize the results to a larger audience (O'Leary, 2021).

Additionally, the small sample could impact the ability to detect small but significant changes in the data. Effect size sensitivity analysis showed that with the sample size of the program, the minimum population effect sizes likely to be detectable were medium ($r = .3-.5$) to large effects ($r > .5$). As a result, some of the changes in the survey data that appeared to be nonsignificant may have been misrepresented. However, all statistically significant changes had effect sizes greater than the minimum detectable effect sizes and interview results appeared to corroborate the survey results, indicating that the small sample size may not have had a major impact on the statistical analysis.

Finally, most children who participated in the research came into the program with high preexisting environmental attitudes. Although the program was advertised to the public, it appeared that most participants were already somewhat familiar with the site, interested in nature, and concerned about the natural world. This translated into relatively high pre-test scores on the CEPS for the whole survey and both subdomains (≈ 4 out of 5). As such, it was relatively difficult to increase these scores, especially through a medium-length, medium intensity program such as the Nature Explorers Day Camp (Beaumont, 2001). Still, changes in the survey data were observed, and several children mentioned that the program influenced their attitudes, indicating that even with high preexisting attitudes, the program may have still had an impact. Additionally, the high preexisting attitudes of the participants limit the generalizability of this research, something that future researchers may wish to address.

Recommendations for Future Research and Implications for Practitioners

The results and discussion presented here provide several opportunities for future research. First, there is an opportunity to assess the longer-term impacts of this program or a similar program on participant environmental attitudes. Additionally, researchers could examine

the effects of a similar program on a broader audience with lower preexisting environmental attitudes to see what effect the program would have. Future research could also explore whether any attitude shifts from the program impacted participants' behaviors or behavioral intentions. This could be assessed immediately after the program or be a longer-term study to examine the lasting effects on participant behaviors.

Future research on the effects of similar programs on site-specific attitudes/feelings and attachment to place could also be worthwhile, as this may lead to stronger positive associations, attitudes, and behaviors. Research on what experiences, techniques, and/or messaging have the greatest impact on attachment to place could provide information for practitioners to use in creating positive connections between their sites and their audiences. Additionally, future research could examine the longer-term impacts of programming on connection to place, as well as behavioral changes related to an increased connection to place, to determine if programs can make a lasting impact.

Other research opportunities relate to the best practices in interpretation and EE programs. One potential research area would be to identify elements of a hands-on experience that make it impactful. This study supports current research that shows hands-on experiences and activities are engaging and memorable, but there is currently little available research on what makes one activity more engaging than another. Another potential area for future research is more clearly defining what qualifies as a novel technique, and which aspects of novelty are most useful and applicable to non-formal education programming. As described earlier, the most effective techniques identified in this study were generally novel, so research on whether the techniques themselves or the novelty of them made them impactful would help provide information for practitioners interested in creating effective nature experiences. Additionally,

there are potential opportunities for using other experience frameworks, such as Csikszentmihalyi's flow theory, to explore the impacts of interpretive experiences.

Research on the effectiveness of thematic interpretation on various audiences could also provide useful information. In this study, it appears that the participants were not highly provoked by the interpretive themes, and understanding if the effectiveness of interpretive themes is affected by the age or other characteristics of the participants could be a beneficial area for future research. Research comparing the effects of thematic interpretation compared to peripheral cues (e.g., activities, role modeling) on what participants remember and retain immediately after a program may be useful for determining what approaches are more effective for influencing participants. Finally, although there is research on the effects of unstructured nature experiences for early childhood education, there is a gap in the research on its place in EE and interpretation for older youths and adults. Based on the results of this study, it appears that these experiences can be impactful even with older audiences; as such, more targeted research on the effects of unstructured experiences incorporated into nature education programs could yield more specific and useful information and recommendations for practitioners.

This research also has several practical implications for programmers and educators desiring to influence participants' environmental attitudes. Foremost among these is embracing novelty in interpretive programming. Incorporating new, unusual, and/or unique experiences, environments, or events appears to be a meaningful way to engage participants emotionally and intellectually as well as making an experience more memorable, increasing the potential for long-term impacts. Another suggestion for practitioners is to interpret serendipitous encounters. Random, unplanned encounters, even very brief ones, were highly memorable to program participants, so it is recommended that practitioners take advantage of serendipitous

opportunities throughout their programs. These serendipitous moments should be connected back to the primary theme of the program for maximum impact. Additionally, program leaders may wish to address the “barriers to elaboration” that appeared in this study. The educators attempted to reduce these barriers as much as possible, but based on the interviews, it appears that they were not completely successful, and the resulting distractions impacted the participants’ enjoyment of the program as well as potentially influencing the overall impacts of the program on them. As such, working to remove or lessen these barriers (e.g., providing more indoor breaks to reduce the effects of heat and insects, better participant management to reduce peer distractions) may help increase the overall impact of a program. Finally, practitioners may also wish to design programs using interpretive themes/persuasive messaging (i.e., the TORE Model, the ELM). These models help give educators a framework with which to structure their programs and connect the various activities, information, and encounters in a holistic way, making the program more meaningful for participants.

Conclusions

Overall, researchers observed small, sometimes significant, increases in participant environmental attitudes and feelings of connection to the site after the day camp program. Effective techniques centered around providing novel experiences that included hands-on activities, unstructured explorations, giving participants a closer look at the natural world, and embracing serendipitous encounters. From these results, it is recommended that practitioners designing interpretive programs embrace novel experience and utilize frameworks like the TORE model or ELM to increase the likelihood of creating effective, meaningful, and impactful programs.

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- Zeppel, H., & Muloin, S. (2008). Conservation benefits of interpretation on marine wildlife tours. *Human Dimensions of Wildlife*, 13, 280-294. <https://doi.org/10.1080/10871200802187105>
- Zhang, W., Goodale, E., & Chen, J. (2014). How contact with nature affects children's biophilia, biophobia, and conservation attitude in China. *Biological Conservation*, 177, 109-116. <http://dx.doi.org/10.1016/j.biocon.2014.06.011>

Appendix A

Program Outlines for Nature Explorers Day Camps

Interpretive Program Plan Worksheet: Theme Planning & Program Development

Presentation Location: Schmeeckle Reserve

Date and Time: 12 VI 2023/10 VII 2023

Program topic, theme, resources, and meanings

- 1. Program Topic:** Introduction to Schmeeckle
 - 2. List 2-4 resources used for initial research:**
 - University of Wisconsin-Stevens Point. (2023). *Schmeeckle Reserve*. UWSP. <https://www3.uwsp.edu/cnr-ap/schmeeckle/Pages/about/history.aspx>
 - Wisconsin DNR. (2022). *Wisconsin's natural communities*. Natural Communities of Wisconsin - Wisconsin DNR. <https://dnr.wi.gov/topic/endangeredresources/communities.asp>
 - 3. List the tangible resources you will include in your program.** (*props, things audience can see, smell, feel, hear, taste, information/facts*)
Schmeeckle visitor center, animals and plants of Schmeeckle, forest, prairie, oak savanna, wetland, rock pile, farm equipment, lake, restoration areas
 - 4. List the intangible meanings that you will include in your program.** (*ideas, concepts, emotions, things that audience members can relate to*)
Human impacts, restoration, preservation, recreation, community
 - 5. Narrowed Program Theme:** See pages 56-66 in your textbook. The theme is *specific & focused, (not "all about ____"), can be interpreted within timeframe, a complete sentence, link tangibles to intangibles, organizational tool*:
Protected for almost half a century, Schmeeckle Reserve has become an "island of green" that preserves Wisconsin's native plants, animals, and habitat.
-

Describe how your program will address the Three Pillars of Interpretation.

- 1. How will this program meet the goals of your agency or organization?**
Schmeeckle Reserve: educate about Wisconsin native resources and interpret the landscape and importance of Schmeeckle.
 - 2. What audience(s) do you expect will attend?** (*ages, background, interests and expectations*)
Children entering 3rd-6th grades; they will be attending the program as part of an eight-day summer day camp. It is expected that they will enjoy nature to at least some extent, although we anticipate that there will be different levels of comfort, awareness, and knowledge about nature.

How will you serve a diverse audience? (*people with disabilities, minorities, retired, families, etc.*)
Talk clearly and loudly enough to be heard; incorporate activities that address multiple senses; ensure that all props and visuals are large enough to be seen clearly or use a proxy; use a variety of hands-on activities; centralized, easy-to-get-to location
 - 3. What specific site-based resource(s) will you interpret?**
Schmeeckle Reserve habitats, animals, and plants as opportunities arise
-

Develop the structure and techniques for your program.

- 1. List the subthemes of your program** (2-4 "chunks" of the theme). (*Subthemes should be specific & focused, a complete sentence, link tangibles to intangibles, logical*)

- A. Schmeeckle Reserve has a long history of supporting people, plants, and animals.
 - B. Hundreds of fascinating and unique animals and plants call Schmeeckle Reserve their home, and each one has incredible adaptations that help it to survive.
 - C. Schmeeckle's diverse habitats are only possible through careful and continuous management.
2. **Brainstorm creative interpretive techniques you can use** (*presentation style, props, involvement...*)
 Primary creative technique will be an exploratory hike set-up (children will be able to guide what the topics are to some extent through serendipity and child-centered explorations; all topics will still be related back to the theme); additional creative techniques will/may include questioning, sensory explorations, I spy/scavenger hunt activities, metaphors and similes, log rolling, close observation, nature games as appropriate, historical photos, etc.

Outline the main parts of your program. Be specific. Consider your time to audience engagement.

1. **POW** (*attention-grabbing introduction*)
 Spend some time brainstorming things that they might see, hear, smell in Schmeeckle
2. **BRIDGE** (*transition from POW to Body: introduce self, establish credibility, state theme, transition to first subtheme*)
 State theme and Maslow's; introduction to ticks w/pinned specimens
3. **BODY & TRANSITIONS**
 - A. **Subtheme 1:** Schmeeckle Reserve has a long history of supporting people, plants, and animals.
 - a. **Describe what you will present:** Talk about the history of Schmeeckle Reserve from pre-settlement through today at various locations throughout the Reserve (e.g., talk about farming near rock piles/equipment; talk about logging in forests)
 - b. **Creative techniques you will use:** questioning, sensory experiences, reading the landscape for clues of history
 - c. **Transition:** N/A; subthemes will be interwoven together on exploratory hike instead of being presented sequentially.
 - B. **Subtheme 2:** Hundreds of fascinating and unique animals and plants call Schmeeckle Reserve their home, and each one has incredible adaptations that help it to survive.
 - a. **Describe what you will present:** Discuss the different animals and plants that live in Schmeeckle as appropriate; talk about adaptations, interesting facts, etc. that make them unique
 - b. **Creative techniques you will use:** Sensory explorations (e.g., sight, smell, sounds), questions, metaphors and similes, I Spy/scavenger hunt, unstructured exploration time
 - c. **Transition:** N/A; subthemes will be interwoven together on exploratory hike instead of being presented sequentially.
 - C. **Subtheme 3:** Schmeeckle's diverse habitats are only possible through careful and continuous management.
 - a. **Describe what you will present:** Talk about management of Schmeeckle as appropriate (e.g., talking about Buckthorn removal, prescribed fire, tree plantings) and visible
 - b. **Creative techniques you will use:** questions, metaphors and similes, observation times
 - c. **Transition:** We're going to head back to the visitor center/pavilion and do a quick wrap up. On our way back, find someone near you and tell them what your favorite thing today was and why you liked it so much.
4. **CONCLUSION** (*creative and inspiring take-home message*)
 - A. **Summarize your main points:** Restate theme; summarize day's activities

B. End on a high note! Take-away, memorable, inspirational message: There's a lot more to explore in Schmeeckle's different habitats; tomorrow we're going to take a closer look at Schmeeckle's forests.

C. Creative techniques used: Questions, visitor participation

Bad Weather Plan: Describe your backup plan. If you will go indoors, how will you adapt your program? How will you inform your audience? If you schedule a rain date, how will you let your audience know the program cancelled? Given bad weather, the program will be modified and done indoors, likely around the museum area and meeting room.

Reflection: Is it Interpretive? How does it address Tilden's first four Principles? Be specific. Make revisions as needed.

1. **How are you Relating to the Experience of the Visitors?** First-hand experiences in Schmeeckle; relating to prior experiences and knowledge through metaphors, similes, and examples
2. **How are you Revealing Meanings Rather Than Just Facts?** Connecting experience to history and evolution of Schmeeckle
3. **How are you Artfully Presenting Interpretation with Creative Techniques?** Hands-on activities; questioning; participant-led experiences
4. **How are you Provoking Thought and Inquiry? (do you have a "call to action/thought"?)** Asking participants to think about how people have shaped the natural world through their actions.

Research/Citations: List 5-8 resources used for research that are credible, diverse (primary & secondary), and with limited or balanced bias. Use MLA or APA style for references. At least one resource should be locally specific to **Schmeeckle Reserve/central Wisconsin** natural/cultural history.

1. Demchik, M., & Buchholz, J. (2023, May 9). *Schmeeckle restoration and management plan, 5-09-23*. Schmeeckle Reserve. https://www3.uwsp.edu/cnr-ap/schmeeckle/Pages/natural_history/2023_Schmeeckle_management_plan.pdf
2. Kaufman, K., Sayre, J., Kaufman, K., Eaton, E. R., Brown, T. T., & Baln, T. D. (2015). *Kaufman Field Guide to nature of the Midwest*. Houghton Mifflin Harcourt.
3. Leslie, C. W., Tallmadge, J., & Wessels, T. (2019). *Into the field: A guide to locally focused teaching*. Orion Magazine.
4. University of Wisconsin-Stevens Point. (2023). *Schmeeckle Reserve*. UWSP. <https://www3.uwsp.edu/cnr-ap/schmeeckle/Pages/about/history.aspx>
5. Wisconsin DNR. (2022). *Wisconsin's natural communities*. Natural Communities of Wisconsin - Wisconsin DNR. <https://dnr.wi.gov/topic/endangeredresources/communities.asp>



Interpretive Program Plan Worksheet: Theme Planning & Program Development

Presentation Location: Schmeeckle Reserve

Date and Time: 13 VI 2023/11 VII 2023

Program topic, theme, resources, and meanings

1. **Program Topic:** Forest structure
2. **List 2-4 resources used for initial research:**
 - University of Wisconsin-Stevens Point. (2023). *Schmeeckle Reserve*. UWSP. <https://www3.uwsp.edu/cnr-ap/schmeeckle/Pages/about/history.aspx>
 - Trimble, S. (2020, October 14). *The forest canopy: Structure, roles & measurement*. CID Bio-Science. <https://cid-inc.com/blog/the-forest-canopy-structure-roles-measurement/>
3. **List the tangible resources you will include in your program.** (*props, things audience can see, smell, feel, hear, taste, information/facts*)
Trees, oak-maple forests, pine forests, ecology, forest birds, amphibians, insects, forest wildflowers
4. **List the intangible meanings that you will include in your program.** (*ideas, concepts, emotions, things that audience members can relate to*)
Community, home, safety, change, discovery
5. **Narrowed Program Theme:** See pages 56-66 in your textbook. The theme is *specific & focused, (not "all about ____"), can be interpreted within timeframe, a complete sentence, link tangibles to intangibles, organizational tool*:
Forests are the high-rise apartment buildings of Schmeeckle, and their different "floors" house a variety of plants and animals.

Describe how your program will address the Three Pillars of Interpretation.

1. **How will this program meet the goals of your agency or organization?**
Schmeeckle Reserve: educate about Wisconsin native resources and interpret the landscape and importance of Schmeeckle.
2. **What audience(s) do you expect will attend?** (*ages, background, interests and expectations*)
Children entering 3rd-6th grades; they will be attending the program as part of an eight-day summer day camp. It is expected that they will enjoy nature to at least some extent, although we anticipate that there will be different levels of comfort, awareness, and knowledge about nature.

How will you serve a diverse audience? (*people with disabilities, minorities, retired, families, etc.*)
Talk clearly and loudly enough to be heard; incorporate activities that address multiple senses; ensure that all props and visuals are large enough to be seen clearly or use a proxy; use a variety of hands-on activities; centralized, easy-to-get-to location
3. **What specific site-based resource(s) will you interpret?**
Schmeeckle Reserve oak-maple and mixed conifer-hardwood forests east of Michigan; animals and plants in the forest

Develop the structure and techniques for your program.

1. **List the subthemes of your program** (2-4 "chunks" of the theme). (*Subthemes should be specific & focused, a complete sentence, link tangibles to intangibles, logical*)

A. The forest canopy is like the top floor, providing an isolated, solitary space perfect for those that like privacy.

B. The understory acts as the main portion of the high-rise, providing housing and dining for many forest residents.

C. Like the basement of a high rise, what is below the ground in the forest is often overlooked, but the things that happen there are essential for keeping everything functioning properly.

2. Brainstorm creative interpretive techniques you can use (presentation style, props, involvement...)

Primary creative technique will be an exploratory hike set-up (children will be able to guide what the topics are to some extent through serendipity and child-centered explorations; all topics will still be related back to the theme); additional creative techniques will/may include questioning, sensory explorations, metaphors and similes, log rolling, quiet observation, etc.

Outline the main parts of your program. Be specific. Consider your time to audience engagement.

1. POW (attention-grabbing introduction) [after reviewing previous day's activities]

I'm here to sell you an apartment in the new Forest Reserve Condominiums, who'd like to tour the "building?"

2. BRIDGE (transition from POW to Body: introduce self, establish credibility, state theme, transition to first subtheme)

State theme and Maslow's

3. BODY & TRANSITIONS

D. **Subtheme 1:** The forest canopy is like the top floor, providing an isolated, solitary space perfect for those that like privacy.

- a. **Describe what you will present:** (At/around the treehouse) discuss the canopy of the forest, define terms, and describe what the canopy does; discuss animals that use canopy and adaptations, observe animals using the canopy
- b. **Creative techniques you will use:** questioning, sensory experiences, quiet observation of the canopy (e.g., "Earth Windows" activity from Cornell, 1979), metaphors and similes
- c. **Transition:** As we walk, imagine that we are climbing down a few flights of stairs to a lower floor in the forest condominiums; how do you think things will change? Feel free to talk about your ideas with a friend or neighbor.

E. **Subtheme 2:** The understory acts as the main portion of the high-rise, providing housing and dining for many forest residents.

- a. **Describe what you will present:** Discuss the understory/shrub layer of the forest, define terms, and describe what it does; discuss animal and plant adaptations for the understory, observe differences in understory in different locations in forest and compare to species in canopy
- b. **Creative techniques you will use:** Questioning, quiet observation, tree identification guides, sensory experiences, metaphors and similes, shelter building (mimicking structure of understory)
- c. **Transition:** We've got one more stop on our tour of the high rise, and although it's not the most glamorous or beautiful place, it helps keep the whole forest running smoothly. What do you think that place is?

F. **Subtheme 3:** Like the basement of a high rise, what is below the ground in the forest is often overlooked, but the things that happen there are essential for keeping everything functioning properly.

- a. **Describe what you will present:** Discuss the floor/below ground layer of the forest, define terms, and describe what it does; discuss animal and plant adaptations for the floor, flip logs and look for residents of the floor, discuss adaptations and roles in ecosystem as appropriate
- b. **Creative techniques you will use:** Questioning, flipping logs and rocks to look for different organisms, sensory experiences, metaphors and similes
- c. **Transition:** As we finish our tour of the apartments, I'll give you some time to think about where you'd like to live in the condos, and then you can let me know when we get back to the pavilion/visitor center. But don't take too long, the space is filling up fast!

4. **CONCLUSION** (*creative and inspiring take-home message*)

- D. **Summarize your main points:** Restate theme; summarize day's activities, follow up on transition with fake "lease" for participants to sign based on where they'd want to live (let participants share where and why)
- E. **End on a high note! Take-away, memorable, inspirational message:** Remember how the different layers of the forest provide homes for different creatures. Tomorrow, we'll explore some more about forests, but with a longer-term perspective.
- F. **Creative techniques used:** Questions, visitor participation

Bad Weather Plan: Describe your backup plan. If you will go indoors, how will you adapt your program? How will you inform your audience? If you schedule a rain date, how will you let your audience know the program cancelled? Given bad weather, the program will be modified and done indoors. There will be a PowerPoint with a few full-photo slides for each habitat to show some of the things that might have been seen outside. Trays with leaf litter/humus/logs will be brought in for children to look through to discover the biodiversity in the soil. Children will build mini shelter structures similar to the understory/shrub layer of the forest to demonstrate how structure creates good areas for creatures to live and feed.

Reflection: Is it Interpretive? How does it address Tilden's first four Principles? Be specific. Make revisions as needed.

1. **How are you Relating to the Experience of the Visitors?** First-hand experiences in Schmeeckle; relating to prior experiences
2. **How are you Revealing Meanings Rather Than Just Facts?** Connecting experience to history and evolution of Schmeeckle
3. **How are you Artfully Presenting Interpretation with Creative Techniques?** Hands-on activities; questioning; participant-led experiences
4. **How are you Provoking Thought and Inquiry?** (*do you have a "call to action/thought"?*) Asking participants to think about how the pieces of the natural world interact with each other based on their observations.

Research/Citations: List 5-8 resources used for research that are credible, diverse (primary & secondary), and with limited or balanced bias. Use MLA or APA style for references. At least one resource should be locally specific to **Schmeeckle Reserve/central Wisconsin** natural/cultural history.

1. Benton, A.H., & Werner, W.E. (1965). *Manual of Field Biology and Ecology* (5th ed.). Burgess.
2. Cornell, J.B. (1979). *Sharing Nature with Children*. Ananda Publications.
3. Gilliam, F.S. (2007). The ecological significance of the herbaceous layer in forest ecosystems. *BioScience* 57:845-858.
4. Peterson, G. (2022, January 21). Layers of the Forest. MSU Extension. https://www.canr.msu.edu/news/layers_of_the_forest
5. ScienceDirect. (2023). *Forest Floor - an overview*. ScienceDirect Topics. <https://www.sciencedirect.com/topics/earth-and-planetary-sciences/forest-floor>



Interpretive Program Plan Worksheet: Theme Planning & Program Development

Presentation Location: Schmeeckle Reserve

Date and Time: 14 VI 2023/12 VII 2023

Program topic, theme, resources, and meanings

1. **Program Topic:** Forest succession
2. **List 2-4 resources used for initial research:**
6. Demchik, M., & Buchholz, J. (2023, May 9). *Schmeeckle restoration and management plan, 5-09-23*. Schmeeckle Reserve. https://www3.uwsp.edu/cnr-ap/schmeeckle/Pages/natural_history/2023_Schmeeckle_management_plan.pdf
7. Martin, J., & Gower, T. (1996, November). *Forest Succession*. Forestry Facts. <https://forestandwildlifeecology.webhosting.cals.wisc.edu/wp-content/uploads/sites/111/2017/07/58.pdf>
3. **List the tangible resources you will include in your program.** (*props, things audience can see, smell, feel, hear, taste, information/facts*)
Mature forest, pine trees, fire, disturbance, animals and plants as they come up
4. **List the intangible meanings that you will include in your program.** (*ideas, concepts, emotions, things that audience members can relate to*)
Community, change, destruction, renewal, survival
5. **Narrowed Program Theme:** See pages 56-66 in your textbook. The theme is *specific & focused, (not "all about ____"), can be interpreted within timeframe, a complete sentence, link tangibles to intangibles, organizational tool*:
Just like people, forests change over time, growing up towards a bright future, finding a stable life, then eventually dying and letting the next generation take over.

Describe how your program will address the Three Pillars of Interpretation.

1. **How will this program meet the goals of your agency or organization?**
Schmeeckle Reserve: educate about Wisconsin native resources and interpret the landscape and importance of Schmeeckle.
2. **What audience(s) do you expect will attend?** (*ages, background, interests and expectations*)
Children entering 3rd-6th grades; they will be attending the program as part of an eight-day summer day camp. It is expected that they will enjoy nature to at least some extent, although we anticipate that there will be different levels of comfort, awareness, and knowledge about nature.

How will you serve a diverse audience? (*people with disabilities, minorities, retired, families, etc.*)
Talk clearly and loudly enough to be heard; incorporate activities that address multiple senses; ensure that all props and visuals are large enough to be seen clearly or use a proxy; use a variety of hands-on activities; centralized, easy-to-get-to location
3. **What specific site-based resource(s) will you interpret?**
Schmeeckle Reserve new planting, young forests west of Michigan, mature forest/Chilla Woodlot west of Michigan; animals and plants in the forest

Develop the structure and techniques for your program.

1. **List the subthemes of your program** (2-4 “chunks” of the theme). (*Subthemes should be specific & focused, a complete sentence, link tangibles to intangibles, logical*)
 - A. Young forests grow fast and thick, with many seedlings fighting for the light to survive.
 - B. As they age, forests thin out, with sun-loving trees providing a home for an understory of shade-loving trees.
 - C. Eventually, the older trees fall to pests, the environment, or old age, and this gives an opening for the cycle to start again.
 2. **Brainstorm creative interpretive techniques you can use** (*presentation style, props, involvement...*)
 Primary creative technique will be an exploratory hike set-up (children will be able to guide what the topics are to some extent through serendipity and child-centered explorations; all topics will still be related back to the theme); additional creative techniques will/may include collecting fallen leaves/twigs to create succession diagram, questioning, sensory explorations, metaphors and similes, measuring trees for age, comparison and contrast of habitats, etc.
-

Outline the main parts of your program. Be specific. Consider your time to audience engagement.

1. **POW** (*attention-grabbing introduction*) [after reviewing previous day’s activities]
 We’ve invented a way of traveling through time to see what forests look like throughout their lifetime. Who’d like to try it out?
2. **BRIDGE** (*transition from POW to Body: introduce self, establish credibility, state theme, transition to first subtheme*)
 State theme and Maslow’s
3. **BODY & TRANSITIONS**
 - G. **Subtheme 1:** Young forests grow fast and thick, with many seedlings fighting for the light to survive.
 - a. **Describe what you will present:** Discuss pioneer species, competition, ecology of young forests
 - b. **Creative techniques you will use:** questioning, sensory experiences, exploration of plants in planting area, both trees and others, exploration of surrounding Aspen/Jack Pine stands, metaphors and similes
 - c. **Transition:** Let’s walk through time again, this time, going forward. As we walk, keep an eye and ear out for any changes. We’ll share those out together as a group at the next spot, but feel free to talk with the folks around you about what you’re noticing.
 - H. **Subtheme 2:** As they age, forests thin out, with sun-loving trees providing a home for an understory of shade-loving trees.
 - a. **Describe what you will present:** Discuss mid-successional forests, competition, shade-tolerance, ecology, species composition
 - b. **Creative techniques you will use:** questioning, sensory experiences, exploration of plants in mid-successional forest (compare diversity to early successional forest, species present, number of creatures, etc.), measuring trees to determine age, metaphors and similes
 - c. **Transition:** We’re going to walk forward through time one more time to see what a fully “grown-up” forest looks like. Before we move on, I’d like everyone to think of something they’d like to look for on this walk. Maybe that’s how many really big trees you can see, or what birds there are, or how many trees are pines or oaks, or whatever you’d like to observe. When we get to our next stop, we’ll give you the chance to share with the group.
 - I. **Subtheme 3:** Eventually, the older trees fall to pests, the environment, or old age, and this gives an opening for the cycle to start again.
 - a. **Describe what you will present:** Discuss late successional forests, disturbances, ecology, effects of disturbance on biodiversity
 - b. **Creative techniques you will use:** questioning, sensory experiences, exploration of dead trees to try to find signs of what killed them, exploring diversity in disturbed and non-disturbed areas, measuring trees to determine age, metaphors and similes

- c. **Transition:** We're going to return back to the pavilion/visitor center now. As we head back, I'd like you all to think about the different connections and life cycles we've seen today.

4. CONCLUSION (*creative and inspiring take-home message*)

- G. Summarize your main points:** Restate theme; summarize day's activities; have participants glue their leaves/twigs to paper showing the different stages of forest succession (Aspen-Jack Pine, Conifer-hardwood, pine-oak)
- H. End on a high note! Take-away, memorable, inspirational message:** Forest age and structure make homes for so many different animals, and as you keep exploring, I encourage you to look for the age and habitats in the forests you explore. Tomorrow, though, we're going to leave the woods and explore somewhere much more open.
- I. Creative techniques used:** Questions, visitor participation

Bad Weather Plan: Describe your backup plan. If you will go indoors, how will you adapt your program? How will you inform your audience? If you schedule a rain date, how will you let your audience know the program cancelled? Given bad weather, the program will be modified and done indoors. Tables with different items relevant to each of the successional stages will be placed on three sides of the room. Items may include leaves/branches from the areas, fruits/seeds from plants in the areas, photos of these areas, representations of animals that live in these places (e.g., pelts, toys, tracks/scat). Will go through each station using content from above. Will attempt to bring in logs from each area to practice determining age from tree diameter.

Reflection: Is it Interpretive? How does it address Tilden's first four Principles? Be specific. Make revisions as needed.

1. **How are you Relating to the Experience of the Visitors?** First-hand experiences in Schmeeckle; relating to prior experiences
2. **How are you Revealing Meanings Rather Than Just Facts?** Connecting experience to history and evolution of Schmeeckle
3. **How are you Artfully Presenting Interpretation with Creative Techniques?** Hands-on activities; questioning; participant-led experiences
4. **How are you Provoking Thought and Inquiry?** (*do you have a "call to action/thought"?*) Asking participants to think about how the pieces of the natural world interact with each other based on their observations.

Research/Citations: List 5-8 resources used for research that are credible, diverse (primary & secondary), and with limited or balanced bias. Use MLA or APA style for references. At least one resource should be locally specific to Schmeeckle Reserve/central Wisconsin natural/cultural history.

1. Cornell, JB. (1979). *Sharing Nature with Children*. Ananda Publications.
2. Demchik, M., & Buchholz, J. (2023, May 9). *Schmeeckle restoration and management plan, 5-09-23*. Schmeeckle Reserve. https://www3.uwsp.edu/cnr-ap/schmeeckle/Pages/natural_history/2023_Schmeeckle_management_plan.pdf
3. Martin, J., & Gower, T. (1996, November). *Forest Succession*. Forestry Facts. <https://forestandwildlifeecology.webhosting.cals.wisc.edu/wp-content/uploads/sites/111/2017/07/58.pdf>
4. Pastor, J. (2016). *What should a clever moose eat?: Natural history, ecology, and the North Woods*. Island Press.
5. Wisconsin Dept. of Natural Resources. (2015). Northern Mesic Forest (Global Rank G4; State Rank S4). In *Ecological Landscapes of Wisconsin*. essay.



Interpretive Program Plan Worksheet: Theme Planning & Program Development

Presentation Location: Schmeeckle Reserve

Date and Time: 15 VI 2023/13 VII 2023

Program topic, theme, resources, and meanings

1. **Program Topic:** Grasslands of Wisconsin
2. **List 2-4 resources used for initial research:**
 - Demchik, M., & Buchholz, J. (2023, May 9). *Schmeeckle restoration and management plan, 5-09-23*. Schmeeckle Reserve. https://www3.uwsp.edu/cnr-ap/schmeeckle/Pages/natural_history/2023_Schmeeckle_management_plan.pdf
 - Field Edventures. (2020). *What is a Prairie?*. EEK! <https://www.eekwi.org/explore/habitats/what-prairie>
3. **List the tangible resources you will include in your program.** (*props, things audience can see, smell, feel, hear, taste, information/facts*)
Grasses, Prairie, Oak Savanna, fire, ecotones/transitions, disturbance, animals and plants as they come up
4. **List the intangible meanings that you will include in your program.** (*ideas, concepts, emotions, things that audience members can relate to*)
Community, change, home, history, restorations, death, renewal
5. **Narrowed Program Theme:** See pages 56-66 in your textbook. The theme is *specific & focused*, (not “all about _____”), *can be interpreted within timeframe*, *a complete sentence*, *link tangibles to intangibles*, *organizational tool*):
Grasslands like prairies and savannas were once commonplace in Wisconsin; now they and the species they support are in danger of disappearing.

Describe how your program will address the Three Pillars of Interpretation.

1. **How will this program meet the goals of your agency or organization?**
Schmeeckle Reserve: educate about Wisconsin native resources and interpret the landscape and importance of Schmeeckle.
2. **What audience(s) do you expect will attend?** (*ages, background, interests and expectations*)
Children entering 3rd-6th grades; they will be attending the program as part of an eight-day summer day camp. It is expected that they will enjoy nature to at least some extent, although we anticipate that there will be different levels of comfort, awareness, and knowledge about nature.

How will you serve a diverse audience? (*people with disabilities, minorities, retired, families, etc.*)
Talk clearly and loudly enough to be heard; incorporate activities that address multiple senses; ensure that all props and visuals are large enough to be seen clearly or use a proxy; use a variety of hands-on activities; centralized, easy-to-get-to location
3. **What specific site-based resource(s) will you interpret?**
Grasslands in Schmeeckle – Zimmerman Prairie, Oak openings/savanna

Develop the structure and techniques for your program.

1. **List the subthemes of your program** (2-4 “chunks” of the theme). (*Subthemes should be specific & focused, a complete sentence, link tangibles to intangibles, logical*)

A. Although they all are mostly grasses and flowers, there are several types of grasslands, each with their own unique plant and animal communities.

B. Fire-adapted grasslands are now imperiled due to fire suppression, woody invaders, and changes in land use.

2. Brainstorm creative interpretive techniques you can use (presentation style, props, involvement...)

Primary creative technique will be an exploratory hike set-up (children will be able to guide what the topics are to some extent through serendipity and child-centered explorations; all topics will still be related back to the theme); additional creative techniques will/may include questioning, sensory explorations, metaphors and similes, comparison of plants from oak opening to forest, comparing flammability of grasses and twigs, songs, etc.

ine the main parts of your program. Be specific. Consider your time to audience engagement.

1. POW (attention-grabbing introduction) [after reviewing previous day's activities]

What do you call open natural areas with very few trees and lots of tall plants? (when someone says "prairie," jump into modified "Prairie Song" by Stan Slaughter).

2. BRIDGE (transition from POW to Body: introduce self, establish credibility, state theme, transition to first subtheme)

Mention that prairies are just one type of grassland, although they are the poster child. State theme and Maslow's

3. BODY & TRANSITIONS

J. **Subtheme 1:** Although they all are mostly grasses and flowers, there are several types of grasslands, each with their own unique plant and animal communities.

- a. **Describe what you will present:** Define a grassland, discuss the different types of grasslands where they are present in the reserve (prairie in Zimmerman Prairie, oak opening in Berard Oaks), what makes each one unique, interesting animal/plant encounters during course of the interpretation
- b. **Creative techniques you will use:** questioning, sensory experiences, metaphors and similes, observation
- c. **Transition:** Even though there are many different types of grasslands, they all require certain conditions to survive, and unfortunately a lot of those conditions have changed.

K. **Subtheme 2:** Fire-adapted grasslands are now imperiled due to fire suppression, woody invaders, and changes in land use.

- a. **Describe what you will present:** Have children brainstorm things that may have impacted grasslands, discuss habitat succession, ecological disturbance regimes, invasive species, changes in land use over time, plant change in oak opening, fire ecology
- b. **Creative techniques you will use:** questioning, sensory experiences, similes and metaphors, fire demonstration (having children burn grass vs sticks in the Menzel pavilion fireplace); plant succession crawl in Oak openings (from Cornell, 1979; start at large dead oak and crawl/walk through prairie until you get to woods, report what you notice)
- c. **Transition:** So, changes in disturbance regimes have really messed with our grasslands...(lead directly into conclusion/restating theme)

4. CONCLUSION (creative and inspiring take-home message)

J. **Summarize your main points:** Restate theme; summarize day's activities

K. **End on a high note! Take-away, memorable, inspirational message:** There's a lot more out here than what we saw today, so on Monday, be ready to take a much closer look at grasslands. Have a great weekend!

L. **Creative techniques used:** Questions, visitor participation

Bad Weather Plan: Describe your backup plan. If you will go indoors, how will you adapt your program? How will you inform your audience? If you schedule a rain date, how will you let your audience know the program cancelled? Given bad weather, the program will be modified and done indoors. Instead of exploring the prairie/savanna outside, children will “create” a prairie/savanna ecosystem inside using fake plants and animals.

Reflection: Is it *Interpretive*? How does it address Tilden’s first four Principles? Be specific. Make revisions as needed.

1. **How are you *Relating to the Experience of the Visitors*?** First-hand experiences in Schmeckle; relating to prior experiences
 2. **How are you *Revealing Meanings Rather Than Just Facts*?** Connecting experience to history and evolution of Schmeckle
 3. **How are you *Artfully Presenting Interpretation with Creative Techniques*?** Hands-on activities; questioning; participant-led experiences
 4. **How are you *Provoking Thought and Inquiry*?** (*do you have a “call to action/thought”?*) Having participants think about human impacts on prairies.
-

Research/Citations: List 5-8 resources used for research that are credible, diverse (primary & secondary), and with limited or balanced bias. Use MLA or APA style for references. At least one resource should be locally specific to **Schmeckle Reserve/central Wisconsin** natural/cultural history.

1. Selvey, R. (2022, December 12). *Wisconsin’s prairies: Past, present, and future*. ArcGIS StoryMaps. <https://storymaps.arcgis.com/stories/b523f7079a4748fbb3be85b4ecbd8f69>
2. Thieme, J. (Ed.). (2016). *Living in the Oak Openings*. The Nature Conservancy
3. Wisconsin Dept. of Natural Resources. (2015). Dry-mesic Prairie (Global Rank G2G3; State Rank S2). In *Ecological Landscapes of Wisconsin*. essay.
4. Wisconsin Dept. of Natural Resources. (2015). Dry Prairie (Global Rank G3G4; State Rank S3). In *Ecological Landscapes of Wisconsin*. essay.
5. Wisconsin Dept. of Natural Resources. (2015). Oak Opening (Global Rank G1; State Rank S1). In *Ecological Landscapes of Wisconsin*. essay.



Interpretive Program Plan Worksheet: Theme Planning & Program Development

Presentation Location: Schmeeckle Reserve

Date and Time: 19 VI 2023/17 VII 2023

Program topic, theme, resources, and meanings

1. **Program Topic:** Grassland biodiversity
2. **List 2-4 resources used for initial research:**
 - Field Edventures. (2020). *What is a Prairie?*. EEK! <https://www.eekwi.org/explore/habitats/what-prairie>
 - Cochran, T. S., & Iltis, H. H. (2000). *Atlas of the Wisconsin Prairie and Savanna Flora*. <https://herbarium.wiscweb.wisc.edu/wp-content/uploads/sites/205/2017/05/ATLAS.pdf>
3. **List the tangible resources you will include in your program.** (*props, things audience can see, smell, feel, hear, taste, information/facts*)
Grasses, Prairie, Oak Savanna, prairie plants, insects, animals and plants as they come up
4. **List the intangible meanings that you will include in your program.** (*ideas, concepts, emotions, things that audience members can relate to*)
Community, home, hunger, native and invasive, beauty, interconnectedness
5. **Narrowed Program Theme:** See pages 56-66 in your textbook. The theme is *specific & focused*, (not “all about _____”), *can be interpreted within timeframe, a complete sentence, link tangibles to intangibles, organizational tool*:
Although some people may only see large fields of grass, grasslands support a diverse and often unnoticed community of animals and plants with unique adaptations to help them survive.

Describe how your program will address the Three Pillars of Interpretation.

1. **How will this program meet the goals of your agency or organization?**
Schmeeckle Reserve: educate about Wisconsin native resources and interpret the landscape and importance of Schmeeckle.
2. **What audience(s) do you expect will attend?** (*ages, background, interests and expectations*)
Children entering 3rd-6th grades; they will be attending the program as part of an eight-day summer day camp. It is expected that they will enjoy nature to at least some extent, although we anticipate that there will be different levels of comfort, awareness, and knowledge about nature.

How will you serve a diverse audience? (*people with disabilities, minorities, retired, families, etc.*)
Talk clearly and loudly enough to be heard; incorporate activities that address multiple senses; ensure that all props and visuals are large enough to be seen clearly or use a proxy; use a variety of hands-on activities; centralized, easy-to-get-to location
3. **What specific site-based resource(s) will you interpret?**
Grasslands in Schmeeckle – Zimmerman Prairie, Oak openings/savanna – and animals (i.e., insects) and plants adapted to these habitats

Develop the structure and techniques for your program.

1. **List the subthemes of your program** (2-4 “chunks” of the theme). (*Subthemes should be specific & focused, a complete sentence, link tangibles to intangibles, logical*)

A. Grassland plants have adapted to survive the harsh conditions by changing their features both above and below ground.

B. Creatures great and small live in grasslands and help to keep the habitat healthy.

2. Brainstorm creative interpretive techniques you can use (presentation style, props, involvement...)

Primary creative technique will be an exploratory hike set-up (children will be able to guide what the topics are to some extent through serendipity and child-centered explorations; all topics will still be related back to the theme); additional creative techniques will/may include questioning, sensory explorations, metaphors and similes, prairie plant root demonstrations, insect examinations, active observation time, etc.

line the main parts of your program. Be specific. Consider your time to audience engagement.

1. POW (attention-grabbing introduction) [after reviewing previous day's activities]

Do modified "Who fits here" activity from Project WILD on whiteboard/blackboard: drawing of prairie on board, have kids either draw or call out things that might live in the prairie and go until either time (~5 minutes) is up or no new things are contributed. Ask if they think this is everything that lives in the Zimmerman Prairie.

2. BRIDGE (transition from POW to Body: introduce self, establish credibility, state theme, transition to first subtheme)

State theme and Maslow's

3. BODY & TRANSITIONS

A. **Subtheme 1:** Grassland plants have adapted to survive the harsh conditions by changing their features both above and below ground.

- a. **Describe what you will present:** Discuss plant adaptations for grasslands using activities (described below), discuss plant diversity in grasslands (quadrat survey), hint at biological interactions
- b. **Creative techniques you will use:** questioning, sensory experiences, quadrat survey (hula hoop on ground, look at and count different plants in the hula hoop [ID optional], and be prepared to share what you notice), root demonstration using turf and prairie plant/sponges, demonstrate depth of prairie plant roots by having children lie down to show depth of roots, walk around prairie and look at plant diversity (undirected; give a few ideas, but do not tell them what to do)
- c. **Transition:** Grasslands aren't just made of plants though; it takes a lot more interactions and connections to make a healthy grassland. Find a friend and brainstorm three things that might be found in a healthy grassland. Let's discuss that over our snack break, then we'll share out.

B. **Subtheme 2:** Creatures great and small live in grasslands and help to keep the habitat healthy.

- a. **Describe what you will present:** Discuss prairie insects, grassland birds, biological interactions, adaptations of creatures, food chain in the prairie, benefits of animals
- b. **Creative techniques you will use:** questioning, sensory experiences, insect "safari," metaphors and similes, active observations of animals and animal/plant interactions, close-up look at insects using magnifying glasses/digital microscopes
- c. **Transition:** All these adaptations help critters like these survive in the harsh sun of the grasslands and thrive in the treeless areas. Together with the plants, ... (go into conclusion)

4. CONCLUSION (creative and inspiring take-home message)

M. **Summarize your main points:** Restate theme; summarize day's activities

N. **End on a high note! Take-away, memorable, inspirational message:** Next time you look at tall grass, prairie flowers, or a colorful butterfly (or other topical insect), think about the amazing adaptations that they have to live in the grasslands. Tomorrow we're going to change scenery and visit somewhere a whole lot wetter.

O. **Creative techniques used:** Questions, visitor participation

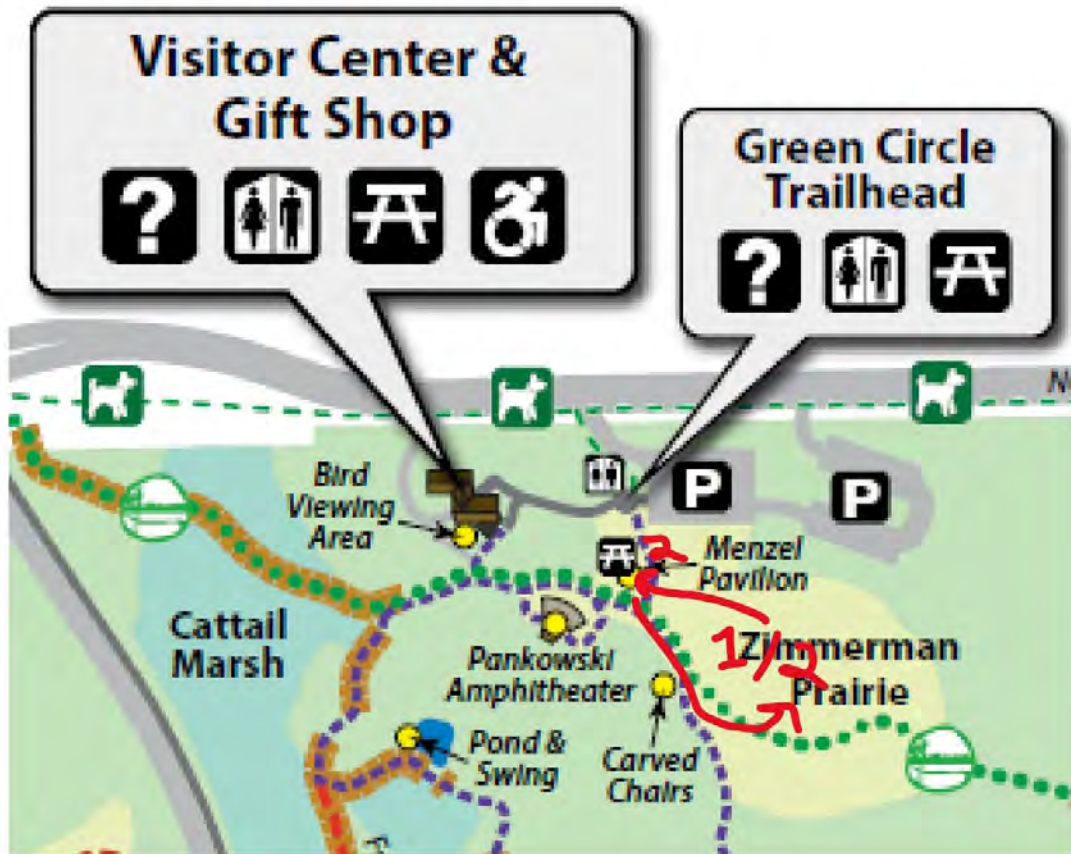
Bad Weather Plan: Describe your backup plan. If you will go indoors, how will you adapt your program? How will you inform your audience? If you schedule a rain date, how will you let your audience know the program cancelled? Given bad weather, the program will be modified and done indoors. Children will explore plant adaptations and diversity using examples and sample plants. Children will explore prairie plant root systems using the sponge demonstration and length printout (other examples of length may also be used), and look at above-ground adaptations like hair using hand lenses/microscopes. Children will explore animal adaptations, especially invertebrates, using sample insects collected earlier in the day by the leaders. Children can look at insects close up using hand lenses/microscopes and identify the insects using simple insect guides; afterwards, they will be asked to share a few things about their favorite/the “coolest” insect they saw.

Reflection: Is it Interpretive? How does it address Tilden’s first four Principles? Be specific. Make revisions as needed.

1. **How are you Relating to the Experience of the Visitors?** First-hand experiences in Schmeeckle; relating to prior experiences
2. **How are you Revealing Meanings Rather Than Just Facts?** Connecting experience to history and evolution of Schmeeckle
3. **How are you Artfully Presenting Interpretation with Creative Techniques?** Hands-on activities; questioning; participant-led experiences
4. **How are you Provoking Thought and Inquiry?** (do you have a “call to action/thought”?) Asking participants to think about how the adaptations of plants and animals help them to survive in harsh conditions.

Research/Citations: List 5-8 resources used for research that are credible, diverse (primary & secondary), and with limited or balanced bias. Use MLA or APA style for references. At least one resource should be locally specific to **Schmeeckle Reserve/central Wisconsin** natural/cultural history.

1. Helzer, C. (2019, September 18). A deep-rooted prairie myth. *The Prairie Ecologist*. <https://prairieecologist.com/2019/09/17/a-deep-rooted-prairie-myth/>
2. Newcomb, L. (1977). *Newcomb’s wildflower guide*. Little, Brown.
3. *Project Wild: K-12 activity guide. activity guide*. (2011). Project WILD.
4. Wisconsin Dept. of Natural Resources. (2015). Dry-mesic Prairie (Global Rank G2G3; State Rank S2). In *Ecological Landscapes of Wisconsin*. essay.
5. Wisconsin Dept. of Natural Resources. (2015). Dry Prairie (Global Rank G3G4; State Rank S3). In *Ecological Landscapes of Wisconsin*. essay.
6. Borror, D.J., & White, R.E. (1970). *A Field Guide to the Insects*. Houghton Mifflin Co Boston.



Interpretive Program Plan Worksheet: Theme Planning & Program Development

Presentation Location: Schmeckle Reserve

Date and Time: 20 VI 2023/18 VII 2023

Program topic, theme, resources, and meanings

1. **Program Topic:** Aquatic Habitats of Lake Joanis
2. **List 2-4 resources used for initial research:**
 - University of Wisconsin-Stevens Point. (2023). *Lake Joanis*. UWSP. https://www3.uwsp.edu/cnr-ap/schmeckle/Pages/visit/lake.aspx#lake_info
 - Hoverman, J. T. & Johnson, P. T.J. (2012) Ponds and Lakes: A Journey Through the Life Aquatic. *Nature Education Knowledge* 3(6):17.
3. **List the tangible resources you will include in your program. (props, things audience can see, smell, feel, hear, taste, information/facts)**
Lake Joanis, the island, animals and plants on Lake Joanis/the island, water, milfoil, ecological communities, sounding lead, canoeing
4. **List the intangible meanings that you will include in your program. (ideas, concepts, emotions, things that audience members can relate to)**
Isolation, protection, beauty, change, restoration
5. **Narrowed Program Theme:** See pages 56-66 in your textbook. The theme is *specific & focused, (not "all about _____"), can be interpreted within timeframe, a complete sentence, link tangibles to intangibles, organizational tool*:
Water creates very different conditions for life, both isolating and connecting places to support unique ecosystems.

Describe how your program will address the Three Pillars of Interpretation.

1. **How will this program meet the goals of your agency or organization?**
Schmeckle Reserve: educate about Wisconsin native resources and interpret the landscape and importance of Schmeckle.
2. **What audience(s) do you expect will attend? (ages, background, interests and expectations)**
Children entering 3rd-6th grades; they will be attending the program as part of an eight-day summer day camp. It is expected that they will enjoy nature to at least some extent, although we anticipate that there will be different levels of comfort, awareness, and knowledge about nature.

How will you serve a diverse audience? (people with disabilities, minorities, retired, families, etc.)
Talk clearly and loudly enough to be heard; incorporate activities that address multiple senses; ensure that all props and visuals are large enough to be seen clearly or use a proxy; use a variety of hands-on activities; centralized, easy-to-get-to location
3. **What specific site-based resource(s) will you interpret?**
Lake Joanis; Moses creek; the island; ecological communities in these places

Develop the structure and techniques for your program.

1. **List the subthemes of your program (2-4 "chunks" of the theme). (Subthemes should be specific & focused, a complete sentence, link tangibles to intangibles, logical)**
A. Different conditions like depth, sunlight, temperature, and substrate create spaces for different organisms to thrive.

B. Lakes, rivers, and other water bodies can create barriers which allow communities to develop relatively free from outside influence.

2. Brainstorm creative interpretive techniques you can use (presentation style, props, involvement...)

Primary creative technique will be an exploratory hike set-up (children will be able to guide what the topics are to some extent through serendipity and child-centered explorations; all topics will still be related back to the theme); additional creative techniques will/may include questioning, sensory explorations, metaphors and similes, boat exploration of aquatic habitats, depth demonstration, habitat demonstrations, measuring trees to determine age, etc.

Outline the main parts of your program. Be specific. Consider your time to audience engagement.

1. POW (attention-grabbing introduction) [after reviewing previous day's activities]

Do some bad water jokes (e.g., What runs, but never walks? How does a river watch its favorite movies? Etc.)

2. BRIDGE (transition from POW to Body: introduce self, establish credibility, state theme, transition to first subtheme)

State theme and Maslow's; transition using another bad joke ("knock, knock; water we waiting for, let's go!")

3. BODY & TRANSITIONS

C. **Subtheme 1:** Lakes, rivers, and other water bodies can create barriers which allow communities to develop relatively free from outside influence.

- a. **Describe what you will present:** Brief safety overview for water, brief boat tutorial, discuss the creation of the island, principle of island biogeography at an appropriate level, the community on the island, animals and plants/evidence of animals/plants, compare and contrast to forests from previous week
- b. **Creative techniques you will use:** questioning, sensory experiences, active unstructured observations, metaphors and similes, tree measurements
- c. **Transition:** Ask children "Are there any other places that you see that might have a different habitat?" If they say yes, ask them to show you where.

D. **Subtheme 2:** Different conditions like depth, sunlight, temperature, and substrate create spaces for different organisms to thrive.

- a. **Describe what you will present:** Discuss the creation of Lake Joanis, habitats on Lake Joanis (e.g., deep water, shallow marsh area by shore, weed beds, ...) and plants/animals that live there
- b. **Creative techniques you will use:** questioning, sensory experiences, unstructured explorations, metaphors and similes, demonstrations (e.g., sounding lead for depth, standing in shallow water, showing plants, ...)
- c. **Transition:** We're going to head back to shore now, and then back to the pavilion. As we do, feel free to talk amongst yourselves about what you all saw and experienced today.

4. CONCLUSION (creative and inspiring take-home message)

P. **Summarize your main points:** Restate theme; summarize day's activities

Q. **End on a high note! Take-away, memorable, inspirational message:** We've seen how water creates different habitats, and there's a lot to learn from the animals and plants that make their homes in these habitats.

R. **Creative techniques used:** Questions, visitor participation

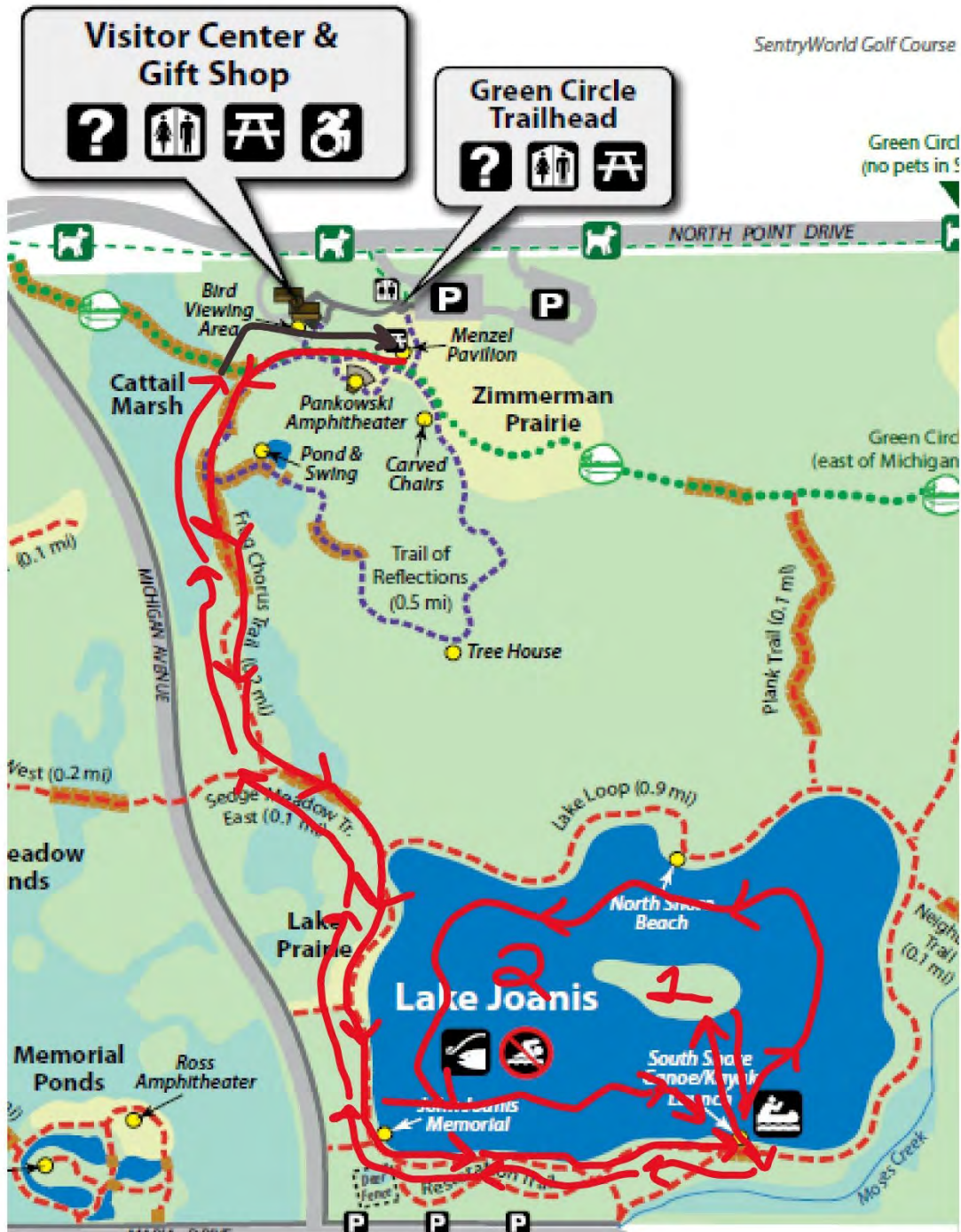
Bad Weather Plan: Describe your backup plan. If you will go indoors, how will you adapt your program? How will you inform your audience? If you schedule a rain date, how will you let your audience know the program cancelled? Given bad weather, the program will be modified and done indoors. Samples of plants and water from different habits will be collected before the program and brought into the visitor center for the children to examine. Each sample

Reflection: Is it *Interpretive*? How does it address Tilden's first four Principles? Be specific. Make revisions as needed.

1. **How are you *Relating to the Experience of the Visitors*?** First-hand experiences in Schmeeckle; relating to prior experiences
2. **How are you *Revealing Meanings Rather Than Just Facts*?** Connecting experience to history and evolution of Schmeeckle
3. **How are you *Artfully Presenting Interpretation with Creative Techniques*?** Hands-on activities; questioning; participant-led experiences
4. **How are you *Provoking Thought and Inquiry*?** (*do you have a "call to action/thought"?*) Asking participants to think about how the water shapes the ecosystems around it.

Research/Citations: List 5-8 resources used for research that are credible, diverse (primary & secondary), and with limited or balanced bias. Use MLA or APA style for references. At least one resource should be locally specific to **Schmeeckle Reserve/central Wisconsin** natural/cultural history.

1. Benton, A.H., & Werner, W.E. (1965). *Manual of Field Biology and Ecology* (5th ed.). Burgess.
2. Freckman, R. (2003). *Vegetation Inventory: Joanis (formerly known as Dreyfus or University) Lake*. UWSP.
3. Lake Partnerships. (n.d.). *Basics of Lake Ecology*. <https://www3.uwsp.edu/cnr-ap/UWEXLakes/Documents/programs/lakeleaders/crew12/Seminar2/VanEgeren-Limno101.pdf>
4. Matthews, T. J., & Triantis, K. (2021). Island biogeography. *Current Biology*, 31(19). <https://doi.org/10.1016/j.cub.2021.07.033>
5. University of Wisconsin-Stevens Point. (n.d.). *Aquatic Invasive Species Quick Guide - Eurasian Watermilfoil (Myriophyllum spicatum L.)* UWSP. <https://www3.uwsp.edu/cnr-ap/UWEXLakes/Documents/programs/CLMN/AISfactsheets/07EurasianWatermilfoil.pdf>



Interpretive Program Plan Worksheet: Theme Planning & Program Development

Presentation Location: Schmeeckle Reserve

Date and Time: 21 VI 2023/19 VII 2023

Program topic, theme, resources, and meanings

1. **Program Topic:** Wetlands
2. **List 2-4 resources used for initial research:**
8. Demchik, M., & Buchholz, J. (2023, May 9). *Schmeeckle restoration and management plan, 5-09-23*. Schmeeckle Reserve. https://www3.uwsp.edu/cnr-ap/schmeeckle/Pages/natural_history/2023_Schmeeckle_management_plan.pdf
9. Luell, S., Nohner, J., Maxwell, E., & Nichols, C. (2020, April 21). The importance of macroinvertebrates in freshwater streams. *Fish Habitat Section of the American Fisheries Society*. <https://habitat.fisheries.org/the-importance-of-macroinvertebrates-in-freshwater-streams/>
3. **List the tangible resources you will include in your program.** (*props, things audience can see, smell, feel, hear, taste, information/facts*)
Wetlands, cattails, sedges, aquatic macroinvertebrates, frogs, animals and plants as they come up
4. **List the intangible meanings that you will include in your program.** (*ideas, concepts, emotions, things that audience members can relate to*)
Community, change, home, history, restorations, death, renewal
5. **Narrowed Program Theme:** See pages 56-66 in your textbook. The theme is *specific & focused, (not "all about ____"), can be interpreted within timeframe, a complete sentence, link tangibles to intangibles, organizational tool*:
The creatures and plants in wetlands tell us a lot about the conditions, community, and health of our water.

Describe how your program will address the Three Pillars of Interpretation.

1. **How will this program meet the goals of your agency or organization?**
Schmeeckle Reserve: educate about Wisconsin native resources and interpret the landscape and importance of Schmeeckle.
2. **What audience(s) do you expect will attend?** (*ages, background, interests and expectations*)
Children entering 3rd-6th grades; they will be attending the program as part of an eight-day summer day camp. It is expected that they will enjoy nature to at least some extent, although we anticipate that there will be different levels of comfort, awareness, and knowledge about nature.

How will you serve a diverse audience? (*people with disabilities, minorities, retired, families, etc.*)
Talk clearly and loudly enough to be heard; incorporate activities that address multiple senses; ensure that all props and visuals are large enough to be seen clearly or use a proxy; use a variety of hands-on activities; centralized, easy-to-get-to location
3. **What specific site-based resource(s) will you interpret?**
Wetlands by Trail of Reflections, wetland plants, wetland animals

Develop the structure and techniques for your program.

1. **List the subthemes of your program** (2-4 "chunks" of the theme). (*Subthemes should be specific & focused, a complete sentence, link tangibles to intangibles, logical*)

A. Wetland plants do a lot of work for free by helping to clean water, stop flooding, and feed wetland creatures (and us!).

B. Aquatic animals like insects are barometers for wetland conditions and knowing what lives in our wetlands tell us about the health of our waterways.

2. Brainstorm creative interpretive techniques you can use (presentation style, props, involvement...)

Primary creative technique will be an exploratory hike set-up (children will be able to guide what the topics are to some extent through serendipity and child-centered explorations; all topics will still be related back to the theme); additional creative techniques will/may include questioning, sensory explorations, metaphors and similes, "Wetland Metaphors" activity, wetland plant "scavenger hunt," pond dipping, water health activity, etc.

Outline the main parts of your program. Be specific. Consider your time to audience engagement.

1. POW (attention-grabbing introduction) [after reviewing previous day's activities]

Wetland metaphors activity – have various items placed out on table and ask what habitat connects to all these items. Suggested items from Aquatic WILD: pillowcase/pillow (resting place), sponge (absorbs water), eggbeater (mixes nutrients), cradle (nursery), strainer (strains debris), filter (filters impurities), antacid (neutralizes toxins), cereal/rice (nutrients), soap (cleans environment)

2. BRIDGE (transition from POW to Body; introduce self, establish credibility, state theme, transition to first subtheme)

State theme and Maslow's; foreshadow functions of wetlands (e.g., "Wetland Metaphors" from Aquatic WILD)

3. BODY & TRANSITIONS

E. **Subtheme 1:** Wetland plants do a lot of work for free by helping to clean water, stop flooding, and feed wetland creatures (and us!).

- a. **Describe what you will present:** Discuss adaptations of wetland plants in general, how wetland plants are useful, individual plants and adaptations/ecological connections as appropriate
- b. **Creative techniques you will use:** questioning, sensory experiences, scavenger hunt (split kids into groups of two or three and have them go out to look for plants that we haven't seen before; when they find one, have them shout it out so we can all go take a look; interpret the plant, then repeat until time is up or no new plants are found)
- c. **Transition:** These plants are important for the functionality of our wetlands, but there are other things that can clue us in to the health of a wetland. What might some of these things be?

F. **Subtheme 2:** Aquatic animals like insects are barometers for wetland conditions and knowing which ones live in our wetlands tell us about the health of our waterways.

- a. **Describe what you will present:** Discuss how aquatic animals survive and why they are important for wetlands, the diversity of life both seen and unseen, demonstrate pond dipping activity, discuss creatures caught, adaptations, and their roles in the ecosystem
- b. **Creative techniques you will use:** Pond dipping, questioning, sensory experiences, metaphors and similes, water health worksheet
- c. **Transition:** We now know a bit about the health of this wetland. As we walk back to the Pavilion/visitor center, I'd like you to brainstorm in small groups some ideas for what might make a wetland more or less healthy. We'll share when we get back.

4. CONCLUSION (creative and inspiring take-home message)

S. **Summarize your main points:** Follow up from transitions; restate theme; summarize day's activities

T. **End on a high note! Take-away, memorable, inspirational message:** We've only got one day left! Tomorrow's going to be full of fun activities.

U. Creative techniques used: Questions, visitor participation

Bad Weather Plan: Describe your backup plan. If you will go indoors, how will you adapt your program? How will you inform your audience? If you schedule a rain date, how will you let your audience know the program cancelled? Given bad weather, the program will be modified and done indoors, likely around the museum area and meeting room.

Reflection: Is it *Interpretive*? How does it address Tilden's first four Principles? Be specific. Make revisions as needed.

1. **How are you *Relating to the Experience of the Visitors*?** First-hand experiences in Schmeckle; relating to prior experiences
2. **How are you *Revealing Meanings Rather Than Just Facts*?** Connecting experience to history and evolution of Schmeckle
3. **How are you *Artfully Presenting Interpretation with Creative Techniques*?** Hands-on activities; questioning; participant-led experiences
4. **How are you *Provoking Thought and Inquiry*?** (*do you have a "call to action/thought"?*) Asking participants to think about what impacts we have on wetland plants and animals, and what they do for us.

Research/Citations: List 5-8 resources used for research that are credible, diverse (primary & secondary), and with limited or balanced bias. Use MLA or APA style for references. At least one resource should be locally specific to **Schmeckle Reserve/central Wisconsin** natural/cultural history.

1. *Aquatic Wild: K-12 activity guide. activity guide.* (2017). Project WILD.
2. Benton, A.H., & Werner, W.E. (1965). *Manual of Field Biology and Ecology* (5th ed.). Burgess.
3. Hausman, L.A. (1950). *Beginner's Guide to Fresh-water Life*. G.P. Putnam's Sons.
4. *Wetlands, Wonderlands*. (n.d.). Wisconsin Coastal Management Program.
5. Wisconsin Dept. of Natural Resources. (2015). Emergent Marsh (Global Rank G4; State Rank S4). In *Ecological Landscapes of Wisconsin*. essay.



Appendix B Informed Consent for Research Participants

Parental Informed Consent Form

Informed Consent to Participate in Human Subjects Research

Dr. Becca Franzen and Griffin Bray, a graduate student at the University of Wisconsin-Stevens Point, are asking for your child(ren) to participate in a study on the effects of interpretive nature programming on children's environmental attitudes. If your child(ren) participate(s) in the study, they will be asked to 1) complete a survey at the beginning and end of the program, 2) allow the researcher to observe their interactions during the program, and 3) allow the researcher to interview your child at the end of the program. The results collected through these methods will be recorded (written down or audio recorded) for research purposes. We are also asking for your participation in the research through completing a short survey on your child(ren)'s experiences in nature and their attitudes towards nature before the start of the program.

The researcher anticipates minimal risk to your child(ren) as a result of your participation in this study. This includes exposure to outdoor elements during programming, engaging in outdoor activities (walking, standing, etc.), and possible mental discomfort due to sharing opinions with the researchers.

Potential benefits from participation in this study include information gained during this programming and the potential for Schmeeckle Reserve to continue this programming at a later date.

Any information we gather from surveys, observations, and/or interviews will be kept anonymous. We will not release information that could identify you or your child.

Your child's participation in this study is completely voluntary. If you want to withdraw them from the study, at any time, you may do so without consequence.

Once the study is completed, you may receive the results of the study. If you would like these results, or if you have any questions in the meantime, please contact:

Dr. Becca Franzen or Griffin Bray
College of Natural Resources
University of Wisconsin – Stevens Point
Stevens Point, WI 54481
Franzen.becca@uwsp.edu or gbray@uwsp.edu

If you have any complaints about your child's treatment as a participant in this study or believe that they have been harmed in some way by their participation, please call or write:

David Barry, PhD
IRB Chair
Associate Professor, Sociology
2100 Main St.
Old Main 208
University of Wisconsin, Stevens Point and Extension
Stevens Point, WI 54481
715.346.3799
irb@uwsp.edu

Although Dr. Barry will ask your name, all complaints are kept in confidence.

I have received a complete explanation of the study, my youth's role in the study, and I agree to allow them to participate I have read and understand the information provided to me; that my child(ren)'s participation is voluntary, and I may withdraw them at any time.

Participant Name

Printed Name and Signature of parent/guardian

Date

Child Assent Script

University of Wisconsin Stevens Point Assent to Participate in Research

Title of Research Study: Effects of thematic interpretive programming on children's environmental attitudes

Principal Investigator: Dr. Becca Franzen

Hi. My name is Griffin. I work here at Schmeckle Reserve and go to school here at the University. I'm trying to learn about what kids like you think and feel about nature, and I would like you to help me by being part of my research study.

A research study is usually done to learn how things work. You are being asked to take part in this research study because you are interested in being outside in programs like this.

You do not have to be in this study if you do not want to. No one will be upset if you don't want to be in the study. It is up to you. You can choose not to take part now and change your mind later if you want. You can ask all the questions you want before you decide.

If it is okay with you and you agree to join this study, you will be asked to take a couple surveys. There are no right or wrong answers on the surveys. I would also like to watch the program as you go through it. I am also hoping to ask you a few questions about your experience in the program at the end of it.

There is nothing bad that will happen to you although you may feel uncomfortable with some of the questions that I will ask. You can skip any questions you do not want to answer and you can stop at any time.

We will try to keep your name and answers secret. When I tell people about my study, I won't use your name. We can't promise complete secrecy though.

If you have questions, concerns, or complaints about the research, talk to the research team at becca.franzen@uwsp.edu or gbray@uwsp.edu. This research has been reviewed and approved by an Institutional Review Board ("IRB"). You may talk to them at (715) 346-3799 or irb@uwsp.edu if your questions or concerns are not being answered by the research team, you want to talk to someone besides the research team, or you have questions about your rights as a research participant.

Optional Elements:

These activities are optional, meaning that you do not have to agree to them to be in the research study. If you are okay with these things, write your initials under "I agree." If you are not, write your initials under "I disagree."

I agree I disagree

The researcher may audio record me to help with data analysis. The researcher will not share these recordings with anyone outside of the immediate study team.

Signature Block for Child Assent

Signature of child

Date

Printed name of child

Printed name of person obtaining assent

Date

Signature of person obtaining assent

Modified Child Assent Script – Approved July 15, 2024**University of Wisconsin Stevens Point
Assent to Participate in Research**

Title of Research Study: Effects of thematic interpretive programming on children’s environmental attitudes

Principal Investigator: Dr. Becca Franzen

Hi. My name is Griffin (or Becca). I work here at Schmeckle Reserve and go to school here at the University (or “I work here at the university”). I’m trying to learn about what kids like you think and feel about nature, and I would like you to help me by being part of my research study.

A research study is usually done to learn how things work. You are being asked to take part in this research study because you are interested in being outside in programs like this.

If it is okay with you and you agree to join this study, you will be asked to take a couple surveys. There are no right or wrong answers on the surveys. I am also hoping to ask you a few questions about your experience in the program at the end of it. To make sure we remember everything you say, we will voice record the interview. You can ask all the questions you want before we start.

There is nothing bad that will happen to you although you may feel uncomfortable with some of the questions that I will ask. You can skip any questions you do not want to answer and you can stop at any time.

We will try to keep your name and answers secret. When I tell people about my study, I won’t use your name. We can’t promise complete secrecy though.

If you have questions, concerns, or complaints about the research, talk to the research team at bfranz@uwsp.edu or gbray@uwsp.edu. This research has been reviewed and approved by an Institutional Review Board (“IRB”). You may talk to them at (715) 346-3799 or irb@uwsp.edu if your questions or concerns are not being answered by the research team, you want to talk to someone besides the research team, or you have questions about your rights as a research participant.

Signature Block for Child Assent

Signature of child

Date

Printed name of child

Printed name of person obtaining assent

Date

Signature of person obtaining assent

Appendix C

Children's Environmental Perceptions Scale (Larson et al., 2011)

Facilitator Instructions:

Read the following statement:

“We want you to think about some things. There are no right or wrong answers. Just be honest about the way you feel. After I read each sentence, you will see five choices: Strongly Disagree (two thumbs down), Disagree (one thumb down), Not Sure (question mark), Agree (one thumb up) and Strongly Agree (two thumbs up). Circle the one that best describes how you feel about each statement. Let's try an example.”

Read the first statement on the questionnaire (“I like ice cream.”) twice, giving 20-30 seconds for participants to respond. Then read the following statement:

“Are there any questions? I'll read one sentence at a time, and you decide how you feel about each one. Raise your hand if you need help.”









































































Read each statement on the questionnaire twice, giving 20-30 seconds for participants to respond to each one.

Analysis:

All items on the survey were used to calculate overall CEPS scores for comparison. Items 2, 4, 6, 9, 10, 12, 14 and 15 were used to calculate eco-affinity scores, and items 3, 5, 7, 8, 11, 13, 16, and 17 were used to calculate eco-awareness scores. Pre- and post-test means for all scores were compared for each session (June and July) as well as for all participants combined using the Wilcoxon signed-ranks test.

My name is _____

I am _____ years old

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
I like ice cream.			?		
I like broccoli.			?		
I like to learn about plants and animals.			?		
Plants and animals are important to people.			?		
I like to read about plants and animals			?		
Plants and animals are easily hurt by people.			?		
I am interested in learning new ways to help protect plants and animals.			?		
People need plants to live.			?		
My life would change if there were no trees.			?		
I would give some of my own money to help save wild plants and animals.			?		
I would spend time after school working to fix problems in nature.			?		
We need to take better care of plants and animals.			?		
I like to spend time in places that have plants and animals.			?		
It makes me sad to see homes built where plants and animals used to be.			?		
I like to learn about nature.			?		
I would help to clean up green areas in my neighborhood.			?		
Nature is easily harmed or hurt by people.			?		
My life would change if there were no plants and animals.			?		

Appendix D

Interview Questions

1. “Tell me about your experience in the summer program.”
2. “Were there any things that you really liked or didn’t like?”
3. “Do you feel like you learned anything new about nature?”
4. “Were there any main ideas that you noticed during the program?”
5. “How do you feel about Schmeckle after the program?”
6. “How do you feel about nature in general after the program?”

When specific examples are given, clarifying questions (e.g., “Could you tell me more about that?”, “What did the naturalists say about that?”, “Can you tell me more about that activity?”) may be asked to gain a deeper understanding of the information.

(Questions 2, 3, 4, and follow up questions adapted from Knapp, 2007)