EFFECTS OF MINDFULNESS INSTRUCTIONS AND MINDFULNESS STRATEGIES ON MINDFULNESS DURING ENVIRONMENTAL INTERPRETATION

A Dissertation

by

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ABSTRACT

A proposed model of mindfulness during environmental interpretation was tested. Mindfulness was proposed to result from a) mindfulness strategies utilized during interpretation, and b) brief mindfulness instructions prior to participation in the interpretation experience. A 2x2 experimental design was utilized. Four hundred fifty (450) participants were randomly assigned to participate in one of two brief mindfulness instruction conditions (Mindful Instructions- Present vs. Mindful Instructions- Absent), and then experience interpretation on one of two websites (Mindful Interpretation- Provided vs. Mindful Interpretation- Not Provided). Proposed outcomes of mindfulness were also tested: immersion, arousal, learning, memorability, meaningfulness, visitor satisfaction, and intention to recommend. Participants completed self-reported measures of mindfulness and its proposed outcomes immediately after visiting the website to which they were randomly assigned. Factorial analysis of covariance revealed a significant effect of mindful interpretation on one of the three dimensions of mindfulness: "noticing new things, sensitive to context." No other significant effects of mindful interpretation or mindful instructions were found. Downstream effects were also tested. Significant, strong (r=.67 to .90) Pearson correlation coefficients confirmed that mindfulness influenced all outcome variables and that those variables in turn influenced the participants' intention to recommend (r=.78 to .85). Interpretation of results suggests a possible reconceptualization of mindfulness, in which engagement is not treated as a dimension of mindfulness, but rather a separate, but related, concept.

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1. INTRODUCTION AND RATIONALE

Impactful interpretation of natural and heritage features is an expectation of both visitors and managers of parks and heritage sites. Interpretation through ranger talks, signage, museums, conversations with interpreters, websites, and displays enriches visitors' experiences. Interpretation helps visitors understand the relevance of the places they visit, and it helps connect the significance of the place to the lives of visitors (Tilden, 1957/2007). Effective interpretation thus yields educated and satisfied visitors. Such visitors leave minimal impacts on the site (Beck & Cable, 2011; Sharpe, 1976), encourage other people to visit the site (Caulton, 1998), and may make positive changes to their lifestyles, attitudes, and values as a result of their interpretation experiences (Beck et al., 2018; Ham, 2013).

Researchers have proposed many techniques and strategies to heighten or improve visitors' interpretation experiences (e.g., Caulton, 1998; Sharpe, 1976; Tilden, 1957/2007). One of these strategies is the introduction of mindfulness into the process of interpretation. Moscardo (1992) first described this approach; she subsequently refined (Moscardo, 1996) and presented it in greater depth. Langer (2000, p. 220) defined mindfulness as "a flexible state of mind in which we are actively engaged in the present, noticing new things and sensitive to context." Techniques thought to facilitate mindfulness include preparatory instructions or meditation (Ramsburg & Youmans, 2014) and using such techniques as novelty, multi-sensory elements, questions, and opportunities for interaction during the interpretation process (Moscardo, 2014). More specifically, Moscardo (1996) proposed that mindfulness results from eight techniques ("setting factors") and three visitor factors: interest, fatigue, and motivation. Her model proposed that mindful interpretation yields greater learning, higher visitor satisfaction, and deeper understanding than "mindless" interpretation strategies, which are more frequently encountered.

Moscardo (2014) emphasized that mindful interpretation may lead to more engaged visitors and greater changes in subsequent visitor behavior. Empirical support for that assertion is lacking; research is thus needed to evaluate the efficacy of mindful interpretation strategies (Kang & Gretzel, 2012). Thus, this study examined the effect of brief preparatory mindfulness instructions and mindfulness strategies during environmental interpretation on mindfulness and its impacts.

1.1. Background

Causes and effects of mindfulness during interpretation have not been studied extensively. Mindfulness research has addressed other topics in parks, recreation, and tourism, such as visitor management (Frauman & Norman 2003, 2004), wildlife tourism (Moscardo et al., 2004), visitor attractions (Moscardo & Ballantyne, 2008), and environmental issues (Chan, 2019; Walker & Moscardo, 2014). Moscardo and Pearce (1986) examined environmental interpretation centers and found a correlation between visitor enjoyment and mindfulness. Moscardo (1996, 1999) proposed that communication (i.e., setting) factors and visitor factors influence visitor mindfulness in heritage and environmental settings. Later research either confirmed or sought to explore these factors in different settings (Ganesan et al., 2014; Noor et al., 2015; Tan et al., 2020; Woods & Moscardo, 2003). Ganesan et al. (2014) explored communication factors in exhibits/displays, guided tours, and printed materials within a heritage tourism context. Noor et al. (2015) further examined these types of communication methods, along with communication factors and mindfulness.

Moscardo (1996, 1999) proposed that the communication factors of multisensory media, novelty, and the use of questions could induce mindfulness among visitors at heritage or

environmental interpretation sites. Studies related to the influence that communication factors had on mindfulness found that printed materials seem to have the greatest influence on mindfulness (Ganesan et al. 2014; Noor et al. 2015). Among Moscardo's (1996, 1999) communication factors, variety, and interactivity/participation (Ganesan et al., 2014), novelty and multisensory content (Noor et al., 2015), and multisensory media and the use of questions (Tan et al., 2020) have been highlighted as interpretive elements that enhance mindfulness in the literature. Noor et al. (2015) found that multi-sensory, novel, or surprising content was favored by study participants. The use of novelty, questions, and multisensory media as elements of mindful interpretation were tested in this study. Existing research also suggests that brief preparatory mindfulness instructions or mindful meditation may be ways to facilitate mindfulness. Ramsburg and Youmans (2014) utilized mindful instructions and mindful meditation techniques and found that such mindful learning experiences were beneficial to participants. Ellis, Lacanienta, et al. (2020) found that mindful instructions during reflection times led to mindful learning experiences among youth travelers. It was thought that mindful instructions along with the strategies suggested by Moscardo (1996, 1999) would facilitate participant mindfulness.

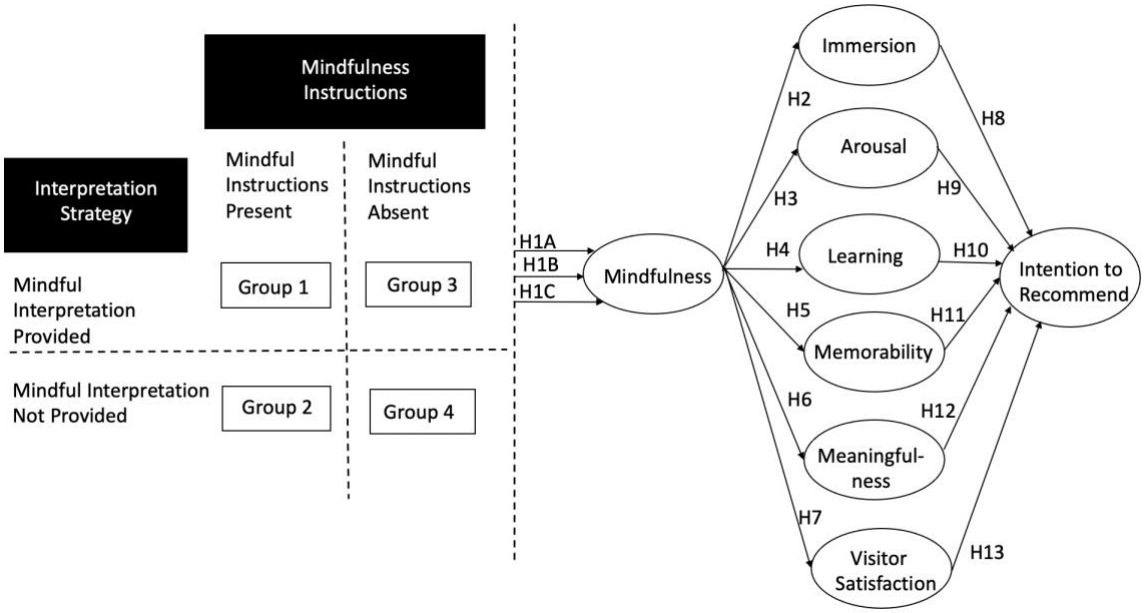
Arguably, the mindful instructions along with Moscardo's strategies may not serve to enhance mindfulness if mindful instructions or the mindful interpretation conditions do now show a significant effect or if the implementation of the different conditions do not significantly differ in terms of participant's level of mindfulness. Thus, the role of mindful instructions and mindful interpretation on participant mindfulness were examined in this study. The mindfulness of visitors not only can be influenced by interpretation techniques but also it can enhance visitors' tourism experiences (Kang & Gretzel, 2012).

Given that mindful experiences are thought to be engaging (Langer, 2014), educational (Carson et al., 2001), increase participant information retention (Ramsburg & Youmans, 2014), can influence customer satisfaction levels (Ndubisi, 2014), can enable learners to derive meaning from experiences (Langer, 1997), and because arousal levels can vary in response to environmental stimuli (Reeve, 2014), variables representing those concepts were included in the study. The variables immersion, arousal, learning, memorability, meaningfulness, and visitor satisfaction were explored in relation to mindfulness. Given the potential long-term impacts for organizations, how those variables influenced intention to recommend were also explored.

Despite the contributions of previous studies, the challenge of facilitating mindfulness through specific interpretation techniques remains in need of further exploration. Definitive solutions to improving the facilitation of mindfulness through interpretation and how mindfulness enhances tourists' experiences remain a research gap in need of further exploration. The purpose of this study was to examine how mindfulness was influenced differently according to mindful instructions and interpretation techniques derived from Moscardo's (1996, 1999) research; the exploration of how mindfulness affected related subjective states during an environmental interpretation experience was also examined (see Figure 1). In order to achieve the purpose of the research study, I selected a well-known national park site, Yellowstone National Park, as the topic for the study. Given that access to the national parks was restricted or limited due to COVID-19, website access to these sites remained an important option for public access to those sites. Given the increase in web accessibility and the greater connectedness of younger users, being able to test interpretation through websites is critical to the future of interpretation for national parks.

Figure 1

Conceptual Framework



2. LITERATURE REVIEW

This chapter provides an integration of literature on mindfulness. Included are a) a description of the various ways mindfulness has been defined, b) mindfulness phenomenology and theory, c) a brief description of mindfulness research in select disciplines, d) tools and strategies for studying mindfulness, e) mindfulness research in heritage and environmental interpretation, and f) research hypotheses for the current study. Scholars have explored mindfulness from many perspectives, but this review focuses on mindfulness as conceptualized by Harvard psychology professor Ellen Langer. Langer is recognized internationally as a leading scholar in mindfulness. She devoted four decades to the study of mindfulness, publishing five books and several dozen academic articles on mindfulness.

2.1. What is Mindfulness?

Langer's first book about mindfulness was published more than thirty years ago (Langer, 1989). In the years following, Langer and other mindfulness researchers have advanced many definitions of mindfulness. Mindfulness has been defined by researchers as a concept, process, and disposition. The scope and nature of these definitions and perspectives is a useful point of departure for our inquiry into mindfulness.

2.1.1. Mindfulness as a Concept

A concept is a mental formulation; concepts have no tangible existence. As such, a formal definition is essential to communicate the precise intended meaning. A formal definition comprises two parts: a genus proximum and a differentia specifica (Zetterberg, 1965). The genus proximum is the larger set of which the phenomenon being defined is a part, and the differentia

specifica are the features that distinguish among members of that set. Zetterberg illustrates the distinction between these two parts of a formal definition by defining the concept, "morale." Morale, Zetterberg explains, is the tendency for a group of people to act together toward a shared goal. The genus proximum in that definition is the tendency to act together. Groups of people may act together for many reasons. A shared goal, the differentia specifica, distinguishes morale from other concepts describing the tendency of people to work together.

Thus, a formal definition of mindfulness requires both a genus proximum and a differentia specifica. A formal definition of the mindfulness concept advanced by Langer is a "flexible state of mind" (genus proximum) in which an individual is "actively engaged in the present, noticing new things and sensitive to context" (differentia specifica) (Langer, 2000, p. 220). Thus, visitors at a heritage site are being mindful when their attention is fully focused on stories being told by interpreters or interpretive materials and they are actively thinking about applications, significance, and relevance of those stories. Langer advocated for teaching facts or skills in a conditional way, allowing for different approaches and types of awareness depending on the situation. In this way, learning in a mindful manner can be characterized as a concept. In a study described in *The Power of Mindful Learning* (Langer, 1997), a lesson for high school students was given so that some students were taught in a conditional (i.e., mindful) way as compared to an unconditional way. Students were asked to recall pictures of drawings. One group was presented the information in a conditional way ("this could be"), the other group in absolute terms ("this is") when the drawings were shown to participants. The mindful group performed better than the unconditional group on questions that required answers to be extrapolated and creatively resolved. Thus, Langer has advocated for students to be taught in a

conditional way. Conditional approaches help to foster creativity through mindful engagement with subject matter.

2.1.2. Mindfulness as Process

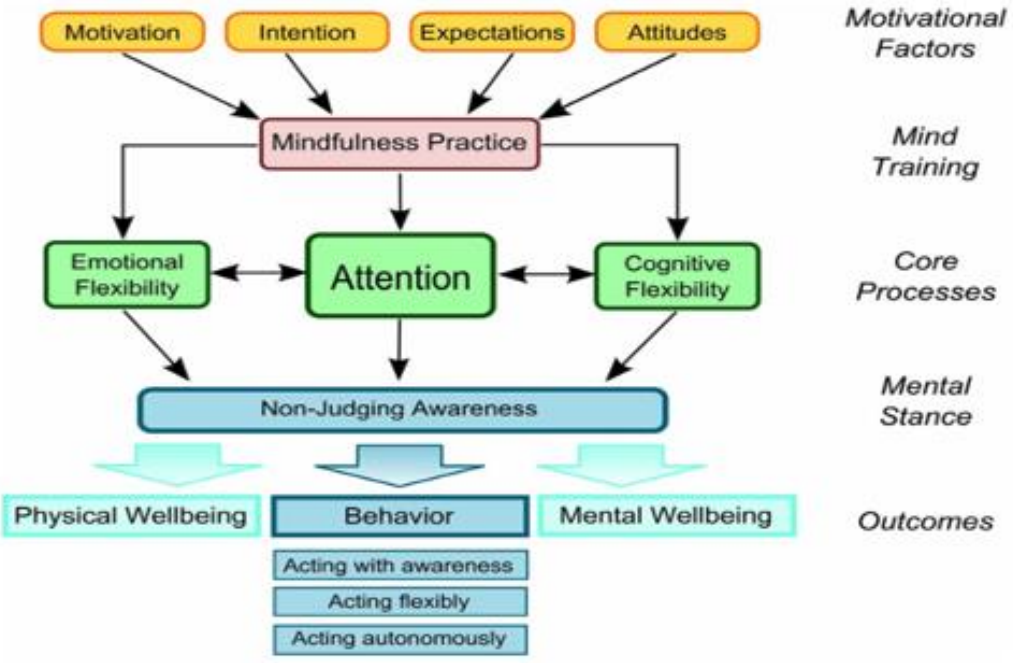
Langer (1989) also described mindfulness as a process. A process is a series of steps and feedback loops leading to a defined outcome. For example, a golfer improves her or his overall score by purchasing optimal golf clubs, picking the right type of golf balls, securing coaching, and then improving the mechanical phases of her or his swing. Mindfulness has been defined as a process (genus proximum) in which novel distinctions are drawn (differentia specifica) (Langer & Moldoveanu, 2000). Langer's use of mindfulness as both process and concept has led to it being viewed both ways by scholars who have applied mindfulness to various professions and disciplines, including parks, recreation, and tourism.

Process models of a dispositional perspective on mindfulness have been conceptualized in the field of neuroscience. An example of a process model that corresponds with Langer's conception of mindfulness is known as The Liverpool Mindfulness Model and is pictured below (Malinowski, 2013, p. 3). In this model, motivational factors (motives, intentions, expectations, and attitudes) influence whether a person engages in mindfulness. As mindfulness takes place, it influences core processes such as attention, cognitive flexibility, and emotional flexibility. The core processes then influence the individual mental stance, and this heightened awareness allows for the outcomes or behaviors that can be characterized as mindful. Given that Langer and Moldoveanu (2000) noted that mindfulness can be understood as a process wherein unique distinctions are drawn, this process model is a useful way to conceptualize mindfulness.

Langer (1997) emphasized that the mindfulness process can be effectively applied to teaching and learning. Application of the mindfulness process expands the mindsets of learners,

Figure 2

The Liverpool Mindfulness Model (Malinowski, 2013)



Note: The Liverpool Mindfulness Model. Reprinted from "Neural mechanisms of attentional control in mindfulness meditation," by P. Malinowski, 2013, *Frontiers in Neuroscience 7*(8), p. 3. Copyright 2013 by P. Malinowski.

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enabling them to gain an appreciation for value uncertainty and the conditional (or context-dependent) nature of much of what is learned. In a study by Alexander et al. (1989), seventy-three people were randomly assigned to the following conditions: a control group with no treatment, a control group focused only on relaxation, a meditation group, and a group that received mindfulness training. The final group attended training sessions where they completed word exercises and creative mental tasks (e.g., thinking of how else common objects could be used, arguing against an established opinion) and all groups received three months of training. The group that received mindfulness training performed significantly better than the other groups on a word fluency test, thereby demonstrating greater cognitive flexibility as compared with the other groups (Alexander et al., 1989). As this study serves to illustrate, the process of being

mindful can be put into practice which can lead to improved cognitive outcomes, and this could be applied in different settings.

2.1.3. Mindfulness as a Disposition

In addition to process and concept, mindfulness has also been defined as a disposition. As a disposition, mindfulness has been described as "the tendency to be mindful in everyday life" (Birrer et al., 2012, p. 235). Utilizing information from the research of Brown and Ryan (2003), a formal definition of dispositional mindfulness could be a process (genus proximum) wherein one cultivates mindfulness principles and behaviors regularly (differentia specifica). Dispositional mindfulness, then, indicates the habit of applying the mindfulness process and concept to stimuli encountered during daily life. Ritchhart and Perkins (2000) studied dispositional mindfulness. Undergraduate students were taught three mathematics lessons, and participants were randomly assigned to groups with further instructions to solve problems in a conditional (i.e., mindful) way, as compared with the unconditional groups. Through the course of this study, the more mindful group was shown to demonstrate greater capacity, creativity, and less mindlessness in their mathematical problem-solving as compared with the other groups.

Scales have been developed to measure dispositional mindfulness (also referred to as trait mindfulness). One notable scale used to measure dispositional mindfulness was designed by Brown and Ryan (2003) and is known as the Mindful Attention Awareness Scale (MAAS). This 15-item measure was designed to distinguish mindfulness in individuals as it can benefit personal psychological well-being. Another noteworthy scale is the Langer Mindfulness Scale (LMS). It was initially designed as a 21-item measure but has since been condensed into a 14-item measure with domains of novelty-seeking (e.g., "I like to investigate things," "I am very curious"), novelty producing (e.g., "I am very creative," "I make many novel contributions"),

Table 1

Key Mindfulness Definitions

Conceptualization of mindfulness	*Definition or key concept*	*Citation*
As concept / state of consciousness	"Mindfulness is a flexible state of mind in which we are actively engaged in the present, noticing new things and sensitive to context."	Langer, 2000, p. 220
Process	"Mindfulness…can be best understood as the process of drawing novel distinctions."	Langer & Moldoveanu, 2000, p. 1
Disposition	Dispositional mindfulness "describes the tendency to be mindful in everyday life."	Birrer et al., 2012, p. 235
Other notable definitions or descriptions	"More formally, mindfulness is defined as an active state of mind characterized by novel distinction-drawing that results in being (1) situated in the present; (2) sensitive to context and perspective; and (3) guided (but not governed) by rules and routines."	Langer, 2014, p. 11
	"The phenomenological experience of mindfulness is the felt experience of engagement."	Langer, 2014, p. 11
	"Mindfulness is a state of conscious awareness in which the individual is implicitly aware of the context and content of information."	Langer, 1992, p. 289
	Major elements of mindful learning: (1) continuously creating new categories, (2) remaining open to new information, and (3) having awareness of multiple perspectives.	Langer, 1989, 1997

and engagement (e.g., “I am rarely aware of changes,” “I avoid thought-provoking conversations”) (Pirson et al., 2018).

The continued practice of mindfulness can lead to dispositional mindfulness, which can be applied in most settings, ideally leading to cognitive benefits for the practitioner.

2.1.4. Mindfulness as concept, process, and disposition (trait)

As this section illustrates, mindfulness has been defined and conceptualized as concept, process, and disposition (see Table 1 above). Mindful learning results from mindful states that occur during the process of instruction or during heritage and environmental interpretation. Langer (1997) identified three major elements of mindful learning: creating new categories, openness to new information, and awareness of different perspectives. In subsequent definitions, Langer and Moldoveanu (2000) noted that mindfulness can be understood as drawing novel distinctions and Langer (2000) highlighted aspects of mental flexibility and present engagement. More recently, mindfulness and mindful learning were defined as “an active state of mind characterized by novel distinction-drawing that results in being (1) situated in the present; (2) sensitive to context and perspective; and (3) guided (but not governed) by rules and routines” (Langer, 2014, p. 11). Although Langer described mindfulness in different ways, one definition must be adopted to proceed with research on the phenomenon. Therefore, for the current study, mindfulness will be defined as follows: “Mindfulness is a flexible state of mind in which we are actively engaged in the present, noticing new things and sensitive to context” (Langer, 2000, p. 220). Thus, mindfulness will be regarded as a concept centered on attentional focus and openness to diverse understanding and application. Langer (1992) noted that an environmental stimulus can be processed in different ways due to the specific context in which an experience is taking

place. This study focuses on mindfulness as immediate conscious experience, in situ mindfulness, with keen attention to its application in heritage and environmental interpretation.

2.2. Mindfulness Phenomenology and Theory

2.2.1. Phenomenology of Mindfulness

The "phenomenological experience of mindfulness is the felt experience of engagement" (Langer, 2014, p. 11). The felt experience of mindfulness has been described in different ways. Langer initially identified three major elements of the experience of mindful learning: (1) continuously creating new categories, (2) remaining open to new information, and (3) having awareness of multiple perspectives (Langer 1989, 1997). In 1997, she expanded the conception of the felt experience of mindfulness to include five elements: alertness to distinction, implicit awareness of multiple perspectives, sensitivity to different contexts, openness to novelty, and orientation in the present. Three components are common to both perspectives: being receptive to change, using skills to guide present behavior, and being aware of details are characteristics of the experience of mindful thinking. Langer also specified the mechanisms giving rise to the felt experience of mindfulness. Noticing or creating novelty draws attention to the subject; thus, concentrating on variability is useful to achieve the five outcomes. Categorizing information and differentiating distinctions are also important. An efficient person can use mindfulness by allocating mental energy and attention well, and like any other skill, mindfulness can be practiced, refined, and utilized with increasing efficiency over time.

2.2.2. Mindfulness Theory

A formal theory comprises sets of assumptions, definitions, and propositions (Chavetz, 1978). In formulating theory, Jaccard and Jacoby (2010) explain, "People place concepts into relationships with other concepts and use these conceptual systems as guides to organizing and explaining the world they experience," (p. 18). Through these relationships and systems of relationships, behavioral science seeks to provide orderly understanding of complex phenomena. Assumptions are statements taken to be true without extensive justification. An example for a behavioral science theory might be as follows: people tend to seek goals that optimize their immediate and future well-being (Chavetz, 1978). Propositions are statements within theories that serve to link concepts and sets of concepts (Jaccard & Jacoby, 2010; Zetterberg, 1965). Links are statements of presumed causes and effects. Behavioral science disciplines establish sets of theoretical propositions and use those as a basis for formulating and testing a form of proposition known as an empirical hypothesis (which Zetterberg referred to as a "common proposition"). In describing the status of theory within his own field of study in the 1960s, Zetterberg (1965) wrote that "there is no doubt that sociology now has a number of lawlike propositions that can be called confirmed or trustworthy" (p. 14). As Zetterberg further described, propositions seek to explain how variates relate in a reasoned statement. Propositions address issues at a level of generality, hypotheses do so by addressing specific circumstances. Zetterberg (1965) defined theory as "systematically organized, lawlike propositions about society that can be supported by evidence" (p. 22). Thus, propositions help to generate theories which can explain issues in the behavioral and social sciences. Jaccard and Jacoby (2010) similarly wrote, "The process of formulating conceptual systems and converting them into symbolic expressions is termed theorization or theory construction" (p. 28). While this

information contains the foundations concerning research in the social and behavioral sciences, defining terms in a succinct and clear manner is also vital to conduct research effectively.

Zetterberg (1965) distinguished among four common types of definitions. Ostensive definitions communicate what is meant by providing an exemplar. “A ruthless dictator,” for example, might be defined as “someone like Adolf Hitler.” Enumerative definitions communicate intended meanings through listing of examples. An enumerative definition of mindfulness might be, “mindfulness is what you are thinking and feeling when you are watching a movie you enjoy, learning something new, or deeply engaged in a focused conversation.” Truth-asserting definitions assert cause-and-effect, utilizing empirically related notions to generate a definition. A truth-asserting definition of interest might be, “the state of consciousness that results from novelty, complexity, and incongruity.” All of these approaches to definition lack sufficient precision to serve adequately as a basis for theory development. Zetterberg thus emphasized the importance of constructing Aristotelian (formal) definitions, which establish a genus proximum and differentia specifica. Defining phenomena this way provides information that the attribute shares in common with a larger class (genus proximum) as well as providing information concerning what sets the defined category apart from the larger class (differentia specifica). Although formal definitions do not provide perfect communication of intended meaning (Zetterberg, 1965), they are an effective way of constructing definitions in behavioral science theory. An Aristotelian definition of mindfulness is, “a flexible state of mind [genus proximum] in which we are actively engaged in the present, noticing new things and sensitive to context [differentia specifica]” (Langer, p. 220).

Langer (1989, 1997) has articulated a theory that has become well established and examined in numerous academic and scholarly settings. In this section, theory characterization,

definition, and classification are examined in relation to mindfulness. "A theory is a set of statements about the relationships between two or more concepts or constructs" (Jaccard & Jacoby, 2010, p. 28). It is essential that all the concepts within those statements (propositions) have formal definitions. In her early work, Langer (1989) noted that a mindful state yields consciousness concerning informational content and context. In 1992 she defined mindfulness as "a state of conscious awareness in which the individual is implicitly aware of the context and content of information" (p. 289). Within this statement, context and content are "differentia specifica" (Zetterberg, 1965); they distinguish mindfulness from other states of conscious awareness. As a brief example, when teaching a topic or subject, variation in teaching method could induce (or fail to induce) a mindful way of thinking among the students who are learning. Consequently, the student can then engage the material in a state of consciousness with present moment engagement and sensitivity, known simply as a mindful way of engaging the situation.

Having described an Aristotelian definition of mindfulness within this theory, one can examine the causes (determinants) and effects (results) of mindfulness. When content and context are noticed in the present, the presumed causes would take place. The heightened state of awareness of content and context that characterizes mindfulness would then lead to the results.

Determinants (Causes)

- Conditional instruction or presentation of information (e.g., presenting a theoretical model in qualified as opposed to absolute terms, introducing objects as this "could be" instead of "this is") has been found to induce mindfulness (Langer, 1989).
- Variation or varied instruction can serve to stimulate mindfulness (Langer, 1997, 2014).
- Creating novelty can induce mindfulness by helping to draw attention to the subject (Langer, 1997, 2014).

- Mindful instructions prior to presentation of context increases mindfulness (Ramsburg & Youmans, 2014).

Results (Effects)

- Increased retention of knowledge or information (Ramsburg & Youmans, 2014).
- Enables people to be sensitive to their surrounding environment, encouraging clarity of thought and action (Demick, 2000).
- Openness to alternative perspectives, categories, or possibilities (Carson & Langer, 2006; Ritchhart & Perkins, 2000).
- Allows for novel distinctions to be drawn in the present moment (Langer, 2014; Langer & Moldoveanu, 2000).

Based on this previous research, the following propositions related to mindfulness theory could be considered:

- Mindfulness increases with use of conditional instruction or interpretation.
- Variation in content and method increases mindfulness.
- Novelty in instruction increases mindfulness.
- Mindful instructions prior to teaching or interpretation increases mindfulness.
- As mindfulness increases, retention of knowledge increases.
- As mindfulness increases, sensitivity to surroundings increases.
- As mindfulness increases, openness to different viewpoints increases.
- As mindfulness increases, ability to draw new distinctions increases.

Propositions of this theory could be categorized according to the system devised by Zetterberg (1965). In his classification system, propositions can be as follows: reversible or

irreversible, deterministic or stochastic, sequential or coextensive, sufficient or contingent, and necessary or substitutable. The causes and effects of Mindfulness theory could be explained via the following categorizations: irreversible, stochastic, coextensive, sufficient, and substitutable. Irreversible informs us that the relationship between determinants and results cannot be reversed. Mindfulness results from novelty in instruction and content, but novelty in instruction and content does not result from mindfulness. Stochastic means relations are presumed to be imperfect, and coextensive means that causes would lead immediately to the effects stated in the propositions. Sufficient means that no moderating or interacting effects are present and substitutable establishes that other elements can affect mindfulness.

2.2.3. Related Concepts and Processes

The use of advance organizers, the Suggestive Accelerative Learning and Teaching method, and the more recent use of "preflection" prior to learning all have some commonalities with mindfulness. These are discussed in this section about related concepts and processes.

2.2.3.1. Advance Organizer

In the 1960s, David Ausubel proposed a theory of meaningful learning. In support of this notion, advance organizers were proposed as a useful tool that can benefit students learning new content. While critics of this approach to learning argued that this concept was too vague, Ausubel noted that advance organizers depended on the kind of learning material, age of the student, and the student's level of understanding with the learning material (Ausubel, 1978). Advance organizers were defined as introductory material that could serve as an overview of the major ideas in a learning passage; they do not necessarily have to be at a higher level of abstraction, generality, or inclusiveness for the student (Ausubel, 1978). They can convey a higher level of learning by omitting details and allowing students to connect past knowledge with

their current lesson. Over time, the use of advance organizers stood up well to empirical scrutiny. A meta-analysis of 135 studies demonstrated that advance organizers were shown to increase learning across grade level, subject area, and format of presentation (Luiten et al., 1980). Advance organizers were thought to help students learn, retain, and organize new information and in another meta-analysis of advance organizer studies, Stone (1983) found that advance organizers have a small although significant function in learning facilitation.

Mindfulness and advance organizers can both be used prior to learning and serve to enable a student or learner to mentally prepare for encountering new material. Both seek to enable learners to enter new learning processes with a beneficial mindset, and both aim to allow learners to remember information after it has been taught. Exercises concerning mental relaxation, or the conditional presentation of new learning material are ways that mindfulness could benefit learners. In a description of advance organizer studies, Cannon-Bowers et al. (1998) noted that advance organizers can help to structure material and can promote knowledge organization and integration, especially with more complex material.

2.2.3.2. The SALT Method

As cited in Schuster et al. (1976), research conducted by Bulgarian academic George Lozanov in the 1970s was deemed to have provided a useful technique for education which was particularly effective for language learning. Perhaps the best known of Lozanov's learning methods is Suggestive Accelerative Learning and Teaching (SALT). This is a method of instruction that utilized physical and mental relaxation exercises, pleasant learning recall, and thereafter sought to introduce new material (Bancroft, 1978). A detailed itinerary for applying the SALT method would follow these steps: physical relaxation, mind calming, recall of early pleasant learning, review, active learning, passive learning, and practice (Schuster et al., 1976).

Within such an itinerary, specific techniques are utilized with some of them being suggestion, use of music, visualization, synchronized breathing, and dramatic enactment (Dipamo & Job, 1991).

Mindfulness shares several similarities with the SALT method, as both relate to learning and ability to recall subject matter. Those seeking to be mindful could benefit from relaxation exercises, entering a calm mindset, or utilizing different learning techniques to view information from a conditional perspective. Dipamo and Job (1991) conducted a methodological review of studies that utilized SALT techniques. Their review indicated that study duration, instructor experience, and participant anxiety levels were all influential to the outcomes of the studies they reviewed. However, the authors noted that many studies lacked control groups or did not use random subject allocation. Among ten studies which were deemed to be sound methodologically, half showed that the experimental group outperformed the control group, but the other half showed no significant difference. These limitations were criticized by the authors, but they noted that SALT techniques have the potential to help learners.

2.2.3.3. Preflection

Another approach to learning and experiences which has some common ground with mindfulness is the notion of "preflection." Preflection is an approach to augment or improve the normal process of reflection and takes place before a learning experience. It is focused on forthcoming thoughts and serves to influence cognitive and motivational processes which can be positive for future outcomes (Ifenthaler & Lehmann, 2012). Completing preflection prior to an experience is not a new idea and has been examined in some studies over the years. This concept was described by van Manen (1991) who discussed the association concerning reflection and action. He noted that there is a distinction in reflection itself depending upon if it occurs before

or after an action takes place. Reflection before an occurrence is known as anticipatory reflection (i.e., preflection), and enables a person to consider possible alternatives, plan, and contemplate possible outcomes. Ifenthaler and Lehmann (2012) studied pre-actional self-regulation and how it related to learning and solving problems. The authors noted that preflection serves as an important component of the process of self-regulation prior to action being taken. This study found that self-regulation prior to encountering a scenario that involved a problem in need of resolution resulted in improved outcomes among participants who engaged in self-regulation (as measured by an assessment scale).

2.2.3.4. Transformational Teaching: Preflection and Reflection

Slavich and Zimbardo (2012) described the principles and methods of an approach to instruction known as transformational teaching. The promotion of preflection and reflection was considered an important element of the application of transformational teaching. Noting that preflection is not used as much as reflection in teaching, the authors referred to the importance preflection has in allowing students to obtain further insight into their own viewpoints, abilities, and attitudes. The examination of personal thoughts is a core element of transformational teaching as it can enhance student attainment of key skills and strategies and can be paired with experiential lessons.

Lehmann et al. (2014) examined the concept of self-regulation in online learning environments. The authors stated that preflective prompts can help to encourage students to activate positive motivation and self-awareness, thereby benefiting learners. This study found that preflective prompts with specific instructions about learning activities were the most helpful for novice learners. Brand et al. (2016) examined preflection among medical students who were going to be assigned to work with older adults. Preflection was utilized as part of reflective

learning sessions which were held with second year medical students. Findings illustrated the importance of preflection in a developmental process. Findings also affirmed the importance of reflective learning as it pertained to medical students preparing to work with an elderly population.

2.2.3.5. Synthesis

Some similarities exist between mindfulness, advance organizers, Lozanov's Suggestive Accelerative Learning and Teaching, and preflection. Advance organizers and mindfulness both seek to introduce learners to new material by cultivating learning mindsets and enabling learners to draw from prior knowledge or experiences. Both have held up rather well to empirical scrutiny over time. Both Lozanov's SALT technique and mindfulness encourage relaxation, calming the mind, and embracing different learning strategies. Both emerged in roughly the same period during the 1970s. However, mindfulness has been subjected to more rigorous academic scholarship and has become more widely recognized due to its applicability to various fields. Preflection and mindfulness serve to help individuals better consider outcomes and plan by enabling for mental exploration of various outcomes. Both can enable an improved understanding of one's abilities and attitudes while activating greater self-awareness and improving motivation. They can also be applied to various learning processes and thereby improve a learner's ability to understand new material. By way of comparison, mindfulness has been studied in more settings over a longer period than has preflection. Although preflection remains a useful tool and could be more vigorously studied, it has been shown to be useful in the studies described previously. Mindfulness has been studied over time and in various fields; the ensuing section briefly examines how mindfulness has been explored in the fields of health, psychology, education, business, and recreation.

2.3. Mindfulness Research and Applications in Select Disciplines

2.3.1. Mindfulness and Health

Early research on mindfulness focused on health consequences. Issues of aging and social control were early key topics of interest. Geer et al. (1970) conducted a study about perceived control and how it influences stress levels. Langer et al. (1975) examined the effectiveness of stress-reducing strategies in a hospital setting. Two strategies to cope with pre-operative and post-operative stress were tested in this study: a strategy that emphasized the cognitive control that patients have (coping strategy) and a strategy that provided information and reassurance without coping suggestions. The results from the post-operative behavioral measures confirmed the hypothesis. Patients exposed to the coping strategy spent less time in the hospital and reported less stress. The coping strategy in this study emphasized the perception of control through cognitive reappraisal of events that could provoke anxiety, as well as the use of selective attention which allowed for stress reduction through addressing anxiety and ability to cope with discomfort. Another study from the same year (Langer, 1975) explored the illusion of control or the expectation that a person's success would be greater than objectively justified.

Langer and Rodin (1976) examined the impacts of choice and personal responsibility in the aged population. That study revealed that in an elderly population, those given a sense of responsibility had greater involvement and participation. Rodin and Langer (1977) conducted a follow-up study on the same population eighteen months later and these studies found that supporting decision-making among the nursing home residents (e.g., taking care of a plant) led to greater activity levels, alertness, happiness, and health among those individuals. Alexander et al.

(1989), studied mindfulness in a population of people who were elderly. The mindful group in the study completed creative mental tasks and word exercises in the training sessions that they attended for three months. The researchers found that the mindful group was able to demonstrate improved cognitive flexibility compared with other groups in this study.

Levy et al. (2001) conducted research about mindfulness and aging. Participants were senior citizens. Each participant was assigned to an attention intervention group and was subsequently asked to recall information after viewing several pictures. Findings indicated that participants who viewed the pictures in terms of novel distinctions (i.e., mindfully) were able to recall more pictures as compared with the other groups. Research about mindfulness in the field of education has led to similar findings about the usefulness of attention variation (Armstrong, 2019; Langer, 1997; Mendelson et al., 2010).

Crum and Langer (2007) studied the connection between mind-set, exercise, and the placebo effect. Participants were female hotel employees whose work involved cleaning hotel rooms. One group was informed that the work they do is good exercise and helps them to lead a healthy lifestyle. Four weeks after being informed of this, measures were taken of the experimental and control groups, and it was found that the informed group had developed a mindset that their exercise at work improved their health outcomes via the placebo effect. Zilcha-Mano and Langer (2016) examined mindfulness in the context of pregnancy outcomes. The study aimed to see if there were beneficial outcomes from mindfulness training during a pregnancy. There were two control groups and a mindful group in the study. Findings suggested that mindfulness may augment the experience of pregnancy by allowing for improved ability to manage negative affect and distress, and by serving to benefit the transition into being a parent.

In summarizing mindfulness research, Langer (2000) noted that increased health and longevity have been seen as a result of mindfulness. In the literature there have been other health related explorations of mindfulness such as Malinowski (2013) who examined mindfulness in the context of neuroscience. Given that the aim of this section was to provide a brief overview of such research as it pertains to Langer's notion of mindfulness, I note that there are other studies—particularly in the field of health—that have addressed the issue of mindfulness. But as these studies have illustrated, mindfulness as defined by Langer can lead to a variety of positive outcomes.

2.3.2. Mindfulness and Psychology

Early mindfulness studies in psychology sought to distinguish the basic features of mindfulness and mindlessness. Langer and Rodin (1976) studied choice in an elderly population. In this study, one group of participants was told about their responsibility for themselves and given a plant to care for. This group which was given a greater sense of responsibility was determined to have greater levels of involvement and active participation. A follow up study on the participants was conducted eighteen months later. Rodin and Langer (1977) found that participants in the study who were in the responsibility condition had a significantly lower mortality rate than those in the comparison group. Langer et al. (1978) examined social behavior and conscious attention. The authors found that communications that did not involve an effortful reply or was not novel often yielded a mindless response. Langer et al. (1979) explored the environmental determinants of memory; they found that engaging in cognitive action served to improve short-term memory and led to improved alertness. Chanowitz and Langer (1981) studied premature cognitive commitments and found that the original context of information

exposure served to limit how it could be used afterwards. These early studies established that benefits to psychological well-being derive from what is now regarded as mindfulness.

The issue of premature cognitive commitments was also the subject of a later study. Langer et al. (1988) studied the association that past cognitive commitment concerning old age had with a person's own aging. Participants who had lived at a younger age with a grandparent had a more youthful perspective of old age. Those participants were deemed by independent judges to have greater alertness and independence and to be more active.

Glomb et al. (2011) wrote a chapter about mindfulness at work. In their review of literature, they indicated that prior studies demonstrated an association between mindfulness treatment, mindful meditation, and improvements in physical health. Mindfulness based practices have been linked with reduced symptoms of psychological and mental conditions. Mindfulness has been deemed to be beneficial to healthy people and those with physical or psychological challenges. De Vibe et al. (2013) examined mindfulness training to manage stress by randomly assigning psychology students to intervention and control groups. The students subjected to a program based upon mindfulness to reduce stress were shown to have a moderate improvement in mental distress and a small improvement in subjective well-being.

In reviewing research about mindfulness, Hart et al. (2013) noted that the interventions in Langer's research have been intended to increase well-being and cognitive performance. This is done largely through emphasizing a person's ability to become more aware of various external stimuli. Much of Langer's research has focused on brief interventions that are instructional, have a short-term focus, seek to initiate self-regulation, or seek to induce a state of mindfulness.

2.3.3. Mindfulness and Education

Mindfulness has been studied extensively in the context of education. In *The Power of Mindful Learning*, Lieberman and Langer (1997) studied mindful manipulations in the context of education. A mindful group of students was asked to make material more significant for themselves, while other groups of students were merely asked to memorize information. The mindful group demonstrated improved information retention as well as greater creativity in how they utilized the information in essays. The authors of this study noted that adding perspective can serve to enhance performance.

Langer et al. (1989) explored the role of uncertainty in education. Their study focused on the issue of how information is originally presented, seeking to see if the subsequent use of that information transpires in a mindful or mindless way. Their experiments revealed that instruction in absolute terms led to mindless use of information and that conditional instruction tends to lead to greater creativity in how the information is processed.

Carson et al. (2001) examined the issue of stimuli and learning. The researchers tested if movement during learning influenced information recall. It was thought that movement would help participants to focus on different types of stimuli, thus enabling them to remember more information viewed on a map. One group from this study did show this effect, which would seem to reinforce reasoning from mindfulness theory that variation in the learning process can help learners to be more mindful and recall more information.

Zenner et al. (2014) examined prior research about mindful based interventions in schools and found that such interventions led to improved cognitive performance and reduced stress, even among adolescents with behavioral disorders. Their study demonstrated that mindfulness could serve to regulate attention and emotions, elevate focus, and increase the cognitive capacity of learners in schools.

Some important findings from these studies are that variation in stimuli can serve to improve attention and that mindfulness can assist in task completion and memorization. Providing students with the ability to consider different perspectives or to understand why events can be meaningful are helpful strategies to enable learners to understand information better. These mindful strategies have been shown to be useful in the field of education.

2.3.4. Mindfulness and Business

Mindfulness has recently become the focus of increased research in business. A brief overview of studies about mindfulness in business examines some applications of mindfulness to this field of study.

Ray et al. (2011) examined mindfulness in the context of business schools, finding empirical support for previously proposed dimensions of organizational mindfulness. The authors concluded that following mindfulness practices can be beneficial to business schools as it can contribute to improved organization and situational awareness. Sauer and Kohls (2011) investigated the issue of mindfulness and success in business leadership. Many leadership roles and responsibilities exist in the business world today; thus, it is important for leaders to understand how they can improve in fulfilling their various roles. The authors theorized that mindfulness could serve to help leaders improve in the following roles: informational roles, interpersonal roles, decision roles, and morally just roles. They also advocated for the use of mindfulness to enable leaders to be more effective in dealing with different situations and because it can sharpen the mind to better accomplish the different roles that leaders fulfill.

Lampe and Engleman-Lampe (2012) examined business ethics education and how mindfulness can be used to improve business education. Mindfulness can serve to increase the consciousness of business students to improve their ability to understand cognitive processes of

self-deception (which contribute to unethical behavior) and can improve self-examination and awareness of ethics. Noting that mindfulness helps to improve cognitive flexibility and emotional regulation, the authors advocated for the inclusion of mindfulness training in business ethics education, believing that it can lead to improved outcomes in the field of business.

Hülshegar et al. (2013) examined mindfulness in terms of job satisfaction and emotional exhaustion. Participants who were in a mindful intervention group experienced more job satisfaction and less emotional fatigue than their counterparts in a control group. Mindfulness was more strongly associated with emotional regulation, a finding particularly relevant to organizations that have more demanding positions for employees. Congleton et al. (2015) described how mindfulness influences the brain and how this can be beneficial for businesses. The authors noted that mindfulness can improve self-regulation and resilience. Better incorporation of mindfulness into businesses can contribute to more effective decision making in business organizations while also helping to protect employees from stress.

As these studies have shown, researchers have approached mindfulness more recently from the perspective of how mindfulness can be a positive influence on organizations. Good et al. (2016) completed an integrative review of research about mindfulness in the workplace. Mindfulness is associated with improved attention, cognitive function, and emotional control—all of which can be beneficial in the workplace. By extension, this can have a positive impact on workplace performance, employee well-being, and relationships within a workplace. Future research would be expected to expand on some of these findings and continue to develop understanding of how mindfulness can benefit business entities.

2.3.5. Mindfulness in Sport and Recreation

Gardner and Moore (2012) reviewed the literature about mindfulness interventions and athletic performance. The focus of mindfulness and acceptance-based models has been to enhance athletic performance. Findings suggest that optimal performance requires nonjudgmental internal awareness and attention focused on task-relevant external stimuli. Prior research has found that mindfulness meditation can alter brain function and that this skill can be used to achieve and maintain an improved attentional state. This greater mental awareness can lead to increased efficiency and awareness of internal experiences. This can be important for athletes to develop and maintain as they seek to achieve optimal performance. The systematic practice of mindfulness can facilitate the achievement and continuation of high-performance levels for athletes.

Anderson and Heyne (2013) described an approach to assessment in therapeutic recreation that was designed to focus on individual strengths. Noting the importance of mindfulness to the cognitive domain of well-being, the authors advocated for the use of mindfulness to measure the impact of interventions in leisure settings. This conceptual paper noted that in prior research mindfulness contributed to well-being.

Wolsko and Lindberg (2013) examined psychological well-being and a personal experience of connection with nature. Relationships among nature connection, psychological well-being, outdoor recreation, and mindfulness were examined through survey data. Higher scores concerning connection with nature were associated with greater mindfulness, outdoor activity participation, and aspects of psychological well-being. Participants who engaged in more appreciative outdoor activities were more likely to express positive emotions and mindfulness. The authors expressed that such a connection should enhance mental health. They also

mentioned that future research should explore in greater detail the relationship between mindfulness and mental health.

2.4. Tools and Strategies for Studying Mindfulness

Mindfulness has been studied in many disciplines and contexts over the years. This has led to the formulation of many tools and strategies for studying mindfulness. Mindfulness measures have taken various forms and so has the manipulation or use of mindfulness determinants during research experiments and studies. These two issues are examined in this section.

2.4.1. Measuring Mindfulness as a State of Consciousness

Measuring mindfulness as a state of consciousness emerged as an issue of study in the 1990s. The mindfulness measure put forth by Moscardo (1992) sought to measure mindfulness in given situations. In the field of parks, recreation, and tourism, this measure of mindfulness has become particularly notable given that it was a measure of mindfulness specific to this field of study. Thus, subsequent research has been conducted using the same type of measurement of mindfulness at various sites such as museums, parks, and festivals (Frauman & Norman, 2003, 2004; Ganesan et al., 2014; Taylor & Norman, 2019; Van Winkle & Backman, 2008). The Moscardo measure of mindfulness will be explored, and the studies that used this measure of mindfulness will be discussed further.

Moscardo (1992) devised a measure of mindfulness on-site for exploration of mindfulness in tourism. Her research setting was museums. She used a 7-item measure of mindfulness using a 4-point response scale (ranging from not at all true to very true). She

classified visitors as being mindful or mindless based on their responses. The mindful group had a greater likelihood of having educational purpose when visiting a museum as compared to their mindless counterparts. Based on her mindfulness model, she examined in this specific study how setting factors (e.g., exhibits and displays) influenced the mindfulness of visitors. Results supported her hypothesis that setting factors and visitor factors can induce mindfulness, leading to more learning, higher satisfaction, and greater understanding. Her Mindfulness Model was presented in further detail in a later publication (Moscardo, 1996). Moscardo (1992) reported the distributions of the responses to the questions measuring mindfulness in her study; Table 2 (below) summarizes participants' responses (p. 242). Although Moscardo did not report a

Table 2

Frequency Distributions of Mindfulness Responses (Moscardo, 1992)

	Levels of Agreement			
Statement	Very True	Moderately True	Somewhat True	Not at all True
	n (%)	n (%)	n (%)	n (%)
1. My curiosity is aroused	117 (42.7)	57 (20.9)	56 (20.2)	45 (16.2)
2. I feel like searching for answers	114 (41.3)	55 (19.8)	53 (19.5)	53 (19.5)
3. I want to explore possibilities	117 (42.7)	53 (19.5)	55 (19.8)	50 (18.0)
4. My interest has been captured	110 (39.8)	52 (19.1)	61 (22.0)	52 (19.1)
5. I feel involved in what I am doing	115 (41.8)	62 (22.7)	50 (18.0)	48 (17.3)
6. I want to enquire further	116 (42.0)	55 (19.8)	53 (19.5)	51 (18.4)
7. I feel in control of what I am doing	139 (50.7)	45 (16.2)	41 (15.1)	50 (18.0)

Note: Reprinted from *A mindfulness/mindlessness model of the museum visitor experience* (Unpublished doctoral dissertation), James Cook University, by G. Moscardo, p. 242. Copyright 1992 by G. Moscardo.

measure of internal consistency (reliability coefficient), there were high positive correlations among statements. More information about this measure can be found in the "Methods" chapter.

Moscardo's (1992) examination of mindfulness on-site at a tourism setting introduced the concept to the field of parks, recreation, and tourism as she was concerned with heritage tourism. Her mindfulness measure has been modified and used by other researchers in the field to explore different contexts. Frauman and Norman (2003, 2004) noted that the items devised by Moscardo were established to capture specific elements of mindfulness and that her results had revealed positive inter-item correlations, resulting in a unidimensional scale. They modified this measure of mindfulness for their studies at state parks and based their scale upon Moscardo's mindfulness measure. Frauman and Norman (2003, 2004) also modified questions from the same mindfulness measure. They initially used a 7-item measure of mindfulness (as Moscardo had done) but used a 7-point response scale to create a Likert-type scale instead. Their purified scale comprised six items to measure mindfulness on-site. The scale produced a Cronbach's alpha of 0.91. The statements used by Frauman and Norman (2003) in their study are shown in Table 3 below (p. 96). The modified measure provided by Frauman and Norman (2003, 2004) was used in two other parks, recreation, and tourism studies more recently. Ganesan et al. (2014) utilized mindfulness by slightly modifying the measure used by Frauman and Norman (2004). The questions measuring mindfulness in Ganesan et al.'s (2014) study were the same questions from Moscardo's (1992) study, but they were reworded to more closely align with the research study. The researchers indicated that the scale was internally consistent with a Cronbach's alpha of 0.799. Consequently, all six mindfulness statements were retained. Taylor and Norman (2019) used five of the six statements to measure mindfulness during the anticipation phase of travel.

Table 3

Mindfulness On-Site, Final Factor Analysis (Frauman & Norman, 2003)

Factor Name	Scale item	Factor Loading	Alpha Reliability Coefficient
Mindfulness On-Site			.91
	have my interest captured	.869	
	search for answers to questions I may have	.850	
	have my curiosity aroused	.844	
	inquire further about things in the park	.825	
	explore and discover new things	.824	
	feel involved in what is going on around me	.821	
Eigenvalue	4.2		
Total percent of variance explained:	70.4%		

Note: Each of the statements was evaluated on a 7 –point Likert-type scale (1= "strongly disagree" to 7= "strongly agree") and preceded by the following, "When at state parks I like to _____" The omitted item was, "feel in control of what is going on around me."

Note: Reprinted from "Managing visitors via 'mindful' information services: One approach in addressing sustainability," by E. Frauman and W. C. Norman, 2003, *Journal of Park & Recreation Administration, 21*(4), p. 96. Copyright 2003 by Sagamore Publishing LLC.

Two other notable studies in parks, recreation, and tourism were influenced by Moscardo's (1992) measure and the subsequent research by Frauman and Norman (2003, 2004). Van Winkle and Backman (2008) used Moscardo's (1992) scale, initially using the 7-item Likert-type measure along with the 7-point response approach. The same modified measure had been used before and was used this time in a study about visitor mindfulness at a festival. The purified scale was comprised of six items to measure mindfulness on-site due to the removal of a

different item ("I explored and discovered new things") and reliability testing revealed a Cronbach's alpha value of 0.70 after the item was removed. This research study found that interest in content along with educational motive influenced mindfulness. These scholars suggested that future research address dimensions of mindfulness given that they removed a different item from the mindfulness scale as compared with Frauman and Norman (2003, 2004). Van Winkle and Backman (2008) noted that a scale developed by Langer that measures propensity toward mindfulness should be examined in the future to help further refine and develop Moscardo's measure. While not designed for on-site evaluation, the Langer scale has been used elsewhere in parks, recreation, and tourism research and is discussed along with other measures of mindfulness.

Building upon all three previous measures of mindfulness, Choe et al. (2014) explored mindfulness on-site at an exhibition. Deriving their mindfulness measure information from Moscardo (1992), Frauman and Norman (2004), and Van Winkle and Backman (2008), the researchers examined mindfulness among attendees of the 2011 Seoul Motor Show. In this study, a 7-item Likert scale with a 5-point response scale was used. Much like Frauman and Norman (2004), the purified scale comprised six items to measure mindfulness on-site (the same questions were used in both studies), and in this case a Cronbach's alpha of 0.88 was obtained.

Despite how much this measure has been used, particularly in parks, recreation, and tourism research, there are drawbacks concerning this mindfulness measure. The measure is lacking in content-related evidence of validity if it is seeking to measure mindfulness as defined by Langer (2000). The items in the measure bear more resemblance to a measure of immersion. Consequently, other measures of mindfulness as a state of consciousness are discussed in the following section.

2.4.2. Other Mindfulness Measures (for state of consciousness mindfulness)

Numerous scales have been developed to measure trait mindfulness (which is addressed in further detail in the next section). For measuring state mindfulness (or in situ mindfulness), two questionnaires were developed. Both measures are self-report measures (Hart et al., 2013). In addition to the full questionnaire designed to measure trait mindfulness, there is a shorter version of the Mindful Attention Awareness Scale (MAAS) by Brown and Ryan (2003) to measure state mindfulness. These authors described state mindfulness as being transitory. The state mindfulness MAAS used five items to measure the respondent's level of state mindfulness and is unidimensional. In a study where the authors first used the state mindfulness questionnaire, high internal consistency was demonstrated as the Cronbach's alpha was 0.92.

Additionally, the Toronto Mindfulness Scale (TMS) developed by Lau et al. (2006) was designed to measure state mindfulness. The authors began with forty-two statements and eliminated six items as their data analysis proceeded. A 5-point scale with zero meaning not at all and four meaning very much was used to obtain participant responses. This large number of items showed high internal consistency and a Cronbach's alpha value of 0.95. The authors ran exploratory factor analysis, examined the factor loadings, and concluded that a two-factor solution fit the data well. The factor loadings enabled the researchers to derive "scale scores" for curiosity and decentering, the labels for the two-factors. Then, confirmatory factor analysis was completed, leading to the final version of the TMS. The TMS is a 13-item measure with scales measuring curiosity and decentering.

These authors described state mindfulness in terms of being a state of mind that is cultivated through meditation practices. The Composite Reliability Index (a measure of internal consistency by factor) was used as a measure of internal consistency by factor and yielded an

outcome of 0.93 for the curiosity scale and 0.91 for the decentering scale in the final version of these components of mindfulness. The authors did not report the reliability measure of the combined state mindfulness scale.

A useful point of analysis about these state mindfulness measurement scales is the version of mindfulness that they are seeking to understand better. Brown and Ryan's (2003) research focused on mindfulness as formulated through Langer's studies as the authors sought to measure an observant open mind that understands what is taking place internally and in an external setting. Baer et al. (2006) noted that the MAAS seems to highlight a measure of mindfulness pertaining to detachment and inattentiveness. This would indicate that it aligns with the state of mind wherein one is either mindful or mindless, a conceptualization put forth by Langer (1989). Lau et al. (2006) viewed mindfulness from a perspective of mindful meditation training. Consequently, the MAAS would be a more useful mindfulness measure considering the scope of the present research.

Ellis, Lacanienta, et al. (2020) examined mindfulness in the context of structured reflections of youth involved in a travel abroad program. Participants took part in structured mindfulness experiences during their travel. "A 'slider scale' from 0 to 100 percent was included for each of the following: pleasure, relaxation, focused on the present moment, free of stress, and absorbed" (p. 178). These measures were summed, and this formed an overall absorption measure. The scale for the absorption measure yielded a Cronbach's alpha of 0.82. However, it should be noted that this descriptive study was not seeking to measure mindfulness itself. In this study, mindfulness was assumed to be the determinant of absorption as it was believed to be integral to the reflection exercises conducted in this research.

2.4.3. Measurement of Mindfulness as a Process or Disposition (trait)

As discussed in an earlier section, a process takes place over time and leads to a specific outcome. Over time, this can lead to the disposition (i.e., trait) of mindfulness developing given that a person can develop the practice of being mindful in everyday life. Most of the mindfulness measures focus on it in terms of being a disposition, bypassing the notion of mindfulness as a process.

Moscardo (1992) noted that mindfulness can be considered a trait-like method of operating, which serves as an intrinsic motivator. There were many scales designed to measure dispositional mindfulness. Brown and Ryan (2003) developed the Mindful Attention Awareness Scale (MAAS) to measure mindfulness. This 15-item measure was designed to distinguish mindfulness in individuals as it can benefit personal psychological well-being. (A 6-point Likert-type response scale was used as in the state mindfulness MAAS.) According to Mrazek et al. (2012), the MAAS is widely used to measure dispositional mindfulness. The 15-item measure of a mindful disposition operationalizes state mindfulness. The scale serves to measure the extent to which a person can focus on current experiences free from distractions.

According to Hart et al. (2013), other measures of dispositional mindfulness include the Freiburg Mindfulness Inventory, Kentucky Inventory of Mindfulness Skills (KIMS), the Cognitive and Affective Mindfulness Scale (CAMS), the Philadelphia Mindfulness Scale, the Southampton Mindfulness Questionnaire (SMQ), Toronto Mindfulness Scale-Trait Version, the Five-Facet Mindfulness Questionnaire (FFMQ), and the Langer Mindfulness Scale (LMS). Of these scales, Hart et al. (2013) wrote that the two most used have been the FFMQ and LMS. The FFMQ used items from some of the other established measures (CAMS, FMI, KIMS, MAAS, and SMQ) to observe multidimensional aspects of mindfulness. In its original form, the LMS was a 21-item measure but has been effectively reduced to a 14-item measure (Pirson et al.,

2018). A 7-point Likert response scale with one meaning strongly disagree and seven meaning strongly agree was used to obtain responses from participants. The LMS comprises subscales that are designed to measure engagement, flexibility, novelty producing, and novelty seeking. The LMS has been most commonly used by Langer and her associates in their research.

The LMS serves as an example of what seeking to measure mindfulness as a process can look like. In the study by Zilcha-Mano and Langer (2016), the shorter version of the LMS was used to examine mindfulness training during pregnancy. The participants began their involvement in the study during weeks 25-30 of their pregnancies. There were specific interventions during the study: three weeks after participation began and one month after the participants gave birth. The interventions in the study were specified for participants to be able to complete reflections about their experiences. A mindful group took part in an initial mindfulness training program, they were contacted daily to complete mindfulness reflections. There were two control groups in the study: an exposure control group wherein participants were exposed to positive and negative pregnancy experiences and a no-treatment control group. The first measure was taken at the start of the study (when participants were in weeks 25-30 of pregnancy), the second measure was taken after a three-week interval had passed since the first measure was taken, and the last measure was taken one month after participants had given birth. This long interval between the second and third measure is worth considering as a limitation of this study. A major focus of the study was between the first and second interventions, as participants in the mindfulness group were completing reflections twice a day in that period. All participants completed a reflection about their pregnancy experiences when the second intervention took place. Improved self-awareness and psychological outcomes were observed in the mindfulness group when this intervention took place, but these effects did not persist after the participants had

given birth. This would seem to indicate that developing the process of mindfulness into a trait takes continued daily practice and may be dependent upon the individual's personal circumstances.

In the field of parks, recreation, and tourism, Ndubisi (2014) used the LMS in his study of destination marketing. Loureiro et al. (2019) also used the LMS in their study of rural tourism. Kang and Gretzel's (2012) study of tourist experiences used dispositional mindfulness measures derived from psychology to effectively measure mindfulness. In Wolsko and Lindberg's (2013) study of recreation participants, the MAAS by Brown and Ryan (2003) was successfully used.

Mindfulness has been measured mostly in terms of being a trait or disposition, but also as a state of consciousness. In the field of parks, recreation, and tourism, Moscardo's (1992) mindfulness measure was developed to apply state mindfulness in museum settings. While her measure has been used over time in various studies to explore mindfulness as a state of consciousness, it has flaws that made it worthwhile to investigate other measures. The shortened MAAS measure by Brown and Ryan (2003) seems to be a promising avenue to use given that it was designed to measure mindfulness as articulated by Langer. Assuming mindfulness to be a process, Zilcha-Mano and Langer (2016) used the LMS in their study. If researchers assume mindfulness to be a trait or disposition, the MAAS (Brown & Ryan 2003) in its long form or the LMS (Pirson et al., 2018) seem to be adequate measures to explore mindfulness over time.

2.4.4. How Have Mindfulness Determinants Been Manipulated?

Mindfulness has been studied as a result (effect) of factors (presumed causes) in many experiments. Several determinants (presumed causes) of mindfulness have been investigated. These variables will be described in this section.

In their study about environmental interpretation, Moscardo and Pearce (1986) used secondary data analysis of the Countryside Commission report from 1978. Variables related to environmental interpretation were explored in this study, one of which was visitor mindfulness. Mindfulness was operationalized by measuring four variables: visitors' subjective knowledge, visitor information recall score, and scores for wanting more information about the topic being interpreted, and scores for wanting more information to be provided by the interpretation center. These were combined to form a mindfulness index, and data analysis revealed that interpretive theme (e.g., historic or conservation) served to improve visitor mindfulness.

Langer et al. (1989) conducted three experiments on the effects of conditional teaching on mindfulness. In these studies, conditional instruction was used as a determinant of mindfulness. That is, results demonstrated that conditional instruction serves to induce mindfulness.

The first framework proposed by Moscardo (1996) listed the following as setting factors which could lead to mindfulness: varied or multisensory media, novelty/conflict/surprise, use of questions, visitor control or interactive exhibits, dynamic exhibits, physical or cognitive orientation, topic or content area, and the presence of guides. The setting factors were thought to combine with visitor factors. The original visitor factors were high interest in content, low levels of fatigue, and educational motive. In her revised framework, Moscardo (1999) changed some of the variables. She changed the label of setting factors to communication factors: good physical orientation, variety or change, multisensory media, novelty/conflict/surprise, use of questions, interactive exhibits or visitor control, and connections to visitors. The visitor factors in the revised framework were lack of distractions, low levels of fatigue, and high interest in content.

Frauman and Norman (2003) examined managing visitors through mindful information services to better address sustainability. The determinants in this study were intrapersonal factors (pre-trip information gathering, openness to experience traits, and previous visitation) and situational factors (benefits sought on-site and mindfulness on-site) with preference for mindfully oriented services as the result. Mindfulness on-site, openness to experience traits, and the learning and excitement dimensions of benefits sought on-site were positively related to a preference for mindfully oriented information services. Frauman and Norman (2004) studied mindfulness as a tool to manage visitors at tourist destinations. In this study, the determinants of mindfulness were benefits sought, preference for mindfully oriented information services, participation in nature-oriented activities, prior site experience, and sociodemographic characteristics. Variables that were not statistically significant determinants of mindfulness were previous site experience and sociodemographic characteristics.

Kang and Gretzel (2012) studied podcast tours and their influence on tourist experiences. The researchers thought that podcast tours would lead to increased mindfulness. Mindfulness was conceptualized as having four sub-dimensions: attention, awareness, non-judgment, and present focus. Results were mixed. Multiple voices integrated into a podcast tour did not lead to greater mindfulness as compared with a single voice. Also, conversational narration in a podcast tour did not lead to increased mindfulness, compared with formal narration. Thus, those determinants in the study did not result in mindfulness. But mindfulness was found to be positively related to perceptions of social presence and greater mindfulness was found to be associated with improved experiences in learning and enjoyment.

Ramsburg and Youmans (2014) studied mindfulness and the retention of information. In the experiments conducted for the study, the participants who were part of a mindful meditation

exercise prior to class lectures scored higher on the quiz they were given than their counterparts. Mindful meditation before the presentation of information led to the outcome of mindfulness for the participants in this study.

Ganesan et al. (2014) examined communication factors that contribute to mindfulness. The determinants of mindfulness in this study were variety, personal connection, and interactivity/participation. For this study, mindfulness was measured by using an instrument adapted from Frauman and Norman's (2004) study. Results showed that variety and interactivity/participation had a significant effect on participant mindfulness. But the type of interpretation yielded interesting outcomes. For exhibitions/displays/artifacts (EDA), variety induced mindfulness. For guided tours and printed materials, interactivity/participation had a significant effect on participant mindfulness. Noor et al. (2015) similarly studied different types of interpretation and mindfulness. They operationalized mindfulness as in the previous study. This study focused specifically on three types of media that served as the determinants of mindfulness: exhibitions/displays/artifacts (EDA), guided tours, and printed materials. EDA and printed materials had a significant effect on participant mindfulness, but the effect of guided tours was not statistically significant. Printed materials had the strongest effect on mindfulness.

Tan et al. (2020) examined visitor factors and communication factors among tourists in Malaysia. In this qualitative study, four determinants of mindfulness were examined: the use of questions, multisensory media, interest level, and visualization. All of the determinants were found to be statistically significant in the study. The use of questions and higher interest levels had the greatest effects on mindfulness. The conceptualization of mindfulness for this study was derived from research completed by Moscardo (1996, 1999).

Other factors have been found to influence mindfulness. They are summarized in Table 4 below. The study by Moscardo and Pearce (1986) demonstrated that interpretive theme resulted in visitor mindfulness. Other determinants of mindfulness from the literature were the following: conditional instruction (Langer et al., 1989); benefits sought, preference for mindfully oriented information services, and participation in nature-oriented activities (Frauman & Norman, 2004); mindful meditation (Ramsburg & Youmans, 2014); variety and interactivity/participation (Ganesan et al., 2014); exhibitions/displays/artifacts and printed materials (Noor et al., 2015); and the use of questions, multisensory media, interest level, and visualization (Tan et al., 2020).

2.5. Mindfulness Research in Interpretation

Research focused on interpretation owes much to the efforts of Gianna Moscardo. Beginning with the study by Moscardo and Pearce (1986), which focused on environmental interpterion, research concerning interpretation and mindfulness expanded in the ensuing decades. Moscardo (1992, 1996) introduced mindfulness into the interpretation process. Thereafter, Frauman and Norman (2003, 2004), explored mindful information services and visitor management. Other topics that have been explored include type of interpretation (Ganesan et al., 2014; Kang & Gretzel, 2012; Noor et al., 2015), visitor awareness (Chan, 2019), and learning experiences (Ellis, Lacanienta, et al., 2020).

2.5.1. Chronology of Mindfulness Studies and Interpretation

Moscardo and Pearce (1986) examined environmental interpretation centers in the United Kingdom with the aim of exploring the relationships among variables connected to environmental interpretation. They chose places of various sizes that had different interpretive

Table 4

Determinants of Mindfulness in Prior Studies

Authors	Determinants of Mindfulness in the Study
Moscardo and Pearce (1986)	Visitor's Subjective Knowledge (if they learned more at the venue), Visitor information recall score, scores for wanting more information about the topic, scores for wanting more information from the interpretation center
Langer et al. (1989)	Conditional Instruction
Moscardo (1996)	Setting Factors- varied or multisensory media, novelty/conflict/surprise, use of questions, visitor control or interactive exhibits, dynamic exhibits, physical or cognitive orientation, topic or content area, and the presence of guides Visitor Factors- high interest in content, low levels of fatigue, educational motive
Moscardo (1999)	Communication Factors - good physical orientation, variety or change, multisensory media, novelty/conflict/surprise, use of questions, interactive exhibits or visitor control, and connections to visitors Visitor Factors- lack of distractions, low levels of fatigue, and high interest in content
Frauman and Norman (2004)	Benefits Sought, Preference for mindfully oriented information services, participation in nature-oriented activities. Previous site experience and sociodemographic characteristics were not significant.
Kang and Gretzel (2012)	Proposed that multiple voices in a podcast tour and conversational narration in podcast tours would elevate mindfulness. These were found to be statistically insignificant.
Ramsburg and Youmans (2014)	Mindful meditation
Ganesan et al. (2014)	Variety and interactivity/participation.
Noor et al. (2015)	Exhibitions/displays/artifacts and printed materials.
Tan et al. (2020)	Use of questions, multisensory media, interest level, visualization

materials, media, locations, and types of visitors. A moderate positive correlation between visitor enjoyment and mindfulness was found. This indicated that visitors were mentally stimulated by their experiences. Visitor enjoyment and how much visitors thought they learned had a high correlation in this study. Positive relationships between understanding and enjoyment were deemed to be more likely to exist in visitor centers with historic or specific and appealing conservation themes. This was seen to promote understanding and comprehension in this study. The study found that center and visitor behavioral variables (time at the center, center size, examination of items, and talking to staff) contributed positively to visitor enjoyment and ability to recall information. Having a specific interpretive theme along with variation and interpretive techniques were critical elements in these outcomes. Greater satisfaction and learning were reported from locations with these more characteristic features.

Moscardo (1996) examined mindfulness in a heritage tourism setting. She introduced the conceptual notion that interpretation is critical to ensure the quality of the tourism experience, and that effective interpretation is useful for sites to be managed effectively. Her observations are also relevant to sustainable tourism. Moscardo put forth the notion that mindfulness can be useful in designing interpretation at built heritage sites. Mindfulness can serve as an integrating concept; it can be used to enhance the quality of visitor experiences while creating a sustainable connection with tourism and heritage sites. Acknowledging Langer's notions of mindfulness and mindlessness, Moscardo noted that setting factors and visitor factors combine to determine visitor mindfulness. Indicators of the effectiveness of mindfulness and interpretation are increased visitor attention, higher levels of visitor preference for site contents, greater recall of learning from interpretation, and higher levels of interest in interpretation materials. For visitors to be mindful, interaction and control, variety, guided tours, and physical orientation, were

deemed to be important. Moscardo noted that familiarity with the site should induce mindfulness due to increased knowledge of the interpretation provided and physical layout of the site.

Woods and Moscardo (2003) studied mindfulness and wildlife education. They used open-ended questionnaires to identify accounts of best wildlife experiences among respondents. Most descriptions included at least one component of mindfulness as it pertains to wildlife tourism. Based on the results, the following were identified as key attributes of mindful experiences with wildlife: a perception of an authentic or natural encounter, involvement of rare wildlife or animals that are seen live for the first time, variety, perceived interactions with wildlife, a perception of personal control in interactions, and multi-sensory experiences. These findings provided confirmation for Moscardo's (1999) revised mindfulness model for visitor communication because support for variety, novelty, multisensory stimulation, visitor control or interaction, and connections to visitors were site factors that had been thought to create mindful experiences for visitors.

Frauman and Norman (2003) explored managing visitors through mindful information services in the context of sustainability. They tested whether a few intrapersonal and situational factors had utility in predicting preference for "mindfully oriented" information services. In this study, the researchers drew upon prior research by Moscardo (1992, 1996, 1999) to determine the information services that were "mindfully oriented." The researchers thought that a conceptual understanding of visitors and service preferences would assist recreation managers in developing good information services. This understanding can enhance interpretation of sustainability issues at sites. Intrapersonal factors included openness to experience traits, pre-trip information gathering, and previous visitation. Situational factors included mindfulness on site and benefits sought. Data were gathered to explore the pre-trip information gathering of visitors,

openness to experience traits, previous site visitation, benefits sought on-site, mindfulness on-site, and preference for mindfully oriented information services. These items addressed types of information services and the way they were delivered or presented. The researchers used factor analysis and identified five dimensions of benefits sought: learning, excitement, escape, family, and reflection. Openness to experience traits, mindfulness on-site, and the learning and excitement dimensions of benefits sought on-site were predictive of a preference for mindfully oriented information services among participants. Mindfulness on-site was the most influential predictor of preference for information services.

Frauman and Norman (2004) investigated mindfulness as a tool to manage visitors at tourism destinations. They studied visitors to four state parks in the southeastern United States. Mindfulness was studied in terms of benefits sought, previous site experience, participation in nature-oriented activities, sociodemographic characteristics, and preferences for mindfully oriented information services. Mindfulness and preference for mindfully oriented information services were measured on Likert-type scales. Benefits sought measured items drawn from the Recreation Experience Preference scale in this study. Three groups were identified in the study: a very mindful group, a mindful group, and a not very mindful group. In comparing the groups, differences were found concerning their preference for services, participation in nature-oriented activities, and benefits sought. The very mindful group was found to have statistically significant higher mean scores than the other groups for the learning and excitement dimensions of benefits sought. The mindful groups had higher mean scores compared to the not mindful group regarding the reflection dimension and concerning benefits sought. There was no statistically significant difference between groups for family dimensions or for prior experience and sociodemographic characteristics pertaining to the preference for mindfully oriented information

services. The very mindful group had a high preference for mindful information services. They also showed more preference for nature-oriented activities in the study. This study suggested using mindfulness to help manage tourists at destinations.

Moscardo et al. (2004) wrote about the role that interpretation plays in wildlife tourism. The authors noted that interpretation contributes to wildlife tourism by helping to support the management of tourist interactions with wildlife, serving to encourage conservation attitudes, and enriching visitor experiences. Interpretation can take different forms as it pertains to wildlife tourism: interpretive signs and brochures, guides, animal displays or demonstrations, and remote viewing technologies. Wildlife interpretation can be effective when multi-sensory activities, participatory activities, and personal connections with visitors are involved. The principles of wildlife interpretation that the authors articulated included the importance of making personal connections to visitors, providing visitors with variety, having well-structured content based around a theme, and having an overall management plan.

Moscardo and Ballantyne (2008) wrote about interpretation and visitor attractions. Noting that visitor attractions provide activities that encompass various types of interpretation such as informational signs, guidebooks, guided tours, and walks that are self-guided, the authors proposed that interpretation plays two key roles for attractions. Interpretation helps to create experiences for the visitor, and it helps to support the attraction's sustainability. To serve visitors well, interpretation can help to build experiences through the provision of activities that provide stories, information, and access regarding the importance of the attraction. Interpretation promotes sustainability by encouraging the minimization of negative impacts, relating sustainability to global issues, and showing that the site itself uses sustainable practices. The authors contended that for interpretation to be effective, visitor attractions need to have a good

orientation and be easy to navigate, allow for opportunities for interactions, enable multi-sensory experiences, and provide multiple perspectives to challenge visitor perceptions.

Kang and Gretzel (2012) examined the effect of voice in podcast tours on tourist experiences in national parks. The researchers were interested in how mindfulness and social presence influence visitor experiences. The researchers viewed mindfulness as a psychological state that can increase a person's readiness for cognitive processing. Results showed that the human voice created a positive social context for interaction, and this influenced the quality of tourist experiences. Results also indicated that social presence and mindfulness help to enhance tourist experiences. This study provided empirical support, showing that mindfulness can enhance tourism experiences.

Ganesan et al. (2014) investigated the effects of communication factors used in three different communication media (exhibits/displays, guided tours, and printed materials) on inducing mindfulness among heritage site visitors. For this study, the mindfulness conceptual framework of Woods and Moscardo (2003) was used. The framework posited that communication and visitor factors can either induce or fail to induce a mindful cognitive state. Communication factors predicted mindfulness for two of the types of communication media. More specifically, for the visitors using exhibits and displays, variety was found to be the significant predictor of mindfulness. For visitors using guided tours and printed materials, interactivity and participation were found to significantly influence participant mindfulness. Printed materials seemed to gain the most from communication factors (e.g., variety, use of questions, connections to visitors), serving to influence a state of mindfulness.

Moscardo (2014) wrote a conceptual paper that critically examined interpretation in tourism. The author reviewed key assumptions and questions concerning the features and

usefulness of heritage interpretation. It is often assumed that interpretation is offered and appreciated, serves to increase understanding, and can influence attitude or behavioral changes. Upon further examination, less support exists to demonstrate the effectiveness of interpretation or to indicate that lasting behavioral changes result from it. In her analysis, she asserted that there is evidence that if visitors are encouraged by interpretation to be mindful of their values or to reflect on them, this may lead to support for greater changes among visitors who experience interpretation.

Walker and Moscardo (2014) examined ecotourism experiences with interpretation and its connection with environmental sustainability. The study used data from cruise ship passengers who were participating in sustainable tourism. This study found that knowledge and commitment of staff members, ability to assist people in making connections, and capacity to produce experiential activities for visitors were important attributes for the participants. Key attributes derived from the experience included environmental awareness, learning, enjoyment, and environmental immersion. Values that participants derived from their experiences were appreciation, environmental responsibility and concern, and greater appreciation of wildlife.

Noor et al. (2015) examined visitor mindfulness at world heritage sites in Malaysia. The study focused on different types of media communication, specifically focusing on 1) exhibitions/displays/artifacts (EDA), 2) guided tours, and 3) printed materials to see how they served to enhance mindfulness. EDA and printed materials were found to have a positive and significant effect on mindfulness, whereas guided tours were not found to have a significant effect. EDA was deemed to allow for greater user control of information and printed materials enabled users to draw connections between past events and the present. Within EDA communication, multi-sensory, novel, or surprising content were preferred among participants.

Printed materials were found to be the most effective in heightening mindfulness among tourists. Participants indicated that interactive EDA led to the highest satisfaction levels.

Chan (2019) examined how well mindfulness could increase visitors' awareness of the environment and contribute to behavioral change. To test the relationships between mindfulness and sustainability awareness and tour package preferences, Australian students taking upper-level business courses who had lived in Australia for longer than ten years participated in the study. Students were randomly assigned to receive information about one of two tour packages to Uluru (in the Northern Territory of Australia) using audio recording tracks. In the "climbing" condition, a tagline urging participants to climb Uluru was included and in the control condition the word climbing was excluded. All students regardless of their condition were asked to rate how appealing the tour package was. The results revealed that being mindful made participants more aware of environmental sustainability and the effect of their behavioral decisions. To be more specific, tour package preference of the participants differed depending on whether they were mindful. Compared to participants who were not mindful, mindful participants showed lower preference for climbing. In addition, the results also indicated that mindfulness increased awareness of tourism sustainability issues by enabling participants to reevaluate preferences for the visit package as it related to sustainability impacts. After listening to a mindfulness-inducing audio track, participants expressed a lower preference for a group tour to Uluru that prominently included climbing the formation as part of the package due to sustainability awareness.

Ellis, Lacanienta, et al. (2020) studied mindful learning experiences during youth programs, looking at their influence on overall experience quality. Youth participants in a travel camp who went to Argentina through the 4-H Global Travelers program experienced guided mindful reflection at the end of their daily activities. This study found that reflection times were

highly absorbing and provided participants with a mindful learning experience. Participants indicated high levels of absorption, perceived value, delight, proclivity to recommend, and deep experience. The structured mindfulness experiences were regarded as highly absorbing and were perceived as being valuable and worth recommending.

Tan et al. (2020) explored communication and visitor factors that influenced mindfulness among heritage tourism visitors. The study took place at George Town, Malaysia. Communication and visitor factors were found to have a significant effect on visitor mindfulness in this study. The empirical evidence demonstrated that the use of questions and multisensory media (communication factors) and high interest levels and pre-visualization of exhibits (visitor factors) were all variables that influenced visitor mindfulness. The use of questions and high interest levels were the two variables that had the greatest effect on mindfulness in the study. This study revealed the importance of communication and visitor factors in inducing a mindful cognitive state among visitors.

2.5.2. Summary: What is Known About Mindfulness in Interpretation?

From this review of the literature on mindfulness and interpretation, three clear trends can be observed. First, mindfulness relates to learning and distinctive experiences. Second, Moscardo's frameworks (1996, 1999) are important both conceptually and due to their influence on ensuing studies. Lastly, research that used her framework with a focus on specific communication and visitor factors has provided important insights regarding mindfulness and interpretation. Each of these three main ideas is examined briefly in this section.

2.5.2.1. Mindfulness and Learning Experiences

Moscardo and Pearce (1986) demonstrated that mindfulness contributes to recall of information and perception of learning. A moderate positive correlation was found between

mindfulness and enjoyment. Experiences involving interpretation and mindfulness can be memorable experiences.

Woods and Moscardo (2003) found that engaging tourists with mindful practices can enhance the influence of wildlife education among tourists. Tourists who are receptive or responsive to the information they learn can be influenced to change their behavior based on what they encounter. The authors contended that mindfulness could help to improve understanding and enable better experiences to be designed for site visitors. Kang and Gretzel (2012) found that mindfulness had a positive influence on social presence perceptions and that higher levels of mindfulness led to improved experiences. This was particularly the case regarding enjoyment and learning in this study.

In addition to the literature about mindfulness and education (reviewed earlier), these specific studies from the field of parks, recreation, and tourism have shown that mindfulness can lead to positive experiences and moments of learning.

2.5.2.2. The Importance of Moscardo's Conceptual Frameworks

Moscardo (1996) first noted the importance of setting factors and visitor factors that can serve to induce mindfulness at sites of interpretation. Her initial framework was focused on visitors to heritage tourism sites. The revised framework (Moscardo, 1999) reaffirmed the general conceptual framework but made some changes to the specific details within it. It was also aimed at a wider audience, targeting tourists at different settings, and enabling the principles to be put into practice more broadly. The communication factors that can help to induce mindfulness in the revised model were variety/change, use of multisensory media, novelty/conflict/surprise, use of questions, visitor control/interactive exhibits, connections to visitors, and good physical orientation. The visitor factors which serve as a basis for mindfulness

were high interest in content, low levels of fatigue, and lack of distractions. The results from mindfulness in both models were more learning, high satisfaction, and greater understanding.

Expanding the original framework enabled the topic to be studied more widely in parks, recreation, and tourism research. Also, the specific factors that were enumerated have been explored in other studies (see below), serving to provide empirical support for Moscardo's ideas.

2.5.2.3. Studies Using Moscardo's Frameworks

Woods and Moscardo (2003) studied interpretation, which can lead to mindfulness in wildlife-based tourism settings. The findings from this study provided confirmation for Moscardo's (1999) framework by demonstrating the importance of providing interpretation that supports novelty, variety, multisensory stimulation, visitor control or interaction, and visitors making connections with the site. These were all deemed to be influences on mindful tourism experiences.

Ganesan et al. (2014) studied different types of interpretation to see if they led to mindfulness. Variety led to mindfulness among visitors who encountered exhibits and displays. Interactivity and participation were the factors that led visitors who used guided tours or printed materials to be mindful. These results indicated that communication factors contribute to predicting visitor mindfulness. Similarly, Noor et al. (2015) studied exhibitions/displays/artifacts (EDA), guided tours, and printed materials to see how they influenced visitor mindfulness. EDA and printed materials were found to lead to mindfulness. EDA were found to enable greater user control through novel, multi-sensory, or surprising content being communicated to tourists. Printed materials were successful in inducing mindfulness as they enabled visitors to make associations between past and present events. Interactive EDA resulted in the highest satisfaction levels among the types of interpretation examined.

Tan et al. (2020) found that the use of questions and multisensory media were communication factors that influenced visitor mindfulness. The researchers also found that high interest levels and pre-visualization of exhibits were visitor factors that served to induce mindfulness. The use of questions and high interest levels were the variables that had the greatest influence on mindfulness in this study.

These studies demonstrated that communication and visitor factors play a role in inducing a mindful cognitive state among visitors. More specifically, among communication factors, ample empirical support exists to show the importance of the following: variety, multisensory stimulation, novelty or uniqueness, the use of questions, enabling visitor control or interaction, and the importance of connections to visitors. For visitor factors, high interest in the content being presented has been observed as a factor leading to mindfulness. These findings from the literature would seem to affirm Moscardo's (1996, 1999) conceptual frameworks as valid tools for studying how elements of interpretation can influence visitor mindfulness.

2.5.2.4. Needed Directions for Mindful Interpretation Research

Frauman and Norman (2003) found that pre-trip information gathering, openness to experience, and prior site visitation were intrapersonal factors that led visitors to prefer mindfully oriented services. They also found that benefits sought on-site and mindfulness on-site led to the same outcome. Frauman and Norman (2004) found that benefits sought, preference for mindfully oriented information services, and participation in nature-oriented activities led to mindfulness in visitors. The authors concluded that future research could examine different techniques to deliver activities and how these impact mindfulness levels. Their findings and suggestions have implications for tourism sites and could influence how interpretation could be effectively approached by organizations.

Moscardo et al. (2004) discussed interpretation in wildlife tourism. Interpretation in wildlife settings can use principles associated with mindfulness, including developing a personal connection with visitors, participatory activities, multi-sensory activities, variety, and structured or themed content. Some of these concepts were echoed by Moscardo and Ballantyne (2008) who advocated for interaction opportunities, multi-sensory experiences, challenging visitor perceptions, and easy-to-navigate physical orientations. The information highlighted in those chapters concerning interpretation in wildlife tourism settings could be examined further in future, empirical studies.

To improve tourist experiences. Loureiro et al. (2019) suggested experience co-creation by site managers. Kang and Gretzel (2012) noted that podcast tours can be examined in contexts other than parks; similarly, in museums or other tourist sites, interpretation and mindfulness can be explored further. Ellis, Lacanienta, et al. (2020) designed mindful learning experiences for youth travelers. Building on ideas from these studies can be extended to interpretive experiences in tourism and travel. Thus, how mindfulness can be used to design interpretation experiences for participants is an area where research can be pursued.

Moscardo (2014) noted that upon closer scrutiny, there is less support showing that interpretation is effective or results in behavioral change. Walker and Moscardo's (2014) study that focused on promoting sustainability behaviors was able to identify values and critical attributes that participants derived from their experiences. Chan (2019) found that mindfulness influenced preference for sustainable behaviors among participants. A close exploration of the consequences proposed in Moscardo's (1996, 1999) frameworks should be undertaken. Some studies have focused on the values and behaviors derived from an experience, but a focus on

learning and understanding could prove beneficial to improving interpretive design. In short, these frameworks can be investigated further in different interpretive settings.

2.5.2.5. Synthesis

Mindfulness has the potential to be examined further in different interpretation settings. Interpretive planning, experience design, and consequences of mindful (or mindless) visitors could be examined in various contexts where interpretation is provided. Applying these notions to several interpretive contexts could lead to further research about mindfulness. Further application into different types of tourism could be warranted considering the potential benefits (e.g., education, agentic inclination) that tourists could derive from the site when they encounter interpretation that leads them to be mindful.

2.6. Mindfulness Benefits: Techniques to Encourage or Facilitate Mindfulness

2.6.1. Effects of Mindfulness on Learning

Ramsburg and Youmans (2014) conducted experiments to assess the effect of mindfulness experiences on students' retention of information they were taught. In the first two of three experiments in this study, randomly selected groups were assigned to either participate in a mindfulness meditation exercise or merely close their eyes to relax. The third experiment was like the first two but used a recorded lecture instead of an in-person lecture. In each experiment, the groups of students who were given mindfulness instructions and engaged in brief mindful meditation prior to a class lecture and quiz scored significantly higher on the quiz compared with their counterparts. Mindfulness helped increase student retention by helping

students to focus more on what mattered and may have minimized wasted energy or distraction. Learning experiences centered on mindfulness can serve to facilitate knowledge retention and lead to increased understanding.

Schonert-Reichl et al. (2015) conducted an experiment on a social and emotional learning program involving mindfulness. The grade school student participants were randomly assigned to a social and emotional learning program that included mindfulness and a social responsibility program. The researchers found that providing youth with mindfulness attention training along with opportunities to demonstrate gratitude, optimism, and kindness led to improved cognitive skill and increased social and emotional competence. Greater empathy and decreased depression symptoms were also observed in the mindfulness group during this research.

Dutt and Ninov (2016) studied the mindfulness levels of tourists who visited Dubai. Tourists who used a tour bus company were sampled and completed a questionnaire about their experiences. The researchers found a positive correlation between what tourists remembered when visiting Dubai and level of mindfulness; the correlation suggested that as a tourist became more mindful, more was remembered about the destination. This study also suggested that the more mindful a tourist is, the more they remembered their experience. This is likely due to mindful thinking being stimulated through new or interesting information encountered during tourism experiences.

Loureiro et al. (2019) studied mindfulness in a rural tourism context. The researchers found that mindfulness had a direct effect on happiness. De Petrillo et al. (2009) examined the impact that mindfulness had on athletes and found that improving mindfulness can lead to less sport related anxiety and perfectionism in athletes. In these situations, the use of mindfulness was shown to be helpful for tourists and athletes.

Studies have shown that mindfulness can be beneficial to destinations or events due to increased visitor satisfaction, greater awareness, better understanding, and more support of sustainability (Frauman & Norman, 2003; Moscardo, 1996; Van Winkle & Backman, 2008). Moscardo (1999) suggested that mindful visitors are more satisfied and able to understand new information better compared with their counterparts. Mindful visitors were also more satisfied from an educational experience when presented with information.

Based on these studies, we can see that mindfulness can be useful in different contexts. Mindfulness has been shown to help with learning and exploring new environments. It can be a tool used to manage stress, regulate emotions, and focus attention. Involvement with mindfulness training can be used along with opportunities to demonstrate skills that can help people become better-rounded individuals.

2.6.2. Benefits of Mindfulness as a Habit or Disposition

The brief examination of some of the benefits of mindfulness serves to illustrate how it can be advantageous to individuals and society. Benefits of mindfulness include increased control and discovery of new options, making it possible for greater outcomes as compared with not being mindful (Langer, 1989). Understanding different options in a situation can enable a person to have greater control, thus becoming more mindful. Langer and Moldoveanu (2000) summarized information about research concerning mindfulness and clarified how mindfulness can be used. Mindfulness can help to keep people situated in the present and enables greater awareness of both context and perspective. This contrasts with when people draw distinctions based on categories contrived in the past, which is known as mindlessness. Drawing novel distinctions can lead to greater sensitivity, increased openness to new information, more creation of new categories, and enhanced awareness. In a broader social context, mindfulness can help to

decrease human error, combat boredom, and decrease prejudice. Human error often relates to behavior that can be traced back to mindlessness; so, by increasing mindfulness, human errors can be reduced in complex situations. The creation of new categories can be used to decrease boredom and mindless categorization. The latter relates to negative attitudes that take place due to mindlessness. The authors discussed that mindfulness can be used in social contexts to influence human behavior. Ellis, Lacanienta, et al. (2020) studied mindful learning experiences in a 4-H youth program among students who traveled to Argentina. They found that daily mindful reflection times were highly absorbing and led to mindful learning experiences among the students in the study. Participants also indicated high levels of delight, perceived value, proclivity to recommend, absorption, and deep experience from their mindful reflection times.

In school settings, mindfulness has been found to help gain and hold student attention (Langer, 2000; Semple et al., 2010). The use of mindfulness in schools has also resulted in improvements in focus, attention, and social skills among students (Napoli et al., 2005). In schools and in formal learning environments, mindfulness has been shown to enable students to improve their learning and coping mechanisms.

The effectiveness of mindfulness has also been shown outside of schools where mindfulness was used for educational purposes to increase students' attention and participation. Among youth involved with summer camp, mindfulness was found to lower depression symptoms and anxiety over time (Liehr and Diaz, 2010). This is not a unique finding as studies indicate that mindfulness is also beneficial for emotional stability. Youth tend to live under several pressures that can lead to negative developments. Mindfulness can be beneficial for the emotional stability of youth. In a study of urban youth, mindfulness instruction mitigated negative results from stress and led to lower levels of depression (Sibinga et al., 2016). A group

mindfulness program intended to decrease and avert depression among teenagers was found to lead to lower levels of depression among adolescents (Raes et al., 2014). Similarly, mindfulness-based cognitive therapy for children was found to be effective in decreasing attention problems and helping to manage anxiety and other behavioral problems (Semple et al., 2010). Introducing youth to mindfulness can have positive results in helping them to develop to their full potential.

Birrer et al. (2012) reviewed mindfulness literature and considered how psychological skills training can be beneficial to athletes. Since past researchers had found that mindfulness practice leads to greater dispositional mindfulness, the authors sought to explore the application of this notion in the sports world. The study found that empirical evidence supports the notion that dispositional mindfulness is a trait related to performance in sports. The authors concluded that developing dispositional mindfulness could lead to better performance for athletes.

De Petrillo et al. (2009) explored the impacts of Mindful Sport Performance Enhancement (MSPE) on runners. The participants in the study were recreational long-distance runners who were assigned to a four-week mindfulness intervention or a control group. The treatment group showed improvement in dealing with organizational demands and had increased mindfulness along with decreased sport-related worry. The findings suggest that MSPE can be helpful in improving mindfulness and can decrease sport related anxiety in long-distance runners.

Based on these studies, we can see that mindfulness can be useful in different contexts. The application of mindfulness can influence an individual's consciousness and could also influence social outcomes on a larger scale. Mindfulness has been shown to help with learning and exploring new environments and can serve to enhance people's experiences.

2.6.3. Techniques for Encouraging or Facilitating Mindfulness

Iberlin and Ruyle (2017) noted that mindfulness implementation in schools can be completed on small or large scales and developed through collaboration with school leaders, teachers, and parents. The importance of customizing mindfulness programs or activities so they are relevant to the specific circumstance they will be applied to is an important consideration. Training and planning are important if educators and schools are to implement mindfulness programs that will be of the greatest benefit to students.

Kang and Gretzel (2012) examined the influence of podcast tours on tourist experiences. From the perspective of site interpretation, the human voice helps to foster a positive environment for social context. This in turn improves the quality of visitor experiences because interpretive media is helpful for tourists. Moscardo (1996) also discussed the quality of visitor experiences at sites, noting the importance of setting factors and visitor factors. These were later changed to communication factors and visitor factors (Moscardo, 1999), a topic discussed in more detail in a later section. The proper interpretive setting when combined with visitors who are in the right frame of mind can lead to mindful visitors who have better outcomes due to appropriate interpretation and mindfulness.

Armstrong (2019) proposed that mindfulness can be integrated into curriculums by utilizing mindfulness when teaching subjects such as reading, writing, math, science, social studies, and even the arts. When incorporated into lessons properly, mindfulness can support academic achievement by reducing anxiety and allowing students to develop skills and cognitive functions that will help them cope with the challenges of learning.

Mindful instructions, mindful meditation, and guided reflection times are techniques that have been used during studies examining mindfulness (Ellis, Lacanienta, et al., 2020; Ramsburg & Youmans, 2014). Both studies found that mindful learning experiences were beneficial to

participants. Whether for knowledge retention or experience enhancement, contemplation that is done mindfully can be an effective technique to induce mindfulness and improve outcomes for participants.

2.7. Variables of Interest in This Study

2.7.1. Interpretation

Interpretation has been examined over the years in various contexts. Freeman Tilden is widely known for his seminal piece on interpretation, first published in 1957, *Interpreting Our Heritage*. In this book, Tilden (1957/2007) stated that interpretation is educational and serves as an activity that reveals relationships and meaning to people. He argued that interpretation should go beyond merely conveying information as there is a need to relate topics to the individual visitor and provoke visitors. Conveying information in a way that provides information and connects to individuals is at the core of what should be accomplished through interpretation. Tilden articulated six principles of interpretation in this work. They are summarized below:

1. Interpretation will be unfruitful unless it relates what is displayed or described to something within the experience or personality of the individual visitor.
2. Interpretation itself should be revelation based upon information.
3. Interpretation is an art that combines other arts and is teachable.
4. The main aim of interpretation is provocation, not instruction.
5. Interpretation should seek to present the whole, not the part, addressing itself to the whole person.

6. Interpretation for children (up to age twelve) should follow a different approach than interpretation for adults.

If interpretation can combine Tilden's principles effectively, it can go beyond merely the cognitive and address the whole person. Connecting topics or ideas with visitors in a way that leads to discovery is relevant to interpretation. Tilden's main ideas as they relate to interpretation have guided interpretive endeavors since they were first introduced over six decades ago.

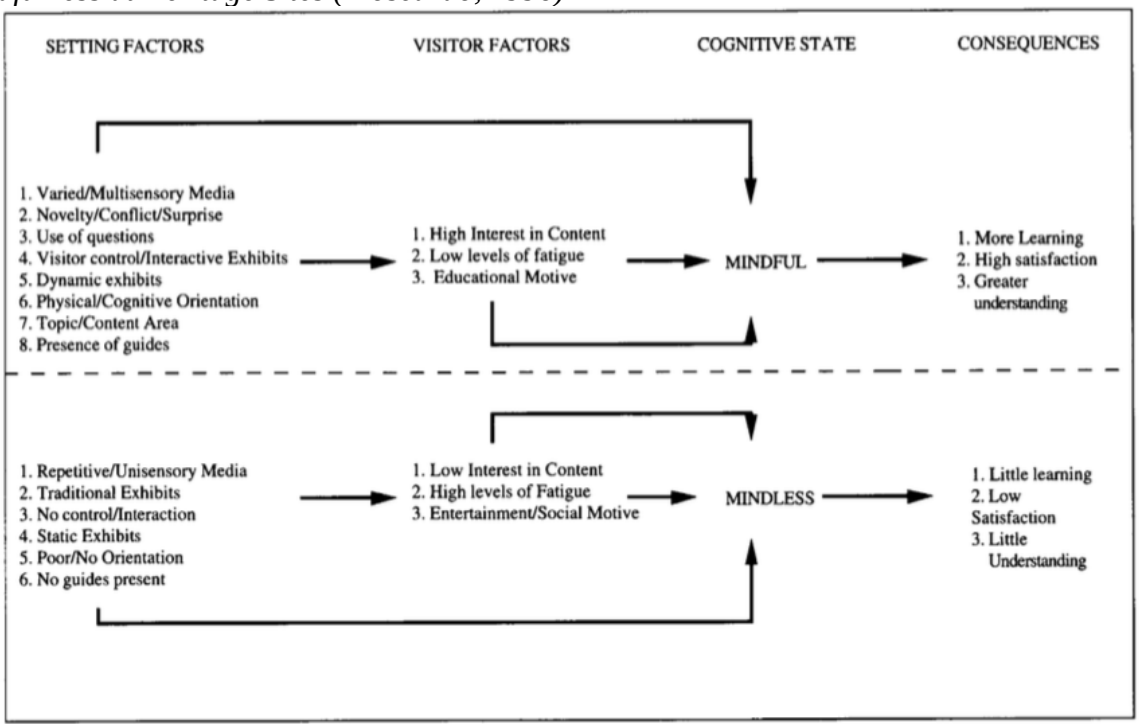
McIntosh (1999) studied the value of heritage experiences. She noted that effective interpretation methods can fail given tourists who visit and are not interested in learning. She also discussed the notion of mindfulness being a precondition to insight which can be obtained from the visitor's experience. Moscardo's research has worked to address those concerns. Moscardo and Ballantyne (2008) defined interpretation as "a set of information-focused communication activities, designed to facilitate a rewarding visitor experience, that encourages visitors to be receptive to a management or sustainability message" (p. 239). Beginning with heritage sites, Moscardo proposed frameworks to improve interpretation at venues people visit.

Moscardo (1996) introduced a conceptual framework to improve visitor experiences at built heritage sites. This framework included mindfulness as it was deemed to be an important factor that could improve visitor experiences and influence how interpretive sites are designed. In this conceptual framework pictured below (Moscardo 1996, p. 383), setting factors and visitor factors combined to determine if site visitors will be mindful or mindless at a site. Moscardo's framework was influenced by Langer's view of mindfulness. More specifically, factors such as personal interest, control, and novelty were thought to induce mindfulness and were deemed to relate to effective site interpretation. The setting factors in the framework related to how exhibits, signs, and displays are situated. The visitor factors included personal motivation and interest or

familiarity with the content at the site. This framework also posited that interpretation at heritage sites provided by guides would help visitors to become mindful.

Figure 3

Mindfulness at Heritage Sites (Moscardo, 1996)



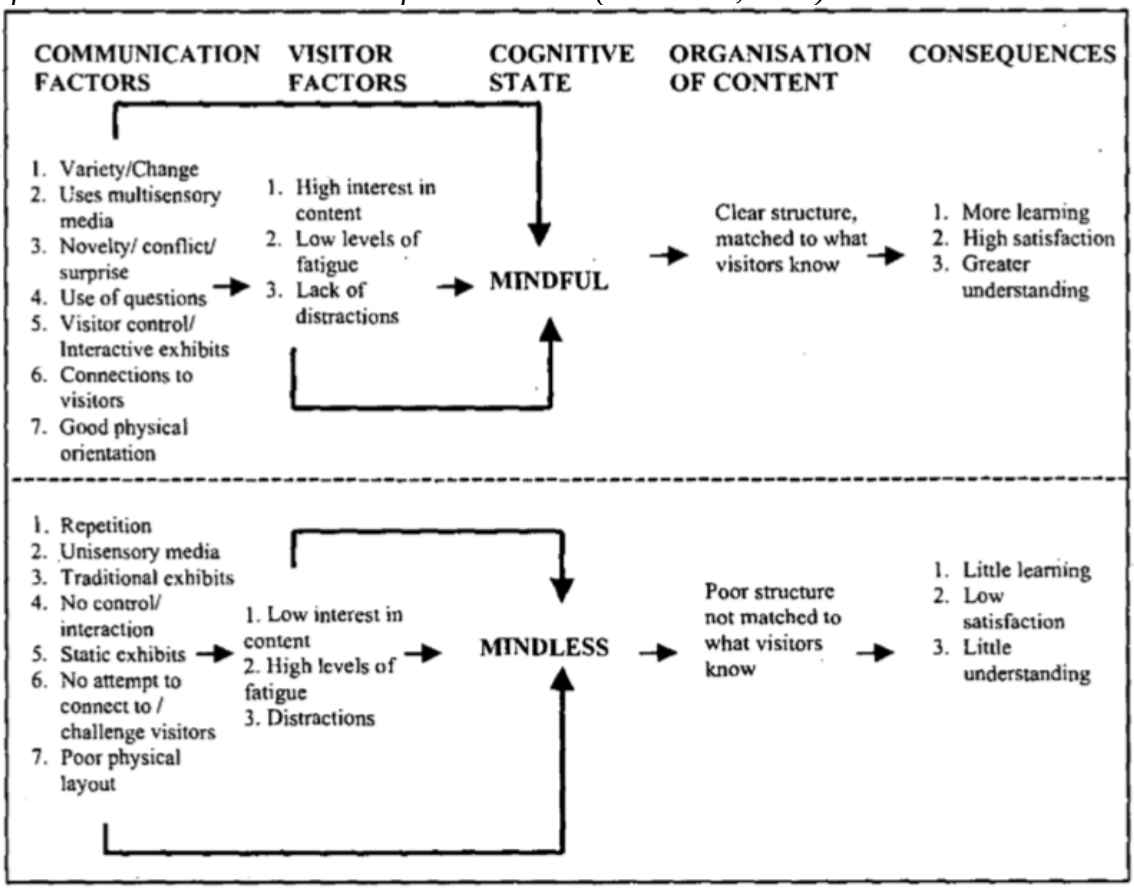
Note: Reprinted from "Mindful visitors: Heritage and tourism," by G. Moscardo, 1996, *Annals of Tourism Research, 23*(3), p. 383. Copyright 1996 by Elsevier Ltd.

This conceptual framework was revised based on subsequent research. As cited in Woods and Moscardo (2003), Moscardo (1999) proposed a mindfulness model for communication with visitors at interpretive venues. The original framework was revised as it had been designed to examine heritage tourism. The revised framework was deemed to be applicable to both heritage tourism sites and wildlife tourism settings. The study by Woods and Moscardo (2003) focused on aspects of interpretation that led to mindfulness in wildlife-based tourism settings. Some key findings from the study were that by engaging tourists in mindful practices, the influence that

wildlife education has on tourists can be enhanced. The receptiveness and responsiveness of tourists to this information can influence them to develop attitudes and alter their behaviors based on what they learned at the destination. The authors highlighted the usefulness of mindfulness in understanding tourist experiences and enabling experiences to be better designed for visitors in the future to improve their learning. The revised framework is pictured below (Woods & Moscardo 2003, p. 99).

Figure 4

Mindfulness at Environmental Interpretation Sites (Moscardo, 1999)



Note: Reprinted from "Enhancing wildlife education through mindfulness," by B. Woods and G. Moscardo, 2003, *Australian Journal of Environmental Education, 19*, p. 99. Copyright 2003 by Cambridge University Press.

With specific regard to the two versions of the conceptual framework, there were three

key revisions. First, an additional stage was added between cognitive state and consequences. This was an acknowledgement that mindfulness itself cannot lead to changed outcomes but is dependent on content and context (e.g., organization and structure). Second, what had been previously categorized as setting factors were categorized in terms of being communication factors. This was done in part due to the differences in attaining and retaining visitor attention. Certain core conditions are needed to gain visitor attention before mindfulness can be induced and communication is critical for this to occur. Lastly, Woods and Moscardo (2003) categorized mindfulness inducing factors into four categories. The categories were 1) features of the tourists or visitors, 2) features of the interpretation and information given to tourists, 3) features of the topic (i.e., what could be considered the focus of the tourism experience), and 4) the features of the experience itself.

One issue with the revised framework that did not exist in the original framework was the addition of how content was organized. In the framework, this is located after cognitive state, which either would be mindful or mindless. In the original framework, the participant's cognitive state led to the consequences. The original framework conveyed the results of a mindful or mindless cognitive state aptly by stating that the consequences occurred thereafter. In the revised version, the cognitive state is followed by what visitors do or do now know and the content itself has either a clear or poor structure. But it is erroneous to have structured the framework this way given that a cognitive state cannot retroactively influence the organization of content and if information does or does not match up with what a visitor knows, it would likely be a cause of a mindful or mindless state, not a result. Therefore, organization of content should be considered in conjunction with the communication and visitor factors and the original framework should be considered as accurate given its structure since setting and visitor factors do influence the

cognitive state of the visitor. Accordingly, the resulting consequences that Moscardo proposed would then take place.

2.7.2. Immersion

Ballantyne et al. (2011) suggested that interpretation could play a role in altering behaviors or attitudes of visitors in a way that contributes to sustainability education. The authors contrasted experiential engagement (i.e., enthusiasm as it concerns a tourist experience) with reflective engagement which concerns a feeling of connection with wildlife. Interpretation at such sites can be geared toward constructive and reflective engagement. Experiential engagement should include enhancement, immersion, and enjoyment.

Pine and Gilmore (1999) described immersion as representing the amalgamation of experiences and consumers. As a condition, immersion takes place when a person enters into an experience. An example of this is virtual reality games, as the participant becomes engrossed and fully partakes in the experience. These authors described immersion as an essential dimension of experience. The authors described immersion as being characterized by focused attention on a limited field of stimulus, immediate action needed within an environment, and immediate feedback concerning the action can be readily received. Immersion activities have also been described as requiring action and feedback as would be presumed to take place in sports games or artistic performances (Csikszentmihalyi, 1990; Ellis et al., 2019).

Ideally, heritage or environmental interpretation that yields mindfulness among participants ought to lead to immersion as participants should experience an increased consciousness of their surroundings. Ballantyne et al. (2011) noted that engaging interpretation experiences should lead to immersion. Walker and Moscardo (2014) noted that interpretation

experiences should lead to visitor mindfulness. Consequently, among the important elements that should be derived from such an experience is immersion.

Ellis et al. (2019) described immersion in the theory of structured experience as being limited to experiences of task performance. According to these researchers, immersion is characterized by high attention focused on a narrow stimulus, a requirement for direct action within the immediate environment, action responses that take place as calculated decisions, direct feedback concerning the usefulness of one's actions, and a perception of control. Another important element of immersion is that it enables the participant to receive immediate feedback from the activity they are partaking in (Ellis, Jiang, Freeman, Lacanienta, & Jamal, 2020).

2.7.3. Arousal

In psychology, arousal refers to a state of increased sensory or emotional response. Arousal can be defined as "the intensity of physiological response to a stimulus on the continuum from calmness to excitement" (Oh et al., 2007; p. 123). Within research that relates to temperament, the concept of arousal is known to consist of components of behavioral characteristics, along with functions within the human nervous system and brain (Strelau, 1994). Bradley & Lang (1994) noted that arousal has been associated with affective reactions to various forms of stimuli. Bagozzi (1996) found that arousal led to the formation of a "halo effect," in other words, positive impressions led to positive beliefs about the topic studied. He also found a significant causal relationship between arousal and satisfaction.

Russell and Mehrabian (1977) described a theory of emotions that included the factor of arousal. In this framework, arousal and non-arousal were one dimension within the theory. Arousal served to describe the level of excitement or alertness in this study.

Reeve (2014) noted that arousal embodies various processes that direct awareness, attentiveness, and stimulation. Individual levels of arousal will largely operate in response to environmental stimulation. People can participate in behaviors that serve to heighten or lessen arousal levels. Arousal levels can be below what is optimal when people are bored, and to remedy this, people can seek out ways to increase their arousal. When arousal levels are too high, they can result in pressure or stress, and to counteract such situations, people can seek to lesson arousal levels. A state of moderate arousal can result in a balance between the two extremes, and peak performance can result from a person being aroused, but not overly stimulated.

2.7.4. Learning

Pine and Gilmore (1999) proposed the notion of an experience economy in their innovative book about this topic. The authors described four realms of experience that serve to offer value: entertainment, esthetics, escapism, and education.

Carson et al. (2001) studied information recall by testing if movement while learning had an impact on remembering information. The authors thought that movement during learning could help participants recall more information by allowing them to concentrate on different stimuli. Findings from this study indicated that observing a map from various perspectives resulted in improved memory and increased attention to the components shown on the map. The researchers concluded that varying student attention related to a learning stimulus could improve individual memory and learning.

Tourism for the purpose of education was popular among European social elites who participated in the Grand Tour, an activity that provided participants with cultural and foreign language education (Ritchie, 2003). The Grand Tour started in the seventeenth century and

continued into the nineteenth century. In contemporary society, the ability to study abroad is an activity that is available to large numbers of students worldwide to improve their education.

Falk et al. (2012) noted that travel and learning have not been well researched. The researchers wrote that examining visitor interpretation has not been given much attention in the field of tourism. Learning in a travel setting transcends traditional schooling as it pertains to knowledge acquisition. Studies have indicated that the learning process is enhanced by travel owing largely to communication skills and cultural awareness. Stone and Petrick (2013) found significant academic research demonstrating that travel outside of formal colleges or university programs can have educational benefits.

Educational experiences enable tourists to absorb what transpires in their presence at a destination. Tourists can be participants in what unfolds before them, but in many cases, tourists seek to improve their knowledge and skills via educational experiences at tourism destinations (Oh et al., 2007). There appear to be benefits to learning outside of one's normal environment or viewing information from different perspectives; both are thought to improve people's learning experiences.

2.7.5. Memorability

Langer et al. (1979) studied memory and its environmental determinants among nursing home residents. They found that regardless of incentive, participation in cognitive activity led to improvement in memory recall. Also, nurses who assessed the research participants determined that engagement in cognitive activity resulted in greater alertness and mental activity.

Pine and Gilmore (1999) noted that experiences that are staged effectively can lead to heightened memory of the event by participants. In this way, tourists can develop positive attitudes toward a destination if they have a good experience at the destination. The creation of

positive memory as it pertains to tourists' experiences and tourists' sharing those memories is a useful tool to encourage future visitation.

Dolcos and Cabeza (2002) noted that the ability to recall past experiences can be heightened through the occurrence of sensory impressions which tend to result in emotional events. The authors wrote that emotional experiences are better remembered than events that are essentially non-emotional.

In his book *Thinking, Fast and Slow,* Kahneman (2011) expounded upon the two information systems that influence the process of making decisions. System 1 makes instinctual choices based on prior experiences and can include associative memory, emotions, and imagery. System 2 is a slower system that is activated to process information when the means of processing in the other system are inadequate for the task. System 2 is activated when the mechanisms utilized by System 1 are challenged. System 2 can obtain questions from System 1 and search for solutions. At times, these two systems work together to address circumstances that arise. An example of this taking place would be what Kahneman termed "availability heuristic" or what is also known as availability bias. When something is retrieved from memory, ease or fluency of retrieval (System 1) or the frequency of content use (System 2) can be used to determine what information is deemed useful in the moment. Experiences involving pain or pleasure tend to evoke stronger preferences, and the peak and end moments of an experience tend to be more commonly remembered than other points in time when an event takes place.

Enjoyment of an experience can also be seen as being significantly influenced by the memories of tourists, specifically what they have felt and experienced at tourism venues. Hosany and Witham (2010) proposed that customers should be able to have memorable experiences. From the perspective of these authors, memorable experiences can serve to create high

satisfaction for tourists. In this way, a memorable experience would function to produce positive recall of the event later. Thus, a memorable experience could function to produce positive feelings among tourists. This point of view was supported by de Freitas Coelho et al. (2018), who noted that the purpose of a tourist's travel experience can lead to memorable experiences during travel.

2.7.6. Meaningfulness

Tourism and travel experiences that are distinctive and significant can serve to gratify tourists' desires and aspirations (Hall & Weiler, 1992; Robinson & Novelli, 2005). Meaningful experiences are sought by tourists and can take the form of gratification through tourism experiences instead of the pursuit of authenticity or escapism (Bruner, 1991; Callahan & Thomas, 2005; Digance, 2003; Noy, 2004).

Kim et al. (2012) included meaningfulness as an important experiential factor that can lead to a memorable tourism experience (MTE). They found that meaningfulness was one of the components of MTE that significantly influenced participant behavioral intention. Kim and Ritchie (2014) assessed the cross-cultural validity of their scale to measure MTE. As part of this study, the validity of the meaningfulness dimension of MTE was confirmed.

Ellis et al. (2016) measured meaningfulness in their study of structured experiences in youth programs. They noted that if a structured experience has a lasting impact on individuals, they will leave their experience considering something they learned from it. To measure meaningfulness, a single item was used in this study: "I am still thinking about something I learned." Participants responded to the statement as "True," "Mostly true," "Neither True or False," "Mostly False," and "False."

2.7.7. Visitor Satisfaction

Satisfaction refers to the overall affective response of a consumer based on a consumption experience (Oliver, 1981). Customer satisfaction has been a concept that has received much attention in academic study and in practice due to how it relates to customer decisions. In the field of tourism, Pizam et al. (1978) defined satisfaction as the outcome of tourists' experiences at destinations when compared with their visit expectations. Tourists feel satisfaction when their experiences exceed what they were expecting to experience; however, they feel dissatisfied if they have feelings of displeasure during their experiences (Reisinger & Turner, 2003). Lee et al. (2008) examined the relationship between festival visitors' emotions, satisfaction, and loyalty. Three items of satisfaction ("I am satisfied with my decision to visit this festival," "I feel very good with this festival," and "Overall, I am satisfied with this festival") (Lee et al., 2008, p. 60) were used to measure satisfaction in their study. Wu (2016) examined the revisit intention of visitors regarding Kaohsiung's Lantern Festival. In this study, three items (right decision, meeting expectations, and pleasure) were used to measure satisfaction. Do Valle et al. (2006) used two items (revisit intention and word-of-mouth) to measure loyalty and its relationship with satisfaction regarding tourists who visited Portugal. These researchers found that higher satisfaction levels led to a greater likelihood of willingness to recommend and intention to return.

De Rojas and Camarero (2008) examined tourists who visited an interpretation center. They found that perceived quality was a determinant of satisfaction. This study focused on the Queen Isabel Interpretation Center at The Royal and Testamentary Palace in Spain. Interpretation offered at this site included brochures, exhibitions, and guided tours. These researchers measured satisfaction on a 5-tem, 5-point response, Likert-type scale: "This is one of the best interpretation centers I could have visited," "I am pleased with my decision to visit this

interpretation center," "I have really had a good time, I have had fun in this center," "I will recommend someone to visit this center," and "I will say positive things about this interpretation center" (de Rojas & Camarero, 2008, p. 536).

2.7.8. Intention to Recommend

In the literature, intention to recommend and intention to revisit have been used to measure the destination loyalty of tourists (Chen & Tsai, 2007; Chi & Qu, 2008). The proclivity or intention to recommend does not appear to have been examined extensively apart from intention to revisit.

Chen and Tsai (2007) focused on how destination image affects behavioral intention. The researchers found that destination image appears to have the most influence on behavioral intentions, namely the willingness to recommend or intent to revisit the destination. Chi and Qu (2008) examined destination loyalty using an integrative approach. The researchers used intention to recommend as part of a measurement of loyalty. Overall satisfaction positively influenced destination loyalty (i.e., revisit intention and intention to recommend) in this study.

Chen and Rahman (2018) examined the relationship between engagement, cultural contact, memorable tourism experience, and destination loyalty. In their study, loyalty was measured in two ways: by measuring intention to recommend and intention to revisit. Three items including "I would recommend this place to my friends" were considered regarding intention to recommend and three items such as "I would revisit this place in the future" were part of the examination of revisit intention to help measure loyalty. A scale to measure revisit intention and intention to recommend was derived from a previous study by Bonn et al. (2007). All items were measured using a seven-point Likert response scale. In this study, MTE had a positive and significant effect on intention to recommend and revisit intention.

As a standalone concept, Reichheld (2003) advocated the use of a single-item scale known as a net promoter score. He argued that this could be useful given that it enables survey results to be easily used and can allow businesses to focus on taking action to pursue growth based on the results. Ellis, Lacanienta, et al. (2020) used a single-item scale to measure proclivity to recommend. In that study, an 11-point response scale was used to indicate the likelihood of participants to recommend a reflection experience. One end of the scale (ten) was anchored with "extremely likely" and zero was "not at all likely."

2.8. Research Hypotheses

Having described the variables of interest in this study and how they have been studied and interrelate, I can turn attention to the hypotheses of this research study. In this section, I share the model of determinants and results, examine the determinants and results of mindfulness theory in the setting of the study, present the relationships in the research model, and expound upon the relationships between variables that led to the hypotheses.

2.8.1. Determinants and Results of Mindfulness in Interpretation Settings

As Aristotelian definitions were discussed previously, attention can turn to propositions about determinants (causes) and results (effects) of mindfulness, as it pertains to heritage and environmental interpretation. Using mindfulness theory, I propose the following determinants and results are:

Determinants (Causes)

- Novelty during interpretation increases mindfulness (Moscardo, 2009).

- Mindful instructions prior to presentation of context increases mindfulness (Ramsburg & Youmans, 2014).
- Conditional presentation of information increases mindfulness (Langer, 1989).
- Variation during interpretation increases mindfulness (Langer, 1997, 2014).
- Multisensory interpretation increases mindfulness (Moscardo, 2009).
- As self-affirmation (personalization) increases, mindfulness increases (Tilden, 1957/2007)
- As strength of educational motive increases, mindfulness increases (Van Winkle & Backman 2008).

Contingencies

- Irrelevant visual, tactile, auditory, taste, and olfactory stimuli moderate the effects of determinants.
- Degree of distress moderates the effects of determinants on mindfulness.

Results (Effects)

- As mindfulness increases, learning increases (Langer, 1989, 1997).
- As mindfulness increases, performance in recall of facts or information following a lecture or travel experience increases (Dutt & Ninov, 2016; Ramsburg & Youmans, 2014).
- As visitor mindfulness increases, enjoyment increases (Moscardo & Pearce, 1986).
- Memorability of an interpretive event increases as the average of peak and end moment mindfulness increases (Kahneman, 2011)

- As mindfulness increases, immersion increases (Ellis, Lacanienta, et al., 2020).

These propositions will be briefly expounded upon to provide further support of the propositions. As cited in Jaccard and Jacoby (2010), a model of argumentation developed by Toulmin (1958) can serve to analyze argument structures; this model was used as a general framework to advance the notions articulated in the previously described propositions. This model served to help develop the premises of the reasoning and argumentation of the causes and effects of mindfulness in the context of heritage and environmental interpretation.

2.8.1.1. Determinants (Causes)—Support

Moscardo (2009) noted that situations characterized by novelty can be associated with mindfulness. This expanded on her previous work as she had suggested that novelty serves to stimulate or encourage mindfulness (Moscardo, 1996). Langer (1997) deemed openness to novelty to be necessary for mindful experiences. Her later research included novelty seeking and novelty producing as domains associated with mindfulness (Pirson et al., 2018). Given that research produced by Langer and Moscardo have highlighted the importance of mindfulness; consequently, it is thought that novelty during interpretation experiences would lead to increased mindfulness.

In the study by Ramsburg and Youmans (2014), groups who participated in a mindful meditation exercise were given mindful instructions to complete mindful meditation before being presented with information. The mindful groups showed improved performance on a quiz compared with their counterparts. This may have been due to higher levels of mindfulness among those participants after they took part in the exercise prior to the quiz. Ellis, Lacanienta, et al. (2020) used mindful instructions and guided reflection techniques. Both studies found that mindful learning experiences were beneficial to participants. Whether for knowledge retention or

experience enhancement, contemplation that is done mindfully can be an effective technique to induce mindfulness and improve outcomes for participants. As the two studies demonstrated, mindful instructions prior to the presentation of information led to increased mindfulness among participants.

In her book, *Mindfulness*, Langer described the conditional presentation of information. In a 1987 research study, Langer and Piper conducted an experiment where objects were introduced to participants in a conditional way (Langer, 1989). To one group, an object was described as "this is" the object. The other group was told this "could be" a certain object. In the experiment, participants were given erroneous directions on purpose, and the group that had been introduced to the objects in a conditional manner was able to devise more creative solutions. A similar study conducted in 1986 by Langer and Joss explored presenting a theoretical model in conditional and absolute terms (Langer, 1989). The group taught in conditional terms (e.g., this "may be," or this "could be") demonstrated an ability to use the information that they were taught creatively. Teaching facts or skills in a conditional way can prevent the formation of mindsets that characterize mindlessness which is why Langer advocated for this approach. Therefore, presenting information conditionally is expected to increase mindfulness.

In her book *The Power of Mindful Learning*, Langer (1997) described variation during instruction. The ability to teach or share facts or skills in a way that provides variation for the learner can be useful for students. In a 1995 study, Mueller and Langer (as cited in Langer, 1997) assessed memory as a function of conditional learning. In this experiment, students were requested to remember what drawings looked like. One group was shown the drawings conditionally ("this could be") and another group was presented the same information in absolute terms ("this is"). Recall and recognition were tested, and the conditional learning group was

shown to have better recall of the drawings. The mindful group was able to perform better on questions that required answers to be extrapolated and creatively resolved compared with the other group. Thus, Langer has advocated for students to be taught with variation as this is a way that can help to foster greater creativity. Variation in teaching is beneficial to learning and to the development of a mindful attitude toward learning. Langer has summarized variation in learning and mindfulness as follows: "The more often we learn the basics with the recognition, from the start, that there are several, perhaps quite disparate ways of accounting for information, the more open we are to alternatives" (Langer, 1997, p. 20). Langer (2014) noted that novelty and variation can induce mindfulness. From an interpretation perspective, variation in the interpretation provided would be expected to increase mindfulness as it coincides with ideas advocated by Tilden (1957/2007), namely that interpretation should go beyond mere instruction and should connect with individuals.

Moscardo (2009) noted that mindfulness is associated with conditions that are characterized by multisensory stimulation. This also expanded on her prior work as she had suggested that multisensory museum exhibits can stimulate mindfulness (Moscardo, 1996). Kang and Gretzel (2012) found that the human voice can generate a positive social setting for interaction. This type of interpretation that enables participants to experience a site or setting through the different senses should allow participants to have a heightened sensory experience conducive to mindfulness. Another variant of this approach was explored Hughes and Moscardo (2017). They found that mobile communication devices can be used to augment existing museum exhibits as participants who used them during their museum visit had higher mindfulness scores. Interpretation that is provided and that includes or enables multisensory stimulation is thus thought to increase participant levels of mindfulness.

In his 1957 book *Interpreting Our Heritage*, Freeman Tilden stipulated that providing information to connect with individuals personally was a key component of effective interpretation. In his first principle of interpretation, he noted that interpretation should connect with the individual visitor, and in his fifth principle he wrote that interpretation should try to address the whole person (i.e., personalization). Moscardo (1996) noted the importance of personal motivation and personal interest in content as factors that could serve to induce visitor mindfulness at interpretation sites. Ellis, Jiang, Freeman, Lacanienta, and Ellis (2020) studied engagement and found that story personalization increased participant engagement. Consequently, self-affirmation for the participant is expected to increase mindfulness.

Van Winkle and Backman (2008) found empirical support for the notion that content interest and educational motive significantly affects mindfulness. The researchers found that as a visitor's educational motivation increases, so does their level of mindfulness. Moscardo (1996) noted that a visitor's personal motivation and interests were significant factors that could serve to influence level of mindfulness. As these studies illustrated, if visitors have a connection with the site, they are more likely to be mindful, especially considering that they are more likely to have a greater level of interest in the site and to have educational goals. It would be anticipated that those with an increasing education motive would also experience increases in mindfulness.

2.8.1.2. Contingencies—Support

The following contingencies are attached to the propositions about the determinants: 1) irrelevant visual, tactile, auditory, taste, and olfactory stimuli will serve to moderate effects of these determinants on mindfulness and 2) degree of distress can also serve to moderate the effect of the determinants. Regarding the first contingency, it is possible for environmental stimuli to be processed in various ways owing to the precise context in which an experience occurs (Langer

1992). Concerning the second contingency, Moscardo (1996) first noted that visitor factors such as interest, fatigue, or personal motive influence if a person can become mindful. Distress would certainly influence the visitor factors Moscardo described. In describing her revised framework, Moscardo (2009) reinforced the notion that multisensory stimulation leads to mindfulness and described distractions as a visitor factor preventing a mindful state among visitors. These notions serve to reinforce both contingencies as irrelevant stimulation and a distressing diversion could serve to moderate the influence of a determinant, thus preventing a person from attaining mindfulness.

2.8.1.3. Results (Effects)- Support

Studies cited in books by Langer (1989, 1997) provide support for the notion that increased mindfulness aids in improving task concentration. Armstrong (2019) noted that mindfulness serves to enable students to focus more on activities and assignments that are part of the learning process. This allows students to successfully deal with test anxiety and can increase cognitive function. Thus, increased mindfulness has been shown to result in higher levels of concentration and would be expected to do so in other contexts.

Ramsburg and Youmans (2014) found that students who participated in a mindful meditation exercise and a class lecture scored better on a quiz than their counterparts scored on the quiz after the lecture and with no meditation. Dutt and Ninov (2016) found a positive correlation between what tourists remember from a trip and their level of mindfulness. Greater mindfulness was associated with remembering more about a trip experience in this study. From these research examples, it can be expected that increased mindfulness can result in recalling information better after an experience has occurred.

Moscardo and Pearce (1986) examined environmental interpretation centers and studied visitor enjoyment. They found a positive correlation between enjoyment among visitors to environmental interpretation centers and mindfulness. The researchers noted that this probably indicated that visitors were stimulated by their experiences at these centers. Moscardo (1996) suggested that acquaintance with a site ought to lead to mindfulness owing to greater knowledge of the interpretation and physical design of the site. Moscardo (1996, 1999) proposed that more learning, higher satisfaction, and greater understanding would result from mindful visitor experiences. Consequently, it is expected that as mindfulness increases, enjoyment would also increase.

Kahneman (2011), in his book *Thinking, Fast and Slow,* described peak intensity and how the human memory processes experiences. His book described a broad depiction of information-processing systems. One system governs a mindful mode of operation and the other a mindless way of operating. The mindless mode works effectively and serves to conserve energy, it also seems to be driven more by emotions. The mindful state of operation is more cognitive in nature and is a slower mode as it requires conscious energy. Much processing of information is done in the mindless mode, but the mindful mode can be activated when a person is faced with information that cannot be easily processed. This would seem to provide an explanation of how the mind can be induced into a state of mindfulness. Thus, it can be presumed that different interpretive strategies can serve to influence whether a visitor to an environmental or heritage site would become mindful when confronted with new information. Kahneman noted that people have strong inclinations concerning experiences involving pain and pleasure. Peak intensity, memory, duration neglect, and pleasure or pain can influence how an experience is recalled after the moment has passed. In human memory, rating an experience after

the fact based upon the peak (or even based on the low point) of an experience and upon how it ended is common. What Kahneman termed the "remembering self" focuses on the peak and end moments of an event. The memorability of an event is thought to increase as peak and end moment mindfulness intensifies. This thinking tends to align with the principles and ideas described by Tilden (1957/2007), wherein interpretation should involve provocation and connect to the full person. Such experiences would likely be memorable moments of an interpretation event that would then be more easily recalled due to higher mindfulness. Therefore, it is expected that the memorability of an interpretive event would increase along with peak and end moment mindfulness.

Ellis, Lacanienta, et al. (2020) developed the theory of structured experience. In this theory, mindfulness and engagement were thought to increase together. Ellis, Jiang, Freeman, Lacanienta, and Ellis (2020) researched the theoretical propositions from the theory of structured experience. Participants who became more mindful were expected to have increased engagement, as mindfulness served as a determinant of engagement in this study (the study focused on in situ engagement). The theoretical propositions about engagement were significant in this research study. Based on these research studies, increased mindfulness is thought to result in greater engagement among participants.

2.8.2. Classification

These propositions can be classified according to the criteria devised by Zetterberg (1965). In his classification system, propositions can be examined in accordance with five categories: reversible or irreversible, deterministic or stochastic, sequential or coextensive, sufficient or contingent, and necessary or substitutable. The positive relationships with the

determinants are considered to be irreversible, stochastic, coextensive, contingent, and substitutable.

Irreversible informs us that the relationship between determinants and results cannot be reversed. Stochastic means relations are presumed to be imperfect. Coextensive means that the mindfulness determinants would lead directly to mindfulness. Contingent informs us that something else may be needed for the determinants to cause mindfulness. In this case, the contingencies (irrelevant stimuli and degree of distress) serve to moderate the effects of the determinants. Lastly, the determinants are classified as substitutable given that other situational elements could affect mindfulness.

The relations among results are considered to be irreversible, stochastic, sequential, sufficient, and substitutable. The relationship between the results cannot be reversed and are presumed to be imperfect (i.e., irreversible and stochastic). They are deemed to be sequential, meaning that results are not immediate. Sufficient shows no moderating or interacting effects and substitutable indicates that other situational elements can result from mindfulness.

2.9. Hypotheses

2.9.1. Interpretation and Mindfulness

Mindfulness is a theory that has helped to explain human behavior in various settings and has been studied concerning interpretation in museum or national park contexts (Ablett & Dyer, 2009; Cohen, 2011; Frauman, 2010; Kang & Gretzel, 2012; Moscardo 1999, 2009; Woods & Moscardo, 2003). Some scholars have examined the importance of interpretation and its relationship with mindfulness. Moscardo (1996) suggested that setting factors and visitor factors

would combine to determine if visitors to a site would be mindful. She proposed that personal interests, control, and novelty could induce mindfulness. She also noted the importance of site interpretation, given that how exhibits, displays, or signs can be situated could influence a person's experience. The personal motivation of visitors and their interest or familiarity with the site were also considered significant. It was also thought that guides providing interpretation would be helpful for visitors to become mindful.

Moscardo and Pearce (1986) demonstrated that interpretive theme induced mindfulness. Woods and Moscardo (2003) examined wildlife-based tourism and indicated that interpretation leads to mindfulness. However, Kang and Gretzel (2012) investigated the effect of podcast tours on tourist experiences at a park. Mindfulness was applied to determine whether the podcast interpretation would be effective. However, unlike other studies, podcast tour characteristics such as information source composition and narration style did not show any statistical effect on mindfulness. Kim et al. (2012) stated that tours that reflect local culture and history and have interpretation would be able to enhance a person's experience at a destination. Moscardo (2017) examined mindfulness in tourism using storytelling. This study indicated that stories play an important role in encouraging mindful tourists and can help them to have positive tourist experiences. Specifically, stories regarding danger, extremes, novelty, and surprise can be effective to attract visitor attention. On the other hand, stories related to families, altruism, taking a stand, heroism, and providing a socially desirable justification for consumption would be the most likely to encourage mindfulness. Hughes and Moscardo (2017) also examined the importance of using mobile communication devices (MCDs), as a tool of interpretation at a museum. The results showed that visitors in the study who did not use MCDs showed the lowest scores for mindfulness and perceived learning. However, visitors who used MCDs spent

significantly longer time at museum exhibits and had the highest scores in the study for mindfulness and perceived learning.

According to Moscardo (2009), mindfulness is associated with situations or environments that have the following characteristics: novelty, relevance to the individual, variation, ambiguity and multiple perspectives, multisensory stimulation, and individually controllable.

H_{1A}: Interpretation characterized by features of multisensory stimulation, use of questions, and novelty will yield stronger mindfulness than interpretation that does not include those three features.

H_{1B}: Preparatory mindfulness instructions will increase mindfulness.

H_{1C}: The interaction effect between mindful interpretation and mindful instructions will increase mindfulness.

2.9.2. Mindfulness and Variables of Interest

2.9.2.1. Mindfulness and Immersion

Csikszentmihalyi (1990) noted that consciousness is ordered by different intentions and goals; these serve to provide order for what is most important to individuals. The merging of awareness and activities can lead to the mental immersion that takes place during experiences. Enhancing consciousness during an experience can serve to enable the participant to consider what significance can be derived from it.

Immersion activities are thought to advance experience quality over that of common or everyday experiences (Ellis et al., 2017). Also, immersion experiences allow for immediate feedback from activity participation (Ellis, Jiang, Freeman, Lacanienta, & Jamal, 2020) and this is thought to be beneficial for activities involving mindfulness.

Research by Langer (1989, 1997) has indicated that mindfulness encourages improved task concentration. The theory of structured experience posited that mindfulness and engagement would increase together and this was empirically proven to occur in a study testing theoretical propositions related to this theory (Ellis, Lacanienta, et al., 2020; Ellis, Jiang, Freeman, Lacanienta, and Ellis, 2020). Mindful experiences themselves are thought to be engaging (Langer, 2014). Thus, mindful experiences are expected to lead to immersion among participants.

H_2: As mindfulness increases, immersion increases.

2.9.2.2. Mindfulness and Arousal

In the field of parks, recreation, and tourism, there is a lack of research examining the relationship between mindfulness and arousal, which can be considered as a research gap.

Bagozzi (1996) noted that arousal could be simulated by communications that summon memories or connect with emotions. It was also noted that it can be induced by stimuli. Furthermore, Reeve (2014) wrote that arousal levels among individuals mostly function in response to stimulation from one's environment. Langer (1992) noted that "familiar forms in new contexts are just as novel as new forms in familiar contexts" (p. 302). It is thought that mindfulness techniques could be employed to serve as a stimulus to induce arousal. Various environmental stimuli can be processed in different ways (Langer 1992) and depending on how they connect with the participant and are processed, this could lead to a state of arousal. It would be expected that as participants experience mindfulness, their arousal levels would tend to increase.

H_3: As mindfulness increases, arousal increases.

2.9.2.3. Mindfulness and Learning

As discussed in a previous section concerning these topics, mindfulness in education has been studied previously. Tilden (1957/2007) described interpretation as being educational, noting that it functions to reveal meaning to people.

Langer et al. (1989) noted that conditional instruction resulted in greater creativity in use of information learned. In a study by Lieberman and Langer, it was found that the mindful group demonstrated greater creativity in how they utilized learned information (Langer, 1997). Carson et al. (2001) found support for the notion that variation in the process of teaching is beneficial to mindful learning. The study by Van Winkle and Backman (2008) discovered empirical support indicating that educational motive and content interest significantly affected participant mindfulness. Other researchers examining mindfulness and education have noted the effectiveness of attention variation in learning (Armstrong, 2019; Mendelson et al., 2010).

Strategies that are thought to enable learners to acquire new information or have their curiosity stimulated include providing students or participants with the opportunity to explore other perspectives or to apply meaning to events. These are thought to enable mindfulness or serve to enhance individual learning.

H_4: As mindfulness increases, learning increases.

2.9.2.4. Mindfulness and Memorability

Mindfulness itself is considered to increase participant retention of information (Ramsburg & Youmans, 2014) and to enable novel distinctions to be drawn in the moment (Langer, 2014; Langer & Moldoveanu, 2000).

Langer (1997) noted that a study conducted by Lieberman and Langer found that a mindful group who were told to make information more significant to themselves showed

improved information retention compared with their counterparts. Carson et al. (2001) found that variation in the process of learning was beneficial to learning recall.

Elements of a memorable experience in an interpretation setting put forth in the literature include visitor control during interactions, having a connection with the site, and physical orientation of the setting (Moscardo, 1999; Woods and Moscardo, 2003). Memorable experiences in tourism that yield delight are characterized by accommodating physical locations that have proficient communication and good interactions between staff and visitors (Rivera et al., 2019).

By enabling students or participants to be able to be mindful, learning experiences or tourism experiences are thought to become more memorable. Such experiences are also thought to be positive for the learner.

H_5: As mindfulness increases, memorability increases.

2.9.2.5. Mindfulness and Meaningfulness

Tilden (1957/2007) described the necessity of interpretation being able to relate subject matter to the individual. He further postulated that interpretation is revelation based on information and that provocation should be an aim of interpretation. These items are thought to make interpretation that is provided meaningful.

Mindful experiences as put forth by Moscardo (1996, 1999) are thought to be meaningful given that novelty, use of questions, and visitor interaction or participation should influence those experiencing interpretation to derive meaningfulness from their experiences.

Langer (1997) noted that enabling learners to provide meaning to what they are learning about can increase mindfulness and openness to learning new information. Providing personal meaningfulness to a topic can help learners attend to it from a different perspective. This can be

done by teaching or presenting information in a way that is conditional, this can enable participants to infer or creatively examine the topic under consideration.

Interpretation experiences can be conveyed in a meaningful way if structured correctly. Mindful experiences are expected to be meaningful to participants if conditional learning is involved or if visitors are guided towards mindfulness. Novelty is thought to be a key element related to attaining mindfulness (Langer 1997, 2014; Moscardo 1996, 1999) and would be expected to be an important element for deriving personal meaningfulness.

H_6: As mindfulness increases, meaningfulness increases.

2.9.2.6. Mindfulness and Visitor Satisfaction

Tung and Ritchie (2011) suggested that active engagement and mindfulness could lead to greater visitor satisfaction. Similarly, Ndubisi (2014) examined the role of mindfulness in consumer behavior and service marketing in Australia and Malaysia. The researcher found that there was a statistically significant difference in trust, satisfaction, and commitment based on a consumer's mindfulness. Thus, consumer trust, satisfaction, and commitment significantly depend on their level of mindfulness.

Choe et al. (2014) explored the experiences of exhibition visitors and mindfulness. They examined satisfaction and mindfulness on-site at the 2011 Seoul Motor Show. The authors noted that there has not been much research done concerning mindfulness at exhibitions, even though they are highly experience-oriented endeavors where memorable results are desirable. Based upon survey results, low mindful and high mindful groups were deduced. They found that the high mindful group had more experience attending exhibitions, had a greater interest in cars, and the number of accompanying group members (fewer was better in this regard) influenced upon participant mindfulness. Mindfulness levels were deemed to influence the on-site experiences of

participants. Those in the high mindfulness group had greater satisfaction and behavioral intentions.

H_7: As mindfulness increases, visitor satisfaction increases.

2.9.3. Intention to Recommend and Variables of Interest

2.9.3.1. Immersion and Intention to Recommend

Csikszentmihalyi (1990) wrote that when activities and awareness merge, it can serve to result in mental immersion during experiences. This is like Pine and Gilmore's (1999) assertion that immersion transpires when an individual becomes part of the actual experience.

Bonn et al. (2007) noted that the physical environment influences the intention to recommend an attraction. Since physical environments can be manipulated, this would seem to be relevant to variables in an experimental design. Changing the environmental cues could influence whether an individual would become immersed in an activity, and by extension if they would recommend it.

The study by Chen and Rahman (2018) anticipated that engaged and immersed tourists would have more memorable tourism experiences, especially if the tourists were immersed in their experiences. Based on the results of their study, the researchers noted that allowing tourists to be immersed in their experiences should lead to memorable experiences. This in turn would positively influence intention to recommend.

H_8: As immersion increases, intention to recommend increases.

2.9.3.2. Arousal and Intention to Recommend

Taheri et al. (2014) noted that motivation and past knowledge can influence items such as commitment, attachment, devotion, and emotional connection.

Hosany and Witham (2010) investigated the dimensions of cruise tourists' experiences, specifically exploring how these experiences connected with satisfaction, and intention to recommend. In this study, tourists' experiences were measured by the scale developed by Oh et al. (2007). Arousal was measured as part of that scale. The study found that level of arousal was related to the experiences of cruise tourists. The authors encouraged further study of how arousal influences behavioral intention as these were thought to merit further study. Loureiro (2015) examined the effect website stimuli had on attitude and intention to visit and recommend a destination. Arousal was found to be important in the formation of positive attitudes among participants. In turn, this led to the intention to visit and intention to recommend among participants. Based on these studies, it is thought that arousal would lead to intention to recommend.

H_9: As arousal increases, intention to recommend increases.

2.9.3.3. Learning and Intention to Recommend

Tung and Ritchie (2011) asserted that understanding and involvement could help to create memorable and authentic experiences for tourists. The researchers noted that the facilitation of experiences that visitors find memorable is important for tourism destinations.

Hosany and Witham (2010) conducted a study to identify the dimensions of cruise tourists' experiences and to investigate the connections between tourists' experiences, satisfaction, and intention to recommend. As part of this study, the scale to measure tourists' experiences devised by Oh et al. (2007) was utilized. As part of that scale, education was measured. The findings from this study indicated that education was insignificant when it came to predicting intention to recommend. The sample size used in this study was small, and the authors encouraged further study regarding these variables.

Ellis, Lacanienta, et al. (2020) examined mindful learning experiences, examining how a 4-H Global Travelers program for youth viewed such experiences on a trip to Argentina. The researchers investigated the proclivity to recommend among participants and found that the mindful learning experiences were viewed as worth recommending by the participants in this study.

H_{10}: As learning increases, intention to recommend increases.

2.9.3.4. Memorability and Intention to Recommend

Pine and Gilmore (1999) contended that businesses should deliver memorable experiences for their customers for repurchase to occur and recommendation to other potential customers to take place.

Chen and Rahman (2018) found that memorable tourism experience (MTE) positively influenced tourists' intention to revisit and recommend a cultural destination to others. Thus, memorable tourism experiences positively influence the intention to recommend in cultural tourism settings. This finding is also supported by Gomez-Jacinto et al. (1999), who found that travel experience can have a positive effect on a visitors' intention to revisit. Woodside et al. (2004) also found that memorable tourism experiences can create positive word-of-mouth. A positive memorable interpretation experience could contribute to increased levels of satisfaction and loyalty among tourists, indicating a greater likelihood to recommend.

Even though it was not investigated directly, based on what Kim et al. (2012) indicated, MTE is associated with tourism experiences that are remembered and recalled. MTEs can serve as an important element that effects tourist behavior. Thus, a positive relationship could be expected between mindfulness and memorable experiences involving interpretation.

MTEs especially influence tourists' intention to recommend their travel experiences to others. For example, Semrad and Rivera (2018) found that memorable festival experiences led to a significant influence on e-Word-of-Mouth. A similar finding was supported in earlier research by Chandralal and Valenzuela (2013) who found that MTEs influenced positive word-of mouth among participants.

H_{11}: As memorability increases, intention to recommend increases.

2.9.3.5. Meaningfulness and Intention to Recommend

Kim et al. (2012) examined MTE and in their study, meaningfulness was one factor of MTE. These researchers found that meaningfulness was a significant component of MTE that had an influence on the behavioral intentions of the participants. Meaningfulness as a dimension of MTE was corroborated in a follow-up study by Kim and Ritchie (2014).

Noy (2004) noted that personal significance and the social context of an experience provide meaningfulness to individuals as they experience an event. The study by do Valle et al. (2006) found that high satisfaction led to an increased willingness to recommend among tourists. Ellis et al. (2016) used meaningfulness in a study about structured experiences during youth programs. Four types of experiences were observed in the study and positive youth development experiences that were structured yielded the highest meaningfulness scores of the experience types examined. The ability to develop or grow personally (i.e., personal development or growth) from an experience is thought to enable individuals to have experiences that are meaningful. In the same way, it is thought that meaningful experiences would also be experiences that would be recommended.

H_{12}: As meaningfulness increases, intention to recommend increases.

2.9.3.6. Visitor Satisfaction and Intention to Recommend

In the study by Chen and Tsai (2007), the researchers found that satisfaction significantly influenced tourists' behavioral intention. To measure behavioral intention, likelihood to revisit and willingness to recommend were used. Thus, satisfaction influenced intention to recommend. The same type of finding emerged in the study by Chi and Qu (2008). They found that satisfaction significantly influenced tourists' destination loyalty. The measure for destination loyalty was comprised of two items "Revisit intention" and "Recommend intention." Again, satisfaction positively influenced intention to recommend.

Ellis, Lacanienta, et al. (2020) used proclivity to promote in their study about structured reflections during a travel abroad program. Delight (considered a form of high satisfaction) and proclivity to recommend were both significant measures as participants indicated that they were delighted by their experiences and would recommend their reflection experiences. Based on these prior studies, it would be expected that visitor satisfaction would result in an intention to recommend.

H_{13}: As visitor satisfaction increases, intention to recommend increases.

3. METHODS

3.1. Overview

This chapter details the methods used for the study. The study examined the effect of two interpretation strategies on the mindfulness of participants during participation in an environmental interpretation experience: a) brief preparatory mindfulness instructions and b) mindful interpretation using techniques proposed by Moscardo (1996). Downstream effects of mindfulness during interpretation were also studied. Four hundred fifty (450) adult participants were randomly assigned to one of four experimental treatment conditions, with each of four groups comprising at least one hundred (100) individuals. Each group represented a combination of effects of two factors: pre-interpretation mindfulness instructions (Mindful Instructions-Present vs. Mindful Instructions-Absent) and mindful interpretation strategy (Mindful Interpretation-Provided vs. Mindful Interpretation-Not Provided), creating a fully crossed, 2 by 2 experimental design. Participant mindfulness was measured immediately after participants viewed the website used in that part of the study. Immersion, arousal, learning, memorability, meaningfulness, visitor satisfaction, and intention to recommend were also measured, representing downstream outcomes in the model. Details are presented in the ensuing sections.

3.2. Materials

Materials included two websites (one reflecting mindful interpretation and the other mindless interpretation), and an online questionnaire using the Qualtrics application. The online

survey application randomly assigned participants to one of two experimental groups for the mindfulness instructions condition of the study (Mindful Instructions-Present, Mindful Instructions-Absent). Instructions were provided for the respective mindfulness instructions condition (see Appendix A). Participants assigned to the Mindful Instructions-Absent group were shown a brief prompt instructing them to click a link to access the website condition. They were not given any directions related to completing mindfulness instructions prior to viewing the website they were assigned to view. Participants assigned to the Mindful Instructions-Present group were given specific instructions that were modeled after those presented in the study by Ellis, Lacanienta, et al. (2020). In that study, guided reflection times were used for structured mindfulness experiences for youth travel participants. The main principles from the Ellis, Lacanienta, et al. (2020) study guided the directions given to participants in this study. Participants were instructed to do the following in the Mindful Instructions-Present condition: "Take a few deep breaths. Feel the air pass through your nose and mouth and deep into your lungs," "Do a quick 'body scan' and relax any muscles you find to be tense," and "Put your troubles away. Think only about the website, not the past or the future." Once participants had viewed these instructions, the application presented them with a manipulation check question (see "Manipulation Checks" section) prior to viewing their assigned website. These approaches to the mindful instructions condition that participants viewed in the online Qualtrics questionnaire were adopted to ensure fidelity of treatment implementation.

After participants viewed the information for their mindful instructions condition, the application randomly assigned them to visit one of two websites: Mindful Interpretation-Provided or Mindful Interpretation-Not Provided. The Mindful Interpretation-Not Provided website was a partial replication of the existing "Yellowstone in 3-D" webpage

(nps.gov/gis/storymaps/cascade/v1/index.html?appid=ee0b10d44b6843b18ccf829c2891ed01). That webpage provides images of select geysers and hot springs at Yellowstone. Visitors to the website scroll through images representing thermal features of Yellowstone. When images of key thermal regions of the park appear (e.g., Mammoth Hot Springs and the Lower Geyser Basin), a pop-up text box appears, providing website visitors with information about that feature. For Mammoth Hot Springs, the pop-up box narrative reads as follows:

> At Mammoth, a network of fractures and fissures form a plumbing system that allows hot water from underground to reach the surface. The water comes from rain and snow fall on nearby mountains and then seeps into the earth where it is eventually heated. Small earthquakes may keep the plumbing open. Limestone, deposited here millions of years ago when a vast sea covered the area, provides the final ingredient. Hot water with dissolved carbon dioxide makes a solution of weak carbonic acid. As the solution rises through rock, it dissolves calcium carbonate, the primary compound in limestone. At the surface, the calcium carbonate is deposited in the form of travertine, the rock that forms the terraces of Mammoth Hot Springs.

This narrative succinctly communicates key geological information about the hot springs, but it does not include features from Moscardo's (1996) model that would qualify it as a mindful interpretation strategy: varied/multisensory media, novelty/conflict/surprise, and use of questions. Thus, in the context of this study, that existing interpretive approach was treated as Mindful Interpretation-Not Provided.

A second website was constructed for the Mindful Interpretation-Provided treatment condition. Narrative in each of the text boxes on that website was replaced with mindfulness interpretation strategies (i.e., multisensory appeal, novelty/conflict/surprise, and questions). Each

of the narratives crafted for the Mindful Interpretation-Provided website was reviewed by a panel of individuals familiar with mindfulness and Moscardo's (1996) model to confirm construct validity of the cause. The individuals in the panel also have extensive professional experience related to heritage or environmental interpretation and provided constructive feedback that enabled the narratives to be improved prior to being used in the study. The Mindful Interpretation-Provided narratives can be viewed in Table 5 below. The Mindful Interpretation-Provided narratives included multisensory descriptions; sought to introduce variety, novelty, or surprising information; and included the use of questions for participants to consider in keeping with suggestions made by Moscardo (1996). Printed interpretation materials were chosen as a focus for this study due to their use in prior studies (Ganesan et al., 2014; Noor et al., 2015) and given that they were found to have the strongest effect on visitor mindfulness in the study by Noor et al. (2015). This approach to the mindful interpretation condition that included random assignment of participants was adopted to ensure fidelity of this treatment condition.

The online questionnaire included items measuring the subjective experiences of participants in each of the four experimental conditions (Mindful Instructions-Present vs. Mindful Instructions-Absent, and Mindful Interpretation-Provided vs. Mindful Interpretation-Not Provided). Variables measured were mindfulness, immersion, arousal, learning, memorability, meaningfulness, visitor satisfaction, and intention to recommend.

3.3. Participants

In order to evaluate an appropriate sample size for the study, power analysis was completed prior to data collection. Power analysis is conducted to understand the likelihood an

Table 5

Webpages and Interpretation Conditions

Web Page	Mindful Interpretation- Provided	Mindful Interpretation- Not Provided
Mammoth Hot Springs	Let's take an imaginary visit to Mammoth Hot Springs. Can you do that? What would you expect to feel, smell, or hear while there? At Mammoth, a network of fractures and fissures form a plumbing system that allows hot water from underground to reach the surface. Water comes from rain and snow that falls nearby and then seeps deep into the earth where it is eventually heated. **You will hear many sounds at Mammoth: *water drips over rock surfaces, gases bubble up through searing hot mud pots, and some lucky visitors may hear the distant sound of elk bugling (whooo-eee). Aromas are also distinct. Sulfur expelled by the mud pots creates an almost unbearable aroma that smells like rotten eggs.* Can you imagine that smell?** *You may be wondering how the natural plumbing system continues to enable the underground hot water to reach the surface. Have you considered that small earthquakes are what help the plumbing remain operational at Mammoth?* **Limestone in the form of travertine is deposited on the terraces of Mammoth Hot Springs, providing pleasant surroundings to view at your visit to Mammoth.**	At Mammoth, a network of fractures and fissures form a plumbing system that allows hot water from underground to reach the surface. The water comes from rain and snow falls on nearby mountains and then seeps deep into the earth where it is eventually heated. Small earthquakes may keep the plumbing open. Limestone, deposited here millions of years ago when a vast sea covered the area, provides the final ingredient. Hot water with dissolved carbon dioxide makes a solution of weak carbonic acid. As the solution rises through rock, it dissolves calcium carbonate, the primary compound in limestone. At the surface, the calcium carbonate is deposited in the form of travertine, the rock that forms the terraces of Mammoth Hot Springs.

Table 5 Continued

Norris Geyser Basin	As in human relations, geological conflict creates heat. Can you imagine the intense heat that is generated in this geyser basin? How hot do you think it gets underground here? Can you imagine feeling the heat as it emerges from deep below the earth's surface? Norris is near the intersection of major faults where the Yellowstone Caldera erupted 640,000 years ago. *These volatile conditions caused a 1959 earthquake which was measured at 7.4 on the Richter scale.* Have you considered how important earthquakes were in forming this area? Norris is one of the hottest of Yellowstone's hydrothermal areas. Many hot springs and fumaroles here have temperatures of (200ºF / 93ºC). ***The sound you would hear at Norris is the roar of steam due to the tremendous heat below the geyser basin, and the smell of Sulphur is present.*** *The highest geothermal temperature of 459ºF (237ºC), Yellowstone's highest, was recorded beneath Norris.*	Norris is one of the hottest and most acidic of Yellowstone's hydrothermal areas. Many hot springs and fumaroles here have temperatures above the boiling point (200ºF / 93ºC). Water fluctuation and seismic activity often change features. Norris is near the intersection of three major faults. One runs from the north; another runs from the west. These two faults intersect with a ring fracture from the Yellowstone Caldera eruption 640,000 years ago. These conditions helped to create this dynamic geyser basin.

Table 5 Continued

Lower Geyser Basin	Yellowstone is renowned for its sources of water. Can you contemplate how much water is in this park's rivers, falls, and lakes? Have you thought about the water below ground too? *This basin has 100 geothermal features; no area in Yellowstone discharges as much hot water.* Most of the hydrothermal activity here occurs at Fountain Paint Pot and Firehole Lake. **You could hear Fountain Paint Pot making bubbling sounds while there**. Did you know that a volume of about 15,300 gallons (58,000 liters) per minute are released in the Lower Geyser Basin? This basin is the largest of nine major geyser basins in Yellowstone. **This basin consists of a flat plain interspersed with meadows and stands of lodgepole pine, with the Firehole River flowing through the central part of the basin**. *Another notable water feature of Yellowstone includes Yellowstone Lake, the largest freshwater lake in North America at an elevation above 7,000 feet (2,134 meters).*	This is the largest geyser basin in Yellowstone, spanning about 18 square miles (29 km²). It consists of a flat plain interspersed with meadows and stands of lodgepole pine, with the Firehole River flowing through the central part of the basin. No other area in the park equals the Lower Geyser Basin in terms of hot water discharge. Measurements made in 1930 indicated a volume of about 15,300 gallons (58,000 liters) per minute! Most of the hydrothermal activity in the Lower Geyser Basin occurs in the Fountain Paint Pot and Firehole Lake areas.

Table 5 Continued

Old Faithful Geyser	Could you consider most elements of your life as being predictable? While you probably can, not everything in life is predictable and that is true in nature. Old Faithful is one of nearly 500 geysers in Yellowstone but is just one of six that are predictable. Explorers in 1870 noted the consistent nature of eruptions from this geyser and gave it its name. Have you ever considered if Yellowstone would even be a national park if it wasn't for this routinely predictable geyser? *On a given day, Old Faithful will erupt about 17 times. Depending on the length of the eruption, between 3,700 gallons and 8,400 gallons of water can be expelled by Old Faithful.* **The sound of Old Faithful erupting is soothing and the water and steam venting lead to the deposit of minerals around Old Faithful. As a result, the blue and yellow-orange pools of water around the vent dominate the region around Old Faithful.** *The length of time between eruptions at Old Faithful has slowly increased due to small earthquakes. Old Faithful remains predictable though. If an eruption lasts less than 2.5 minutes, there will be a one-hour interval until the next eruption. If the eruption is longer than 2.5 minutes, then the interval until it erupts again will be 90 minutes. Eruptions can range from just a minute and a half to five minutes in length.* But Old Faithful has lived up to its name, only lengthening the time between eruptions by about 30 minutes in the last 30 years. Old Faithful is the iconic geyser of Yellowstone National Park as watching Old Faithful Geyser erupt has become a tradition. People from all over have journeyed to watch this famous geyser erupt on a predictable basis.	Watching Old Faithful Geyser erupt is a Yellowstone National Park tradition. People from all over the world have journeyed here to watch this famous geyser. The modern park is renowned for its wildlife and scenery, but it was its unique thermal features like Old Faithful Geyser that inspired the establishment of Yellowstone as the world's first national park in 1872. Old Faithful is one of nearly 500 geysers in Yellowstone and one of six that park rangers currently predict. It is uncommon to be able to predict geyser eruptions with regularity and Old Faithful has lived up to its name, only lengthening the time between eruptions by about 30 minutes in the last 30 years. Old Faithful is the iconic geyser of Yellowstone National Park. The grey geyserite creates a gentle slope up to the vent of the geyser. The vent itself is actually a depression, and not the protruding "cone-like" feature. The prominent "cone-like" feature is a result of the prevailing wind, with water and steam constantly depositing minerals on one side of the vent. The blue and yellow-orange pools of water around the vent are extremely delicate and full of microbial life. The small pools and terraces dominate the region around Old Faithful.

Note: Questions are underlined, multisensory info is in bold, novel/surprising info is in italics.

effect can be detected. Power can help to determine the probability of the rejection of a false null hypothesis. It is known that several factors influence power (Myers & Well, 2003), but effect size and sample size are known to be the most prominent influences. Power analysis suggested a minimum sample size of 240 with 60 in each of the four experimental conditions, with a significance level (α) of .05, statistical power (β) of 0.8, and an effect size (γ) over 0.2. The larger the effect size expected, the smaller the sample size can be. The minimum sample size for the study was deemed to have adequate statistical power while assuming at least a small effect size ($\gamma = 0.2$). After data were collected and outliers excluded, there were 450 responses used in the final data analysis.

A population describes the group of individuals of interest to a study and a sample is the set of individuals from a population of interest (Privitera, 2014). Two populations were examined as part of this research study. It was expected that people with an interest in parks or the environment would have an increased interest in participating in the study. So, one of the two populations was defined as people with an interest in a) U.S. national parks, b) the environment or environmental issues, or c) environmental interpretation, and who have an affiliation with an organization that corresponds to at least one of those categories. The general population of the United States was the second population of interest. In seeking to sample from the first population, various organizations were contacted that were representative of that population. Organizations that were contacted and shared the survey with their members to participate in the study were as follows: the National Park Service (NPS), the National Association of Interpretation (NAI), Texas Outdoor Adventure Directors, the Katy Prairie Conservancy, the Yellowstone to Yukon Conservation Initiative, Friends of Brazoria Wildlife Refuges, Bayou Land Conservancy, Friends of Hagerman, Gulf Coast Bird Observatory, Texas Master Naturalist

Program, and the Brazos Valley Museum of Natural History. The general population was sampled by a Qualtrics survey panel. This panel of respondents was sampled from a population of millions of potential Qualtrics panelists. The Qualtrics panel sampled was comprised of English-speaking adult U.S. residents over the age of eighteen years old. No specifications were requested in terms of other demographic characteristics. Self-selection likely occurred. Participants were informed that the study had to do with a National Park context. Individuals with interest in national parks may thus be over-represented in the sample. Qualtrics did not record the number of invited versus accepted panelists.

Table 6 contains demographic data for the total sample. Most (70.7%) were female, and the most prevalent age group was 60-69 years old (25.3% of responses). Most respondents were White/Caucasian (82.7%). Most respondents (67.1%) reported their household income as being less than $75,000 per year. Just over half of respondents (50.4%) were employed and about one-third (32.4%) were retired. Most respondents had a bachelor's degree or higher (67.3%) and most respondents were married (53.6%).

One variable of interest in the study was the number of times participants had visited Yellowstone National Park before participating in the study. These results can be viewed in Table 7. In the sample of the population interested in parks and environmental issues, most respondents (58.2%) had previously visited Yellowstone National Park. In the sample of the general population, most of those participants (69.7%) had not previously visited the park. The effect of having visited Yellowstone is discussed further in the "Conclusions" chapter.

Table 6

Demographics

Item	N (%)	Item	N (%)
Gender (n=450)		***Income (n=450)***	
I prefer to not respond	7 (1.6%)	I prefer to not respond	66 (14.7%)
Male	125 (27.8%)	Less than $25K	62 (13.8%)
Female	318 (70.7%)	$25K – Less than $50K	94 (20.9%)
Age (n=450)		$50K – Less than $75K	80 (17.8%)
18-29	76 (16.9%)	$75K – Less than $100K	58 (12.9%)
30-39	68 (15.1%)	$100K – Less than $125K	32 (7.1%)
40-49	61 (13.6%)	$125K – Less than $150K	25 (5.6%)
50-59	68 (15.1%)	More than $150K	66 (14.7%)
60-69	114 (25.3%)		
More than 70	63 (14.0%)		
Racial/ethnic identity (n=450)			
I prefer to not respond	10 (2.2%)		
Native American /Alaska Native	6 (1.3%)	***Employment (n=450)***	
Hispanic	18 (4.0%)	I prefer to not respond	10 (2.2%)
Asian	14 (3.1%)	Full time employment	161 (35.8%)
Black / African American	25 (5.6%)	Part time employment	66 (14.7%)
White / Caucasian	372 (82.7%)	Unemployed	39 (8.7%)
Other	5 (1.1%)	Retired	146 (32.4%)
Education Level (n=450)		Other	28 (6.2%)
I prefer to not respond	11 (2.4%)		
High School	61 (13.6%)	***Marital Status (n=450)***	
Some College	75 (16.7%)		
Bachelor's Degree	107 (23.8%)	I prefer to not respond	15 (3.3%)
Graduate Studies	36 (8.0%)	Not married	194 (43.1%)
Graduate Degree	160 (35.6%)	Married	241 (53.6%)

3.4. Measures

This section provides a description of the scales used to measure the outcome variables. Outcome variables were mindfulness, immersion, arousal, learning, memorability, meaningfulness, visitor satisfaction, and intention to recommend.

Table 7

Number of Prior Visits to Yellowstone National Park by Study Participants

N Park Visits	N Parks/Env. Population Sample	N General Population Sample	N Total Participants
0	104	140	244
1	66	27	93
2	25	20	45
3	24	4	28
4	9	2	11
5	4	3	7
6	3	1	4
7	2	0	2
9	1	0	1
10	2	0	2
12	3	0	3
13	1	0	1
15	0	2	2
16	0	1	1
20	2	0	2
26+	3	1	4
Total	249	201	450

3.4.1. Mindfulness

Mindfulness measures were reviewed in detail in the literature review, particularly in the "Tools and Strategies for Studying Mindfulness" section. Measurement of mindfulness followed from formal definitions. It is worth noting again that the current research study focused on mindfulness as immediate conscious experience (i.e., in situ mindfulness). Langer (2000) defined mindfulness in terms of three dimensions: 1) engagement, 2) a flexible state of mind, and 3) noticing new things and being sensitive to context. Existing measures of mindfulness do not capture all three characteristics. Thus, items were drawn from existing mindfulness scales and

modified to represent the three domains identified by Langer (2000). Items were drawn from the following scales: Mindful Attention Awareness Scale or MAAS (Brown and Ryan, 2003), Frauman and Norman (2003), the Toronto Mindfulness Scale (Lau et al., 2006), and the Langer Mindfulness Scale or LMS (Pirson et al., 2018). I constructed additional items used in the study. A complete list is presented in Table 8. The table illustrates how many items were considered and eventually chosen for use in the study. Five items were chosen to represent the "engagement" dimension, and three items were chosen to represent each of the dimensions of "flexible state of mind" and "noticing new things, sensitive to context". The specific items were chosen as they were thought to adequately represent the dimension being measured. A panel of experts reviewed the items before the surveys were distributed (see "Procedures" section). The response format for mindfulness items ranged from "never" to "entire time," thereby providing a measure of prevalence of mindfulness during each participants' exploration of the website. A 100-point electronic "slider" scale was used to measure mindfulness.

Given that the definition of mindfulness chosen for this study (Langer, 2000) comprised three dimensions of mindfulness, the mindfulness subscales were examined once data collection was completed. Specifically, the items and dimensions were scrutinized to determine the quality and construct validity of this important measure for the study. The average mindfulness score among the eleven items was used as the mindfulness variable score in the later statistical analysis.

Once the number of valid and useful responses was determined, reliability (internal consistency) of multi-item measures was conducted. While the "Results" chapter contains more detailed information about valid responses and all variables in the study, mindfulness information relevant to the three dimensions is included here. The Cronbach's alpha of the

Table 8

Mindfulness Scale Items

Engagement: a) focus of attention on an unfolding narrative or story, b) heightened emotions, and c) agentic inclinations (Ellis et al., 2019)	1. **I was deeply focused on the experience of visiting the website.** * 2. **I found it easy to stay focused on ~~what was happening during the activity~~ *the website* (MAAS). *** 3. **I felt deeply involved in exploring ~~what was going on around me~~ *the website* (F&N). *** 4. **My brain was deeply engaged while exploring the web site (suggested by expert panelist). *** 5. **My emotions were activated while exploring the website. *** 6. I was very attentive through the activity, without rushing through it (MAAS). 7. I paid close attention during the activity (MAAS). 8. I was fully aware of the task, not doing it automatically (MAAS). 9. I experienced intense emotions. 10. I wanted my experience to continue. 11. I felt deeply involved in what was going on around me (F&N). ***= selected to use**
Flexible state of mind: A state of immediate awareness in which one is actively exploring new ideas and perspectives	**1. I was open-minded during ~~the activity~~ *my website experience*, even when something challenged my beliefs (LMS). *** **2. I was curious about what I might learn ~~about myself~~ by just taking notice of what my attention became drawn to (TMS). *** **3. I was receptive to ~~unpleasant~~ *new* thoughts and feelings (TMS). *** 4. I was more invested in observing my experiences as they arose than in figuring out what they could mean (TMS). 5. I was more concerned with being open to my experiences than controlling or changing them (TMS). ***= selected to use**

Table 8 Continued

Noticing new things and sensitive to context: A state of attention in which one recognizes additional or novel elements while exploring a given stimulus field.	**1. I explored possibilities (F&N). *** **2. I discovered new things. *** **3. I had new ideas. *** 4. I found answers to questions I had (F&N). 5. I had my interest captured (F&N). 6. I was curious about my reaction to things (TMS). 7. I discovered creative solutions. ***= selected to use**

Item Citations: MAAS (Brown and Ryan, 2003); F&N (Frauman & Norman, 2003); TMS (Lau et al., 2006); LMS (Pirson et al., 2018). No citation means I constructed the item for this study.

eleven items used to measure mindfulness was 0.94. Langer's (2000) definition indicated that there were three dimensions to mindfulness: 1) "engagement," 2) "flexible state of mind," and 3) "noticing new things, sensitive to context." To examine these dimensions and the items that were thought to correspond to them (see Table 8 above), alpha values for each dimension were calculated. For the dimensions of mindfulness, Cronbach's alpha was as follows: the "engagement" dimension was 0.93, the "flexible state of mind" dimension was 0.85, and the dimension for "noticing new things, sensitive to context" was 0.88. This indicated reliability of the three dimensions of mindfulness. The intercorrelations between each pair of the three dimensions ranged from 0.70 ("Engagement" and "Noticing new things, sensitive to context") to 0.73 ("Flexible state of mind" and "Noticing new things, sensitive to context").

3.4.2. Immersion

Ellis et al. (2017), defined immersion as a transitory state with the following characteristics: "high focus of attention on a limited stimulus field," an "environmental demand for immediate behavioral action," and "immediate feedback on the efficacy of those actions" (p. 3). Although Moscardo's (1992) measure of mindfulness did not include items representative of the dimensions of Langer's (2000) definition of mindfulness, items on that scale do constitute an

appropriate measure of immersion, given the Ellis et al. (2017) definition. Thus, Moscardo's measure was used as an immersion measure in this study.

Moscardo's (1992) scale as originally worded comprised the following items: "My curiosity is aroused," "I feel like searching for answers," "I want to explore possibilities," "My interest has been captured," "I feel involved in what I am doing," "I want to enquire further," and "I feel in control of what I am doing." Moscardo did not report a reliability coefficient for the scale. She did report the matrix of inter-item correlations. Standardized item alpha can be calculated from that matrix, using the formula for Cronbach's alpha (see below).

$$\alpha = \left[\frac{k}{k-1}\right]\left[1 - \frac{\sum \sigma_{ij}^2}{\sum \sigma_T^2}\right]$$

Where k is the number of items, σ_T^2 is the total variance, and σ_{ij}^2 is the shared variance among the items. Using that formula, alpha was .88.

Frauman and Norman (2003, 2004) noted that the seven items devised by Moscardo in her scale had positive inter-item correlations, forming a unidimensional scale. Frauman and Norman's (2003, 2004) modified scale yielded a Cronbach's alpha of 0.91. The two researchers also conducted factor analysis and validity was indicated by factor loadings greater than .80, and 70% of the variance among the scale items was explained by a single factor. Items used in the current study corresponded to a focus of attention, environmental demand for action, and need for feedback related to participant actions as described in the definition of the variable. The items used in this study are as follows: "My curiosity was aroused," "I felt like searching for answers," "I wanted to explore possibilities," "My interest was captured," "I felt involved in what I was doing," "I wanted to inquire further," and "I felt in control of what I was doing." The response

format ranged from “never” to “entire time,” and a 100-point electronic “slider” scale was used to measure immersion.

3.4.3. Arousal

Oh et al. (2007) used four items to measure arousal during tourists’ visitations to Bed and Breakfast (B&B) lodging businesses. Arousal items were as follows: “How interesting was your stay at this B&B,” “How stimulating was your stay at this B&B,” “How exciting was your stay at this B&B,” and “How enjoyable was your stay at this B&B?” The researchers reported an alpha reliability coefficient of .91. Validity was demonstrated in several ways. Factor loadings were higher than .62, and *t*-ratios were significant, thus indicating convergent validity. Squared multiple correlations for all items averaged 74%, supporting convergent validity. Confidence intervals of between-construct correlations did not include the value of one, establishing discriminant validity.

The Oh et al. (2007) arousal measure was used in a study by Loureiro (2014). The composite reliability for the measure was reported as .88. Loureiro (2014) also reported evidence of convergent and discriminant validity. The same measure was used in a study by Kastenholz et al. (2018). In contrast to Loureiro’s five-point response scale, Kastenholz et al. used a 7-point Likert-type scale. Composite reliability for the measure was .90. Evidence of convergent and discriminant validity were also reported by those researchers.

Oh et al. (2007) defined arousal as a psychological state, arising from a “physiological response to a stimulus on the continuum from calmness to excitement” (p. 123). Items were slightly re-worded to reflect the context of the current study. The arousal items for this study were as follows: “How interesting was your interpretation experience,” “How stimulating was your interpretation experience,” and “How exciting was your interpretation experience?” One

item used by Oh et al. (2007) was not used in the final data analysis for this study: the item that addressed how enjoyable the experience was. While it was included in data collection, it was omitted from the data analysis as the item could have been understood as a measure of enjoyment or could have been considered as potentially measuring that as a variable. The response format for the arousal variable ranged from "not at all" to "extremely," and a 100-point electronic "slider" scale was used to measure arousal.

3.4.4. Learning

Oh et al. (2007) used four items to measure a variable called "education." Education items in the study were as follows: "The experience has made me more knowledgeable," "I learned a lot," "It stimulated my curiosity to learn new things," and "It was a real learning experience." The researchers reported alpha reliability of .94 for this scale. Evidence of convergent and discriminant validity were reported. The education measure was used in a study by Hwang and Lee (2019) and was measured using a 7-point scale. Those researchers reported composite reliability as .93. Additionally, the researchers reported evidence of convergent and discriminant validity.

The main ideas concerning the variable used by Oh et al. (2007) were utilized in this study. In the current study, the learning variable was defined as follows: a dimension of experience that is characterized by gaining knowledge. The same items were used in this study as had been used in the study by Oh et al. (2007) with one exception. The item "It was a real learning experience" was changed to "It was an impactful learning experience" in order to reduce ambiguity associated with the word, "real." In the current study, the response format ranged from "not at all" to "extremely," and a 100-point electronic "slider" scale was used.

3.4.5. Memorability

Oh et al. (2007) used three items to measure a variable called “memory.” Memory items in the study were as follows: “I will have wonderful memories about this B&B,” “I will remember many positive things about this B&B,” and “I won’t forget my experience at this B&B.” The researchers reported an alpha reliability coefficient of .92 for this scale. Convergent validity and discriminant validity were reported by these researchers. This memory measure was used in a study by Kastenholz et al. (2018), who used a 7-point Likert-type scale. Composite reliability was reported as .88. Evidence of convergent and discriminant validity were also reported by Kastenholz et al. (2018).

The main ideas concerning the variable used by Oh et al. (2007) were utilized in this study. In the current study, the memorability variable was defined as follows: a transitory state that is characterized by the ability to recall an event or experience after it has happened. Items were re-worded to reflect the context of the current study. The memorability items for this study were as follows: “I will have wonderful memories about this interpretation experience,” “I will remember many positive things about this interpretation experience,” and “I won't forget my interpretation experience.” In the current study, the response format ranged from “strongly disagree” to “strongly agree” and was measured on a 7-point Likert-type scale.

3.4.6. Meaningfulness

Meaningfulness was previously measured by Ellis et al. (2016) and the researchers used a single item to measure meaningfulness. In their study, the meaningfulness item was as follows: “I am still thinking about something I learned.” Pearson correlation coefficients were calculated in the study among three variables: perceived value, engagement, and meaningfulness. Validity of the meaningfulness measure was demonstrated in their study because the validity coefficients ranged from .48 (engagement and meaningfulness) to .61 (perceived value and meaningfulness)

and were significant at the $p<.001$ level. This item was subsequently used in studies by Taggart (2017) and Lacanienta et al. (2020), both of whom found that the item performed consistently with theory and demonstrated construct validity.

The main definition of the meaningfulness variable from Ellis et al. (2016) was used; thus, for the purpose of this study, meaningfulness was defined as a state of mind following an activity that demonstrates the "extent to which" the experience "yielded active thought about something learned during that experience" (p. 165). In this study, meaningfulness was measured with the same item ("I am still thinking about something I learned.") on a 5-point scale as in the original study: "True," "Mostly true," "Neither True or False," "Mostly False," and "False."

3.4.7. Visitor Satisfaction

Oh et al. (2007) used two items to measure customer satisfaction in their study about B&B lodging businesses. Customer satisfaction was measured on a 7-point response scale ranging from "Terrible" to "Delighted" and "Very dissatisfied" to "Very satisfied," respectively. The researchers reported an alpha coefficient of .77 for this scale. Convergent validity and discriminant validity were reported by these researchers as described in the section about the arousal measure. This customer satisfaction measure was used in a study by Hosany and Witham (2010) to measure overall satisfaction and was measured using a 7-point response scale; alpha reliability was reported as .84. Convergent and discriminant validity were also reported by these researchers.

When reviewing the measurement items in detail, it was found that the specific response labels for the 7-points were not identical. Furthermore, both items used the labels "Mostly dissatisfied" and "Mostly satisfied," but at different points in the measurement scales (this was not clearly conveyed in the study by Oh et al., 2007). Thus, it was decided to use one item

instead of two as a measure of satisfaction, and the "Very dissatisfied" to "Very satisfied" item was not utilized. The main ideas concerning the satisfaction variable from Oliver et al. (1997) were utilized to help define the variable used in this study. In the current study, the variable was defined as follows: a psychological state in response to time spent on an experience, on a continuum from disgust to delight. While the notion of customer satisfaction helped to inform the conceptualization of this variable, it was called "visitor satisfaction" due to the nature of this study being focused on environmental interpretation. Visitor satisfaction was measured with a 100-point electronic "slider" scale. The response format ranged from "Disgusted" to "Delighted" in this study to match the definition of the variable.

3.4.8. Intention to Recommend

The proclivity to recommend measurement was based on the widely used Net Promoter Score that was first introduced by Reichheld (2003). Reliability of the Net Promoter Score was assessed in a study by Wilberforce et al. (2018). These researchers reported reasonable test-retest reliability as the quadratic weighted kappa was reported as .706 for the Net Promoter Score. Net Promoter Score involves reducing interval level data to ordinal level. Some researchers preserve the interval-level character of their data (e.g., Ellis, Lacanienta, et al., 2020). A single item is used. Participants are asked to indicate the likelihood that they would promote the product or service to their friends, family, or colleagues. Intention to recommend was measured by Ellis, Lacanienta, et al. (2020) on an 11-point response scale: "extremely likely" (scored as ten), "Neutral" (scale midpoint), and "not at all likely" (scored as zero). Validity was demonstrated through significant positive bivariate correlations with measures of theoretically related constructs.

Drawing from research and descriptions of the same type of concept in other settings (Reichheld, 2003; Ellis, Lacanienta, et al., 2020), I proposed the definition of intention to recommend for this study as follows: an inclination a participant has after participation in an activity to promote or share the experience with others. In the current study, the item was as follows: "How likely are you to promote this interpretive experience to others?" The response format ranged from "not at all" to extremely likely," and a 100-point electronic "slider" scale was used to measure intention to recommend.

3.4.9. Manipulation Checks

Two manipulation checks were included for participants, one for the mindfulness instructions and one for the mindful interpretation strategy. The first was to confirm that participants understood and had participated in the mindfulness instructions condition. For participants assigned to the Mindful Instructions-Present condition, a question asked them the following: "Are you relaxed, thinking only about the present, and ready to enjoy the sights, sounds, and aromas of Yellowstone by viewing the website?" The answers respondents were able to choose from were as follows: "Yes, I am ready to see the website," "I tried, but didn't feel like I could do it," and "No, I just want to see the website." Then, participants in that condition were able to view the website they were assigned to the mindful interpretation condition. Participants assigned to the Mindful Instructions-Absent condition were simply shown instructions on how to continue to the website for the mindful interpretation condition.

The second manipulation check question was for the mindful interpretation strategy (i.e., website) condition and participants were able to see this question after they had completed viewing the website they had been assigned to view. The prompt and question for the website manipulation check were as follows: "Some participants viewed a website that included

questions for you to ponder along with descriptions of sounds and aromas you would encounter at the thermal features. Other participants viewed a website that did not include these features. Which is true for you?" The answers participants were able to choose from were as follows: "The website I viewed included questions and descriptions of sounds and aromas," "The website I visited did not include questions and descriptions of sounds and aromas," and "I do not recall." This enabled participants to have the opportunity to identify if they were assigned to the Mindful Interpretation-Provided or Mindful Interpretation-Not Provided group.

3.5. Procedures

Table 9 provides a detailed list of procedures for the study. Expert reviews of the mindfulness scale items were secured before data collection was initiated. Two well-known scholars of mindfulness reviewed the mindfulness items, and one additional item was added to reflect a suggestion made by a scholar. The feedback from these scholars provided evidence of construct validity of causes and effects. Data collection was conducted through the online survey application, Qualtrics. The organizations that potential participants were associated with were emailed the questionnaire and information about the purpose of the study. Once this took place, potential participants were invited to participate and the link to the online Qualtrics questionnaire was shared for individuals to access.

For the population interested in parks and environmental issues, participants were told that the first 100 respondents would be eligible to receive a $5.00 Amazon.com gift card in exchange for their participation. Once a participant clicked the survey link, the web browser of each individual who chose to participate was directed to the questionnaire. The questionnaire welcomed the

participant, summarized the purpose of the study (i.e., to evaluate different approaches to interpretation of natural features), and provided informed consent. Once a respondent began to participate in the online survey, the Qualtrics survey application randomly assigned participants to one of the two mindfulness instructions conditions (Mindful Instructions-Present or Mindful Instructions-Absent) and directed the participant's browser to a page implementing the respective treatment condition instructions as described previously in the "Materials" section. Once participants were finished with the mindfulness instructions condition they had been assigned, participants were also randomly assigned to a condition for the website they would view (Mindful Interpretation-Provided or Mindful Interpretation-Not Provided.). The written narratives for those conditions can also be found in the "Materials" section in Table 5. Participants had the opportunity to visit the website they were randomly assigned to for as long as they chose to. When finished with the website, participants were asked to complete the measures of mindfulness and the other subjective states that were part of the study. Table 9 summarizes the research participant's journey through the study and Appendix A contains the questionnaire.

Table 9

Research Procedure

Step	Event
1	Questionnaires and Procedures were finalized through expert review.
2	Potential participants received an email invitation to participate in the study.
3	Participants clicked the link embedded in the email invitation, being transferred to the Qualtrics questionnaire.
4	Participants read the study introduction and informed consent information. By proceeding as a participant in the study, participants indicated that they understood the information that was shared with them at this stage.
5	Participants were given the directions for and were prompted to complete the mindful instructions condition they were randomly assigned to.
6	Participants viewed the interpretive website they were randomly assigned to.
7	Participants used Qualtrics to complete the response measures of interest for the study: Mindfulness, Immersion, Arousal, Learning, Memorability, Meaningfulness, Visitor Satisfaction, and Intention to Recommend. Demographic variables were Gender, Age, Racial or Ethnic identity, Household income, Education, Employment status, Marital status, and number of prior visits to Yellowstone National Park.
8	Participants had the option to share their email address to receive a gift card for participating in the study. Thereafter, participants received a notice thanking them for their participation in the study.

3.6. Methods of Data Analysis

Descriptive statistics were calculated to evaluate the distributions of scores and to describe characteristics of the sampled populations. Hypotheses were tested using factorial analysis of covariance (ANCOVA) and Pearson correlations. The ANCOVA model used to test hypotheses 1a, 1b, and 1c included the two factors (mindful instructions and mindful interpretation) and two covariates. Covariates were sample (respondents with park or environmental affiliations vs. panel) and number of previous visits to Yellowstone. The covariates were important to control because familiarity with and affinity for parks in general and with Yellowstone could be expected to affect responses to interpretation. Previous visitors to Yellowstone have existing knowledge about thermal features and memories of having visited such iconic attractions as Old Faithful, Mammoth Hot Springs, and the Norris Geyser Basin. It is reasonable to assume that people with memories (the parks sample) would perceive the website differently than a population of people not defined by affiliation with and affinity for parks or environmental issues (panel participants).

According to Privitera (2014), two types of generalizations may be made for the results of survey research: empirical generalizations and theoretical generalizations. An empirical generalization occurs when a researcher's goal is to estimate a population parameter using sample data. Theoretical generalization occurs when a researcher explores if relations between variables are consistent with what would be anticipated according to expectations described by an established theory. The testing of a theoretical proposition or predictions from theory aligns with the type of generalization being made from the results of this study. The targeted populations were examined in order not to estimate individual parameters, but to test relations among constructs proposed by mindfulness theory, in the context of environmental

interpretation. Consequently, Pearson correlation coefficients were calculated to test relations between mindfulness and its presumed results (immersion, arousal, learning, memorability, meaningfulness, visitor satisfaction, and intention to recommend, hypotheses 2 to 13).

4. RESULTS

This chapter describes the results of the data analysis. The chapter is organized into three sections. The first section summarizes the descriptive statistics: the central tendency, dispersion, and distribution shape of mindfulness and the other variables of interest in the study. Cronbach's alpha is reported for each multi-item measure. The second section summarizes the analysis of covariance (ANCOVA) results. Effects of both factors and their interaction were tested (hypotheses 1a, 1b, and 1c), controlling for the number of previous visits to Yellowstone and affiliation with park or environmental groups (parks sample vs. panel sample). The third section describes results of analyses of relations between mindfulness and downstream concepts (hypotheses 2-7, i.e., how mindfulness relates to immersion, arousal, learning, memorability, meaningfulness, and visitor satisfaction). Relations between the downstream concepts and intention to recommend (hypotheses 8-13) are also reported.

4.1. Descriptive Statistics

Data collection commenced on April 23, 2021, and was completed on May 21, 2021. There were 507 raw total responses. Responses flagged by Qualtrics as high fraud scores or low ReCAPTCHA scores, indicative of a response that is potentially fraudulent or a likely bot, were eliminated. This process reduced the total number of responses to 485. From there, the distribution of responses was examined for outliers in terms of the amount of time it took respondents to complete the questionnaire. Nearly every response took at least three minutes to complete, and it was reasoned that the entire process should be completed in 20 minutes or less. Thus, all retained responses took at least three minutes and no more than twenty minutes for

participants to complete. Removal of outliers left the number of total responses at 450. Data analysis proceeded with this number of participants given that all responses were deemed to have completed participation in the study in a reasonable timeframe.

Item-to-total correlations and alpha reliability coefficients for each multiple-item scale were examined next. Correlations among the eleven items measuring mindfulness were all positive and ranged from .43 to .89. The "engagement" dimension of mindfulness contained five items, and correlations ranged from .59 to .89. The "flexible state of mind" dimension of mindfulness contained three items, with correlations ranging from .62 to .69. The "noticing new things, sensitive to context" dimension of mindfulness contained three items, with correlations ranging from .68 to .75.

The seven items used to measure immersion had high positive correlations that ranged from .40 to .83. The three-item arousal measure produced positive correlations ranging from .83 to .89. The four-item measure of learning yielded positive correlations ranging from .77 to .90. The three-item measure of memorability produced high positive correlations, ranging from .79 to .86. The consistent positive inter-item correlations produced alpha reliability coefficients ranging from .85 (flexible state of mind dimension of mindfulness) to .94 (mindfulness total score). Six of the eight reliability coefficients were greater than .90 (see Table 10 below).

Distributions of scores for each variable were then examined. The number of participants, number of items, alpha reliability coefficients for multi-item measures, mean, standard error, standard deviation, coefficient of variation, skewness, and kurtosis are reported for all variables in Table 10 below. Recall that all variables except for memorability were measured on a 100-point "slider" scale. Memorability was measured on a 7-point response scale. The means of all items were above the mid-point of the scales used: 4.44 for memorability, and for all remaining

variables, the means were over 57 on the 0-100-point scale. Distributions of scores had slight negative skewness and kurtosis. Twenty-one of twenty-two coefficients were negative for skewness and kurtosis. The distribution of only one variable, meaningfulness, exceeded 1.0 in absolute value of skewness or kurtosis (kurtosis =-1.22).

Table 10

Descriptive Statistics

Variable	Number of Participants	N. of Items	Alpha	Mean	SE	SD	CV	Skew	Kurtosis
Mindfulness	450	11	0.94	64.47	1.09	23.04	35.73	-0.64	-0.09
*Engagement	450	5	0.93	62.84	1.16	24.69	39.29	-0.50	-0.43
*Flexible state of mind	450	3	0.85	69.75	1.17	24.72	35.44	-0.85	0.16
*Noticing new things, sensitive to context	450	3	0.88	61.89	1.32	27.92	45.11	-0.54	-0.70
Immersion	450	7	0.94	63.05	1.21	25.73	40.81	-0.57	-0.51
Arousal	450	3	0.95	63.23	1.35	28.65	45.31	-0.57	-0.71
Learning	450	4	0.95	62.18	1.37	29.15	46.88	-0.52	-0.80
Memorability	450	3	0.93	4.44	0.08	1.60	36.17	-0.35	-0.56
Meaningful-ness	450	1	-	57.62	1.58	33.49	58.12	-0.35	-1.22
Visitor Satisfaction	450	1	-	69.30	1.23	26.05	37.59	-0.81	-0.02
Intent to Recommend	450	1	-	62.48	1.45	30.82	49.34	-0.53	-0.83

* = Subscale

Descriptive statistics for mindfulness and its dimensions were calculated within cells (i.e., the four treatment groups): 1) Mindful Instructions-Present, 2) Mindful Instructions-Absent, 3) Mindful Interpretation-Provided, and 4) Mindful Interpretation-Not Provided. Results are shown in Table 11. The table shows the distribution of mindfulness and its three dimensions in terms of

Table 11

Descriptive Statistics for Mindfulness by Group

	Number of Participants	Mean	St. Error
Mindfulness			
Mindful Instructions- Present	218	66.18	1.56
Mindful Instructions- Absent	232	62.88	1.51
Mindful Interpretation- Provided	224	66.51	1.54
Mindful Interpretation- Not Provided	226	62.55	1.53
Engagement Dimension of Mindfulness			
Mindful Instructions- Present	218	64.53	1.67
Mindful Instructions- Absent	232	61.28	1.62
Mindful Interpretation- Provided	224	64.14	1.65
Mindful Interpretation- Not Provided	226	61.68	1.64
Flexible State of Mind Dimension of Mindfulness			
Mindful Instructions- Present	218	70.96	1.67
Mindful Instructions- Absent	232	68.62	1.62
Mindful Interpretation- Provided	224	71.83	1.65
Mindful Interpretation- Not Provided	226	67.75	1.64
Noticing New Things, Sensitive to Context Dimension of Mindfulness			
Mindful Instructions- Present	218	64.14	1.87
Mindful Instructions- Absent	232	59.82	1.81
Mindful Interpretation- Provided	224	65.16	1.84
Mindful Interpretation- Not Provided	226	58.81	1.83

the marginal mean associated with the effect of the experimental treatment condition along with the number of participants and standard error. The marginal means were in the expected directions (see Table 11 above). Mindful Interpretation-Present groups scored higher than Mindful Interpretation-Absent on all variables. Similarly, Mindful Instructions-Present groups scored higher than Mindful Instructions-Absent groups on all outcome variables.

Table 12 shows the Pearson correlation coefficients for each pair of variables. The dimensions of mindfulness along with all the dependent variables were positively interrelated. Correlations among the dependent variables were all significant and strong, ranging from .67 to .90. Most of the coefficients were between the values of .76 and .87.

Table 12

Correlations

	Variable	Mindful-ness	A	B	C	D	E	F	G	H	I
A	*Engagement	0.93									
B	*Flexible state of mind	0.88	0.71								
C	*Noticing new things, sensitive to context	0.88	0.70	0.73							
D	Immersion	0.90	0.84	0.74	0.82						
E	Arousal	0.83	0.84	0.64	0.71	0.87					
F	Learning	0.84	0.77	0.67	0.81	0.88	0.88				
G	Memorability	0.67	0.70	0.46	0.60	0.71	0.77	0.73			
H	Meaningfulness	0.76	0.72	0.58	0.74	0.76	0.77	0.83	0.68		
I	Visitor Satisfaction	0.78	0.80	0.60	0.65	0.84	0.87	0.81	0.73	0.72	
J	Intention to Recommend	0.74	0.75	0.57	0.64	0.78	0.85	0.81	0.77	0.70	0.84

*= Subscale, dimension of mindfulness

4.1.1. Manipulation Check Results

Two manipulation checks were included in the study. They were designed to verify whether participants noticed the manipulation of the mindful interpretation strategy (i.e., website) condition or followed the instructions in the mindful instructions condition. For the mindful interpretation strategy condition, a chi-square test was completed. The result demonstrated that the condition was manipulated effectively (see Table 13 below). For the website treatment, 80.4% of the respondents exposed to the Mindful Interpretation-Provided website in the study correctly identified that the website they viewed had included questions along with descriptions of sounds and aromas. For the respondents who viewed the Mindful Interpretation-Not Provided website, 61.5% of respondents correctly identified that the website they had seen did not include questions or descriptions of sounds and aromas.

Table 13

Result of Manipulation Check for the Website Condition

Response	Website Treatment		
	Mindful Interpretation Provided	Mindful Interpretation Not Provided	Total
The website I viewed included questions and descriptions of sounds and aromas.	180 (80.4%)	47 (20.8%)	227 (50.4%)
The website I visited did not include questions and descriptions of sounds and aromas.	20 (8.9%)	139 (61.5%)	159 (35.3%)
I do not recall	24 (10.7%)	40 (17.7%)	64 (14.2%)
Total	224	226	450

Note. χ^2 (2, N = 450) = 170.982, $p < .001$. Cramer's $\nu = .308$, $p < .001$.

For the mindful instructions condition, after respondents were given directions related to the website they would view, they were prompted to take a few deep breaths, relax their muscles, and focus their thoughts on the website they were about to view. After these directions, the questionnaire contained the following question: "Are you relaxed, thinking only about the

present, and ready to enjoy the sights, sounds, and aromas of Yellowstone by viewing the website?" The answer prompts for participants were as follows: "Yes, I am ready to see the website," "I tried, but didn't feel like I could do it," and "No, I just want to see the website." For the Mindful Instructions- Present, Mindful Interpretation- Provided condition, there were 107 total responses. In that group, 102 respondents (95.3%) indicated that they had completed the mindfulness instructions prompt, 3 respondents (2.8%) indicated that they had attempted to follow the directions, and 2 respondents (1.9%) answered that they had not completed the exercise. For the Mindful Instructions- Present, Mindful Interpretation- Not Provided condition, there were 111 total responses. In that group, 102 respondents (91.9%) indicated that they had completed the mindfulness instructions prompt, five respondents (4.5%) indicated that they had attempted to follow the directions, and four respondents (3.6%) answered that they did not complete the exercise. Given that over 91% of respondents in both groups answered that they had completed the exercise and over 96% of respondents in both groups indicated that they had completed or attempted to complete the mindfulness exercise, this manipulation was deemed to be sufficiently effective for the purpose of this study.

4.2. Analysis of Covariance

Results of the ANCOVA for overall mindfulness are reported in Table 14 below. Neither factor had a significant effect. Thus, the null forms of Hypothesis 1a, 1b, and 1c were retained. It is perhaps notable, though, that the probability of the *F* ratio for the mindful interpretation strategy (i.e., website) factor approached the statistical significance criterion (p=.069 vs. p<.05), and the marginal means for that factor were in the expected direction ($\overline{x}_{MindfulInterp}$ = 66.51 vs.

$\bar{x}_{Comparison}$ = 62.55). The Mindful Instructions-Present group also had a higher mean than the Mindful Instructions-Absent group (66.18 vs. 62.88), but the effect was not significant at $p<.05$ ($p=.129$).

Effects of mindfulness instructions and mindful interpretation on dimensions of mindfulness were also tested. Mindful interpretation (the "website" effect) was found to have a significant ($F_{1,444}$ =5.96, $p=.015$) effect on the dimension of mindfulness named, "noticing new things, sensitive to context." The mean for the Mindful Interpretation- Provided group for that dimension was about six units higher than the mean of the comparison group (65.16 vs. 58.81).

Significant effects were also found for the covariate, sample, on three dimensions of mindfulness: "engagement" ($F_{1,444}=4.27$, $p=.039$), "flexible state of mind" ($F_{1,444}=3.96$, $p=.047$), and "noticing new things, sensitive to context" ($F_{1,444}=6.58$, $p=.011$). These results indicate that the mindfulness dimensions were different for the sample interested in parks and environmental issues compared with the general population sample. For the "engagement" dimension, the general population sample had a higher mean (65.54 vs. 60.66). For the "flexible state of mind" dimension, the parks sample had a higher mean (71.64 vs. 67.40). For the "noticing new things, sensitive to context" dimension, the general population had a higher mean (65.94 vs. 58.63). The implications of this are discussed further in the "Conclusions" chapter.

Table 14

ANCOVA for Mindfulness and Its Dimensions

Mindfulness

Source	*df*	*SS*	*MS*	*F*	*p*	*η2*
M. Instruction	1	1219	1218.90	2.31	0.129	.005
Website	1	1756	1756.20	3.33	0.069	.007
Park Visits	1	371	371.30	0.70	0.402	.002
Sample	1	842	841.80	1.60	0.207	.004
Web by M. I.	1	112	112.50	0.21	0.644	.000
Error	444	233935	526.9			
Total	449	238263				

Engagement

Source	*df*	*SS*	*MS*	*F*	*p*	*η2*
M. Instruction	1	1187	1187.48	1.96	0.162	.004
Website	1	677	677.15	1.12	0.291	.003
Park Visits	1	4	4.02	0.01	0.935	.000
Sample	1	2583	2583.30	4.27	0.039*	.010
Web by M. I.	1	355	354.68	0.59	0.444	.001
Error	444	268854	605.53			
Total	449	273671				

Flexible state of mind

Source	*df*	*SS*	*MS*	*F*	*p*	*η2*
M. Instruction	1	616	616.31	1.02	0.314	.002
Website	1	1859	1859.47	3.07	0.080	.007
Park Visits	1	1148	1148.20	1.90	0.169	.004
Sample	1	2395	2395.32	3.96	0.047*	.009
Web by M. I.	1	0	0.46	0.00	0.978	.000
Error	444	268886	605.60			
Total	449	274278				

Table 14 Continued

Noticing new things, sensitive to context

Source	*Df*	*SS*	*MS*	*F*	*p*	*η2*
M. Instruction	1	2094	2093.53	2.76	0.097	.006
Website	1	4511	4511.15	5.96	0.015*	.013
Park Visits	1	1609	1608.61	2.12	0.146	.005
Sample	1	4987	4986.53	6.58	0.011*	.015
Web by M. I.	1	67	66.92	0.09	0.766	.000
Error	444	336307	757.45			
Total	449	350071				

4.3. Downstream Effects

Pearson correlation coefficients between mindfulness and the downstream variables are shown in Table 15. As hypothesized, immersion, arousal, learning, memorability, meaningfulness, and visitor satisfaction all had strong positive, and statistically significant (p<.01) correlations with mindfulness and its dimensions. Correlations with the mindfulness score ranged from r=.67 (memorability) to r=.90 (immersion). These results support hypotheses 2-7; mindfulness is positively related to the hypothesized outcomes. The relations between these variables were not found to differ by sample as all variables had strong, positive, and statistically significant (p<.01) correlations in both samples. For the parks sample, correlations with mindfulness ranged from r=.71 (memorability) to r=.88 (immersion) and for the panel sample these correlations ranged from r=.64 (memorability) to r=.92 (immersion).

Relations between each of the three dimensions of mindfulness (engagement, flexible state of mind, and noticing new things, sensitive to context) and the downstream effects were also tested. All dimensions of mindfulness were positively correlated with the downstream

variables. The dimension with the weakest set of correlations was "flexible state of mind" (r=.46 to .67). The dimension with the strongest set of correlations was "engagement" (r=.70 to .84).

Table 15

Pearson Correlations Between Mindfulness and Other Variables

	Mindfulness	Engagement	Flexible state of mind	Noticing new things, sensitive to context
Immersion	0.90	0.84	0.74	0.82
Arousal	0.83	0.84	0.64	0.71
Learning	0.84	0.77	0.67	0.81
Memorability	0.67	0.70	0.46	0.60
Meaning-fulness	0.76	0.72	0.58	0.74
Visitor Satisfaction	0.78	0.80	0.60	0.65

The remaining hypotheses were also tested using Pearson correlation coefficients. Of interest was how the downstream variables (those affected by mindfulness) influenced intention to recommend. As hypothesized, immersion, arousal, learning, memorability, meaningfulness, and visitor satisfaction all had strong positive, and statistically significant (p<.01) correlations with intention to recommend. These results supported hypotheses 8-13; the six variables influenced by mindfulness were positively related to participant intention to recommend. The correlation between immersion and intention to recommend was r=.78, arousal and intention to recommend was r=.85, learning and intention to recommend was r=.81, memorability and intention to recommend was r=.77, meaningfulness and intention to recommend was r=.70, and visitor satisfaction and intention to recommend was r=.84. The relations between these variables were also not found to differ by sample as all six variables had strong, positive, and statistically significant (p<.01) correlations with intention to recommend in both samples. For the parks

sample, correlations between the six variables and intention to recommend ranged from *r*=.64 (meaningfulness) to *r*=.84 (visitor satisfaction) and for the panel sample these correlations ranged from *r*=.75 (memorability) to *r*=.87 (arousal).

5. CONCLUSIONS

This chapter provides a summary of the research and integrates the results with prior studies. The limitations, directions for future research, and implications for interpretation are also discussed.

5.1. Summary

The purpose of this study was to examine if mindfulness would be influenced according to a) mindful interpretation techniques derived from Moscardo's (1996, 1999) frameworks, and b) brief mindfulness instructions. Examining the effect this had on other variables in the nomological net of mindfulness was also investigated. Prior research indicated that variety and interactivity/participation (Ganesan et al., 2014), novelty and multisensory content (Noor et al., 2015), and the use of questions (Tan et al., 2020) resulted in mindfulness. Past researchers also found that mindful instructions contributed to participant mindfulness (Ellis, Lacanienta, et al., 2020; Ramsburg & Youmans, 2014). Thus, mindful instructions were examined in an experimental study, along with the specific communication factors that prior researchers had indicated should result in participant mindfulness.

ANCOVA and Pearson correlations were used to test hypotheses derived from Moscardo's (1996, 1999) frameworks. ANCOVA revealed a significant effect of mindful interpretation on "noticing new things, sensitive to context." No significant treatment effects were found on overall mindfulness, or the other two dimensions measured, "flexible state of mind" and "engagement."

These results suggest that a more precise conceptualization of mindfulness may be needed. The definition of mindfulness used in this study included "a flexible state of mind" (Langer, 2000, p. 220) as the genus proximum. The genus proximum of a formal (Aristotelian) definition is the larger set of which other components are elements. Differentia specifica, which are elements within that larger set, include engagement and noticing new things, sensitive to context. Yet, Langer previously also advanced a formal definition of mindfulness that did not include engagement (one of the two differentia specifica): "mindfulness is a state of conscious awareness in which the individual is implicitly aware of the context and content of information" (Langer, 1992, p. 289). Langer advanced a similar definition more recently that also excludes engagement. Her 2014 definition cast "active state of mind" as the genus proximum and "novel-distinction drawing" as the differentia specifica (Langer, 2014, p. 11). Novel-distinction drawing requires noticing new things and being sensitive to context. Thus, it is fully reasonable to construct a model of mindfulness which regards mindfulness as a flexible state of mind in which one is noticing new things and sensitive to context. Engagement might be conceptualized as a separate, but related construct; a phenomenon co-occurring and correlated with mindfulness as interpretation experiences unfold. Vast literature exists on engagement (e.g., Christenson et al., 2012). Engagement has been shown to be impacted by factors different from the factors that influence mindfulness. Engagement is enhanced when the activity at hand is intrinsically motivated, and when the activity at hand presents challenges commensurate with the skill level of the participant/actor (e.g., Csikszentmihalyi, 1975; Ellis et al., 2021).

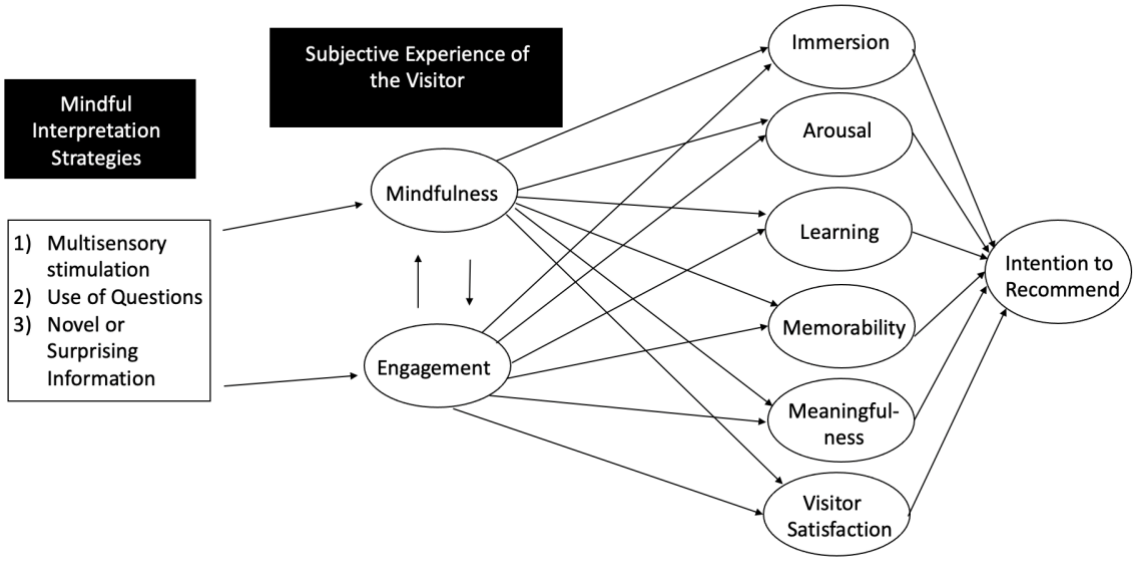
Such a reconceptualization of mindfulness and engagement would be conceptually consistent with Langer's (1992, 2014) definitions. Empirically, an appropriate measure of mindfulness could be constructed by combining the genus proximum (i.e., "a flexible state of

mind") with only one of the two differentia specifica (i.e., "noticing new things, sensitive to context"). A separate measure of engagement could also be calculated. To explore this alternative conceptualization of mindfulness and engagement, a measure of mindfulness was created and evaluated using the same ANCOVA model reported in Chapter 4. Consistent with hypotheses derived from Moscardo's frameworks, the effect of mindful interpretation was significant ($p<.05$), and the correlation between mindfulness and engagement was $r=.76$ ($p<.01$). Thus, in terms of this recasting of Langer's (2000) definition of mindfulness, it is reasonable to conclude that mindful interpretation increases mindfulness. Yet, the broader definition of mindfulness that included both engagement and noticing new things, sensitive to context was used for this study. Neither mindful interpretation nor mindful instructions had a significant effect on overall mindfulness when the broader definition was used.

The reconceptualization of mindfulness and engagement based on definitions provided by Langer is also informative regarding Moscardo's frameworks. Mindful interpretation strategies used in this study could be considered as the beginning point of an interpretive experience that leads to mindfulness and other outcomes (much like what setting factors and communications factors were in previous conceptual frameworks put forth by Moscardo, 1996, 1999). These items could serve to influence visitors' subjective experiences. From an experience design perspective, it may be the case that the subjective experience a participant or visitor has during an interpretive encounter is influenced by interpretation strategies. The subjective experience of mindfulness along with engagement could then result in the consequences or outcomes that were observed in the current study (see Figure 5 below). Her original framework could be extended to consider if participants would recommend their experiences. This approach would enable a more detailed examination of the outcomes that result from mindfulness.

Figure 5

Moscardo's Framework Reconsidered



The Pearson correlation analyses of downstream effects revealed significant relations between mindfulness and certain effects postulated by Moscardo (1996, 1999). The positive and statistically significant relationships found between mindfulness, immersion, arousal, learning, memorability, meaningfulness, and visitor satisfaction confirmed hypotheses 2-7. Those variables influenced by mindfulness (immersion, arousal, learning, memorability, meaningfulness, and visitor satisfaction) had positive and statistically significant relationships with participant intention to recommend. These results supported hypotheses 8-13. This examination of what results from mindfulness provides needed information concerning why a mindful experience is appropriate and if an interpretive site could benefit from creating mindful experiences.

In making judgements about potential effects of mindful interpretation and mindful instructions, it is also important to note that the patterns of group means for both mindful interpretation and mindful instructions were in the expected direction. The consistency of the

patterns of means in the context of nonsignificant *F* ratios signals that the study may have lacked sufficient power to detect treatment effects. Type 2 errors may have occurred in evaluating hypotheses about effects of the experimental treatments on mindfulness.

The population sampled (i.e., parks sample vs. panel sample) had a significant effect on dimensions of mindfulness. The mindfulness dimensions "engagement" ($F_{1,444}$=4.27, p=.039), "flexible state of mind" ($F_{1,444}$=3.96, p=.047), and "noticing new things, sensitive to context" ($F_{1,444}$=6.58, p=.011) were all statistically significantly different. The previous section entitled "Analysis of Covariance" describes the directions of these differences. So, using population sampled as a covariate (a kind of blocking variable) was a wise choice.

5.1.1. Discussion of Intercorrelations Found in the Study

The bivariate relations among mindfulness and the downstream effects (Table 12) are substantial. They range in magnitude from .46 (memorability and the flexible state of mind dimension of mindfulness) to .90 (immersion and mindfulness). The strength of these relations suggests that, although they conceptually represent unique constructs theoretically linked as results of mindfulness (Mody et al., 2020; Oh et al., 2007), their empirical structure may be appropriately arranged hierarchically, as a factor. A conceptual framework is needed as a foundation for such analysis. One approach would be to consider items in the data set to represent related dimensions of value. Prebensen et al. (2014) distinguished between value-in-exchange and value-in-use. Value-in-exchange refers to the sacrifice of personal resources such as time, money, and psychological safety required to participate in an activity. Value-in-use refers to returns on exchange occurring during and after the experience the individual accessed through the exchange of personal resources. It is also reasonable to propose two dimensions of value-in-use: value-during-use and value-from-use. Value-during-use refers to the subjective

states (states of emotion, interest, intentionality, and agency) that emerge as an activity unfolds in real-time. Values-during-use within the data set available include enjoyment, immersion,

Table 16

Maximum Likelihood Factor Analysis

	Loading	Communality	Ω
Mindfulness			0.94
Deep Focus	0.86	0.74	
Easy to Focus	0.83	0.69	
Deeply Involved	0.91	0.83	
Brain Engaged	0.92	0.84	
Emotions Activated	0.75	0.56	
Open Mind	0.63	0.40	
Curious	0.74	0.54	
New Thoughts	0.72	0.51	
Possibilities	0.72	0.52	
New Things	0.71	0.50	
New Ideas	0.69	0.47	
% var	64.50		
Value During Use			0.97
Curiosity Aroused	0.85	0.72	
Searching for Answers	0.77	0.60	
Explore Possibilities	0.81	0.65	
Interest Captured	0.90	0.80	
Involved	0.87	0.75	
Inquire Further	0.83	0.68	
Felt in Control	0.58	0.34	
Interesting	0.91	0.82	
Stimulating	0.93	0.87	
Exciting	0.92	0.84	
Enjoyable	0.92	0.85	
% var	72%		

Table 16 Continued

Value From Use			0.96
More Knowledgeable	0.85	0.73	
Learned a lot	0.89	0.79	
Curious to Learn More	0.88	0.77	
Was impactful learning	0.92	0.85	
Meaningfulness	0.85	0.72	
Wonderful Memories	0.78	0.61	
Remember positive things	0.83	0.69	
Won't forget	0.74	0.55	
Delightedness	0.87	0.76	
Recommend	0.88	0.77	
% var	72%		

engagement, and arousal. Value-from-use follows from value-during-use, and includes learning, memories, intentions, curiosity, meaningfulness and post-hoc satisfaction. Given this conceptual framework, dimension reduction among these three sets of values is appropriate.

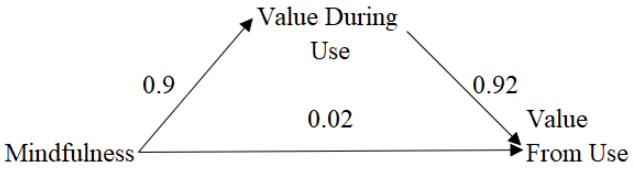
Dimension reduction was accomplished through maximum likelihood factor analysis. Results are presented in Table 16. As that table reveals, unitary factor solutions provided excellent representations of the variables in each set. In the analysis of mindfulness items, a single factor explained 64.50% of the total variance. Loadings ranged from .63 (new ideas) to .97 (deep focus and easy to focus). Coefficient omega (composite reliability; Raykov, 1997) was .94. The eleven items measuring value-during-use also loaded high on a single factor. Nine of the eleven items produced loadings in excess of .80. The single factor explained 72% of the total variance, and the composite reliability of the factor score was .97. For value-from-use, all 10

items produced loadings greater than .73, and the single factor explained 72% of the total variance. Coefficient omega was .96.

The focus of this study is on causes and effects of mindfulness. Thus, the causal model in Figure 6 was tested using path analysis. Bivariate correlations of .895 and .845 were found between mindfulness and value-during-use and value-from-use, respectively. (The correlation between the two value dimensions was .939). Path analysis revealed that value-during-use mediates the relation between mindfulness and value-from-use. The direct effect of mindfulness on value from use was non-significant (*b*=.02), but the indirect effect through value during use was substantial, (.90*.92=) .83. Thus, exploratory examination of dimensionality revealed a potentially important direction for future research.

Figure 6

Path Analysis of Conceptual Model of Value-in-Use



5.2. Integration with Previous Results

Interpretation serves to help visitors understand the importance of places they visit. Tilden (1957/2007) noted that interpretation should enable visitors to understand how a site is relevant to an individual. Many scholars have discussed the importance of interpretation (Beck & Cable, 2011; Beck et al., 2018; Caulton, 1998; Ham, 2013; Sharpe, 1976; Tilden 1957/2007).

Moscardo (2014) noted that there is limited empirical evidence concerning the effectiveness of interpretation. She also highlighted the notion that mindful interpretation may influence visitor behavior. Visitor mindfulness can be influenced by interpretation and can augment the tourism experiences that people have (Kang & Gretzel, 2012). This study built upon prior research (Ganesan et al., 2014; Noor et al., 2015) that examined Moscardo's (1996, 1999) frameworks and helped to fill a gap in the literature by empirically exploring the effectiveness of interpretation strategies and mindfulness instructions through an experimental design study.

Prior studies related mindfulness to specific topics within the field of parks, recreation, and tourism: environmental interpretation (Moscardo & Pearce, 1986), information services and visitor management (Frauman & Norman 2003, 2004), wildlife tourism (Moscardo et al., 2004), visitor attractions (Moscardo & Ballantyne, 2008), cultural events (Van Winkle & Backman, 2008), tourist experiences (Kang & Gretzel, 2012; Taylor & Norman, 2019), environmental issues (Chan, 2019; Walker & Moscardo, 2014), and learning experiences (Ellis, Lacanienta, et al., 2020). Frauman and Norman (2003) explored how visitor characteristics influenced a visitor's preference for mindful information services. Frauman and Norman (2004) examined how mindfulness can help with visitor management at destinations. In chapters about interpretation, Moscardo et al. (2004) and Moscardo and Ballantyne (2008) put forth conceptual notions to advance the study of interpretation. Other studies explored mindfulness in specific contexts such as a cultural festival (Van Winkle & Backman, 2008), podcast tours (Kang & Gretzel, 2012), ecotourism and sustainable tourism (Walker & Moscardo, 2014), travel anticipation (Taylor & Norman, 2019), and environmental awareness (Chan, 2019).

Prior research in parks, recreation, and tourism had identified that reflection times led to mindful learning experiences (Ellis, Lacanienta, et al., 2020). Research from psychology showed

that mindful instructions and meditation resulted in greater mindfulness among participants taking a quiz (Ramsburg & Youmans, 2014). Thus, mindfulness instructions were tested in this study. Contrary to the findings of the two earlier studies, providing mindful instructions was not found to be significant in this study. Both prior studies were completed with in-person participants and the current study was fully online. Perhaps that is an issue to be investigated further. The study contributed to the advancement of research about environmental interpretation and mindfulness as discussed in the next paragraphs.

Moscardo and Pearce (1986) studied environmental interpretation and mindfulness. This is one of the few empirical studies that explored both topics. In that study, mindfulness was a result of the other variables in the study (visitor's knowledge, visitor recall, desire for more information about the topic, and desire for more information at the interpretation center). Walker and Moscardo (2014) examined ecotourists' experiences. Interpretation was of interest to the researchers given that it could influence opinions concerning environmental sustainability. This primarily qualitative inquiry noted the importance of interpretive staff and attributes derived by tourists, namely environmental awareness, and learning. The authors did note that interpretation experiences should result in visitor mindfulness. A handful of prior studies have sought to confirm or examine Moscardo's (1996, 1999) conceptual frameworks (Ganesan et al., 2014; Noor et al., 2015; Tan et al., 2020; Woods & Moscardo, 2003). Of those studies, two were quantitative in nature (Ganesan et al., 2014; Noor et al., 2015), and those also sought to test the communication factors from Moscardo's model. None of those studies were conducted virtually or utilized experimental design; those were unique contributions of the current study to the testing of Moscardo's framework.

Unlike the study by Moscardo and Pearce (1986), mindfulness was hypothesized to result from the experimental conditions of the current study. Specific elements of the communication factors described in Moscardo's (1996, 1999) frameworks were examined in this study, namely multisensory media, novelty or surprise, and the use of questions in interpretive narratives. These communication factors were thought to result in mindfulness for participants. In contrast to what was thought, in the current study, hypotheses 1a, 1b, and 1c were not supported (i.e., mindful interpretation, mindful instructions, and their interaction did not result in greater mindfulness). The ANCOVA results from this study seem to offer mixed results when compared to the specific findings of prior studies. The type of interpretation offered did not significantly impact visitor mindfulness in this study, a result that would seem contrary to the suggested outcomes that Walker and Moscardo (2014) had described. Similarly, although the studies had different aims, the results reported by Ganesan et al. (2014) and Noor et al. (2015) both examined communication factors from the frameworks by Moscardo. It is noteworthy that both of those studies found results that were not significant along with those that were statistically significant. Ganesan et al. (2014) found that variety and interactivity/participation were determinants of mindfulness, and that personal connection was not significant. Ganesan et al. (2014) also found that for different types of interpretation, different communication factors were more effective. For example, for exhibitions/displays/artifacts (EDA), variety induced mindfulness, but for guided tours and printed materials, interactivity/participation was effective. Noor et al. (2015) built on the previous study, finding that printed materials and EDA induced mindfulness, but that guided tours were not significant. In the current study, communication factors were conceptualized in order to inform the website condition that was presented to participants as mindful interpretation. It was found that sample was significant for the three dimensions of

mindfulness and that the website condition was significant for the mindfulness dimension called "noticing new things, sensitive to context." The latter finding provides some empirical support for the notion that a dimension of mindfulness is influenced by the interpretative content participants were exposed to. For that condition, the content presented was mindful interpretation (e.g., multisensory descriptions, novel or surprising information, and the use of questions were included in the interpretive narratives) or interpretation that was deemed not to be mindful. This provides some support for the research outcomes noted by Ganesan et al. (2014). Those researchers found that variety (operationalized as multisensory media and novelty) and interactivity/participation (operationalized as using questions in interpretation and allowing for some element of visitor control) influenced mindfulness. This study provides some support for those research findings, namely that multisensory media, novelty, and the use of questions influenced a dimension of mindfulness (participants also had control over their website experience in the study). Also, this finding provides some support for what Noor et al. (2015) noted, that printed materials lead to mindfulness. As an online study, printed materials were the primary method of interpretation, although in web-based form. While not fully supportive of the findings by Noor et al. (2015), empirical support was found that printed mindful interpretation influenced a dimension of participants' mindfulness.

Proposed consequences of mindfulness in both versions of the models proposed by Moscardo (1996, 1999) were more learning, high satisfaction, and greater understanding. In the current study, mindfulness was found to be related to the following variables: immersion, arousal, learning, memorability, meaningfulness, and visitor satisfaction. Mindfulness affecting the satisfaction variable was what had been predicted by Moscardo in her frameworks. The learning variable in this study was confirmed to be related to mindfulness in the study. Prior

studies have shown that communication factors influence mindfulness (as described in the prior paragraph), but less attention has been paid to the part of the framework looking at results of mindfulness, namely that more learning, higher satisfaction, and greater understanding result from mindfulness. A previous study by Frauman and Norman (2004) found that mindfulness led to improved learning and understanding. Thus, confirming findings by those two researchers, Moscardo's ideas that mindfulness results in learning and satisfaction were supported in this study.

Measurement of mindfulness is another unique contribution from this study to the literature. Since the definition of mindfulness articulated by Langer (2000) noted three attributes of mindfulness, this study sought to examine empirically if the three attributes could be considered as dimensions of mindfulness. From the literature review, it became apparent that no one existing measure could be made to fit the dimensions or definition chosen for this study. Consequently, items were drawn from previously developed scales and prior studies. Items from past research by Brown and Ryan (2003), Frauman and Norman (2003), Lau et al. (2006), and Pirson et al. (2018) were used. Additionally, I created and added items specifically for this study. The eleven items used to measure mindfulness based on Langer's (2000) definition produced a Cronbach's alpha value of 0.94. The mindfulness dimensions also had high Cronbach's alpha values: the five item "engagement" measure was 0.93, the three items that measured "flexible state of mind" were 0.85, and the three items used to measure "noticing new things, sensitive to context" were 0.88. These results indicate reliability of these dimensions measuring mindfulness, and review by an expert panel prior to the commencement of the study provided evidence of construct validity.

5.2.1. Implications for Mindfulness Theory in an Interpretive Setting

In an effort to inform future research, it would be useful to identify important concepts concerning mindfulness theory in the context of interpretation. This section seeks to ascertain a formal theory of mindfulness in the context of interpretation based upon the research study that was completed. Mindfulness as immediate conscious experience (i.e., in situ mindfulness) is what the research study examined, and thus is the focus here as well. Mindfulness theory itself was discussed from a broad perspective in the literature review (see the "Mindfulness Phenomenology and Theory" section). Mindfulness theory in heritage or environmental interpretive settings was described in the "Research Hypotheses" section. Based on the information from prior research that informed the study, propositions related to mindfulness theory can be considered. The definition, propositions, and classifications about mindfulness that are informed by this research study can be found in Table 17. Again, it is worth noting that the use of Langer's (2000) definition is included, but engagement could be considered as being a separate construct and the use of the word "engaged" from the definition could be interpreted as meaning involved.

Table 17

Mindfulness Theory in an Interpretive Setting

Theory Element	Corresponding information
Definition:	Mindfulness is "a flexible state of mind in which we are actively engaged in the present, noticing new things and sensitive to context" (Langer, 2000, p. 220).
Propositions:	
Determinants of Mindfulness	Variation in interpretive content increases mindfulness (Langer, 1997, 2014). Novelty or multisensory interpretation increases mindfulness (Moscardo 2009).

Table 17 Continued

Results of Mindfulness	As mindfulness increases, immersion increases (Ellis, Lacanienta, et al., 2020). As mindfulness increases, learning increases (Langer, 1989, 1997). As mindfulness increases, memorability increases (Kahneman, 2011). As mindfulness increases, enjoyment increases (Moscardo & Pearce, 1986).
Classifications	All relations specified in the propositions are irreversible, stochastic, coextensive, sufficient, and substitutable

Given the results of this study, further exploration would be needed concerning a previously mentioned proposition: "Mindful instructions prior to presentation of context increases mindfulness (Ramsburg & Youmans, 2014)." This could be added in the future if verified by further empirical research. The last proposition listed as a result requires some further explanation. Oh et al. (2007) did have an item to measure the variable "arousal" that was included in the data collection, but not analyzed with the main results. For this study, the item was "How enjoyable was your visit to the website?" If considered as a single-item measure of enjoyment (like the six main variables influenced by mindfulness in the research model that were capable of being influenced by mindfulness as originally examined in the study), the enjoyment measure had a strong positive and statistically significant ($p<.01$) correlation with mindfulness ($r=.81$). Therefore, the last proposition was included as it was also measured during the research study. Contingencies should also be noted, namely that irrelevant stimuli would moderate the effects of determinants and degree of distress would also moderate the effects of the

determinants on mindfulness. It is thought that the information in Table 17 would be valuable for future research about mindfulness in the context of interpretation.

5.3. Limitations

Limitations of the current study should be noted. Four notable limitations will be discussed: the study being fully online, the data collection limitations that ensued, study participants, and techniques to build on or improve this study.

This study was conceptualized and conducted while Texas A&M University was operating under specific research guidance due to the COVID-19 pandemic. Human subjects research was required to be conducted virtually. While an online format enabled the study to be completed in accordance with the research guidance, it is also a notable limitation of the study. If the study had been completed in-person or in a lab setting, it would have provided the opportunity for better scrutiny to enable study participants to closely follow the directions and perhaps spend the same amount of time participating in the study. Replication of this study or a study with similar aims using all in-person participants is one potential way to follow-up on the line of inquiry pursued in this research study. It would allow for monitoring of participants to ensure that they are fully participating in the study. Also, it could confirm the results of the current study or demonstrate a different result. This would be informative as to the differences between in-person and virtual studies related to interpretation or mindfulness.

The limitation that online data collection presented must also be acknowledged. The issue of potential survey fraud was screened out to the extent possible. Potential respondents who do not use email or who do not regularly use the internet were excluded from the samples. This

reduced the potential number of people in both populations to sample from. A more representative sample of each population could have included those who are less connected to the internet. The use of financial incentives may have influenced several participants who chose to respond. The ability to encourage participation among those who may not have wanted an incentive or who may have been reluctant to respond without feeling some tangible benefit from the study was a limitation regarding sampling. A final issue related to data collection was that several people started the questionnaire but did not complete it. This may have occurred because participants did not want to spend time completing the questionnaire or because they lost interest in the study after initiating involvement. The mindful interpretation (i.e., website) condition was shared as a link and participants had to return to the questionnaire to complete it. While careful attention was given to the directions that were shared with participants, it remains likely that at least some of the participants who started the survey and clicked the link for the website may not have finished due to some confusion related to this issue.

The heterogeneity of study participants might be considered as a limitation of this study. The sample with a special interest in park or environmental issues was recruited from organizations that had specific affiliations or interests in those areas. Given that population differences were found to be statistically significant between the parks sample and the general population sample for the three dimensions of mindfulness, further consideration could be given to how the parks sample was defined. The parks-affiliated sample was defined in broad terms and perhaps could have benefitted from a narrower focus of organizations to sample from. On the other hand, recruiting done in the same manner as was done in the study could have excluded people who had many prior visits to Yellowstone, and this may have been a more refined approach to sampling from that population.

In looking at the overall participant demographics, two outcomes stand out. Participants were predominately female (70.7%). The racial/ethnic identity that most respondents identified with was White/Caucasian (82.7%). These could limit the generalizability of results (external validity). Obtaining an overall sample that was more balanced in terms of participants' gender would have been ideal, particularly for readers interested in parameter estimates of individual variables (empirical generalization). Similarly, future inquiries that could achieve increased diversity in terms of participant racial or ethnic background might be useful. If samples that include greater diversity are obtained, it may shed light on any group mindfulness differences or similarities. Additionally, while the sample of participants (450) was enough to serve the purposes of this study, it is thought that a larger overall sample size may have averted a Type 2 error, yielding evidence of treatment effects.

The potential techniques to improve subsequent studies are also worth considering. Initially, the study was designed to test a meditation condition prior to the interpretation strategy (i.e., website) condition being tested. But because the study was fully online, this was modified prior to the launch of the study. Testing to see if a meditation condition contributes to mindfulness would be useful inquiry as it would build on an existing study that explored this issue (Ramsburg & Youmans, 2014). Another idea to build on the current study would be to use techniques from the theory of structured experience (Ellis et al., 2019; Ellis, Jiang, Freeman, Lacanienta, & Jamal, 2020) to build on the idea of refining the conditions in this study. This last point will be discussed along with other issues in the next section.

5.4. Directions for Future Research

Future research could take different directions based not only on the previously discussed findings that were noted from this study, but also from the limitations as well. The most notable of these different directions can be found in a brief research agenda for mindfulness in interpretive settings (see Table 18 below). The main ideas from this table are expounded upon in the remainder of this section. The issue of mindfulness and time spent in an interpretive experience is considered in the final section. Perhaps most notably, mindfulness might be reconceptualized as a flexible state of mind in which the

Table 18

A Research Agenda for Mindfulness in Interpretive Settings

Complete the same study in person rather than online	Test effects of Moscardo's visitor factors	Expand research into specific subtopics
•Are on-site outcomes the same as the online study?	•Level of content interest	• Can mindfulness be used within other interpretive techniques (e.g., storytelling, signage)?
•Does treating engagement as a separate variable yield improved model fit?	•Strength of educational motive	•Does age affect mindfulness?
•Does mindful meditation prior to interpretation increase mindfulness during interpretation?	•Level of fatigue and distraction	•How long must one interact with an exhibit before achieving a high level of mindfulness?

individual is noticing new things and sensitive to context. Engagement, which was treated as a dimension of mindfulness in the current study, could be treated as a separate, but related variable, covarying with mindfulness in real time, as activities unfold.

Some issues related to the current study that became apparent after data analysis as potential avenues of research are described in this paragraph. While mentioned in the "Limitations" section, the testing of mindful meditation and interpretation to see if participant mindfulness would increase should be explored in future research. This would presumably be best to research through an in-person study and would build on an area where further research is needed. Ellis, Lacanienta, et al. (2020) used mindful reflection times to help assess the overall experience quality of participants. Similarly, guided reflection times either before or after interpretation experiences could be worth further examination to see if reflection could result in greater participant mindfulness. While Moscardo's (1996, 1999) frameworks have been expounded at length, there is one area of consideration that has not received much consideration. Moscardo (1992) found support for setting factors and visitor factors influencing participant mindfulness. These were expanded on in her subsequent frameworks. Moscardo (1996) described setting factors and visitor factors, the latter consisting of higher interest in content, low levels of fatigue, and educational motive. Moscardo (1999) changed the name of setting factors to communication factors and described visitor factors as being high interest in content, low levels of fatigue, and lack of distractions. It appears that empirical research that included a focus on visitor factors is rare. Noor et al. (2014) found that gender, age, education, nationality, familiarity, and number of visits were not related to visitor mindfulness at a World Heritage Site. Tan et al. (2020) found that the visitor factors "high level of interest" and "visualization" influenced visitor mindfulness. A focus for future research could incorporate visitor factors that closely align to Moscardo's (1996, 1999) frameworks to obtain a better idea of participant interest and focus prior to participation in a study about interpretation. In line with Moscardo's original visitor factors, Van Winkle and Backman (2008) found that content interest and

educational motive heighten mindfulness. Further research into the visitor factors or scrutinizing visitor motivation as they relate to interpretation and mindfulness would be useful to research further.

Also, as discussed in the "Integration with Previous Results" section, this study added to existing literature about Moscardo's (1996, 1999) frameworks. The study built on prior studies completed by Ganesan et al. (2014) and Noor et al. (2015). Those two studies explored the communication factors in the framework. Those factors can be further explored to see how multisensory media, novelty or surprise, and the use of questions can influence interpretive experiences or participant mindfulness. For future online studies, seeking to incorporate sound into the multisensory media would be worthwhile to examine. This may also be beneficial to examine for future in-person studies as well. Given that the results of the current study did not confirm the main findings from the most recent previous studies that examined the issue, future research should seek to provide further insights regarding Moscardo's communication factors, interpretation, and mindfulness. A proposed consequence of mindfulness in Moscardo's frameworks (1996, 1999) was that more learning, higher satisfaction, and greater understanding would take place. Frauman and Norman (2004) had previously found that mindfulness resulted in improved learning and understanding, providing some confirmation of Moscardo's conceptual framework. Confirmation for Moscardo's ideas was also found in the current study. In this study, mindfulness positively influenced learning and satisfaction among participants. More attention has been paid to the communication factors in Moscardo's conceptual framework than to the consequences of mindfulness that she described. Research can continue to examine both issues further. Further research demonstrating that mindful participants improve learning, understanding, and satisfaction would be beneficial for interpretation participants and sites. From

a management perspective, this would be relevant as these types of visitors are likely to have better experiences and share them with others.

This study provided evidence that mindfulness influences immersion, arousal, learning, memorability, meaningfulness, and visitor satisfaction. These in turn influenced participant intention to recommend. While the current study supported some consequences of mindfulness that Moscardo had suggested, her original framework could be extended to consider if participants would recommend their experiences. This issue is discussed in more detail in the final section. Further research focused on extending Moscardo's framework may provide information that could help managers improve the interpretation offered at sites or be able to attract more people to visit sites.

Moscardo and Pearce (1986) noted the connection between mindfulness and interpretation. They found that interpretive themes (e.g., historic or conservation) improved visitor mindfulness. Later, Moscardo (2017) noted that stories or specific story themes can play an important role in encouraging visitor mindfulness. This notion coincides with information described by the researchers who formulated the theory of structured experience. In this theory, Ellis et al. (2019) and Ellis, Jiang, Freeman, Lacanienta, and Jamal (2020) described the important role that an unfolding story or narrative being presented can have—serving to provoke an audience or increase self-relevance among participants. In an applied study, it was found that coherence and self-relevance of a story can result in greater engagement of participants in a story-like activity (Ellis, Jiang, Freeman, Lacanienta, & Ellis 2020). It is thought that using story narratives for interpretation that are focused on seeking to create self-relevance, coherence, or provocation among participants could increase mindfulness. The efficacy of different

interpretation narratives should also be examined considering techniques and findings put forth by the theory of structured experience.

There are other potential avenues for further research related to interpretation or mindfulness. Tilden (1957/2007) noted that interpretation should be different for children as opposed to adults. Examining the influence that age has on interpretation, either building on the notion by Tilden (1957/2007) or exploring this topic as it relates to groups of adults (e.g., young adults versus senior citizens) could be insightful to study further. Tilden's principles have been subjected to empirical scrutiny recently. Douglas et al. (2018) found that relevance questions increased engagement in a heritage interpretation setting. Ellis, Jiang, Freeman, Lacanienta, and Ellis (2020), found empirical support for the effectiveness of interpretive principles put forth by Tilden—that coherence and self-relevance enhance participant engagement. While not a focus of the current study, future research in environmental interpretation or heritage interpretation should seek to build on this more recent research to investigate empirically Tilden's interpretive principles.

5.5. Implications for Interpretation

Providing environmental and heritage interpretation has become an expected provision for both visitors and managers at such sites. While this can take different forms depending on the site, there is an underlying assumption that visitor experiences can be improved through interpretation (Caulton, 1998; Sharpe, 1976; Tilden, 1957/2007) and that effective interpretation can lead to positive changes for those who experience interpretation (Beck et al., 2018; Ham,

2013). This study sought to examine empirically the effectiveness of interpretation, taking up the suggestion to do so made by Moscardo (2014).

From Moscardo's (1996, 1999) frameworks, ideas to improve interpretive experiences were put forth. These frameworks suggested the use of specific techniques to induce mindfulness. These frameworks also noted what resulting mindful behavior could be. This paragraph focuses on the former; the next paragraph discusses the latter part of the framework. The use of novelty, multi-sensory features, and use of questions in interpretation were tested in the current study given that Moscardo (1996, 1999) noted that they should result in greater mindfulness. Moscardo (2014) also reiterated the importance of those three elements for interpretation. Noor et al. (2015) had previously noted that printed materials can induce mindfulness, so written interpretive narratives were included in the study. Partial support for this notion was found in the current study as printed interpretation online was used and was found to influence the dimensions of participant mindfulness measured in this study. The mindful interpretation (i.e., website) condition that tested the use of novelty, multi-sensory features, and use of questions was significant for the mindfulness dimension called "noticing new things, sensitive to context." The use of mindful interpretation can influence if visitors or participants notice new things or display an increased awareness related to what they are experiencing.

Moscardo (1996, 1999) proposed that more learning, higher satisfaction, and greater understanding would result from mindfulness in interpretation contexts. Previously, Frauman and Norman (2004) found that mindfulness resulted in improved learning and understanding. In the current study, mindfulness influenced the following variables: immersion, arousal, learning, memorability, meaningfulness, and satisfaction. Additionally, in the current study, the variables immersion, arousal, learning, memorability, meaningfulness, and satisfaction all positively

influenced intention to recommend. In this way, mindful outcomes can lead visitors or participants to recommend their experience to others. This is thought to result in greater interest and participation in interpretation activities or at interpretive sites. Additional empirical research should explore this issue, but mindful experiences can result in participant immersion, arousal, improved learning, memorable and meaningful experiences, and satisfaction, all of which in turn lead to greater intention to recommend by participants.

It is important to note that the same interpretive techniques will influence certain populations in different ways. This is a unique contribution and a key takeaway from the current study. Sample was significant for the three dimensions of mindfulness, demonstrating that a population interested in parks and environmental issues was influenced by the same interpretation techniques differently than the general population. This is important to be aware of when constructing interpretation narratives and experiences. This, too, should be researched further empirically, but it is thought that storytelling techniques (Moscardo, 2017) or experience structuring techniques (Ellis et al., 2019; Ellis, Jiang, Freeman, Lacanienta, and Ellis, 2020; Ellis, Lacanienta, et al., 2020) would provide a way to do this effectively in the future.

5.5.1. Interpretive Experiences: Mindfulness and Time

Participants spent a relatively limited amount of time with the interpretation experience that was examined as part of the current research study. While in an interpretive setting, visitors can decide how much time they spend experiencing the interpretation that is provided (e.g., at a museum). It may be beneficial to examine whether length of time for an interpretation experience is related to mindfulness.

If mindfulness and engagement are considered as separate but related constructs during interpretation experiences, it would be necessary to conceptualize what may influence

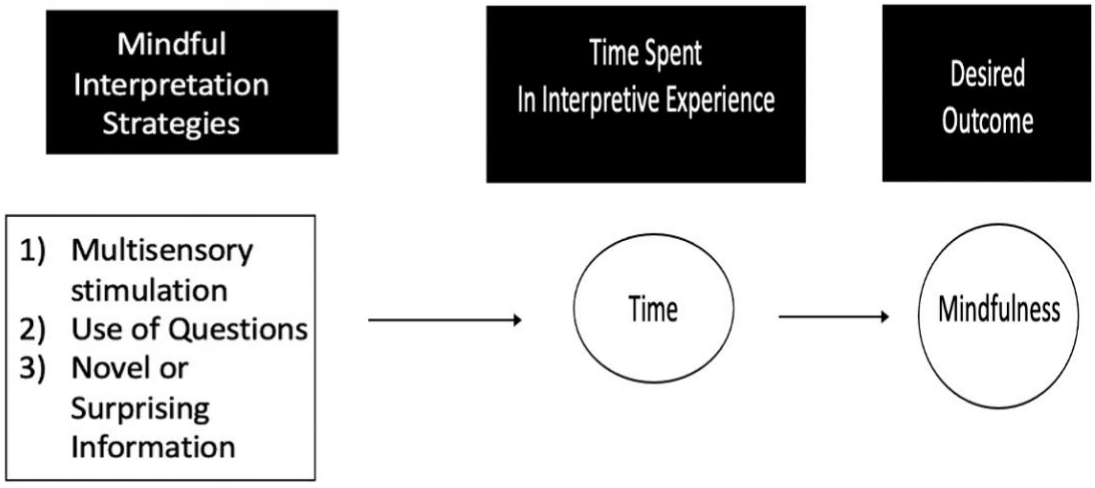
mindfulness during the time spent involved in an interpretive setting. According to this conceptualization, it would be useful to examine time spent by the visitor and the influence this has on their level of mindfulness.

The further study of the length of time it may take to structure a mindful experience would be beneficial for interpretive sites. The length of time would probably vary for different populations, based on insights obtained from this study. Further empirical study of this issue could provide beneficial insight concerning the structuring of interpretive experiences. A preliminary model related to this matter is shown below in Figure 7. Given that multisensory stimulation, use of questions, and novel or surprising information were described by Moscardo (1996, 1999) as being able to influence visitor mindfulness, it is thought that those three mindful interpretation strategies would be able to induce mindfulness as a desired outcome. Thus, time spent in the interpretive experience would need to be examined in detail, to see how that can influence participant mindfulness. It is thought that the time spent that would result in mindfulness may vary depending on the participant or population being studied. The desired outcome of mindfulness is thought to be an outcome that could be dependent on time spent in such an interpretive experience.

In short, interpretive encounters could be thought of differently according to the desired outcome the interpreter is seeking to provide. If mindfulness is the goal of such an encounter, then the model could be followed. The mindful interpretation strategies along with enough time spent in an interpretive experience could result in the outcome of mindfulness. If there are different goals that interpreters have in mind for participants, those could be organized or structured differently to achieve specific desired outcomes.

Figure 7

Mindfulness and Length of Interpretive Experience



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APPENDIX A

QUESTIONNAIRE

Q1 Introduction

Howdy! Thank you very much for considering helping me with my doctoral dissertation at **Texas A&M University**! I am studying the effects of different interpretation strategies on participant mindfulness during environmental interpretation. Results will help interpreters and park rangers better serve visitors. I appreciate your contribution to the advancement of knowledge about heritage and environmental interpretation.

The first 100 participants to fully complete the survey ***will receive a $5.00 gift card for purchases on Amazon.com***. To claim the gift card, you will need to share a valid email address at the end of the survey.

Your participation is entirely voluntary. Your responses will be kept completely confidential. This survey is easy to complete. You will be directed to a website about Yellowstone National Park's thermal features. Please enjoy a visit to the website. After your visit, please answer the questions about your experience. This whole process will take approximately **8-10 minutes** of your time. You can stop the survey at any time if you encounter a question you do not want to answer.

You may have questions about your rights. If you want to file a complaint or provide a comment about how the study is conducted, contact the person in charge of this study: Thomas Eck, PhD

Candidate, Texas A&M University Department of Recreation, Park and Tourism Sciences, e-mail address: teck@tamu.edu. You can also contact Dr. Gary Ellis, Professor, Texas A&M University Department of Recreation, Park and Tourism Sciences, (979) 845-6018, gellis1@tamu.edu. If you have other questions or concerns about this study, please contact the Human Research Protection Program at Texas A&M University (which is a group of people who review the research to protect your rights) by phone at 1-979-458-4067, toll free at 1-855-795-8636, or via email at irb@tamu.edu for: additional help with any questions about the research, voicing concerns or complaints about the research, obtaining answers to questions about your rights as a research participant, concerns in the event the research staff could not be reached, the desire to talk to someone other than the research staff.

Q2- Mindful Instructions Present – Mindful Interpretation Provided (Condition 1)

Please enjoy the following website about Yellowstone. **Please imagine that you are visiting the park while you view the website**. While visiting the website, imagine that you can feel the warmth of the sun and a gentle breeze in your hair. Enjoy the extraordinary sights, sounds, aromas, and beautiful scenery of Yellowstone.

People often visit parks to relax. So please take a moment to do the following before you start the video:

-Take a few deep breaths. Feel the air pass through your nose and mouth and deep into your lungs.

-Do a quick "body scan" and relax any muscles you find to be tense.

-Put your troubles away. Think only about the website, not the past or the future.

Q2a

Are you relaxed, thinking only about the present, and ready to enjoy the sights, sounds, and aromas of Yellowstone by viewing the website?

- ○ Yes, I am ready to see the website.
- ○ I tried, but didn't feel like I could do it.
- ○ No, I just want to see the website.

Q2b

Please return to this page (i.e. this tab in your browser) when you have finished visiting the website.

Click the blue website link below: Have a nice visit to Yellowstone!

Remember, when you finish visiting the website, use your browser tabs to return to this questionnaire. Then, click the arrow below to proceed.

Q2- Mindful Instructions Present – Mindful Interpretation Not Provided (Condition 2)

Please enjoy the following website about Yellowstone. **Please imagine that you are visiting the park while you view the website**. While visiting the website, imagine that you can feel the warmth of the sun and a gentle breeze in your hair. Enjoy the extraordinary sights, sounds, aromas, and beautiful scenery of Yellowstone.

People often visit parks to relax. So please take a moment to do the following before you start the video:

-Take a few deep breaths. Feel the air pass through your nose and mouth and deep into your lungs.

-Do a quick "body scan" and relax any muscles you find to be tense.

-Put your troubles away. Think only about the website, not the past or the future.

Q2a

Are you relaxed, thinking only about the present, and ready to enjoy the sights, sounds, and aromas of Yellowstone by viewing the website?

- ○ Yes, I am ready to see the website.
- ○ I tried, but didn't feel like I could do it.
- ○ No, I just want to see the website.

Q2b

Please return to this page (i.e. this tab in your browser) when you have finished visiting the website.

Click the blue website link below: Have a nice visit to Yellowstone!

Remember, when you finish visiting the website, use your browser tabs to return to this questionnaire. Then, click the arrow below to proceed.

Q2- Mindful Instructions Absent – Mindful Interpretation Provided (Condition 3)

Please return to this page (i.e. this tab in your browser) when you have finished visiting the website.

Click the blue website link below: Have a nice visit to Yellowstone!

Remember, when you finish visiting the website, use your browser tabs to return to this questionnaire. Then, click the arrow below to proceed.

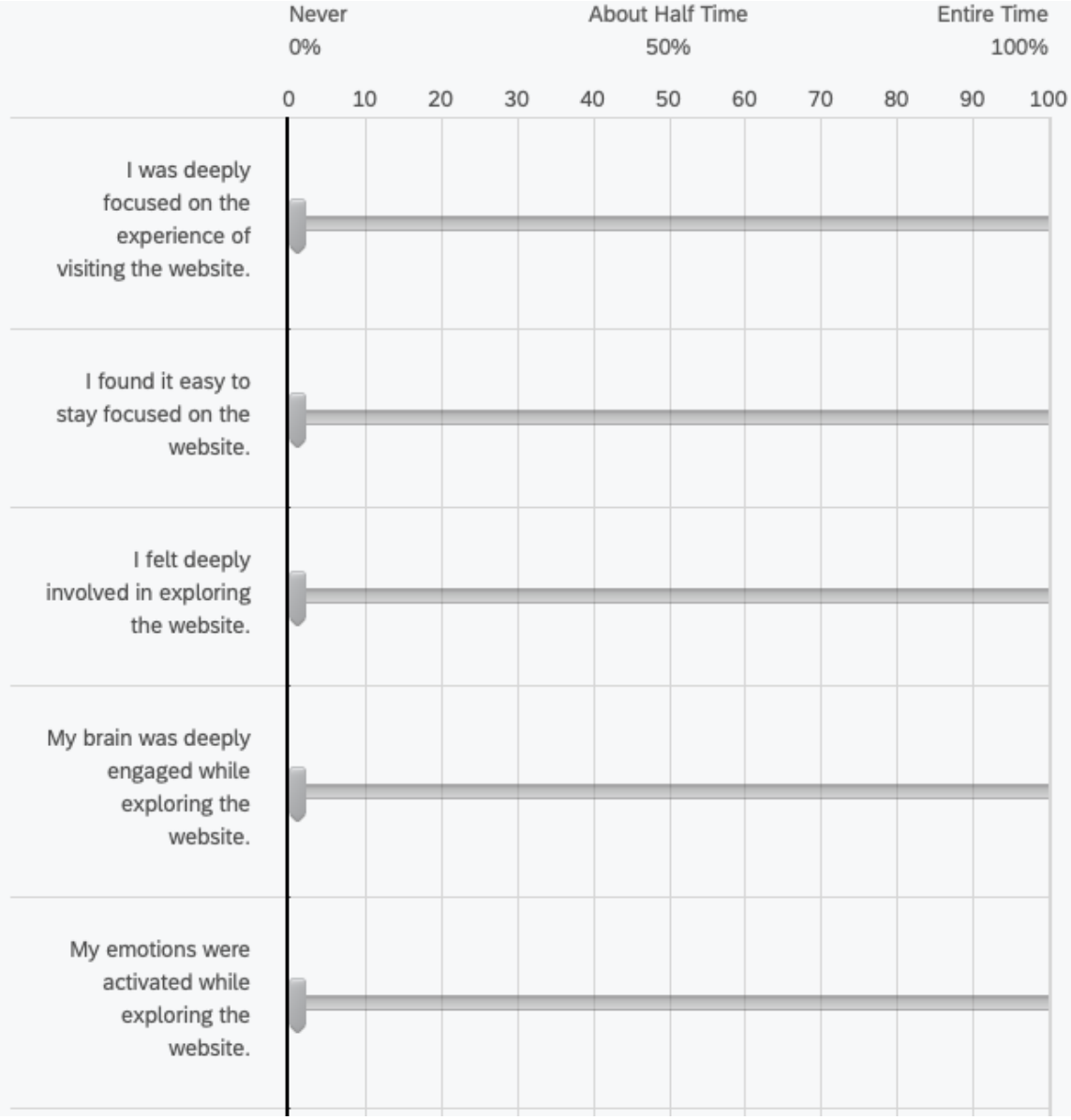
Q2- Mindful Instructions Absent – Mindful Interpretation Not Provided (Condition 4)

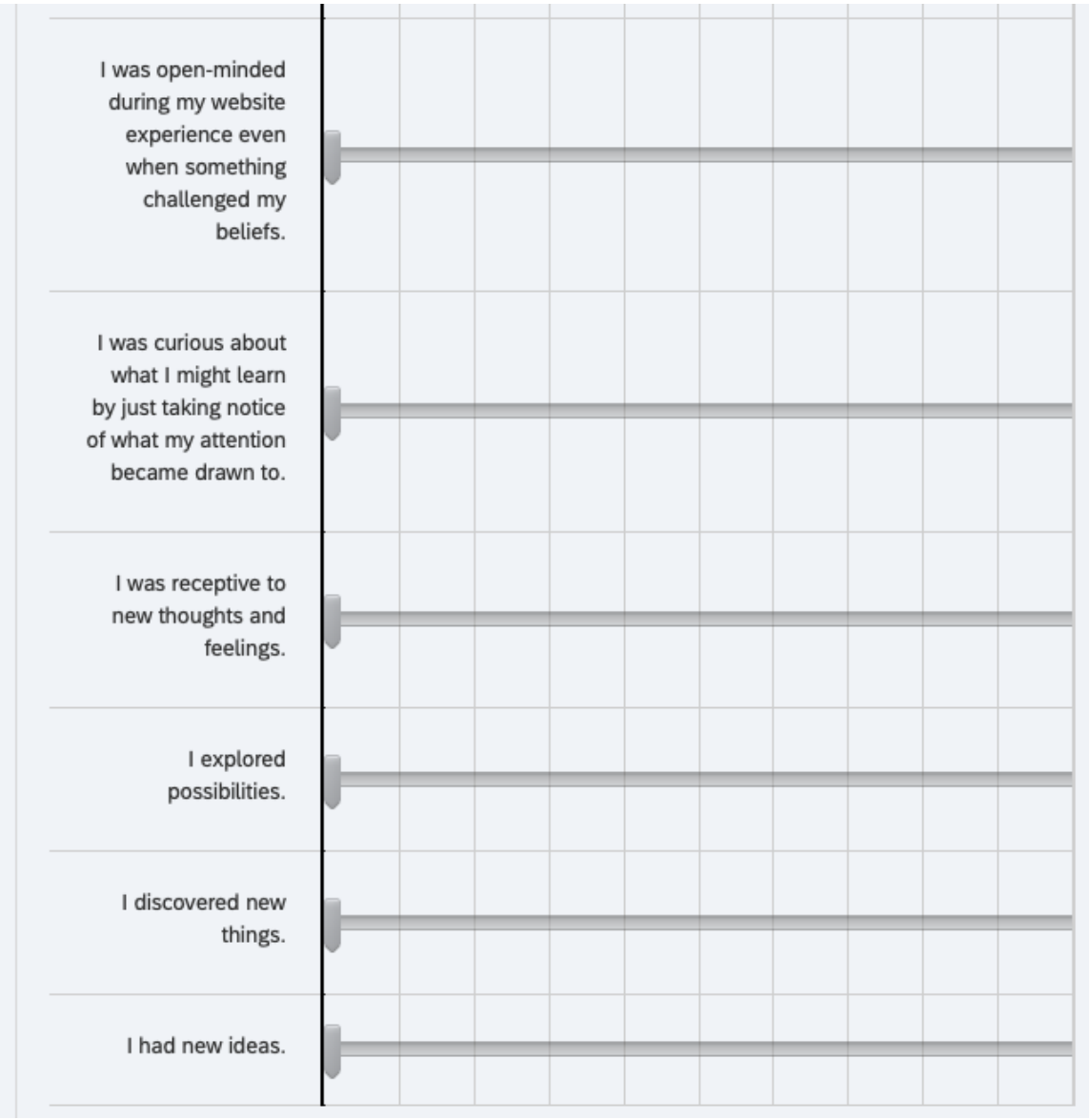
Please return to this page (i.e. this tab in your browser) when you have finished visiting the website.

Click the blue website link below: Have a nice visit to Yellowstone!

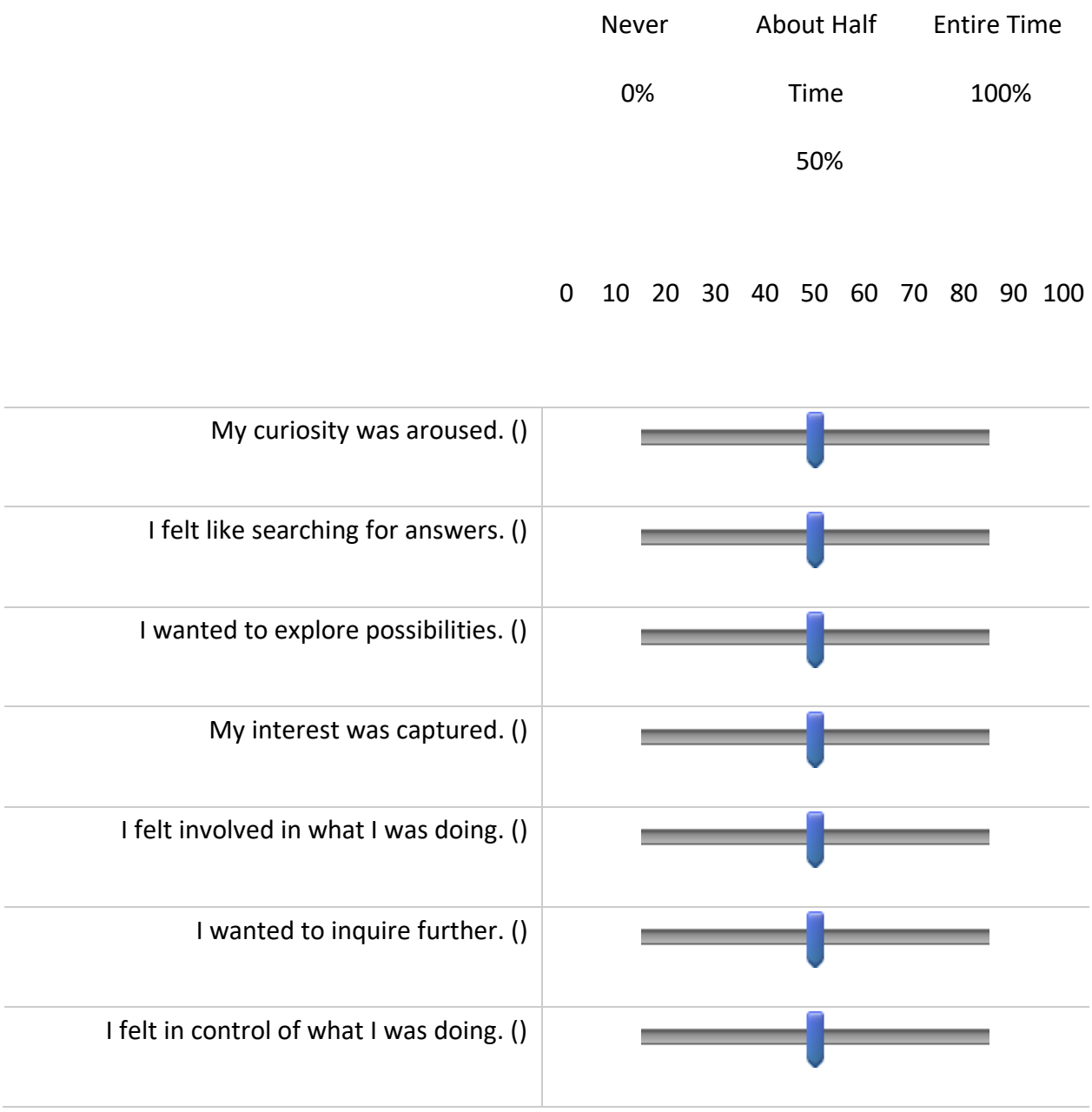
Remember, when you finish visiting the website, use your browser tabs to return to this questionnaire. Then, click the arrow below to proceed.

Q3 Read the prompt below and drag the slider bar to the percentage that best characterizes your experience. "During your visit to the website, what percent of your time would the following statements describe your experience?"

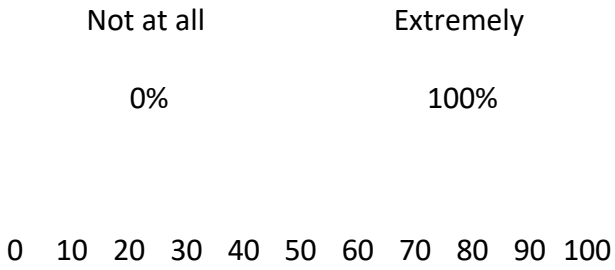



I was open-minded during my website experience even when something challenged my beliefs.
I was curious about what I might learn by just taking notice of what my attention became drawn to.
I was receptive to new thoughts and feelings.
I explored possibilities.
I discovered new things.
I had new ideas.

Q4 Read the prompt below and drag the slider bar to the percentage that best characterizes your experience. "During your visit to the website, what percent of your time would the following statements describe your experience?"

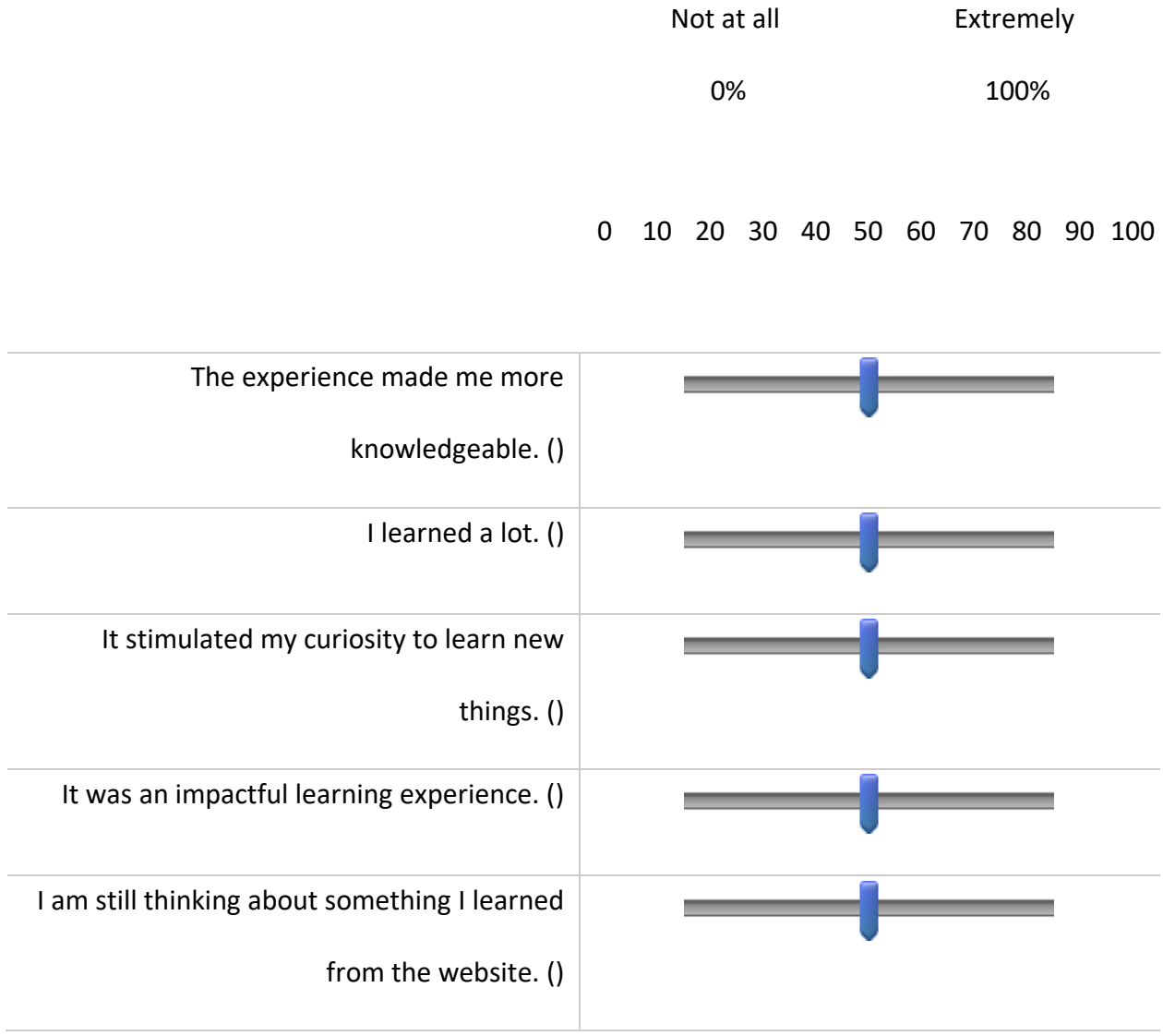


Q5 Read the questions below and drag the slider bar to the percentage that best characterizes your experience while viewing the website.



How interesting was the website? ()	
How stimulating was the information on the website? ()	
How exciting was your visit to the website? ()	
How enjoyable was your visit to the website? ()	

Q6 Read the prompt below and drag the slider bar to the percentage that best characterizes your experience with the website.



Q7 Read the statements below and select the value that best characterizes your website experience.

	Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
I will have wonderful memories about this website experience.	○	○	○	○	○	○	○
I will remember many positive things about this website experience.	○	○	○	○	○	○	○
I won't forget my website experience.	○	○	○	○	○	○	○

Q8 Please share your reaction to your overall website experience.

	Disgusted	Mixed	Delighted
	0%		100%
	0 10 20 30 40 50 60 70 80 90 100		
My overall website experience ()			

Q9 Read the question below and drag the slider bar to the percentage that best characterizes your experience.

	Completely certain that I will not 0%	Completely certain that I will 100%
	0 10 20 30 40 50 60 70 80 90 100	
If a friend asked, how likely is it that you would recommend this website? ()		

Q10 Some participants viewed a website that included questions for you to ponder along with descriptions of sounds and aromas you would encounter at the thermal features. Other participants viewed a website that did not include these features. Which is true for you?

- ○ The website I viewed included questions and descriptions of sounds and aromas.
- ○ The website I visited did not include questions and descriptions of sounds and aromas.
- ○ I do not recall.

Q11 About how many times have you visited Yellowstone National Park?

▼ 0 ... 26 or more

Q12 What is your gender?

- ○ Male
- ○ Female
- ○ I prefer not to respond

Q13 What is your racial or ethnic identity?

- ○ Asian
- ○ Black / African American
- ○ Hispanic
- ○ Native American / Alaska Native
- ○ Native Hawaiian / Other Pacific Islander
- ○ White / Caucasian
- ○ Other
- ○ I prefer not to respond

Q14 What is your age in years?

- ○ 18-29
- ○ 30-39
- ○ 40-49
- ○ 50-59
- ○ 60-69
- ○ 70+

Q15 Which of the following best represents your annual household income?

- ○ Less than $25,000
- ○ $25,000-$49,999
- ○ $50,000-$74,999
- ○ $75,000-$99,999
- ○ $100,000-$124,999
- ○ $125,000-$149,999
- ○ Over $150,000
- ○ I prefer not to respond

Q16 What is your highest level of completed education?

- ○ High School
- ○ Some College
- ○ Bachelor's Degree
- ○ Graduate Studies
- ○ Graduate Degree
- ○ I prefer not to respond

Q17 Which of the following best describes your current employment situation?

- ○ Full Time Employment
- ○ Part Time Employment
- ○ Unemployed
- ○ Retired
- ○ Other
- ○ I prefer not to respond

Q18 Which of the following best describes your current marital status?

- ○ Married
- ○ Not married
- ○ I prefer not to respond

Q19 Your response has not been recorded yet. If you are one of the first 100 participants completing a survey, you can claim a $5.00 Amazon.com gift card. To do so, please enter your email address below.

It is expected that gift cards will be emailed (to the email address you provide) within two weeks of survey completion.

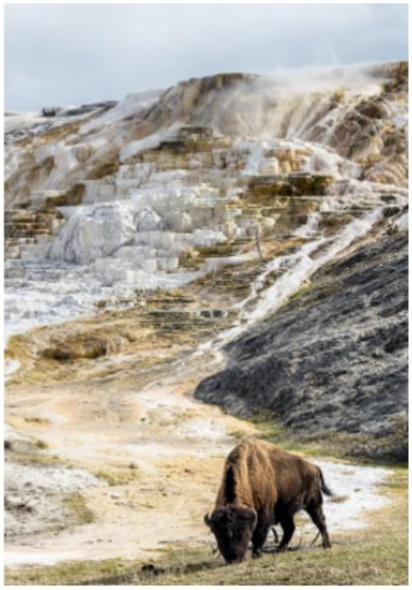
_____

APPENDIX B

WEBSITE SCREEN SHOTS

Mindful Interpretation Provided

Mammoth Hot Springs



Let's take an imaginary visit to Mammoth Hot Springs. At Mammoth, a network of fractures and fissures form a plumbing system that allows hot water from underground to reach the surface. Water comes from rain and snow that falls nearby and then seeps deep into the earth where it is eventually heated. What would you expect to feel, smell, or hear during a visit to such a place?

At the parking lot, you will notice the boardwalk you will walk on and may see a herd of bison, deer, or elk in the distance.

You pass bubbling mud pots as you approach the boardwalk that allows you to experience the wonders of Mammoth Hot Springs. The mud pots might remind you of bubbles emerging from the top of a chocolate milkshake. Aromas are also distinct. Sulfur expelled by the mud pots creates an almost unbearable, pungent aroma that smells like rotten eggs. Can you imagine that aroma?

As you travel along the boardwalk, you notice many new exciting sights, sounds, and smells. Water drips over rock surfaces, gases bubble up through searing hot mud pots, and you may hear the distant sound of elk bugling (like a high clarinet slur of "whooo-eee!"). Limestone in the form of a chalky mineral called travertine is deposited on the terraces, providing richly contrasting colors ranging from brilliant white to tan and brown. A natural plumbing system enables the underground hot water to reach the surface. You may enjoy these contrasting colors as you walk along the boardwalk.

As you exit the Mammoth Hot Springs area, you may reflect on the fact that small earthquakes continue to fuel the thermal features at Mammoth Hot Springs. These small earthquakes help the "plumbing" remain operational at Mammoth. Would you feel any discomfort in knowing that you have been standing in areas in which small earthquakes frequently occur?

Norris Geyser Basin

Geological conflict creates heat. Can you imagine feeling a blast of intense heat generated by a geyser in this basin? How hot do you think the temperature gets underground here? Hot enough for a sauna? In most cases, the thermal features here are significantly hotter than a sauna would be, with temperatures at or above the boiling point of water.

Norris is one of the hottest of Yellowstone's hydrothermal areas. Many hot springs and fumaroles here have temperatures of 200ºF (93ºC). The highest geothermal temperature at Yellowstone was recorded beneath Norris. The 459ºF (237ºC) record is a temperature hot enough to melt tin. The roar of steam you would hear at Norris is due to the tremendous heat below the geyser basin. The pungent aroma of rotten eggs you would smell is sulphur rising from deep below the surface.

Norris is near the intersection of major faults (deep cracks) where the Yellowstone volcano erupted 640,000 years ago. These volatile conditions caused a 1959 earthquake which was measured at 7.4 on the Richter scale. An earthquake of that magnitude could inflict major serious damage over a large area. A November 2012 earthquake measuring 7.4 of the Richter scale was centered in Guatemala. People in far-away Mexico City and El Salvador felt that earthquake. Can you imagine seeing geysers form from such powerful earthquakes?

Lower Geyser Basin

Yellowstone National Park is renowned for its sources of water. How much land area do you think water from Yellowstone's rivers, falls, and lakes would cover? Enough to fill a shopping mall? A small town? A big city? The total surface area of the above ground water from Yellowstone would convert to 167.2 square miles (433 km^2). To make a comparison, the total land area of Washington, DC is 68.3 square miles (177 km^2). In like units, all the above ground water in Yellowstone is more than two times the total area of Washington, DC. But there is more! Yellowstone has vast quantities of water below ground also!

Geothermal energy is heat extracted from the earth. The Lower Geyser Basin has 100 geothermal features. No area in Yellowstone discharges as much hot water. Most of the geothermal activity here occurs at Fountain Paint Pot and Firehole Lake. What colors might you see here? Fountain Paint Pot consists of brown, red, and yellow mud which is visible from a boardwalk trail where you could also see blue water pools. Firehole Lake is the largest hot spring in this basin. It is notable for its uncommon brown colored water, the result of warm water bacteria. You could hear Fountain Paint Pot bubbling furiously while there. About 15,300 gallons (58,000 liters) per minute are released in the Lower Geyser Basin. About how many water bottles do you think you could fill with this much water? One hundred? Ten thousand? If that amount of water was placed into 16.9-ounce (0.5 liter) water bottles, that would be over 115,000 bottles! If we stacked that many water bottles, our tower would reach almost 15 miles into the clouds!

This basin, the largest of nine major geyser basins in Yellowstone, consists of a flat plain interspersed with meadows and stands of lodgepole pine, with the Firehole River flowing through the central part of the basin. Another notable water feature of Yellowstone National Park includes Yellowstone Lake, the largest freshwater lake in North America at an elevation above 7,000 feet (2,134 meters). This lake lies at an elevation above sea level, which is five times the height of the Empire State Building.

Old Faithful

Are most elements of your life predictable? Not everything in life is predictable and that is true in nature as well. Old Faithful, one of nearly 500 geysers in Yellowstone, is just one of six whose eruptions are predictable. On a given day, Old Faithful will erupt about 17 times. If you wanted to see an eruption of Old Faithful, you might have to wait between a half hour and an hour and a half. Explorers in 1870 noted the consistent nature of eruptions from this geyser and gave it its name. Do you suppose Yellowstone would be a national park if it wasn't for this reliable geyser?

The length of time between eruptions at Old Faithful has slowly increased due to small earthquakes. Old Faithful remains predictable though. If an eruption lasts less than 2.5 minutes, there will be a one-hour interval until the next eruption. If the eruption is longer than 2.5 minutes, then the interval until it erupts again will be 90 minutes. Eruptions can range from just a minute and a half to five minutes in length. But Old Faithful has lived up to its name, only lengthening the time between eruptions by about 30 minutes in the last 30 years.

While waiting for Old Faithful to erupt, you might stand on the boardwalk and watch small furry mammals with bright eyes (pika) play and search for food. They scurry over the boardwalk and peak out from beneath it. You might also notice enormous bison lumbering around, in search of good grazing opportunities. Can you imagine birds you might spot soaring over the Old Faithful area? Some of these could be bald eagles, golden eagles, osprey, hawks, and turkey vultures.

How do you imagine Old Faithful *sounds*? An eruption of Old Faithful sounds like highly pressurized water exiting a firehose. The water rises high into the air and splashes rhythmically to the ground. Blue and yellow-orange pools of water form around the vent and dominate the region around Old Faithful. Depending on the length of the eruption, between 3,700 gallons and 8,400 gallons of water can be expelled by Old Faithful. The water carries small minerals that collect around the base of the geyser. What colors would you guess come from minerals in the water? In Yellowstone, hot springs, pools, and run-off channels exhibit all colors of the rainbow. Many of the brightly colored pools contain masses of tiny living organisms which thrive in hot temperatures.

Old Faithful is the iconic geyser of Yellowstone National Park. Watching Old Faithful Geyser erupt has become a tradition for many repeat visitors. People from all over have journeyed to watch this famous geyser erupt on a predictable basis.

Mindful Interpretation Not Provided

Mammoth Hot Springs

At Mammoth, a network of fractures and fissures form a plumbing system that allows hot water from underground to reach the surface. The water comes from rain and snow falls on nearby mountains and then seeps deep into the earth where it is eventually heated. Small earthquakes may keep the plumbing open.

Limestone, deposited here millions of years ago when a vast sea covered this area, provides the final ingredient. Hot water with dissolved carbon dioxide makes a solution of weak carbonic acid. As the solution rises through rock, it dissolves calcium carbonate, the primary compound in limestone. At the surface, the calcium carbonate is deposited in the form of travertine, the rock that forms the terraces of Mammoth Hot Springs.

Norris Geyser Basin

Norris is one of the hottest and most acidic of Yellowstone's hydrothermal areas. Many hot springs and fumaroles here have temperatures above the boiling point (200°F / 93°C).

Water fluctuation and seismic activity often change features. Norris is near the intersection of three major faults. One runs from the north; another runs from the west. These two faults intersect with a ring fracture from the Yellowstone Caldera eruption 640,000 years ago. These conditions helped to create this dynamic geyser basin.

Lower Geyser Basin

This is the largest geyser basin in Yellowstone, spanning about 18 square miles (29 km^2). It consists of a flat plain interspersed with meadows and stands of lodgepole pine, with the Firehole River flowing through the central part of the basin.

No other area in the park equals the Lower Geyser Basin in terms of hot water discharge. Measurements made in 1930 indicated a volume of about 15,300 gallons (58,000 liters) per minute! Most of the hydrothermal activity in the Lower Geyser Basin occurs in the Fountain Paint Pot and Firehole Lake areas.

Old Faithful

Watching Old Faithful Geyser erupt is a Yellowstone National Park tradition. People from all over the world have journeyed here to watch this famous geyser. The modern park is renowned for its wildlife and scenery, but it was its unique thermal features like Old Faithful Geyser that inspired the establishment of Yellowstone as the world's first national park in 1872.

Old Faithful is one of nearly 500 geysers in Yellowstone and one of six that park rangers currently predict. It is uncommon to be able to predict geyser eruptions with regularity and Old Faithful has lived up to its name, only lengthening the time between eruptions by about 30 minutes in the last 30 years.

Old Faithful is the iconic geyser of Yellowstone National Park. The grey geyserite creates a gentle slope up to the vent of the geyser. The vent itself is actually a depression, and not the protruding "cone-like" feature. The prominent "cone-like" feature is a result of the prevailing wind, with water and steam constantly depositing minerals on one side of the vent. The blue and yellow-orange pools of water around the vent are extremely delicate and full of microbial life. The small pools and terraces dominate the region around Old Faithful.