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MEANINGFUL LEARNING AT A NATIONAL HISTORIC SITE: HOW
INTERPRETIVE TOUR MESSAGE CONTENT AFFECTS VISITOR
LEARNING TRANSFER

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In Partial Fulfillment
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Doctor of Philosophy
Parks, Recreation and Tourism Management

by
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ABSTRACT

This study examines meaningful learning transfer at a historic site.
Transfer is the ability to apply knowledge to a new situation or setting and can be
divided into near and far transfer. Near transfer is characterized by the ability to
transfer knowledge to a similar situation, whereas far transfer is the ability to
transfer knowledge to a different situation. This between-subject post-test only
field experiment investigated the effect of interpretive message design on visitors'
ability to transfer leaning from an interpretive audio tour at a heritage site.
Interpretive messages were designed to examine the effect of message organizers
(i.e. presence or absence of an advance organizer) and message content (i.e. basic,
personalized or analogical references) on learning transfer. Visitors to the
Winnipeg Exchange District National Historic Site during the 2006 Winnipeg
Fringe Theatre Festival were intercepted at the outdoor site and were asked to
listen to an interpretive audio tour. After listening to the audio tour participants
completed near and far transfer tests. The MANOVA results revealed that no
significant differences existed between messages with and without advance
organizers with regards to learning transfer. Significant differences were found
between personalized messages and basic messages with regards to near and far
transfer; furthermore, significant differences existed between analogical reference
messages and basic messages with respect to far transfer.   These results suggest
that near and far transfer are accomplished through different mechanisms and
therefore messages need to be carefully designed to accomplish the type of

transfer desired. This study provides interpreters with insight into how visitors'

meaningful learning can be enhanced at historic sites.

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CHAPTER I

Introduction

Tourism to heritage sites has grown swiftly in recent years (Douglas,

Douglas, & Derrett, 2001). To date, the United Nations Environmental, Scientific

and Cultural Organization (UNESCO, 2005) has identified 788 properties that

have been placed on the world heritage list and these sites are visited by millions

of visitors annually (UNESCO, 2005). Heritage sites world wide are seeing an

increase in the number of visitors (UNESCO, 2005). While cultural tourism is

growing, so is the research focused in this area. Although people have been

traveling to experience other cultures since Roman times, it was not until the

1970's that tourism researchers began to recognize that travel to specifically gain

an understanding of culture and heritage was a distinct tourism product

(McKercher & du Cros, 2002). While this type of tourism was initially seen as a

niche market for better educated and affluent members of society, in the 1990's it

was recognized that somewhere between 30 – 70% of international travelers are

involved in some cultural tourism while away from home (McKercher & du Cros,

2002). Cultural tourism, which includes visits to heritage sites, typically involves

learning about, experiencing or understanding cultural activities and resources and

emphasizes educational, experiential and communicative experience (Douglas,

Douglas, & Derrett, 2001). Studies examining motives for visiting heritage sites

provide support for the assertion that cultural tourists are interested in learning

while visiting heritage sites (MacKay, Andereck, & Vogt, 2002; Poria, Butler & Airey, 2004; Zeppel, 2002).

Learning is an important aspect of visits to heritage sites. Providing interpretation to make heritage resources meaningful and understandable to visitors is a common component of heritage tourism (Prentice, Guerin, & McGugan, 1998; Tilden, 1977). Interpretation is typically considered a free-choice learning opportunity where visitors are provided with an occasion to learn about places, people, events, or processes through objects and experience (Tilden, 1977). While studies have examined visitor learning outcomes from interpretation, the focus is typically on examining facts learned and visitor self-ratings of their learning (Prentice et al., 1998). In a study examining visitor learning from interpretation at a heritage site, Prentice et al. conclude that, "Unless we can better model learning at attractions, the extent to which factual learning may be used as a proxy for the less easily measured processes will remain unknown" (Prentice et al., 1998, p. 19). This statement highlights the fact that past research examining learning at heritage attractions has focused primarily on visitors' ability to recall specific information learned from interpretation, but has not sufficiently examined other types of learning. Researchers examining the role of visitor interpretation in learning have suggested a need to look toward cognitive psychology and educational psychology to aid in understanding the learning outcomes of visitor experiences while at a site (Ballantyne & Uzzell, 1999; Koran, Willems, & Camp, 2000; Loomis, 1996). An examination of learning outcomes presented by Mayer (2002), an educational psychologist,

addresses the need for multiple conceptualizations of learning and identifies three

potential learning outcomes. These are; no learning, rote learning and meaningful

learning (Mayer, 2002). The concept of meaningful learning is likely the type of

learning that Prentice and colleagues (1998) suggested needs to be evaluated in

future examinations of learning outcomes from tourism experiences. According to

Mayer, meaningful learning is characterized by the ability to transfer knowledge

to novel situations.

Transfer is a way of examining the extent of meaningful knowledge

gained (Mayer, 2002). The concept of transfer discussed in education and

cognitive psychology has not been employed to inform learning outcomes in

tourism settings. Learning for transfer typically includes applying acquired

knowledge to novel settings. This gained knowledge is characterized by

meaningful learning where individuals understand, unlike rote learning where

people recall and remember (Mayer, 2002). Past research has identified

techniques useful for enhancing learning transfer including adding advance

organizers, personalization and analogical references to instructional material

(Ausubel, 2000, Gentner, Loewenstein, & Thompson, 2003; Mayer, 2002.).

Advance organizers are organizational prompts presented prior to a lesson to help

individuals relate new information to existing knowledge and interpret new

information based on what is already known (Mayer, 2002). Message

personalization is a technique where personal language like, you and your, is

included in a lesson (Moreno & Mayer, 2000). Analogical references are

examples and cases given to help learners understand the main principle of a lesson (Gentner, Loewenstein, & Thompson, 2003).

The ability to transfer learning from heritage tourism experiences is particularly important in a tourism context where visitors may never revisit the situation or setting where the initial learning has taken place. If visitors want to learn while at a destination, it seems reasonable to assume that they desire meaningful learning experiences that lead to understanding that results in the ability to transfer this knowledge to contexts outside of the initial learning environment.   Visitors who understand the place they are visiting will likely have a better experience resulting in greater satisfaction (Moscardo, 1996). Additionally, understanding will allow visitors to modify their own behaviour minimizing their negative impact on the site contributing to the sustainability of the resource (Moscardo, 1996). Through understanding visitors attitudes towards heritage sites can be improved and used to acquire support for preservation (Timothy & Boyd, 2003). Finally, by providing meaningful learning opportunities visitors will be able to transfer what they have learned to various situations at the site or to heritage resources around the world, ensuring the continued sustainability of tourism to heritage resources. Uzzell and Ballantyne (1998) quote Tilden as saying, "through interpretation understanding, through understanding appreciation and through appreciation protection" (p. 12). Site interpreters look for ways to provide visitors with satisfying learning experiences that contribute to the protection of resources. This study will examine how interpretive messages can be manipulated, using techniques identified in the

literature, to enhance visitors' ability to transfer meaningful learning gained from and interpretive tour.

<p style="text-align:center">*Purpose of the Study*</p>

The purpose of this study was to examine transfer of meaningful learning in a free-choice learning setting. Specifically this study looked at the effect of interpretive message design on visitors' ability to transfer leaning from a heritage tourism site. Furthermore, this study explored the use of advance organizers, personalization and analogical references as techniques to induce meaningful learning that can be transferred.

Research Question 1

How does an advance organizer, in the form of an introductory paragraph, affect transfer of meaningful learning in a free-choice learning environment?

Null Hypothesis 1.

No differences exist between messages with and without advance organizing introductory paragraphs with regards to near transfer.

Null Hypothesis 2.

No differences exist between messages with and without advance organizing introductory paragraphs with regards to far transfer.

Research Question 2

How does interpretive message content affect transfer of meaningful learning in a free-choice learning environment?

Null Hypothesis 3.

No differences exist between basic, personalized, and analogical reference messages with regards to near transfer.

Null Hypothesis 4.

No differences exist between basic, personalized, and analogical reference messages with regards to far transfer.

Implications

The results of this study will advance the current understanding of factors affecting transfer of meaningful learning. To date, there is no research that specifically examines transfer of learning in free-choice learning environments. Typically, transfer research has taken place in laboratory and formal education settings and therefore a tourism setting presents the opportunity to expand the current research that explores learning transfer.

While research exists that examines the effect of various message designs on learning transfer, none examine advance organizers, personalization and analogical references in the same study. This study will inform destination managers of the advantages of certain message designs, over others, when leaning transfer is sought.

Learning transfer has typically been measured as a single phenomenon however, near and far transfer have been identified as two components of learning transfer. This study examines both near and far transfer separately as outcomes that might result from a free-choice learning environment.

The result of this research will be valuable to tourism managers in a number of ways. This research will provide managers with tools to design

interpretive messages that enhance meaningful learning, enabling visitors to transfer what they have learned to novel settings. Whether managing impacts, or providing visitors with lasting outcomes, transfer of learning is an important concept in providing recreational learning opportunities for visitors.

Conceptual Definitions

Meaningful learning: learning that can be used in novel situations and settings to solve problems, understand a concept or create new information. Specifically, meaningful learning is characterized by knowledge that can be transferred (Mayer, 2002).

Learning transfer: The ability to use information in new situations and contexts. Knowledge can be transferred to solve new problems or understand new concepts; this is forward transfer. Backward transfer is the ability to take current learning and connect it to what is already known. Near transfer includes transferring knowledge to similar situations or context as the original learning, while far transfer involves using knowledge in different settings or contexts (Haskell, 2001).

Mindful abstraction: This occurs when a principle is drawn from information presented and becomes decontextualized from the initial learning situation (Perkins & Salomon, 1992). According to the low-road, high-road theory of transfer, the main principle must be abstracted with conscious, thoughtful effort (Perkins & Salomon, 1992).

Advance organizers: These are organizational cues presented to learners prior to learning new information that help connect and interpret new information based on what is already known (Mayer, 2002).

Self-referencing: The phenomenon where people are better able to retain information when it is processed in relations to aspects of themselves (Moreno & Mayer, 2000). Specifically, it is thought that when information is encoded in reference to ones-self, greater elaboration and organization occurs (Symons & Johnson, 1997). Personalization of a message is the technique used to induce self-referencing (Moreno & Mayer, 2000)

Analogical encoding: The process where two or more examples are compared and the result of this enables understanding of the basic structure common to both examples (Gentner, Loewenstein, & Thompson, 2003). Analogical referencing is used to describe messages that induce analogical encoding.

This chapter has provided insight in to the need for the proposed study. The main purpose of this study has been outlined and important terms have been defined to ensure the topics discussed throughout this dissertation are understood. The next chapter will review the literature related to the purpose of this study. Then a contextual framework will be discussed. The methods chapter will outline how the research for this study was conducted. Then, the results of the study will be presented followed by a discussion of the results. Finally, the conclusion will highlight the implications of this research, discuss the limitations, and present future research ideas.

CHAPTER II

Literature Review

This chapter reviews literature that provides theoretical and practical

guidance to understand learning transfer in a free-choice learning environment.

As such, literature from tourism, interpretation, cognitive psychology and

educational psychology is examined. The chapter will begin by providing an

overview of research in free-choice learning environments and will then focus

specifically on research about learning in tourism settings. Next, meaningful

learning will be examined which will lead to a discussion of the learning transfer

literature. This literature review will provide the information needed to allow for

a thorough presentation of conceptual framework used for the present study.

Free – Choice Learning

Learning that takes place while visiting a destination has been

distinguished from formal learning environments, such as school. Ham (1992)

discusses the difference between captive audiences in formal learning settings and

non-captive audiences at informal recreational learning settings. Specifically,

Ham notes that non-captive audiences are "any audience that has the option of

ignoring the information without punishment or loss of a potential reward…"

(Ham, 1992, p. 6). Free-choice learning is another term used to describe learning

that is not compulsory, where individuals choose to learn the information

presented (Falk, 2005). In museums and other recreational learning settings

groups of individuals have varied prior knowledge, the learner's focus is often

pulled in many directions and individuals spend little time with the subject matter

when compared to formal learning environments. Falk and Dierking (2000) add

that individuals vary greatly in what and how much they learn in free-choice

learning environments and that this learning is based on personal, social and

environmental factors. The Contextual Model of Learning, presented by Falk and

Dierking, is intended to address the complexity of learning in these environments

and combines the personal context, the physical context and the socio-cultural

context into one learning model. As a holistic model, it encompasses various

factors that affect learning in a museum setting. While the authors recognize that

the model was created to deal with learning in museum environments, it is

considered an appropriate model of learning in diverse environments

(see Figure 1).
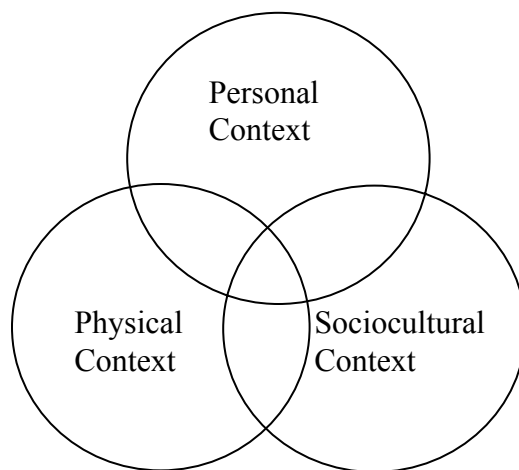
Figure 1. Contextual model of learning (Falk & Dierking, 2000).

The model presented by Falk and Dierking (2000) is a descriptive model based on observations of museum visitors. Since this model is based on observational research, it is not intended to be predictive. According to Falk and Dierking, the main components of the personal context are motivation, expectations, prior knowledge and experience, interest, choice and control. The socio-cultural context includes within-group mediation and facilitated mediation by others. Finally, the physical context consists of advance organizers and orientation, design and reinforcing events and experiences outside the museum.

Learning in a Tourism Context

Learning is an ongoing process that occurs in diverse contexts throughout an individual's life (Falk, 2005). Visitors are exposed to numerous learning opportunities while traveling including unplanned opportunities such as interactions with locals, as well as planned opportunities like interpretive tours. Whether at wilderness parks, zoos, museums or historic sites, there is usually some form of visitor interpretation to enable visitors to participate in a learning experience. Interpretation is the process through which visitors learn about the resource visited and is key to making heritage places understandable and meaningful to visitors (Tilden, 1977). Specifically, interpretation is often intended to communicate a message to visitors that destination managers anticipate will educate visitors about the place, help to manage visitor behavior and gain visitor support for the continued preservation of the site.

Typically, learning outcomes resulting from tourism experiences are evaluated by examining visitors' recall of specific facts and details from an

interpretive learning opportunity, usually accomplished through written material, guided tours, film and audio tours (Ham, 1992; Prentice, Guerin and McGugan, 1998; Tilden, 1977). Studies in both the interpretation and tourism literature have demonstrated that various factors can affect visitors' ability to retain and recall learned information (Prentice, 1993; Prentice et al., 1998). Interest, attention, motivation, exhibit design and competency of interpreters have all been documented as factors that influence visitors' ability to retain and recall presented information (Light, 1995; Loomis, 1996; Ryan & Dewer, 1995; Frauman & Norman, 2004, Prentice, 1993).

Research evidence exists that supports the idea that visitor learning consists of more than just the ability to recall and retain information learned while visiting a destination. A recent qualitative study conducted with senior travelers set out to identify the types of learning experiences older travelers identify and the conditions that contribute to learning in travel (Roberson, 2003). After conducting interviews with eight travelers, the author outlined four themes; learning about one's character, learning about trust, learning about the world and learning about home (Roberson, 2003). In this study, participants revealed that they learned about who they are, how they see themselves and what they can do. While traveling, interactions with new people, dealing with the intricacies of travel and reflections about their travel experience all contributed to better understanding themselves. Learning about how to trust was another important outcome of these seniors' travel experiences. Specifically, trusting themselves, the people they were with and God. Through travel, participants felt they learned

to appreciate other cultures. Their view of the world was broadened through experiences when traveling. While away from home, these seniors found that they learned about their own home. Contrasting life at home with life in the visited country allowed them to simultaneously appreciate home as well as critique it.

This study highlights the diversity of learning outcomes that arise from tourism experiences. As well, it suggests that meaningful learning is an important aspect of learning from the visitors' perspective. Participants did not recall specific facts when asked about their learning, instead they discussed how what they learned connected to knowledge they had about themselves, their home and the world (Roberson, 2003). This qualitative study provides further support for a need to look at more than just rote learning outcomes.

Within the tourism literature most research examining visitor learning has focused on learning as a motive for site visits, less research exists that examines how and what visitors learn from tourism experiences (Poria, Butler, & Airey, 2004; Prentice, Guerin, & McGugan, 1998; Zeppel, 2002). Meanwhile, the interpretation literature provides additional insight into the learning outcomes visitors achieve during site visits (Ballentyne & Uzzell, 1999; Light, 1995). While research exists in tourism and interpretation journals that has examined visitor learning, little research exists that specifically examines meaningful learning outcomes. Cognitive and educational psychology researchers have explored this concept in detail and this next section will review the findings of meaningful learning research.

Meaningful Learning

Richard Mayer (2002) describes learning as, not only the acquisition of knowledge, but also the ability to use that knowledge. This recognition led to the distinction between rote learning and meaningful learning (Mayer, 2002). Mayer provides a detailed description of three learning outcomes; no learning, rote learning and meaningful learning. No learning is characterized by a lack of retention and inability to apply information to a new situation. When rote learning occurs, individuals are able to recall presented information but are unable the use the knowledge gained to solve problems. Meaningful learning, according to Mayer, occurs when information is understood and can be used to solve problems. It is meaningful learning that results in transfer of learning, where individuals apply what is learned in one situation to another situation.

Mayer (2002) describes six cognitive process categories required for learning. The first, 'remember', is related to retention or rote learning. The five remaining process categories are related to learning transfer. These categories are; understand, analyze, evaluate, create and apply. The author states that 'understand' is the most common transfer-based learning outcome emphasized in the education system. Understanding can include interpreting, exemplifying, classifying, summarizing, inferring, comparing and explaining. The next cognitive process, 'analyze', entails differentiating relevant from irrelevant or important from unimportant information. 'Analyze' can also include organizing elements that are learned and assigning a point of view, bias, or value from the information. Another cognitive process leading to transfer is evaluating.

Evaluating can comprise of checking for inconsistencies within a process and critiquing to determine the appropriateness of a procedure for a particular problem. 'Create' is the fourth process related to transfer. 'Create' includes generating alternative hypotheses, planning a method to accomplish a task, and producing a product. The final cognitive process enabling transfer is 'apply'. Applying involves both executing and implementing. Executing is the application of a procedure to a familiar task whereas implementing is the application of procedures to unfamiliar tasks. In studies examining learning transfer questions to measure transfer often require learners to apply what was learned in a lesson to a novel situation (Mayer & Anderson, 1992; Moreno & Mayer, 2000; Moreno & Mayer, 2004)

Mayer's (2002) work provides a clear depiction of the distinction between different types of learning. His discussion of meaningful learning is particularly valuable since he presents various cognitive processes that occur during learning transfer. Mayer suggests that the meaningful learning is needed to enable individuals to transfer learning from one setting or situation to another.

Ausubel's (2000) detailed description of meaningful learning is consistent with Mayer's depiction. Ausubel describes the concept as the acquisition of new meanings based on "symbolically expressed ideas (the learning task) [that] are related in a nonarbitrary, nonverbatim fashion to what the learner already knows…" (p. 67). Non arbitrary means that the ideas can be logically related to other relevant ideas: meaningful connections are made between the new

information and existing knowledge. Nonverbatim implies that the new idea is not dependent on specific words: it can be expressed in a variety of ways.

According to Ausubel's description, meaningful learning requires both; potentially meaningful material and a meaningful learning set. Material is considered meaningful when it can be related to the learner's existing structures of knowledge in a nonarbitrary and nonverbatim fashion. A meaningful leaning set describes the learners' ability to relate new material to existing structures of knowledge. According to Ausubel (2000) by ensuring that ideas are related to existing knowledge in a nonarbirary and nonverbatim manner, people will be able to incorporate, understand, retain and organize great amounts of new ideas.

Ausubel identifies three categories of meaningful learning, which are; representational learning, propositional learning, and concept learning. Representational learning is characterized by understanding the meaning of symbols. Propositional learning is when the meaning of ideas are expressed by groups of symbols combined into a proposition or sentence. Conceptual learning occurs when the meaning of an abstract idea is understood. In summary, meaningful learning is when new information is related to existing knowledge using ones own words that accurately describe the phenomenon.

Fardanesh's (2002) description of meaningful learning agrees with both Mayer and Ausubel. Specifically he describes meaningful learning as structured and organized understanding where component ideas and relationships are recognized and established by the learner (Fardenesh, 2002). According to

Fardanesh, understanding is demonstrated by the ability to paraphrase, summarize and answer questions about the learned body of knowledge.

In their review of transfer, Schwartz, Bransford and Sears (2005) discuss the concept of "learning with". The authors present three kinds of knowing in their article. While the first two types of knowing presented are believed to be commonly measured in education settings, Schwartz et al. focus their attention on interpretative knowing. Interpretative knowing refers to using existing knowledge to interpret new situations. Furthermore, Schwartz et al. (2005) state that "what one notices about new situations and how one frames problems has major effects of subsequent thinking and cognitive processing" (p. 9). This type of knowing is not unlike the concept of meaningful learning presented by Mayer (2002) and is also believed to result in transfer (Schwartz et al., 2005).

The above discussion highlights the importance of understanding as an outcome of meaningful learning. Mayer's (2002) work has focussed on measuring understanding, as a reflection of meaningful learning, by evaluating the ability to transfer learning. Learning transfer is "the effect of previous learning on new learning. It occurs successfully when a person uses knowledge from previous experience to help learn something new" (p. 5).

Learning Transfer

Learning transfer has been described as either backward or forward, negative or positive, and near or far (Detterman, 1993; Haskell, 2001; Perkins & Salomon, 1992). Backward transfer involves linking new information to prior knowledge, whereas forward transfer occurs when new information is used in a

novel situation (Gentner, Loewenstein, & Thompson, 2004). Negative transfer

takes place when learning in one context undermines performances in a different

context. This generally only occurs early in learning a skill or subject and is

usually is not problematic once people advance (Perkins & Salomon, 1992).

Positive transfer refers to learning which takes place in one context and enhances

learning in another context. Positive transfer can be further divided into near and

far (Detterman, 1993). Near transfer occurs when knowledge can be transferred

to similar tasks and context while far transfer takes place when learned

information can be applied to different contexts.

Barnett and Ceci (2002) identified six domains to distinguish between near

and far transfer, these are; knowledge domain, physical context, temporal context,

functional context, social context and modality. Far transfer of the knowledge

domain occurs when the learner can apply what is learned to different subject

matter. An example of far transfer of the physical context is when information

learned at school is applied to a home setting. The temporal context of far

transfer refers to when information learned today is applied in a year. An

example of far transfer in the functional context is when learning that occurs in an

academic setting is applied to leisure. Far transfer of the social context occurs

when one learns something in a group and applies it to a solitary setting. When

referring to the modality, far transfer occurs when something is learned through

reading in a book and applied by actually doing the activity.

Fisch (2001) examined factors common across theories of transfer and

applies them to an education television context. In so doing, the author identifies

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the three components necessary for transfer. These are; initial learning, mental representations and transfer situation. When initially learning information for transfer, rote memorization is not sufficient, instead elaborated understanding appears necessary for transfer (Bransford & Schwartz, 1999; Perkins & Salomon, 1992). The role of mental representations is present in most theories of transfer. According to various authors mental representations must be abstracted beyond the learning context to be applied in novel contexts (Salomon & Perkins, 1989; Gick & Holyoak, 1980; Haskell, 2001). Diverse practice, where individuals are exposed to multiple examples, also enables transfer of information by allowing the learned information to become detached from context (Gick & Holyoak, 1980; Salomon & Perkins, 1989). The last step necessary for transfer to occur is the application of information learned to a novel setting. For this to occur, an individual must see the information as applicable to a situation. Originally, Thorndike and Woodworth (1901) suggested that individuals evaluate the extent to which identical elements are shared between previously learned information and the target situation. Expanding on this concept, researchers have distinguished between surface structure similarity and deep structure (Holyoak & Koh, 1987). Surface structure refers to the specific content and context of the information while deep structure refers to the underlying principle.

Mayer (2002) summarized the prominent views about how transfer occurs into three major perspectives; general transfer, specific transfer and mixed transfer. The general view of transfer refers to the concept of formal discipline. This classical educational theory suggested that learning in areas such as Latin

and mathematics enhance the mind's ability to transfer. Current research on transfer reveals that this theory is inadequate and is not supported by current research evidence (Ceci & Ruiz, 1993). The theory of transfer by identical elements suggested by Thorndike and Woodworth (1901) is a specific view of transfer. In early investigations exploring transfer, Thorndike found that transfer did not typically occur. As previously mentioned, this early research led researchers to believe that transfer was dependent on identical elements between the initial learning situation and the application situation. This concept of how transfer occurs was deemed insufficient (Ceci & Ruiz, 1993). While it was useful for explaining how near transfer occurs, it was unable to describe why far transfer occurs. The final view of transfer involves a mix of both specific transfer and general principles. Salomon & Perkins (1989) have used this approach in their theory of high-road low-road transfer where they incorporated previous theories of transfer into a theory that provides insight into how both near and far transfer occur (Bransford & Schwartz, 1999; Mayer, 2002; Schwartz, Bransford, & Sears, 2005).

In Perkins & Salomon's (1992) conceptualization of transfer, two mechanisms are believed to result in transfer; these are, load-road and high-road transfer. Low-road transfer is when well-learned routines are activated in a similar environment or situation in which the original information or skill was learned. High-road transfer involves abstraction and making novel connections and can occur in contexts that are dissimilar from the original learning situation.

A review of the transfer literature by Perkins and Salomon (1992) revealed that a number of factors affect transfer; these are, thorough and diverse practice, explicit abstraction, active self-monitoring, mindfulness and using a metaphor or analogy. Thorough and diverse practice refers to learning by gaining extensive practice in diverse context that results in "flexible relatively automatized bundle of skills easily evoked in new situations." (Perkins & Salomon, 1992, p. 5). Explicit abstraction of the material, where general principles are understood, is also considered an important requirement for transfer. Metacognition during learning is important when transfer of the information is sought; this is achieved through active self-monitoring. According to Perkins & Salomon mindfulness fosters both active self-monitoring and explicit abstraction. Mindfulness particularly refers to active mental involvement in learning where one pays attention to multiple perspectives and context (Langer, 1997). Metaphors and analogies aid in transferring information because the newly learned material is based on previously learned material allowing it to be easily integrated into existing cognitive structures (Perkins & Salomon, 1992).

Low-road (automatic) transfer is thought to result in near transfer. This type of transfer allows information learned in one situation to be transferred as long as the transfer situation presents stimulus conditions similar to the original learning situation and triggers the semi-automatic responses (Perkins & Salomon, 1992). This type of transfer involves affordances, whereby information learned in one situation can be transferred as long as the situation presents conditions similar to the original situation where information was learned, thereby triggering the

semi-automatic responses. This incorporates early research findings by Thorndike (Detterman, 1993) that lead to his theory of identical elements. This type of transfer requires repeated practice in varied contexts. The knowledge is transferred when the novel occasion resembles the learning occasion sufficiently, in both stimulus characteristics and context. Falk and Dierking (2000) point out that learning is tied to the environment in which it occurs and that people have difficulty transferring from one situation to another. Research examining situated cognition provides evidence that learning is context bound (Salomon & Perkins, 1989). Research suggests that for individuals to be able to generalize their knowledge to a new situation individuals must recognize similar elements between the context where the information was first learned and the new context (Salomon & Perkins, 1989). According to these authors, practice enables transfer by forcing cognitive elements to adapt to each of the practice contexts so that eventually what was learned becomes detached from the original context. Practice may eventually lead to automization, where behavior can become fast and effortless (Salomon & Perkins, 1992). Automatic behavior can be induced whenever situation cues suggest that it is appropriate. Salomon & Perkins believe that low-road transfer will occur when performance is unintentional, implicit, based on modeling and driven by reinforcement.

High-road transfer requires that individuals abstract learned information from the original learning context and purposely search for connections to new situations. This high-road is more likely to result in far transfer than the low-road, according to Perkins and Salomon. In Salomon and Perkins' (1989)

conceptualization of transfer, mindful abstraction is seen as the key to high-road

transfer. Mindful abstraction is described by the authors as "deliberate, usually

metacognitively guided and effortful, decontextualization of a principle, main

idea, strategy, or procedure, which then becomes a candidate for transfer" (p.

126). Abstraction is necessary because it provides a bridge allowing people to

transfer from one context to another. Abstraction refers to both a process and

product. As a product, it is a generalized representation of the learned

information. As a process, there are many ways abstraction can be achieved.

Abstraction allows individuals to extract and re-represent the information in a

general form. Abstractions can take the form of rules, principles, categories and

labels. Mindfulness is necessary since it enables individuals to comprehend the

abstraction. Mindfulness involves drawing novel distinctions and connections

between information and is considered by these authors to be a form of mental

elaboration that enables deeper level processing (Salomon & Perkins, 1992).

When mindfully abstracting concepts, more paths in the mental map may be

created enabling easier access to the abstraction in the future.

The main difference between low-road and high-road transfer are the

processes that result in transfer. According to Salomon & Perkins (1992),

automatic, stimulus-controlled, and extensively practiced behaviors or cognitions

will lead to low-road transfer. Alternatively, high-road transfer can be facilitated

by mindful processing information that decontextualizes the cognitive elements.

Salomon & Perkins (1989) present two techniques for educing transfer.

To induce low-road transfer, which results in near transfer, hugging is the

recommended technique. Hugging involves teaching the information in a way that resembles the intended transfer situation as much as possible. To encourage high-road transfer bridging is suggested. Bridging involves encouraging learners to be mindful and to make connections and abstractions when learning new information.

Researchers in cognitive and educational psychology have examined learning transfer from a variety of perspectives and in various learning settings. To date, research has yet to examine this particular concept in a free-choice learning environment.

Instructional Manipulations and Learning Transfer

Interpretive programs are common free-choice learning opportunities in recreational settings. A number of specific interpretive techniques have been shown to contribute to visitor learning at a destination. A text by Sam Ham (1992), intended as a resource for park interpreters, identifies various techniques employed by interpreters in park settings. Ham states that interpretive material should be meaningful and personal. Visitors should be able to connect presented information to something they already know. When information fits within existing knowledge people are better able to attach meaning to it (Ham, 1992). This is supported by research examining self-referencing that suggests people should be encouraged to think about their own experience in reference to new information to enhance meaningful learning and transfer (Moreno & Mayer, 2000). Studies conducted by Moreno and Mayer (2004) suggest that personalized messages promote transfer of learning. The authors also note that the self-

referential effect has been explored regularly in cognitive psychology and has

revealed that when information is processed in reference to oneself, retention is

heightened (Moreno & Mayer, 2000). In a set of experiments, Moreno and Mayer

hypothesized that self-referencing encourages learners to engage in active

cognitive processing allowing learners to integrate the learned information into

existing knowledge, which would result in transfer of learning. Self-referencing

was induced by creating personalized messages. Personalized messages included

references to the learner throughout the lesson. Specifically, the words "you" and

"your" were inserted throughout the instructional material.   In total, five

experiments were designed to examine the self-referential effect in multi-media

learning environments. The results of these experiments indicated that

participants in the self-referential group (the subject who were given the

personalized instructional material) generated significantly more creative

solutions to the problem-solving transfer questions in all five experiments.

Moreno and Mayer's research suggests that self-referencing induces transfer

regardless of whether the message is presented with speech or text, as a lesson or

game, or includes questions or no questions.

When discussing interpretive techniques, Ham (1992) also mentions the

importance of bridging, or connecting new concepts to existing concepts by using

examples, analogies and comparisons. The analogical encoding research

conducted by Gentner, Loewenstein, and Thompson (2004) does lend support to

this idea. Analogical encoding is "the explicit comparison of two partially

understood situations…which can foster the discovery of common principles and

allow transfer to new structurally similar situations." (p. 1). Analogical transfer

occurs when connections between a known problem and a new one are recognized

and a potential solution is exposed (Gentner et al., 2004; Gick & Holyoak, 1980).

When discussing mindful abstraction, Salomon and Perkins (1989) state that

while it is necessary to abstract, rote abstraction of a principle is not sufficient, the

abstraction must be well understood by the individual. The research by Gentner et

al. (2004) reveals that when individuals are provided with an abstract principle

and an example of a concept they are unable to transfer the concept to novel

situations. However, when asked to compare the similarities and differences

between the example and principle, a task believed to induce analogical encoding,

they are able to successfully complete a transfer task.

Analogies appear to contribute to learning transfer in more than one way.

Halpern, Hansen and Riefer (1990) found that when individuals are presented

with a far analogy that does not closely resembles the information intended to be

learned they are better able to transfer than if they are presented with an analogy

that closely resembles the material. The authors hypothesize that this may be

because it does not require as much effort to understand the relationship between

the near analogy as the far analogy (Halpern et al., 1990). In their review of the

analogical transfer literature, Barnett and Ceci (2002) suggest that understanding

at a deep level is required to understand and transfer a principle. This also lends

support to the mindful abstraction hypothesis presented by Salomon and Perkins

(1989), whereby individuals must be mentally active in abstracting a

decontextualized principle.

Ham (1992) stresses the importance of thematic interpretation. He recommends a theme be presented at the beginning of interpretation to act as an advance organizer, helping visitors to understand the "so what" of the program (Ham, 1992). His justification is that people are better able to remember the main idea than the facts and that by providing the theme at the beginning of an interpretive program the main idea is highlighted. Mayer (2002) discusses the utility of advance organizers for enhancing learning transfer. He states that an advance organizer provides "an organized framework for acquiring the new incoming information" (Mayer, 1983, p. 41). An experiment conducted by Mayer revealed that providing an advance organizer, in the form of a diagram, prior to a lesson enhanced creative problem solving (a measure of transfer) (Mayer, 1983).

Mayer acknowledges two types of organizers; expository and comparative. Expository organizers provide learners with new information that that is be necessary for interpreting the material. Alternatively, comparative organizers are used to connect the new information to existing knowledge.

While not all studies examining the utility of advance organizers have demonstrated the benefit of their use, Mayer (2002) examined conditions where advance organizers were most advantageous. Advance organizers should be used when individuals lack necessary prerequisite knowledge that is needed to understand material. Also, when transfer is desired the advance organizers are appropriate because they help learners to understand the information in the instructional material. Finally, advance organizers are useful as long as they are easy to understand and present a clear model of the material. Alternatively

advance organizers are believed to be inappropriate when individuals know a great deal about the topic. Empirical evidence suggests that they do not assist learning in this case (Mayer, 2002). This is thought to be true because individuals with knowledge about a topic already possess the mental scaffolding necessary to organize and integrate the new information (Mayer, 2002).

Personalization, analogical references and advance organizers are known to affect learning transfer; However, no research has examined how these instructional techniques affect near and far transfer in particular. The research reviewed above suggests how these techniques enhance organization, integration and mindful abstraction, which in turn affects transfer, however further discussion is needed to fully understand the relationship between instructional techniques and transfer. The conceptual framework presented in the next section will tie the various concepts already discussed together in one framework and will be used to design a study that examines how instructional manipulations can be used to affect near and far transfer.

CHAPTER III

Conceptual Framework

As the previous chapter highlights, meaningful learning is an ongoing

process that occurs in a variety of settings, including tourism. Learning in a

tourism context has been addressed in past research, however the ability to

transfer learning to novel setting has been overlooked. The cognitive approach

will be used as a guide to understand how interpretive messages can be

manipulated to affect visitors' near and far learning transfer while visiting a

heritage site.

The Cognitive Approach

The cognitive approach to understanding how instructional methods and

visitor factors affect meaningful learning will provide a conceptual framework to

discuss how meaningful learning, that leads to transfer, can be accomplished in a

free-choice learning environment. Mayer (2002) presents a concise overview of

the cognitive approach to research on instructional method design, where

instructional manipulations and learner characteristics affect the learning process,

which leads to learning outcomes that can be seen in the outcome performance

(see Figure 2). For example, if instructional techniques are manipulated by

adding personalization the learning process involves self-referencing. This leads

to a meaningful learning outcome where the outcome performance is transfer.

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┌──────────────┐
│ Instruction  │
│ manipulation │
└──────────────┘ ╲
                  ╲      ┌──────────┐      ┌──────────┐      ┌─────────────┐
                   ╲──►  │ Learning │ ───► │ Learning │ ───► │ Outcome     │
                   ╱     │ process  │      │ outcome  │      │ performance │
┌──────────────┐  ╱      └──────────┘      └──────────┘      └─────────────┘
│ Learner      │ ╱
│ characteristic│
└──────────────┘
```
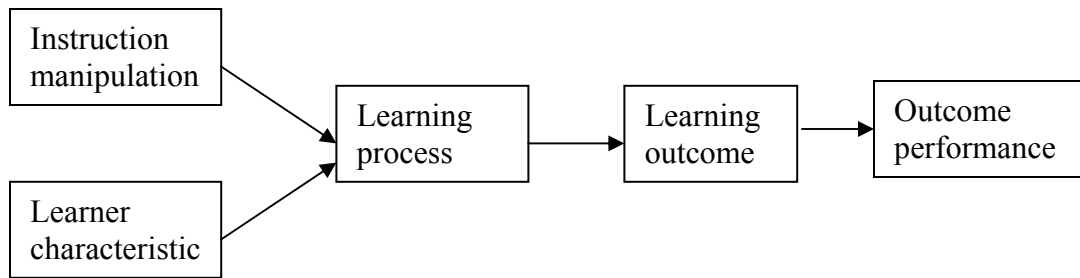
Figure 2. Cognitive approach to research on instructional methods. Adapted

from Mayer, 2002, p. 13

   This approach, suggested by Mayer (2002), is superior to the behavioral

approach, which does not inform researchers about why or how a particular

instructional method is better or worse than another. Mayer (2002) also discusses

the contextual approach mentioned in the previous chapter, which adds

complexity to the cognitive approach by recognizing that methods of instruction

are connected to the social and cultural context in which they are used. This

means that the effectiveness of a particular method will be affected by interactions

between teachers and learners and various aspects of the social environment.

While Mayer believes the contextual approach offers needed attention to the

socio-cultural aspect of learning, he states that research using this model is not

sufficiently developed. Falk and Dierking (2000) subscribe to the contextual

approach in examining learning in museums. Their well-developed model of

contextual learning presents specific aspects of the socio-cultural context that

affects visitor learning. These are within-group socio-cultural mediation and

facilitated mediation by others. This component of learning is recognized as

valuable to understanding meaningful learning outcomes, however it will not be examined in depth here since its affect on visitor learning is beyond the scope of this study.

Since the cognitive model is used to guide this study each component will be examined in detail. First the instructional characteristics will be examined, followed by learner characteristics. Next, the learning process is discussed. Finally the learning outcome and outcome performance will be described in detail

Instructional characteristics.

According to Mayer (2002) when meaningful learning is the desired learning outcome, teachers should guide learners' attention to relevant aspects of the presented material. Instruction should be designed to aid the learner in organizing the material. To integrate information, instructional material should be designed to assist in the integration process by connecting new information with the learner's existing knowledge. In his text on teaching for meaningful learning, Mayer provides an overview of methods of instructional design appropriate for prompting meaningful learning by helping learners to organize and integrate new information into existing cognitive structures (Mayer, 2002). Specifically, Mayer (2002) presents multiple instructional techniques that lead to transfer by helping learners to develop coherent cognitive structures that are necessary for learning to be meaningful.

Providing learners with productive feedback can help the learner construct knowledge by enabling them to make sense out of the learning session. While useful in classroom settings or in-person interpretation, this aspect of instructional

design is not appropriate for all interpretive programs. For example, audio tours or self-guided tours offer little opportunity to provide learners with productive feedback.

Adjunct questions are believed to aid in developing cognitive structures. Mayer (2002) discusses the use of adjunct questions specifically for text based learning and concludes that when questions are presented in advance of the material to be learned, they indicate to the learner aspects of the material to which they should attend. Alternatively, post lesson questions require the learner to review sections of the text that have already been read, increasing exposure to the material. While Mayer examines the utility of questions specifically for text based learning, Sam Ham (1992) provides insight into the value of questions in environmental interpretation. Ham suggests that questions can be used to focus attention, bring out similarities and differences between things, enable individuals to generalize or reason beyond the information presented, to show people how information can be applied or to get people to think about solutions to problems. After reviewing the interpretation literature in detail, Moscardo (1996) concludes that questions help visitors learn by enabling cognitive organization. Lehman and Lehman (1984) provide empirical evidence of the value of questions at interpretive exhibits at a museum. They found that individuals who answered questions about an exhibit performed better on a subsequent test about the content of the exhibit. Specifically, they found that questions posed prior to entering the exhibit had a greater affect than questions asked post exhibit visit. Mayer (2002) stresses the importance of the careful selection of the type of question asked.

Questions focused on rote facts likely lead to memorization. Meanwhile, meaningful questions are more likely to result in knowledge that can be transferred. Ham compares the use of close-ended and open-ended questions in interpretation. Ham suggests that open-ended questions are more useful than closed questions at activating creative thinking and imagination.

Another organizational technique, suggested by Mayer to enhance understanding while learning from text based material, is signaling (Mayer, 2002). Signaling devices are not necessarily meaningful pieces of information, but instead they make the structure of the presented information more clear (Mayer, 2002). Signal devices can; cue learners about relations among topics, provide an abstracted statement about key information, act as summary statements of key information at the end and be pointer words that emphasize important information. For example, headings are common signals used to help readers organize presented information. The use of signals in text helps to ensure the organization of the material presented is clear. Moscardo (1996) also stresses the importance of structure when learning from interpretation in order to help learners organize information within their existing knowledge.

Ausubel (1968) proposed using advance organizers to help learners organize and integrate new information. Advance organizers are "scaffolding for the stable incorporation and retention of more detailed and differentiated material that follows" (Ausubel, 1968, p. 148). These organizers are presented to individuals prior to learning to help them organize and interpret new information (Ausubel, 1968; Ham, 1992; Mayer, 2002). Falk and Dierking (2000) agree with

the value of advance organizers when they state that "providing conceptual advance organizers significantly improves people's ability to construct meaning from experiences." (p. 139). Ham (1992) suggests using a theme as an advance organizer in interpretive settings. He believes that this enables learners to see the relevance of the information provided. This is important because when people can see where a presentation is headed it becomes easier to connect with the information (Ham, 1992).

Examples and analogies are believed to help promote learning transfer (Gentner, Loewenstein, & Thompson, 2003; Holyoak & Koh, 1987; Loewenstein, Thompson, & Gentner, 2003; Mayer, 2002). Cases and problem-solving examples are considered useful for promoting transfer since they act as a base that individuals can access when solving new problems (Loewenstein, Thompson, & Gentner, 2003; Mayer, 2002). When learners are provided with opportunities to apply the main concept or principle of a lesson to different cases, individuals can abstract the principle which can then be applied to diverse situations in the future (Gentner, Loewenstein, & Thompson, 2003).

Another technique used in instructional design to enhance transfer is personalization. This technique is based on the self-referencing literature and suggests that when information is learned in relation to one's self, retention and transfer is heightened (Moreno & Mayer, 2000). This occurs because people are very knowledgeable about themselves and when new information is encoded in reference to the self it becomes well integrated into cognitive structures and is well elaborated (Brown, Keenan, & Potts, 1986). Personalizing a message with

first person language is thought to induce self-referencing which enhance

elaboration and integration of new material (Moreno & Mayer, 2000)

While the techniques suggested for improving meaningful learning

presented here are supported by research evidence, it is important to recognize

that there is no specific guaranteed method to promote meaningful learning that

results in transfer (Mayer, 2002). The techniques chosen to convey a particular

interpretive message need to be based on the medium in which the message is

presented and needs of the audience (Ham, 1992).

Learner Characteristics.

In Mayer's (2002) review of the cognitive approach to instructional

design, he recognizes the importance of learner characteristics in affecting

individuals' learning outcomes and performance. While Mayer does not discuss

the learner characteristics in detail, the contextual model of learning presented by

Falk and Dierking (2000) clearly identifies visitor characteristics that are likely to

affect learning in free-choice environments. The visitor characteristics presented

in this model will be reviewed here since the main difference between the

cognitive model and the contextual model is the addition of socio-cultural context

in the later and therefore the learner characteristics should be the same across both

models. Motivation, prior knowledge, interests, and choice and control make up

the learner characteristics discussed in the contextual model of learning.

Motivation for learning can be intrinsic or extrinsic. Intrinsic learning

occurs when someone learns for the sake of learning (Csikszentmihalyi &

Nakamura, 1989). Meanwhile, motivation is considered extrinsic when the

benefits sought by involvement in an activity are extraneous to the activity. These two types of motivation are not necessarily opposite ends of a common continuum. Rather, some researchers believe they should be considered separately (Falk & Dierking, 2000; Pintrich & Schunk, 2002). Extrinsic and intrinsic motivation are not stable and can vary over time and settings. An activity that was once intrinsic may become extrinsic, the reverse is also possible. Evidence exists to support that intrinsic motivation relates positively to meaningful learning (Falk & Dierking, 2000; Pintrich & Schunk, 2002).

Moscardo (1996) identifies an educational motive as a prerequisite for mindfulness. In turn, mindfulness is a component of meaningful learning that results in transfer (Moscardo, 1996; Perkins & Salomon, 1989). However, a study conducted by Falk, Moussouri, and Coulson (1998) revealed that all museum visitors involved in a study at the Smithsonian stated both educational and entertainment motives for visiting the museum. Falk et al. (1998) suggest that visitors are seeking a learning-oriented entertainment experience and that this should be considered when evaluating visitor motivation.

Motivation to learn can be goal oriented and reflect a performance or mastery orientation (Dweck & Leggett, 1988). Mastery orientation is characterized by a desire to master skills and understand the material, whereas performance orientation refers to demonstrating competence with the learned material (Bereby-Meyer & Kaplan, 2005). Learners who demonstrate mastery orientation are more aware of their understanding and learning and tend to use more effective learning strategies (Pintrich & Schunk, 2002). Alternatively,

shallow processing is negatively correlated with mastery orientation. According to Pintrich and Schunk performance goals tend to be negatively correlated with deeper cognitive strategies. Recent research suggests that an individual's goal orientation may affect their ability to transfer knowledge (Bereby-Meyer & Kaplan, 2005). Specifically, Bereby-Meyer & Kaplan found that mastery oriented individuals performed better on a transfer task than performance oriented individuals.

Within the contextual model of learning, Falk and Dierking (2002) state that interest, as part of the personal context, is a psychological construct which can impact visitor learning in free-choice environments. Moscardo (1996) also identifies interest as an important visitor characteristic that can affect recreation-based learning. Individuals with high interest have been shown to be better able to construct elaborate situational models, while low interest individuals are better at verbatim memory (Schraw, Flowerday, & Lehman, 2001), suggesting that higher interest should lead to greater meaningful learning.

Locus of control refers to whether an individual has an internal or external sense of control. Individuals with an internal locus of control believe that they have control over their behavior. Meanwhile, an individual with an external locus of control tends to think that they do not have control over their lives and that outside factors control their life (Falk & Dierking, 2000). Locus of control is believed to affect learning, as well as motivation (Pintrich & Schunk, 2002). According to Falk and Dierking (2000) learning is at its peak when individuals have choice over what and when they learn. Also, when individuals feel that they

control their own learning they are better able to achieve meaningful learning

(Falk & Dierking, 2000).

Finally, the learners existing knowledge is an important characteristic that

affects meaningful learning and the ability to transfer (Falk & Dierking, 2000;

Mayer, 2002). Since integration into existing knowledge is an important

component of both the cognitive and contextual approaches to learning, prior

knowledge and experience will inevitably affect an individual's learning outcome.

The more fully developed schema an individual possesses about a particular topic,

the better they can integrate newly acquired information (Schunk, 1996).

Learning Process.

This component of the cognitive approach to meaningful learning involves

selecting, organizing and integrating information (Mayer, 2002). As shown in

figure 3, incoming information from the eyes and ears is held in the sensory

memory. Individuals must select relevant information based on what is presented,

which then goes to the working memory that holds a limited amount of the visual

and verbal information (Mayer, 2002; Schunk, 1996). Once information is in

working memory it must be organized into coherent mental representations. The

final step required for meaningful learning is the integration of newly learned

information with existing knowledge into long-term memory (Mayer, 2002).

Schema theory adds additional insight into how organization and integration aid

in meaningful learning.

A schema is a mental representation of knowledge where typical

relationships between concepts are connected (Schunk, 1996). Schemas allow

large amounts of information to be organized meaningfully. According to Schunk (1996), schemata help individuals to encode new information because the material is elaborated into an existing meaningful structure. Specifically, activation of existing schema is believed to be critical to acquire new knowledge (Dansereau, 1995). Furthermore, if existing schema are not activated understanding and encoding new information is impeded (Dansereau, 1995). As well, schema are believed to act as scaffolding when accessing existing knowledge (Dansereau, 1995).
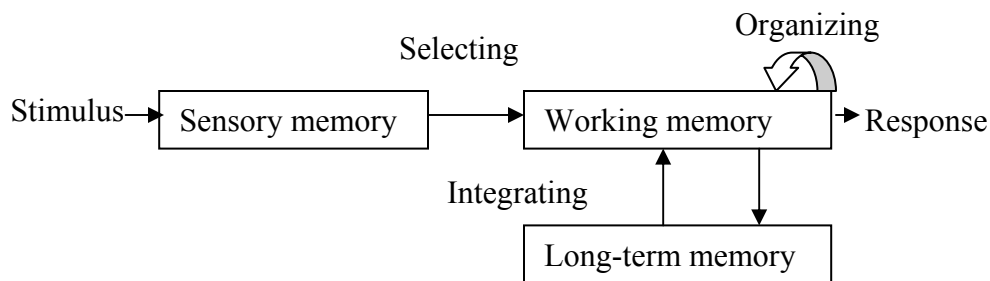
Figure 3. Cognitive processes for meaningful learning. Adapted from Mayer, 2002, p. 7

While examining the cognitive processes involved in transfer of learning, Salomon and Perkins (1989) discuss the role of mindful abstraction. As mentioned in the previous chapter, mindful abstraction is the "deliberate, usually metacognitively guided and effortful, decontextualization of a principal, main idea, strategy, or procedure, which then becomes a candidate for transfer." (Salomon & Perkins, p. 126, 1989). The authors present two reasons why mindful abstraction aids in transfer. Specifically, Salomon and Perkins note that in order to abstract the principle active learning is required whereby the leaner

engages their previous knowledge structures (schema). As demonstrated in figure 3, integration with previous knowledge is important to learning. Also, to determine what and how to abstract information, the authors reason that the learner must make choices and may take many mental paths to do so engaging various schema (Salomon & Perkins, 1989). This seems likely to engage the organizing of cognitive information, another important component of meaningful learning that results in transfer. For these reasons, mindful abstraction is a cognitive process that will result in meaningful learning enabling transfer.

Learning Outcome.

The learning outcome portion of the cognitive and contextual approaches refers to what is learned (Mayer, 2002). As demonstrated in the previous chapter, learning can be characterized by three outcomes. These are; rote learning, meaningful learning and no learning. Mayer states that learning with understanding, rather than remembering, can be applied to new situations and is often a desired outcome of education. Specifically in tourism contexts, it is meaningful learning that is often the goal of interpretative programs (Ham, 1992; Loomis, 1996; Prentice et al., 1998; Tilden, 1977). As such, the learning outcome sought for in this study is meaningful learning where individuals understand the information and can use in future situations or contexts.

Outcome Performance.

To measure the outcome of meaningful learning, transfer performance is fitting. This is true because meaningful learning, where material is understood, is characterized by the ability to transfer this knowledge to novel situations

(Bransford & Schwartz, 1999; Mayer, 2002; Salomon & Perkins, 1989; Schwartz, Bransford, & Sears, 2005). Within the transfer literature, this outcome has been measured in a variety of ways. Most frequently transfer is measured by providing individuals with a novel task to perform after initial learning (Bransford & Schwartz, 1999; Gentner, Loewenstein, & Thompson, 2004; Schwartz, Bransford, & Sears, 2005). If the information to be learned is used in solving the problem or completing the task, then transfer is said to have taken place. Mayer states that, "Understanding occurs when learners construct a coherent mental representation from the presented material; it is reflected in the ability to use the presented material in novel situations and is assessed by transfer tests" (Mayer, p. 15, 2001). When evaluating transfer of knowledge, as opposed to skill transfer, typically qualitative questions are designed to evaluate transfer. Transfer tests used by Mayer and colleagues (Mayer & Anderson, 1991; Mayer, Bove, Bryman, Mars, & Tapangco, 1996) typically require individuals to read or listen to a passage and then to solve a problem that requires the information from the passage to be understood. In evaluating subjects' responses Mayer looks for creative solutions to the problem. In a study where participants were presented with a multimedia lesson on lightning formation, transfer was evaluated by asking participants to respond to the following questions; "What could you do to decrease the intensity of lightning?', "Suppose you see clouds in the sky but no lightning, why not?" and "What causes lightning?". Subjects were asked to spend no more than 2.5 minutes writing as many possible answers to each of these questions (Mayer, 2001; Mayer & Anderson, 1991). A transfer score was then computed by

counting the number of acceptable answers the learner wrote across all transfer

questions (Mayer, 2001). Answers based on common knowledge that did not

require reading the passage were not counted. Two blind-raters scored the

transfer answers and disagreements were solved by consensus. Mayer (2001)

computed the total number of possible acceptable answers and then individuals

were given a score expressed as a percentage of the total. The transfer measures,

used by Mayer, focus on forward transfer where learning is applied to a novel

problem. Some researchers advocate the value of also evaluating backward

transfer (Bransford & Schwartz, 1999; Gentner, Loewenstein, & Thompson,

2004; Schwartz, Bransford, & Sears, 2005). Bransford and Schwartz state that

when evaluating transfer, not only should the outcome of learning be examined,

but individuals' ability to relate new information to their previous knowledge

should also be considered. Loewenstein et al. (1999) achieved this by first

presenting participants with training materials, exposing them to either the

treatment or control condition, and then asking them to "Please think of an

example, preferably from your own experience, that embodies the same principle

as that on the previous page" (p. 3). Coders rated whether recalled examples

were example of the principle. Subjects received scores of 0 = no element of the

principle, 1 = some element and 2 = all elements (Loewenstein et al., 1999).

The Conceptual Framework and the Present Study

This detailed discussion of the conceptual framework has provided insight

into how to achieve the purpose of this study. As previously mentioned, the

purpose of this study was to examine transfer of meaningful learning in a free-

choice learning environment. Specifically, message design was examined as a factor that can impact meaningful learning and in turn affect transfer from a free-choice learning setting.

While the focus of this study was message design, certain visitor characteristics were considered likely to affect visitors' understanding and transfer of knowledge and therefore these variables were measured so that they could be controlled during data analysis if necessary. The visitor characteristics measured were interest and existing knowledge. Motivation was not be examined in the present study since visitors were be asked to listen to the audio tour regardless of their motivation to participate.

As previously mentioned, there is no single instructional technique that is guaranteed to lead to transfer and therefore techniques selected should be based on the message medium (Ham, 1992; Mayer, 2002). Instructional techniques thought to enhance meaningful learning, resulting in transfer, have been identified above and three of the techniques were examined in this study. Advance organizers, personalization and analogical references were integrated into a basic interpretive message in order to examine the effect of these techniques on learning transfer.

As previously mentioned, the learning process requires cognitive organization and integration. Ausubel (1968) states that advanced organizers help people learn new material by providing conceptual material in a general abstracted form that enables individuals to integrate knew knowledge into existing mental structures. Ham (1992) suggests stating the theme of the presentation

before the interpretive program to help learners organize new material. The theme acts as an advance organizer that provides learners with the general principle of the message prior to the learning experience, which helps learners by providing them with a basic framework to organize and integrate the new information. It provides anchoring of the new information. Therefore, an advance organizer, that states the main points of the message, was included in this study.

The analogical transfer literature suggests that comparing similarities and differences between examples can lead to transfer. Based on this literature, when provided with examples and cases, individuals are able to actively abstract a principle, which is integrated into existing knowledge structures and can be applied to future situations (Gentner, Loewenstein, & Thompson, 2003). This study examined the effect of multiple examples, which highlighted the diverse situations to which the interpretive message applies, on learning transfer.

The self-referencing literature suggests that when individuals encode information in reference to themselves they are better able to integrate the information into their existing knowledge facilitating future transfer (Moreno & Mayer, 2004; Moreno & Mayer, 2000; Symons & Johnson, 1997.). Past research has demonstrated that personalization can induce self-referencing. Therefore, the effect of interpretive messages designed with personalized language on learning transfer, was examined.

Figure 4 provides an overview of the relationships between the variables included in the current study. Specifically, the instructional manipulations

examined in this study were advance organizers, personalization and analogical references. These instructional techniques are believed to result in greater integration, organization and mindful abstraction of the main ideas presented in the learning material. These learning processes lead to a meaningful learning outcome which results in the ability to leaning transfer, which is the performance outcome that is examined in this study.

Instruction manipulations ■ Advance Organizer ■ Personalization ■ Analogical References	Learning process ■ Organization ■ Integration ■ Abstraction	Learning Outcome ■ Meaningful Learning	Outcome Performance ■ Transfer Near Far
Learner characteristics ■ Interest ■ Knowledge			
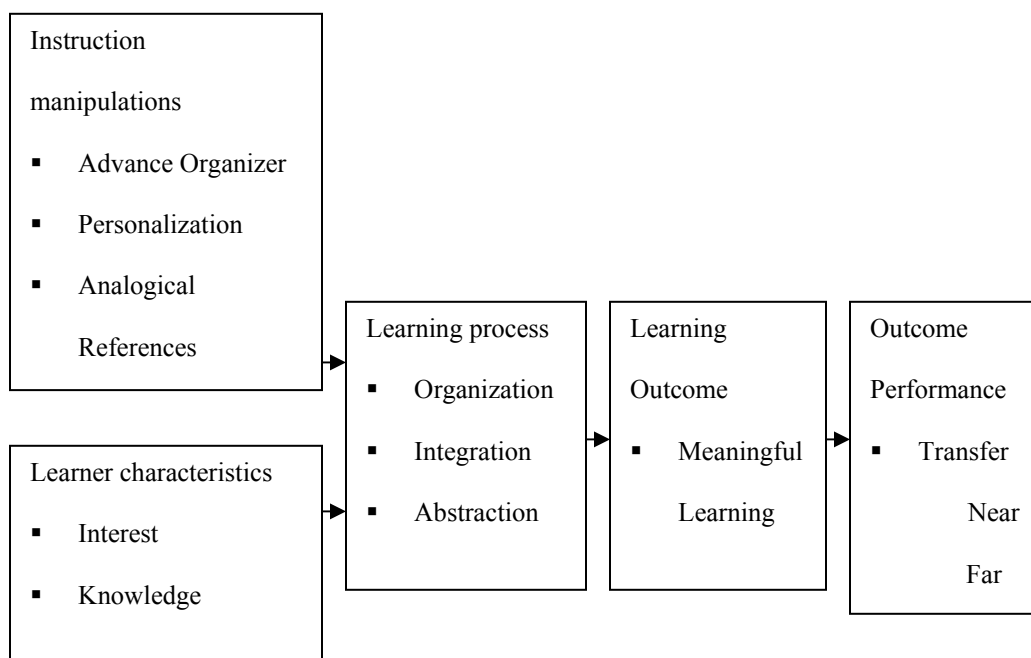
Figure 4. Conceptual model used to guide this study.

This chapter has provided a discussion of the concepts included in this study. Relationships between these variables have been examined and a conceptual framework to guide the present study was presented. The next chapter will review the methods used to examine the relationships between these variables in order to answer the research questions proposed at the beginning of this study.

CHAPTER IV

Methods

Setting

This research took place during the 2006 Winnipeg Fringe Theatre

Festival located in the Province of Manitoba, Canada. The Winnipeg Fringe is a

12 day theatre festival that attracts over 70, 000 visitors to Winnipeg's historic

Exchange District. The Winnipeg Fringe was interested in developing an

interpretive audio tour of the historic Exchange District working with one of their

sponsors, the Exchange District Business Improvement Zone (BIZ). The

Exchange District BIZ, a not-for-profit organization, is currently responsible for

providing interpretation of the district.   Both organizations were supportive of

this research and were willing to give the researcher control over the content of

the interpretive tour.

Within recent years a novel form of tours has emerged. These tours allow

visitors to listen to an interpretive message on their cell phone while visiting a

destination. This unique type of tour is well suited to sites spread over a large

area because visitors and walk around the site at their own pace and listen to an

interpretive recording when they are ready. Specifically, these tours are being

used by the tourism industry to provide visitors with historic information about

neighborhoods and historic districts within cities (Candide Media Works, 2006).

Audio tours were selected as the interpretive technique for this study for various

reasons. First, the content and delivery of an audio tour can be carefully

controlled by the researcher. Also, no audio tours were available within the Exchange District and so the tour developed for this study provided would not compete with existing tours provided by the BIZ. Since no audio tours were available in this neighbourhood, the results of this research provided the BIZ with information to help determine whether this type of tour should be developed in the future. Finally, this research was the first to examine how content of an audio tour affects visitor learning.

Design

A between-subjects post-test only field experiment design was employed to examine the relationship between interpretive message design and transfer of learning. In total, six interpretive messages were developed (see Appendix A). As discussed in the conceptual framework, advance organizers, personalization and analogical references were used to create the treatment conditions. Specifically a base comparison message was created and elements were added to the base message to induce advance organization, analogical encoding and self-referencing. The control message simply presented a typical interpretive message about the Exchange District National Historic Site (see Appendix A). This message was developed by reviewing existing interpretive material provided at the site and online. The final interpretive message was provided to the Exchange District Business Improvement Zone (BIZ), the organization currently providing interpretive tours of the District. The lead interpreter for the BIZ reviewed and approved the message designed for the audio tours. The second message contained the base message presented in the control, as well as an advance

organizer. The advance organizer was a brief introduction that presented the main

theme of the message by highlighting the three main points discussed in the

message. The advance organizer was intended to prepare learners to incorporate

the information into existing knowledge structures by presenting a clear model of

the material (Ham, 1992; Mayer, 2002). The third message was the base message

with analogical references added throughout. Since examples act as analogies

that promote analogical transfer numerous references to examples were added to

the base message (Gentner, Loewenstein, & Thompson, 2003; Holyoak & Koh,

1987; Loewenstein, Thompson, & Gentner, 2003; Mayer, 2002). The fourth

message contained analogical references throughout and an advance organizer

with analogical references. The fifth message was the personalized message

where the base message had added references to the listener throughout

(personalization). This treatment was designed by replicating personalization

treatments used by Moreno and Mayer (2000, 2004) in past research. Specifically

reference to the individual, such as you and I, were added to the base message.

The final treatment message was the personalized message with an advance

organizer written with personalization. Table 1 summarized the content of each

interpretive message and Appendix A contains the transcripts of the messages.

All variations of the message were less than 3.5 minutes long.

Table 1

Treatment Conditions

	Message type		
Presence of advance organizer	Basic	Analogical references	Personalization
No advance organizer	1	3	5
Advance organizer	2	4	6

Study Population

Visitors to the Winnipeg Exchange District, a 40 block Canadian National Historic Site, during the 2006 Winnipeg Fringe served as the study population for this study. The study population is estimated to be 70,580. This estimate was based on the recorded attendance at the outdoor stage during the 2005 Winnipeg Fringe Theatre Festival (The Winnipeg Fringe Theatre Festival, 2005).

In total, 180 subjects were sought for this study. To examine how the sample would reflect the population, the desired confidence level and interval were needed as well as the size of the population (Babbie, 2005). With a desired confidence level of 95% and confidence interval of +/- 5%, a total of 382 respondents would be required. However the number of required subjects dropped to 96 if a confidence interval of +/-10% is considered acceptable. According to Tabachnick and Fidell (2001) at least 20 cases are needed in each cell in order for MANOVA to remain robust. Based on this information a sample

size of 180 was sought, which ensures 30 responses per treatment and fell between 96 and 382 respondents.

Prior to determining the exact location for data collection the researcher conducted practice intercepts to help select the ideal location and intercept techniques. The Winnipeg Fringe Festival was responsible for programming Canada Day (July 1st) celebrations at the Old Market Square stage located in the heart of the Exchange District. Since this area serves as the outdoor site during the Fringe Festival and is surrounded by architectural features discussed in the audio tour, it was deemed an appropriate location for this study. Practice intercepts revealed that visitors found it difficult to hear the audio tour on the cell phone while performances were taking place on the outdoor stage. Visitors were asked to listen to the tour on a compact disk player with headphones and found it much easier to hear the audio tour even while performances were taking place. Since performances would be running from noon until midnight everyday of the festival a decision was made to use compact disk players and headphones for this study instead of the cell phones.

Each day of the 12 day festival, the principle investigator and trained volunteer research assistants were stationed in the pre-selected high traffic area in the Winnipeg Exchange District. Specifically, the researcher and research assistants were at the old market square, an outdoor area surrounded by architectural features discussed in the audio tour. This area was the official outdoor site for the Winnipeg Fringe Theatre Festival, resulting in high pedestrian traffic. The time of day data collection began was systematically varied to ensure

day (1pm-5pm), evening (5pm-9pm) and late evening (9pm-12am) visitors had a

chance of being asked to participate in the study (see Table 2).

Table 2

Sampling Day and Time

July	July	July	July	July	July	July	July	July	July	July	July
19	20	21	22	23	24	25	26	27	28	29	30
LE	D	E	LE	D	E	LE	D	E	LD	D	E

Note. LE-Late evening, 9pm-12am, D- day, 1pm-5pm, E- evening, 5pm-9pm

Subjects were systematically selected from individuals who passed within

a 5ft radius of the interceptor. Specifically, at the beginning of a data collection

shift, the fifth person to pass by the investigator was approached and asked to

participate in the study. Subsequent subjects were selected by asking the first

person to pass within the 5ft area, once the previous person has completed the

phone tour and survey, to participate. In total, 15 respondents were required each

day of the festival to meet the target sample size.

Data Collection

When individuals were approached they were informed that the purpose of

the study was to understand visitors' experience with the audio tour. They were

informed that if they choose to participate, they would first listen to a 2-3 minute

interpretive message about the Exchange District and were then asked to answer a

questionnaire that took approximately 15 minutes to complete. They were

informed that participation was voluntary and they could stop participating at any time (see Appendix B). This was in accord with Clemson University's Institutional Review Board guidelines for human subjects in reseach. Respondents were offered a thank you gift for their participation; they were given a ticket to a festival show ($8 value). Only individuals over 18 were eligible to participate in this study.

Once an individual agreed to participate, they were provided with a compact disc player and headset. In total six different disks were used, one for each of the experimental conditions. The audio tour disks were systematically rotated to ensure that each of the six messages was heard at least two times each day of the festival. Also, the first disk used at the beginning of each data collection session was varied.

Once a participant listened to the interpretive message, they were given a questionnaire to complete (see Appendix C). The questionnaire included questions about visitors' interest, existing knowledge, their experience with the audio tour, general demographic information and ability to transfer learning. After subjects completed their survey, they placed it in a sealed envelope and were given a gift for their participation in the study. Visitors were also given a short pamphlet to read that provided a detailed explanation of the study (see Appendix D).

Measurement

The self-administered questionnaire included questions about visitor demographics, characteristics and transfer of learning. Demographic questions

included questions about age, sex, and education. These questions were used to describe the sample and compare the sample with known characteristics of the population of visitors the Fringe Festival in the Winnipeg Exchange District.

Respondent characteristics.

Respondent characteristic questions included questions about existing knowledge, interest and experience with the audio tour. Existing knowledge was measured by asking respondents to "Please rate your existing knowledge about these topics from not at all knowledgeable to extremely knowledgeable". Topics listed included "The History of the Winnipeg Exchange District, Historic District Designation, and Historic Preservation". The measurement scale included *not at all knowledgeable, somewhat knowledgeable, knowledgeable, very knowledgeable, extremely knowledgeable* and *don't know.*

Interest was measured with a question asking "Please rate your interest in the following topics from extremely uninterested to extremely interested". Topics listed included "The history of the Winnipeg Exchange District, Historic District designation and historic preservation". Response options included *extremely uninterested, uninterested, neither interested nor uninterested, interested, extremely interested* and *don't know*.

Participants were asked to indicate how much they agreed or disagreed with the following statements "This audio tour was informative", "this audio tour was interesting", "this audio tour was entertaining" and "I learned something valuable from this audio tour". Response options included *strongly disagree, disagree, neither agree nor disagree, agree, strongly agree* and *don't know.*

Likelihood to participate in various forms of interpretive tours was measured by asking participants "While visiting a historic district, how unlikely or likely would you be to:" "call an audio cell phone tour from your own cell phone?", "take part in a guided tour?", take part in a head set audio tour?", "take part in an MP3 player audio tour?" and "take part in a self-guided tour?". Response options included *extremely unlikely, unlikely, neither likely nor unlikely, likely, extremely likely* and *don't know.*

Learning Transfer.

In past research, transfer has frequently been measured with problem solving exercises, where individuals were asked to apply what was learned to a new problem (Mayer, 2002). Mayer has used problem solving transfer measures in numerous studies and while the specific wording of the measures used to evaluate transfer has changed based on the content of the information presented to students, Mayer has used the same type of measure in various experiments (Mayer & Moreno, 1998; Moreno & Mayer, 2000). Specifically, after completing a lesson, students were asked questions that required them to apply knowledge gained from the lesson to solve a problem. For example after learning about lightning, students were provided with four transfer problems, these were, "What could be done to decrease the intensity of a lightning storm?", What does air temperature have to do with lightning?", "Suppose you see clouds in the sky, but no lightning. Why not?", and "What causes lighting?" (Moreno & Mayer, 2000).

A pre-test was conducted with 35 Clemson University undergraduate Parks, Recreation and Tourism Management students to determine whether a

problem solving transfer question was appropriate for measuring transfer of learning from an interpretive audio tour. Students listened to a 3 minute audio tour about the Pantages Playhouse Theatre and were then asked to complete a questionnaire. The pre-test question that measured transfer with a problem solving exercise required respondents to read two short paragraphs and then answer questions. The first paragragh was "The Royal Alexandra Theatre built in Toronto in 1905 is a fine example of Beaux-Arts-Style. This theatre hosted a number of famous performers including the Marx Brothers, Mae West and Ingrid Berman. This stage presented audiences with varied performances including musicals like Hair and Godspell. This theatre was named a Canadian National Historic Site in 1987." The question that followed this paragraph was "Why do you think this site is a cherished heritage site". This first paragragh and question was intended to reflect knowledge domain near transfer since the problem solving scenario closely resembled the context and content of the interpretive message. The second paragraph stated "Port au Choix, on the west side of Newfoundland's Great Northern Peninsula, has been populated for thousands of years. The rich waters off this coast have supported many different groups of people, including those who live here today. The remains of four ancient cultures have been found at Port au Choix to date. Archaeologist searched many years for a site such as this one, which sheds light on our understanding of native peoples in this part of the world". Again, respondents were asked "Why do you think this site is a cherished heritage site". This second paragraph and question was intended to measure knowledge domain far transfer since the context and content did not closely

resemble the interpretive messages. Following Mayer's technique, an answer key was developed to aid in coding responses to the two questions. Specifically, answers that received points had to indicate that interesting people, important events or distinctive design made the site a cherished heritage site, since these were the main points made in the interpretive message. If respondents wrote one of these items as a response they received 1 point, two of these items resulted in 2 points and three items resulted in 3 points. Responses on each of the two problem-solving questions ranged from zero to three. In total, 34% of students demonstrated near transfer, while 14% of students demonstrated far transfer. Since this pre-test demonstrated that after listening to an audio tour students were able answer the questions and demonstrate transfer, the researcher decided to use Mayer's problem solving transfer measure for this study. The specific learning transfer questions used in the study were modified after the pretest. The questions were adjusted to reflect information contained in the actual interpretive messages used for this study. Initially, eight transfer questions were designed, four to measure near transfer and four to measure far transfer. The eight questions were sent to Dr. Richard Mayer for review. As a result of Mayer's comments and suggestions six questions were selected and slight changes were made (Mayer, 2006). Specifically three questions were selected to measure near transfer and three questions were used to measure far transfer. An answer key was created to use when coding participants responses to the questions. An answer was considered to reflect transfer when the information in the response was clearly derived from the information contained in the interpretive audio tour. While

responses did not need to use the same language as the answer key to receive transfer points, the main points of the answer needed to be present. Each answer reflecting transfer was given one point.

Since near transfer is demonstrated when individuals transfer information to similar settings or contexts, the near transfer questions provided respondents with a problem solving scenario where the context of the problem was similar to the context of the information presented in the audio tour (Haskell, 2001). The first near transfer question was "A turn of the century trade district located in Toronto, has a rich history. A community group is working towards preserving the area. What should they keep in mind if they want their preservation efforts to be successful?". Answers reflecting transfer for this question included "preserve historically significant aspects of the site" and "preserve the functional role of the site". The second near transfer question was "An early trade and manufacturing district in St. John's, Newfoundland recently applied for National Historic Site Designation. For what reasons could this area qualify for this designation?". The following answers where considered examples of near transfer "the design of the site", "connection with important people and/or events", "commemorate a way of life", and "important in the development of Canada". The final near transfer question was "A 100 year old warehouse, in a Historic District in Ottawa, was designated a National Historic Site by the Canadian Government. This site has recently been sold and the new owner intends to turn the site into a parking lot. Do you think they can do this? Why or why not?". The near transfer answer for this question was "National designation does not offer legal protection".

Since far transfer is demonstrated when individuals transfer information to settings or contexts that differ from the original setting or context, the far transfer questions provided respondents with a problem solving scenario where the context of the problem was different from the context of the information presented in the audio tour (Haskell, 2001). The first far transfer question was "If you were asked to decide whether a 150 year old farming community should be considered a National Historic District what qualities would you look for?". Answers reflecting transfer were "the design of the site", "connection with important people and/or events", "commemorate a way of life", and "important in the development of Canada". The second far transfer question was "In rural Saskatchewan there are many small towns that have historic value because of their involvement in the Canadian Grain Exchange. Why do you think preservation of these areas has been unsuccessful?". Far transfer answers for this question included "preserve historically significant aspects of the site" and "preserve it's functional role". The final far transfer question was "An early Catholic Church in a small town in rural Quebec was recently torn down. How is this possible since it had National Historic Site Designation?". The far transfer answer to this question was "National designation does not offer legal protection".

The next chapter will provide the results of the data analysis. Specifically, descriptive statistics will be used to better understand the respondents who participated in this study and their experience with the audio tour. Data will then be analyzed, using MANOVA, to understand the effect of the treatments on near and far learning transfer.

CHAPTER V

Results

The focus of this chapter is on providing a detailed description of the

results and is presented in two phases. The first section presents data related to

respondent characteristics and tour experience. Next, the research questions are

addressed.

Response Rate

Individuals were intercepted in person at the outdoor site of the Winnipeg

Fringe Theatre Festival during a two week period in July 2006. In total, 298

individuals were approached and invited to participate in the study, however only

181 individuals agreed to participate resulting in a 60.75% response rate. Of the

181 respondents, 31 listened to audio tour one, 30 listened to audio tour two, 29

listened to audio tour three, 31 listened to audio tour four, 30 listened to audio

tour five and 30 visitors listened to audio tour six.

Respondent Characteristics

Demographic data collected revealed that the majority of visitors who

participated in this study were female (59.88%). More than half of the

participants had a University education (52.90%). The respondent's average age

was 34.81 and ranged from 18 to 66 years old.

Participants were first asked various questions to better understand their

experience with historic tours. Table 3 presents the frequencies for each variable

and table 4 presents the modes, means and standard deviations. When asked how

likely they would be to take various types of tours while visiting a historic district, the majority of respondents felt that they were likely to take a guided tour (51.14%). Respondents were also asked about their likelihood of calling a cell phone audio tour, the most frequently selected response was extremely unlikely (40.24%). When asked about their likelihood to take part in a head-set audio tour, 41.38% of respondents said they would be likely to participate in this type of tour. Visitors were also asked about how likely they would be to take an MP3 player audio tour and 28.07% responded that they would be likely to participate in this type of tour, while 26.32% stated they would be unlikely to take an MP3 player audio tour. Finally, 42.69% of respondents indicated that they would be extremely likely to take a self-guided tour while visiting a historic district.

Table 3

Frequency of Responses for Likelihood of Tour Participation

Variable and scale anchors	Frequency	Percent	Valid percent	Cumulative percent
Likelihood of taking a cell phone tour				
Extremely unlikely	68	37.36	40.24	40.24
Unlikely	57	31.32	33.73	73.96
Neither likely nor unlikely	20	10.99	11.83	85.80
Likely	20	10.99	11.83	97.63
Extremely likely	4	2.20	2.37	100

Table 3

Frequency of Responses for Likelihood of Tour Participation Continued

Total	169	92.86	100	
Likelihood of taking a guided tour				
Extremely unlikely	6	3.30	3.41	3.41
Unlikely	25	13.74	14.20	17.61
Neither likely nor unlikely	21	11.54	11.93	29.55
Likely	90	49.45	51.14	80.68
Extremely likely	34	18.68	19.32	100
Total	176	96.70	100	
Likelihood of taking a head-set tour				
Extremely unlikely	12	6.59	6.90	6.90
Unlikely	41	22.53	23.56	30.46
Neither likely nor unlikely	37	20.33	21.26	51.72
Likely	72	39.56	41.38	93.10
Extremely likely	12	6.59	6.90	100
Total	174	95.60	100	
Likelihood of taking an MP3 tour				
Extremely unlikely	27	14.84	15.79	15.79

Table 3

Frequency of Responses for Likelihood of Tour Participation Continued

Unlikely	45	24.73	26.32	42.11
Neither likely nor unlikely	39	21.43	22.81	64.91
Likely	48	26.37	28.07	92.98
Extremely likely	12	6.59	7.02	100
Total	171	93.96	100	

Likelihood of taking a

self-guided tour

Extremely unlikely	3	1.65	1.75	1.75
Unlikely	16	8.79	9.36	11.11
Neither likely nor unlikely	11	6.04	6.43	17.54
Likely	68	37.36	39.77	57.31
Extremely likely	73	40.11	42.69	100
Total	171	93.96	100	

Table 4

Descriptive Statistics for Likelihood of Participating in Different Tour Types

Tour type	N	Mode	*M*	*SD*
Guided tour	176	4	3.69	1.05
Cell phone tour	169	1	2.02	1.10
Headset tour	174	4	3.18	1.08

Table 4

Descriptive Statistics for Likelihood of Participating in Different Tour Types

Continued

MP3 tour	171	4	2.84	1.20
Self-guided tour	171	5	4.12	1.01
Valid N	162			

Note. Responses were based on a 5 point scale (1 = *extremely unlikely*,

3 = *neither likely nor unlikely*, 5 = e*xtremely likely).*

Study participants were asked whether they own a cell phone and MP3

player. While 53.76% of respondents stated they own a cell phone, only 30.99 %

stated that they own an MP3 player. When asked if there was anything that would

prevent them from using a cell phone to take an audio tour 25.31% of respondents

replied that incurring a cost would prevent them and 8 stated that using their

limited minutes would prevent them from using they cellular phone to take an

audio tour. When visitors were asked if there was anything that would prevent

them from using an MP3 player to take an audio tour the responses varied. In

total 3.80% of the sample indicated cost as a reason they would not take a tour

with an MP3 player and 3.31% indicated issues with downloading onto the MP3

player as a reason not to take an MP3 player tour.

Participants were then asked about their experience with the audio tour

they listened to for this study. Table 5 presents the frequencies for the experience

variables and table 6 presents the descriptive statistics. Over half of the

respondents agreed that the tour was informative (65.14%) and interesting (59.09%), meanwhile over one-third neither agreed nor disagreed that the tour was entertaining (37.36%). Almost half of the respondents agreed that they learned something valuable from the audio tour (48.84%).

Table 5

Frequency of Responses for Experience with the Audio Tours

Variable and scale anchors	Frequency	Percent	Valid percent	Cumulative percent
This audio tour was informative				
Strongly disagree	0	0	0	0
Disagree	4	2.20	2.29	2.29
Neither agree nor disagree	16	8.79	9.14	11.43
Agree	114	62.64	65.14	76.57
Strongly agree	41	22.53	23.43	100.00
Total	175	96.15	100.00	
This audio tour was interesting				
Strongly disagree	2	1.10	1.14	1.14
Disagree	5	2.75	2.84	3.98
Neither agree nor disagree	34	18.68	19.32	23.30

Table 5

Frequency of Responses for Experience with the Audio Tours Continued

Agree	104	57.14	59.09	82.39
Strongly agree	31	17.03	17.61	100
Total	176	96.70	100	
This audio tour				
was entertaining				
Strongly disagree	3	1.65	1.72	1.72
Disagree	33	18.13	18.97	20.69
Neither agree nor disagree	65	35.71	37.36	58.05
Agree	57	31.32	32.76	90.80
Strongly agree	16	8.79	9.20	100
Total	174	95.60	100	
I learned something valuable				
from this audio tour				
Strongly disagree	1	0.55	0.58	0.58
Disagree	12	6.59	6.98	7.56
Neither agree nor disagree	32	17.58	18.60	26.16
Agree	84	46.15	48.84	75.00
Strongly agree	43	23.63	25.00	100
Total	172	94.51	100	

Table 6

Descriptive Statistics for Visitors' Experience with this Audio Tour

Variable	N	Mode	*M*	*SD*
This audio tour was informative	175	4	4.10	0.64
This audio tour was interesting	176	4	3.89	0.76
This audio tour was entertaining	174	3	3.29	0.94
I learned something valuable from this audio tour	172	4	3.91	0.87
Valid N	170			

Note. Responses were based on a 5 point scale (1 = *strongly disagree*, 3 = *neither agree not disagree*, 5 = *strongly disagree*).

Respondents were asked to rate their knowledge about the history of the Winnipeg Exchange District, National Historic District designation and historic preservation on a five point scale ranging from *not at all knowledgeable* to *extremely knowledgeable*. Table 7 presents the frequencies for the knowledge variables and table 8 provides the descriptive statistics. The most frequently selected response with regards to knowledge about the history of the Exchange District was *somewhat knowledgeable* (42.05%). Nearly half of the respondents indicated that they were *not at all knowledgeable* about National Historic District Designation (46.86%). Over one-third respondents (39.77%) indicated that they were *not at all knowledgeable* about historic preservation and approximately another one-third stated that they were *somewhat knowledgeable* (36.93%).

Table 7

Frequencies for Respondents' Self-rated Knowledge

Variable and scale anchors	Frequency	Percent	Valid percent	Cumulative percent
Knowledge about the history of the Winnipeg Exchange District				
Not at all knowledgeable	46	25.27	26.14	26.14
Somewhat knowledgeable	74	40.66	42.05	68.18
Knowledgeable	44	24.18	25.00	93.18
Very knowledgeable	9	4.95	5.11	98.30
Extremely knowledgeable	3	1.65	1.70	100
Total	176	96.70	100	
Knowledge about historic district designation				
Not at all knowledgeable	82	45.05	46.86	46.86
Somewhat knowledgeable	59	32.42	33.71	80.57
Knowledgeable	28	15.38	16.00	96.57
Very knowledgeable	6	3.30	3.43	100.00
Extremely knowledgeable	0	0	0	100.00
Total	175	96.15	100.00	
Knowledge about historic preservation				
Not at all knowledgeable	70	38.46	39.77	39.77

Table 7

Frequencies for Respondents' Self-rated Knowledge Continued

Somewhat knowledgeable	65	35.71	36.93	76.70
Knowledgeable	29	15.93	16.48	93.18
Very knowledgeable	11	6.04	6.25	99.43
Extremely knowledgeable	1	0.55	0.57	100
Total	176	96.70	100	

Table 8

Descriptive Statistics for Visitors' Self-rated Knowledge

Variable	N	Mode	*M*	SD
The History of the Winnipeg Exchange District	176	2	2.14	0.92
Historic District Designation	175	1	1.76	0.84
Historic Preservation	176	1	1.91	0.93
Valid N	174			

Note. Responses were based on a 5 point scale (1 = *not at all*

knowledgeable, 3 = *knowledgeable*, 5 = *extremely knowledgeable*).

Respondents' interest in the history of the Winnipeg Exchange District, Historic District Designation and historic preservation was measured using a 5 point likert-type scale that ranged from *not at all interested* to *extremely interested*. Table 9 presents the frequencies for the interest variables and table 10 displays the descriptive statistics. More than two-thirds of the respondents stated that they are interested in the history of the Winnipeg Exchange District (67.06%) and more than half are interested in historic preservation (57.4%); furthermore more than half of respondents are interested in historic district designation (55.03%).

Table 9

Frequencies for Respondents' Levels of Interest in the Content of the Audio Tours

Variable and scale anchors	Frequency	Percent	Valid percent	Cumulative percent
Interest in the history of the				
Winnipeg Exchange District				
Not at all knowledgeable	5	2.75	2.94	2.94
Somewhat knowledgeable	4	2.20	2.35	5.29
Knowledgeable	15	8.24	8.82	14.12
Very knowledgeable	114	62.64	67.06	81.18
Extremely knowledgeable	32	17.58	18.82	100
Total	170	93.41	100	

Table 9

Frequencies for Respondents' Levels of Interest in the Content of the Audio

Tours Continued

Interest in historic district designation				
Not at all knowledgeable	3	1.65	1.78	1.78
Somewhat knowledgeable	14	7.69	8.28	10.06
Knowledgeable	47	25.82	27.81	37.87
Very knowledgeable	93	51.10	55.03	92.90
Extremely knowledgeable	12	6.59	7.10	100
Total	169	92.86	100	
Interest in historic preservation				
Not at all knowledgeable	3	1.65	1.78	1.78
Somewhat knowledgeable	12	6.59	7.10	8.88
Knowledgeable	25	13.74	14.79	23.67
Very knowledgeable	97	53.30	57.40	81.07
Extremely knowledgeable	32	17.58	18.93	100
Total	169	92.86	100	

Table 10

Descriptive Statistics for Visitors' Level of Interest in the Content of the

Audio Tours

Variable	N	Mode	*M*	*SD*
The history of the Winnipeg Exchange District	170	4	3.96	0.8
Historic District designation	169	4	3.57	0.81
Historic preservation	169	4	3.85	0.87
Valid N	169			

Note. Responses were based on a 5 point scale (1 = *extremely uninterested*,

3 =*neither interested nor uninterested*, 5 = *extremely interested*).

Learning Transfer

Learning transfer was measured using the six open-ended questions

described in chapter IV. Questions were designed to allow respondents to transfer

knowledge gained from the audio tour to the transfer question. The answer key

described in the methods section provided a list of answers that indicated learning

transfer from the audio tour to the transfer question. While respondents did not

need to use the exact wording listed on the answer key to receive points for

transfer, the meaning of the participants' responses needed to be the same as the

meaning of the correct response listed on the answer key. For example, question

four asked "An early Catholic Church in a small town in rural Quebec was

recently torn down. How is this possible since it had National Historic Site

Designation?". The answer key indicated that the transfer answer was "National

designation does not offer legal protection", however respondents received a transfer point for "Designation does not mean it is protected from being torn down", "Since it isn't legally protected when it is a historic site they can do this", and other similar responses.

In order to ensure reliable coding, the respondents' answers were coded twice, by a different coder each time. Inter-rater reliability indicates how consistently two coders assigned the same number of points to a participants response (Armstrong, Gosling, Weinman, & Marteau, 1997). Cohen's Kappa is a recommended statistic for evaluating inter-coder reliability (Dewey, 1983). The value for Cohen's Kappa was .728 for the near transfer measure and .828 for the far transfer variable, these are considered acceptable (see Table 11) (Lombard, Snyder-Duch, & Bracken, 2005). When the coders disagreed on how a particular response should be coded the item was discussed until agreement was achieved, typically the more conservative number of transfer points were assigned.

Table 11

Inter-rater Reliability Results for Near and Far Transfer Variables

Cohen's Kappa measure of agreement	Value	Asymp. std. error	Approx. T	Approx. *p*
Near transfer items	0.788	0.03	21.16	0.00
N of valid cases	515			
Far transfer items	0.828	0.03	21.53	0.00
N of Valid Cases	520			

74

As previously discussed, three of the six questions measured near transfer and the other three questions measured far transfer. The first near transfer question had only one possible correct transfer answer, the second near transfer question had two possible correct answers and the third question had four possible answers. The number of correct answers for the three near transfer question were added together to provide a total near transfer score, this resulted in a total of seven possible near transfer points. Far transfer was also measured using three questions where the first question had one possible answer, the second question had two possible answers and the third question had four possible correct answers. The correct answers for the three far transfer questions were also added together to achieve a total far transfer score; therefore, the total possible points that could be earned for far transfer was also seven. The results revealed that the computed near transfer scores ranged from zero to six, indicating that none of the respondents earned the total number of possible near transfer points (see Table 12). The results indicated that respondents had far transfer scores that ranged from zero to five (see Table 12). None of the participants received the total number of possible far transfer points. Table 13 summarizes the range of near and far transfer scores by each treatment group. In total, the average near transfer score was 1.12 and the average far transfer score was .80.

Table 12

Distribution of Transfer Scores

			Valid	Cumulative
Scores	Frequency	Percent	percent	percent
Near transfer				
0	59	32.42	34.71	34.71
1	64	35.16	37.65	72.35
2	25	13.74	14.71	87.06
3	15	8.24	8.82	95.88
4	5	2.75	2.94	98.82
5	1	0.55	0.59	99.41
6	1	0.55	0.59	100
Total	170	93.41	100	
Far transfer				
0	86	47.25	50.29	50.29
1	52	28.57	30.41	80.70
2	21	11.54	12.28	92.98
3	7	3.85	4.09	97.08
4	3	1.65	1.75	98.83
5	2	1.10	1.17	100.00
Total	171	93.96	100.00	

Table 13

Range of Near and Far Transfer Scores by Audio Tour

Type of Transfer	N	Min	Max	M	SD
Tour 1					
Total Near Transfer	29	0	4	1.07	1.07
Total Far Transfer	29	0	2	0.52	0.74
Valid N	29				
Tour 2					
Total Near Transfer	28	0	5	0.68	1.09
Total Far Transfer	30	0	5	0.60	1.28
Valid N	28				
Tour 3					
Total Near Transfer	28	0	4	1.64	1.31
Total Far Transfer	28	0	3	0.93	0.90
Valid N	28				
Tour 4					
Total Near Transfer	28	0	3	0.82	0.72
Total Far Transfer	28	0	4	0.75	1.04
Valid N	28				
Tour 5					
Total Near Transfer	27	0	6	1.37	1.52
Total Far Transfer	27	0	5	1.15	1.23
Valid N	27				

Table 13

Range of Near and Far Transfer Scores by Audio Tour Continued

Tour 6

Total Near Transfer	29	0	3	1.17	0.93
Total Far Transfer	28	0	3	0.93	0.98
Valid N	28				

Answering the Research Questions

The purpose of this study was to examine the effect of different message designs on visitors' ability to transfer learning. Since many visitor factors could affect visitors' learning transfer a number of variables were examined to determine if they should be included in the analysis as covariates. Specifically participants' age, education, interest, knowledge and perception of the audio tour as interesting, entertaining and valuable were considered possible covariates. In order to determine whether they should be included in the analysis, the correlations between these variables with the dependent variables were examined. None of the potential covariates were correlated with the dependent variables ($p>.05$) and therefore none of them were included in subsequent analysis (see Appendix E).

Data screening.

Screening for outliers was necessary since they can affect the outcome of statistical analysis. Mertler and Vannatta (2002) suggested transforming variables into z-scores to uncover outliers. An examination of the z-scores for the near and far transfer variables revealed that outliers were present. Mertler and Vannatta

(2002) suggested that z-scores beyond ±4.00 should be treated as outliers when the sample size is over 100. Case 35 had a z-score of 4.21 on the near transfer variable, whereas case 49 had a z-score of 4.00 and 128 had a z score of 4.00 on the far transfer variable. Examining these cases revealed that they were properly entered into SPSS and that the scores appeared accurate after reviewing the questionnaires; therefore these cases were left in the data set. Transformations have been commonly used to deal with outliers and with data that is not normally distributed (Mertler & Vannatta, 2002). Since outliers were present and the data was positively skewed transformations were applied. The near transfer variable had a substantial positive skew; therefore a log transformation was used to convert the data. The far transfer variables appeared severely positively skewed; as a result the inverse of the variable was calculated (Mertler & Vannatta, 2002). Since the inverse of the far transfer variable was used, care was needed when interpreting results of subsequent analysis because a lower transformed far transfer score indicated greater far transfer. Examining the new near and far transfer variables revealed that the transformation made the outliers fit within the distribution and minimized the skewness; however the variables continue to display an abnormal distribution. Once the univariate distributions of the dependent variables were examined, the multivariate distributions were inspected. Multivariate outliers were detected by using the statistical procedure Mahalanobis distance (Tabachnick & Fidell, 2001). According to Mertler and Vannatta the criterion for identifying a case as an outliers is a Mahalanobis distance that is significant at p<.001 when compared to the chi-square critical value. Neither of

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the transformed transfer variables had Mahalanobis distance scores beyond the critical value of p<.001

MANOVA assumptions.

MANOVA requires that observations within each sample be randomly sampled and be independent of each other; this was achieved by randomly selecting participants and assigning them to a treatment group (Mertler & Vannatta, 2002). MANOVA requires normally distributed data. Univariate normality was examined by visually inspecting the near and far transfer variables. The data appear positively skewed even after the transfer variables were transformed by taking the log of the near transfer variable and the inverse of the far transfer variable. Normality was also examined for each variable within each group. Again, the near and far transfer variables remained positively skewed across each treatment group; however MANOVA is robust to violations of normality and a sample size of 20 cases in the smallest cell typically ensures robustness, therefore data analysis proceeded (Tabachnick & Fidell, 2001). Linearity is another assumption that must be met for MANOVA. Examining the scatterplots of the dependent variables revealed that they were not entirely elliptical which would have been an indication of linearity; this was likely because the data were not normally distributed. Pearsons correlation coefficient was calculated between the two dependent variables and the results indicated a linear relationship (r=-.433, p<.001). Univariate homoscadasticity is another assumption that must be met for MANOVA procedures. Levene's test was used to assess whether equality of variance existed for each variable between groups.

The results of Levene's Test were not significant for the near or far transfer
variables which indicated homogeneity of variance, which is required for
MANOVA (see Table 14).

Table 14

Levene's Test of Equality of Error Variances

Variable	F	Df 1	Df 2	p
Variances between messages with and without advance organizers				
Log of near transfer	0.19	1	166	0.67
Inverse of far transfer	0.91	1	166	0.34
Variances between basic, personalized and analogical referencing messages				
Log of Near Transfer	2.70	2.00	165.00	0.07
Inverse of Far Transfer	1.21	2.00	165.00	0.30

Research question 1.

The first research question asked "How does an advance organizer, in the
form of an introductory paragraph introducing the theme of the message, affect
transfer of meaningful learning in a free-choice learning environment?". The null
hypotheses addressing this question were **no differences exist between messages
with and without advance organizing introductory paragraphs with regards**

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to near transfer and **no differences exist between messages with and without advance organizing introductory paragraphs with regards to far transfer.**

In order to address these null hypotheses the effects of treatments containing an advance organizer and treatments without an advance organizer on near and far transfer scores were examined. All treatments that contained and advance organizer were coded 1 and treatments without an advance organizer were coded 2. MANOVA was used to examine the differences in transfer between these two groups. Box's Test of Equality of Covariance Matrices indicated that equal variances could be assumed since F(3, 4960080)=1.116 and p=.341. Wilks' Lambda statistic was not significant (F=.829, p=.438) indicating that there were no differences between advance organizer and no advance organizer treatment groups with regards to near and far transfer (Λ=.990, F(2,165)=.829, p=.438) (see Table 15).

Table 15

Wilks' Lambda Multivariate Tests for Research Question One

Effect	Value	F	Hypothesis df	Error df	p	η^2
Intercept	0.08	955.78	2.00	165.00	0.00	0.92
Presence or absence of An advance organizer	0.99	0.83	2.00	165.00	0.44	0.01

The first two null hypotheses were not rejected since there were no significant differences between the transfer means of messages with and without advance organizers (see Table 16).

Table 16

Manova Results for Research Question One

Source	df	F	η^2	P
Between subjects				
Log of Near Transfer	1	0.79	.01	.376
Inverse of Far Transfer	1	1.51	.01	.221
S within-group error				
Log of Near Transfer	168	(0.05)		
Inverse of Far Transfer	168	(0.09)		

Note. Values enclosed in parentheses represent mean square errors. *S* = subjects.

Research question 2.

The second research question designed to guide this research asked "How does interpretive message content affect transfer of meaningful learning in a free-choice learning environment?". This led to the null hypotheses that **no significant differences exist between basic, personalized, and analogical reference messages with regards to near transfer** and **no significant differences exist between basic, personalized, and analogical reference messages with regards to far transfer**.

Testing the null hypotheses involved examining the differences between a basic message, personalized message, and analogical message with regards to near and far transfer. The basic message with an advance organizer and the basic message without the advance organizer were coded as 1. The analogical message with an advance organizer and the analogical message without the advance organizer were coded as 2. The personalized message with an advance organizer and the personalized message without the advance organizer were coded as 3. MANOVA was used to examine the effects of the treatments on the near and far transfer variables. Box's Test of Equality of Covariance Matrices indicated that equal variances could be assumed since $F(6, 674718.9)=.187$ and $p=.556$. Wilks' Lambda statistic was significant indicating that significant differences existed between treatment groups with regards to near and far transfer ($\Lambda=.917$, $F(4,328)=3.624$, $p=.007$), multivariate $\eta^2=.042$ (see Table 17).

Table 17

Wilks' Lambda Multivariate Tests for Research Question Two

Effect	Value	*F*	Hypothesis *Df1*	Error *Df1*	*p*	η^2
Intercept	0.08	961.20	2.00	164.00	0.00	0.92
Message Design						
Basic, Personalized,						
Analogical references	0.92	3.62	4.00	328.00	0.01	0.04

The univariate ANOVA results indicated that treatment (1, 2 or 3) had a significant effect on near transfer (F=3.903, p=.022, partial η^2=.045) and far transfer (F=6.087, p=.003, partial η^2=.069) (see Table 18). The null hypothesis stating that, no significant difference exist between messages with personalized language, analogical references and basic messages with regards to near transfer and no significant difference exist between messages with personalized language, analogical references and basic messages with regards to near transfer, were rejected. Table 19 provides LSD Post-Hoc comparisons of the treatment's effect on near and far transfer. Results revealed that groups exposed to personalized messages had a significantly higher (p<.05) mean score on near transfer than groups who listened to basic messages. LSD Post-Hoc comparisons were also examined for the treatment effects on the far transfer dependent variable and indicated that messages with analogical references and personalized messages had significantly higher (p<.05) mean score on far transfer than basic messages.

Table 18

Manova Results for Research Question Two

Source	df	F	η^2	P
	Between subjects			
Log of Near Transfer	2	3.90	0.05	0.02
Inverse of Far Transfer	2	6.09	0.07	0.00
S within-group error				
Log of near transfer	165	(0.05)		

Table 18

Manova Results for Research Question Two Continued

Inverse of Far Transfer	165	(0.09)

Note. Values enclosed in parentheses represent mean square errors.

S = subjects.

Table 19
LSD Post Hoc Comparisons Between Messages

Dependent Variable	Message Design (I)	Message Design (J)	Mean Difference (I-J)	Std. Error	*p*
Log of Near Transfer	1	2	-0.05	0.04	0.27
		3	-0.12	0.04	0.01
	2	1	0.05	0.04	0.27
		3	-0.07	0.04	0.10
	3	1	0.12	0.04	0.01
		2	0.07	0.04	0.10
Inverse of Far Transfer	1	2	0.12	0.06	0.03
		3	0.19	0.06	0.00
	2	1	-0.12	0.06	0.03
		3	0.07	0.06	0.21
	3	1	-0.19	0.06	0.00

Table 19
LSD Post Hoc Comparisons Between Messages Continued

	2	-0.07	0.06	0.21

The results of this study provide insight into the effects of interpretive message design on learning transfer in free-choice environments. Chapter VI will present a detailed discussion of the results presented here. Past research will be employed to provide insight into the outcomes of this study.

CHAPTER VI

Discussion

The purpose of this study was to examine transfer of meaningful learning in a free-choice learning environment. Specifically this research looked at the effect of interpretation message design on visitors' ability to transfer learning from a heritage tourism context. In this chapter, the results of the field experiment will be discussed and related to the existing literature.

Respondent Characteristics

The demographic results of this study were compared with results from the 2005 Winnipeg Fringe Visitor Survey (Van Winkle, 2006). The results revealed no significant differences between the two sets of respondents with regards to gender, however there were significant differences between the two sets of respondents with regards to age and education. The subjects in the present study are younger and less educated than the 2005 visitors. These results could indicate a difference in the fringe population from 2005 to 2006 or it could be the result of sampling. Notably, the 2005 visitor survey was distributed to visitors at the 22 indoor venues and at the outdoor site, while the questionnaire used in the present study was only distributed at the outdoor site. Possibly the visitors to the outdoor site are younger and less educated than visitors attending performances at indoor venues.

The results of this study revealed that visitors to the Exchange District during the Fringe are more likely to participate in guided or self-guided tours than

audio tours when visiting historic sites. Currently, in the Exchange District, only guided and self-guided tours are available to visitors. While the results of this study suggest that visitors favour guided tours over technologically driven tours, audio tours could provide an additional interpretive opportunity but should not replace traditional tour options at this time. If site management decides to develop audio tours they could focus on providing visitors with head-sets or allowing visitors to download tours onto their MP3 players, since cell phone tours were identified as the least likely tour option that visitors would choose. If cell phone tours are developed the pricing of the service needs to be carefully planned since the main hurdle preventing visitors from participating in a cell phone tour was the potential cost incurred by users. Visitors stated that they were unlikely to participate in audio tours during historic district visits. Since this emerging type of tour could provide site management with a way to expand existing interpretive services, additional research needs to examine why visitors prefer guided and self-guided tours over audio tours before audio tours are added to existing programming

On average, visitors agreed that the audio tours were informative and interesting and they felt that they learned something valuable.   This is encouraging to those responsible for providing interpretation at the site, since it provides evidence of the outcomes visitors experience from participating in historic site interpretation. Besides the audio tours used for this study, no other interpretive material available at the site provides the visitors with the same information about historic designation. This study provides evidence that the

information contained in the audio tours is positively received by visitors and perhaps should be added to existing interpretive offerings at the site. When visitors were asked about whether they found the audio tour entertaining the average response was neither agree nor disagree. Since the purpose of the study was to examine the affect of different message designs, the audio tours were clear and simple to minimize factors that could affect visitors learning. If site interpreters want visitors to have an entertaining experience the audio tours designed for this study could be modified. Music, entertaining anecdotes and celebrity voice are included in audio tours at other historic sites (Candide Media Works, 2006). These techniques could increase visitors' perception of the audio tour as entertaining; however these tools could also affect transfer of leaning.

Respondents did not consider themselves knowledgeable about the history of the district, designation or historic preservation. This could explain why the visitors felt they learned something valuable from the tour and found the tour interesting and informative. When asked about their interest in the history of the Winnipeg Exchange District, Historic District designation and historic preservation, visitors indicated that they are interested in these topics. Exchange district interpreters may want to add content to existing tours to educate visitors about these topics since these are subjects visitors do not feel they know a lot about and they are interested in these topics. Providing visitors with the opportunity to learn about these topics could enhance preservation efforts by making visitors aware of issues faced by historic sites. The comments section of the questionnaire provides evidence of visitors' increased awareness of historic

preservation issues and their desire to contribute to preservation efforts. For

example one visitor commented "I know next to nothing about the process of

declaring sites as historically significant but I think knowing our history is very

important and being able to see it is a vital learning tool". Another respondent

commented "There should be laws to protect areas [that are] designated, just as

the environmental laws protect the environment. Public hearings should be

required before any attempt to either sell or renovate a historic site".

Transfer of Learning

Examining visitors' responses to the transfer of learning questions reveals

that transfer (near and far transfer combined) is not commonly demonstrated.

Over one quarter of the respondents did not demonstrate any transfer of learning

from the audio tours to the transfer questions. Examining the distribution of total

transfer reveals that the data are extremely positively skewed, indicating that most

respondents had low transfer scores and few respondents received high transfer

scores. These results do mirror some previous research where evidence of

learning transfer was infrequent (Fisch, 2001). Alternatively, Moreno and

Mayer's (2000, 2004) results indicated normally distributed transfer scores, where

most respondents had transfer scores in the middle of the distribution and fewer

subjects had very high and very low transfer scores. A possible reason that the

studies conducted by Moreno and Mayer demonstrated more transfer of learning

was that the subjects were students in formal education settings. The students

likely believed that the purpose of the transfer test was to evaluate their learning

from the information presented in the lesson. Alternatively, in free-choice

learning settings individuals aren't typically tested on the material learned and therefore may not be as well prepared to answer the transfer of learning questions posed in the present study. When asked to respond to the transfer questions in this study, respondents were not specifically told to use the information learned in the audio tour when answering the questions. Fisch (2001) points out that people use a variety of information when they transfer information to a new situation. Participants in this study who did not demonstrate transfer might not have transferred information gained from the audio tour but might have transferred from other situations. Past research examining the lack of transfer has not specifically identified whether; the transfer phenomenon itself is uncommon, whether finding examples of transfer in experimental settings is difficult, or if current measures are transfer are inadequate and do not reflect the amount of actual transfer that takes place (Bransford & Schwartz, 1999; Detterman, 1993). This research study suggests that transfer from an interpretive audio tour in a free-choice learning environment is not common. Since the present study employed a measure of transfer used repeatedly by Moreno and Mayer it seems unlikely that the transfer measure used in this study was inadequate, however it is possible that this measure does not adequately reflect transfer in a free-choice learning setting. The present study took place in the field and therefore it seems unlikely that the experimental setting is the reason for the skewed transfer scores; however, further research needs to examine different measures of transfer and their effectiveness in various settings.

In this study, total transfer consists of both near and far transfer. Near transfer occurs when individuals transfer content learned in one situation to another similar situation, whereas far transfer is when individuals transfer to a context that is different from the context where the information that was learned. Looking at the two types of transfer separately reveals that over one third of respondents did not demonstrate any near transfer and over half of the respondents did not demonstrate any far transfer. The results of this study suggest that near transfer is more common than far transfer. Respondents were better able to apply newly learned information to similar scenarios (near transfer questions) than to different situations (far transfer questions). This provides support for the identical elements theory of transfer first proposed by Thorndike and Woodworth (1901). According to Thorndike et al. people are best able to apply information to situations that share identical elements to the learning situation but have difficulty applying information when the learning and application situations are different. Salomon and Perkins (1989) incorporated this idea into their conceptualization of transfer. According to Salomon and Perkins low-road to transfer leads to near transfer and occurs when people transfer learned information to similar situations because a stimulus situation triggers an automatic and practiced response (Salomon & Perkins, 1989). Individuals are able to automatically apply what was learned in one situation to another situation without effort. Low-road transfer can be induced by teaching material in a way that it closely resembles the intended transfer situation. In this study, the information in the interpretive audio tour (the learning situation) was closely related to the near transfer measure (intended

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transfer situation); whereas the learning situation intentionally differed from the far transfer situation. According to Salomon & Perkins, far transfer requires mindful abstraction of the main concepts in order to allow individuals to transfer learned information to a different situation. According to the results of this study low-road near transfer is more common than high-road far transfer. This suggests that transfer by mindful abstraction is less common than automatic transfer of responses.

Advance Organizers

The first hypothesis used to guide this study suggested that messages with advance organizers would result in greater near and far transfer than messages without advance organizers. The reason for this claim is that advance organizers help individuals with the selection and organizational phases of the cognitive processes for meaningful learning (Mayer, 2002). Advance organizers also act as scaffolding, providing the necessary pre-requisite information to enable individuals to learn new information (Ausubel, 2000). The advance organizer used in the present study offered a brief overview of the material presented in the audio tour to help participants select information to attend to and organize this new information. The findings reveal that no significant differences exist between messages with and without advance organizers. Messages with advance organizers do not result in significantly better near or far transfer than the messages without advance organizers.

Mayer (2002) suggests scenarios when advance organizers are useful and when they are a hindrance. Advance organizers were included in this study

because Mayer stated that when transfer is the intended outcome advance organizers are helpful, however Mayer also states that advance organizers do not aid in learning when people already have the knowledge necessary to act as scaffolding when learning the new information. When asked to rate their own knowledge about the history of the Exchange District, Historic District designation and historic preservation few respondents indicated that they were knowledgeable, which suggests that they did not have the necessary scaffolding to learn the material presented in the interpretive message and therefore advance organizers should have increased their ability to transfer learning. It is possible that visitors are more knowledgeable than they indicated and therefore do not require the advance organizer; alternatively it is possible that while they were not knowledgeable about the Exchange, historic designation or preservation they had other knowledge that acted as a base to help them learn the new material. Another reason to explain why messages with the advance organizer did not result in greater near or far transfer is that the advance organizer itself was not appropriate. Advance organizers can take many forms (Mayer, 2002). The advance organizer in this study was a brief introductory paragraph that outlined the key information contained in the interpretive message. It is possible that other types of advance organizers, such as a graphical organizer, would have resulted in greater transfer. Research conducted by Mayer reveals that combining graphical organizers with an auditory lesson enhances transfer (Mayer, 2002). This is because the graphical organizers help learners to organize new information without overloading their working memory with too much text (Mayer, 2002).

Examining the differences between the six interpretive messages designed for this study reveals that the basic message with an advance organizer resulted in significantly less near and far transfer than the personalized messages with or without the advance organizer and the analogical message without the advance organizer (see Appendix F). The fact that the personalized message and analogical message without advance organizers resulted in greater transfer than a basic message with the advance organizer highlights the fact that the advance organizer used in this study does not aid in transfer and results in less transfer than certain messages without advance organizers. The advance organizer could result in less transfer for a few reasons. The redundancy effect (Kalyuga, Chandler, & Sweller, 1999) takes place when "eliminating redundant material results in better performance than when the redundant material is included" (p. 352). This occurs because the redundant material places a burden on working memory, also known as cognitive load (Kalyuga et al., 1999; Mousavi, Low, & Sweller, 1995; Sweller, 1994). When working memory is overloaded new information does not get integrated into long term memory (Mayer, 2002). According to Kalyuga et al. this burden can be relieved by splitting information between visual and auditory channels. This suggests that an advance organizer might be more effective if presented through a different channel (i.e. visual) than the main message. While this cognitive explanation is possible, a motivational explanation is also promising and may help explain why the basic message with an advanced organizer resulted in significantly less transfer than other messages without the advance organizer. Self-determination research highlights the

importance of intrinsic motivation and perceived locus of control for deep

conceptual processing of material (Deci & Ryan, 2000; Grolnick & Ryan, 1987).

Feelings of autonomy are believed to affect individuals' intrinsic motivation.

Free-choice learning environments are characterized by individuals' freedom of

choice and intrinsic motivation to learn. Perhaps the advance organizer

undermines this intrinsic motivation by outlining the expected learning outcomes,

thereby reducing the meaningful learning that takes place. Finally, it is also

possible that it was not the presence of the advance organizer that prevented

transfer but the presence of personalization and self-referencing that significantly

enhanced transfer which resulted in the significant difference between the basic

message with an advance organizer and the personalized messages and the

analogical message with no advance organizer.

Personalization

The results reveal that personalized messages result in greater near and far

transfer than the basic messages, allowing the null hypothesis proposed at the

beginning of this study to be rejected. Existing research examining the effect of

personalization on transfer suggests that personalization, which leads to self-

referencing, results in greater learning transfer because it helps individuals to

elaborate on the learned material (Moreno & Mayer, 2000). Salomon and Perkins

(1992) also discuss the role of elaboration in transfer. Specifically, they suggest

that mindful abstraction, where main concepts are extracted from the learning

situation, is a form of cognitive elaboration. According to Salomon and Perkins

far transfer occurs when concepts are mindfully abstracted (a form of

elaboration). Since the subjects who listened to the personalized message demonstrated significantly more far transfer than subject who listened to the basic message, it seems reasonable to conclude that personalization leads to greater elaboration in the form of mindful abstraction. While the results support the high-road theory of far transfer they initially appear to conflict with the low-road theory of near transfer. Specifically, Salomon and Perkins suggest that new knowledge will be transferred to similar situations (near transfer) when the information is well-practiced and becomes automatic. The participants in this study who listened to the personalized message did not have the opportunity to practice the material to the point of automaticity, yet they were better able to transfer their knowledge to a near transfer situations compared to the participants who listened to a basic message. Perhaps, learning material in reference to one's self is sufficient to allow the automatic application of the learned material to a similar situation. If this is the case, the low-road to transfer theory needs to expand to include technique other than practice as ways to create automatic responses. Personalization seems to allow for better integration of learned materials into existing cognitive structures which in turn enhances both automatic application of learned material to similar situation and the mindful abstraction of material to different situations.

Analogical References

The results of this study indicate that analogical references result in greater far transfer than basic messages; however, when examining near transfer, no differences between analogical and basic messages are present. The reason

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analogical references are believed to increase transfer is because they lead to greater elaboration of the message allowing for abstraction of the main concepts. Specifically, by recognizing that the concepts presented in the interpretive message apply to a range of situations, through exposure to multiple examples, individuals are better able to take the concept out of context and apply it to diverse situations, including far transfer scenarios. According to Salomon and Perkins (1989) "higher abstraction does not, however, foster a greater amount of transfer to a situation already within the range of the initial abstraction." (p. 128). This suggests that the material presented in the interpretive message was already within near transfer range which is why analogical references did not improve near transfer. Salomon and Perkins suggest that this is the case because while mindful abstraction aids in far transfer this is at the expense of poor learning of the original material because the "greater the generality makes it harder to connect the representation to any given particular" (p. 129). These results appear to support the Salomon and Perkins theory of high-road low-road transfer.

Analogical References and Personalization

The results reveal that no significant differences exist between the analogical reference and personalized messages with regards to near or far transfer. While these two techniques appear to work in different ways, they do not seems to have significantly different results. Analogical references enable mindful abstraction of the main points of the message while personalization allows for self-referencing which enables greater integration of the learned material (Moreno & Mayer, 2000; Salomon & Perkins, 1989). While these

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techniques use different mechanisms they both achieve greater far learning

transfer than a basic message.

This chapter has used existing literature to provide an indepth discussion

of the results. Now that a clear understanding of the outcome of this research has

been provided, the concluding chapter will discuss implications, limitations and

future research.

CHAPTER VII

Implications and Conclusions

The purpose of this dissertation was to examine transfer of meaningful learning in a free-choice learning setting. Specifically, this research looked at the effect of interpretive message design on visitors' ability to transfer leaning from a heritage tourism site. This was an important perspective to gain, since learning transfer has not been explored in a free-choice learning environment but is an important learning outcome. Interpretive messages are common tools used to enhance learning at heritage sites and can be manipulated to enhance learning transfer. This study offered preliminary insight into interpretive techniques useful for enhancing transfer and provides insight into future research that could improve our understanding of meaningful learning at tourism destinations. The theoretical and practical implications of this research will be examined and an overview of future research stemming from this study will be provided.

Theoretical Implications

Theories of transfer can be divided into specific, general and mixed (Mayer, 2002). This study provides support for a mixed theory of transfer where near and far transfer result from different mechanisms (Salomon & Perkins, 1989). The results presented here reveal that different techniques are needed to enhance near and far transfer and that simply improving one type of transfer does not guarantee the other type of transfer will also be enhanced. Personalization leads to greater near and far transfer. This suggests that improving learners' ability to integrate

information into existing mental structures, accomplished through personalization, increases individuals ability to automatically apply the learned information to a similar situation (near transfer). Additionally the results suggest that personalization also helps learners to elaborate on the information when it needs to be transferred to a different situation (far transfer). Providing analogical references in interpretive messages leads to greater far transfer when compared to basic messages; however, analogical references do not lead to greater near transfer when compared to basic messages. This suggests that this technique enhances mindful abstraction, a form of cognitive elaboration, but does not enhance automatic application of learned material.

Learning transfer research has been examined in educational and training settings but has not been applied to free-choice learning environments, until now. This research supports the applicability of the transfer concept to diverse learning settings. A myriad of free-choice learning environments exist where learning transfer theory can be applied. Specifically, the learning transfer measure used by Moreno and Mayer (2000, 2004) and applied to a free-choice learning setting in the present study, seems appropriate for measuring transfer from a variety of lessons in diverse learning environments. While the specific transfer measures must be designed in conjunction with the learning material, the type of questions are appropriate in a variety of settings.

In the past, Moreno & Mayer (1998; 2000) did not differentiate between near and far transfer with their transfer measures. This study demonstrates how near and far transfer can be measured separately using the same type of questions.

Separating these two types of transfer allows researchers to better understand the mechanisms that result in each type of transfer.

Practical Implications

When designing interpretive tours, interpreters should consider the outcomes they want their visitors to achieve. If interpreters and destination managers want visitors to be able to take the information gained from their visit and apply it to diverse situations in the future, then interpretive messages need to be designed to promote transfer. Destination managers and interpreters will be better able to provide visitors with the outcomes they desire, encourage positive visitor behaviour and gain support for the continue protection of resources, by designing communication and interpretive material to promote transfer. Past research has demonstrated that visitors want to learn during destination visits (Light, 1995; Prentice, 1993). Since learning transfer is an outcome of meaningful learning, providing educational opportunities that lead to transfer allows site managers to provide visitors with their desired outcomes. Additionally, programs that promote transfer will aid in managing visitor behaviour because when educating visitors on appropriate behaviour the information needs to be able to be transferred to situations outside of the initial learning environment in order to prevent the negative outcomes of visitation. For example, if the focus of an interpretive program teaches visitors about damage cause by people touching artefacts and visitors are unable to transfer learning, then when visitors tour sites they might not apply what was learned during the interpretive program to the situation. Finally, the ability to transfer learning

occurs once individuals have meaningfully learned something (Mayer, 2002). Meaningful learning is characterized by understanding, which, if achieved during an interpretive visit, can lead to support for the protection of the resource. Positive affective attitudes towards heritage sites are developed by enabling people to connect to historic places, which results in their desire to protect the place visited (Timothy & Boyd, 2003). Moscardo (1996) states that "for many people the information they encounter while at leisure may offer the only opportunity to learn about their bonds to the environment, or to their history and culture" (p. 6). Understanding, achieved through meaningful learning, contributes to people's ability to connect with a place (McIntosh & Prentice, 1999).

The results of the field experiment offer insight into interpretive message design techniques that will be useful for interpreters. Specifically, personalization should be included throughout the interpretive message when transfer is desired. Analogical reference messages contribute to visitors' ability to far transfer (compared to basic messages) but do not enhance their near transfer; whereas personalization contributes to both greater near and far transfer (compared to basic messages). Messages learned using the personalization technique allow visitors to apply their learning to diverse situations and is therefore useful in interpretive settings where it is unknown how visitors will use the information in the future.

Advance organizers applied to audio tours should be designed with care. While often advance organizers contribute to learning transfer by providing organization, they might also prevent transfer by leading to cognitive overload.

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When using advance organizers in interpretive settings interpreters should carefully consider their visitors existing knowledge and they type of organizer best suited to the situation.

Limitations

While this study provides valuable insight into interpretive message design to enhance transfer, there are some limitations that need to be considered when interpreting and applying the results of this study. This field experiment took place at one site using one basic interpretive message. There is a possibility that the results of this study are only applicable to this particular message at this site; therefore the results need to be interpreted with care and provide only preliminary insight into learning transfer in free-choice environments.

While the purpose of this study was to examine the utility of advance organizers, personalization and analogical referencing to enable individuals' learning transfer, it is recognized that there are many different ways the advanced organizers, personalization and analogical referencing could be developed to achieve this goal. Incorporating these techniques in different ways could affect learning transfer.

The data for this study was collected during a festival, which could affect the outcome of the study. The festival environment is noisy and busy and it is possible that the festival environment distracted visitors who were listening to the audio tour, affecting their ability to learn from the interpretive message. Also, festival visitors might not be characteristic of all historic site visitors and therefore data collection when the festival is not underway could yield different results.

Notably, none of the visitor characteristics (age, education, knowledge, interest, experience) affected learning transfer; therefore even if heritage site visitors differ from festival visitors based on these characteristics the outcomes of this study should be similar.

The transfer measures used in this study were based on questions developed by Moreno and Mayer (2000, 2004). The open-ended questions used had both strengths and weaknesses. Since these types of questions had been used in the past their utility for measuring transfer was clear. Respondent were able to apply knowledge gained from the audio tour to the diverse situations presented in the questions. Using an answer key allowed the researcher to determine whether transfer had occurred and the inter-coder reliability revealed that two independent coders reliably coded the questions in the same manner. The questions used might not have been sensitive to the full range in transfer ability. Individuals received transfer scores that ranged from 0-5 for near transfer and 0-6 for far transfer, however, based on the answer key, it was possible to get 7 points, which no respondents received.

Future Research

This research provides preliminary insight into how learning transfer can be achieved in a free-choice learning environment. Various opportunities for future research have become apparent as a result of this study. A number of future directions for research examining transfer in free-choice learning environments are examined below.

Future research that examines learning transfer in free-choice environments should strive to address the questions raised by the present study. In the present study advance organizers did not enhance learning transfer; therefore future research should examine the utility of organizers in greater detail. Specifically, the effect of different types of organizers on transfer should be examined. For example, when presenting visitors with audio tours the effect of graphical and oral organizers could be explored. Also, since existing knowledge can impact the utility of advance organizers studies could look at how different levels of existing knowledge affect the relationship between advance organizers and transfer.

This study demonstrates that personalization contributes to both near and far transfer. While the discussion provided insight to help explain how personalization contributes to both types of transfer, research is needed to understand exactly how this technique leads to near and far transfer. A future study could determine whether personalization leads to near transfer by enabling automatic responses and whether personalization leads to far transfer by enhancing elaboration through mindful abstraction.

Analogical references appear to lead to mindful abstraction enabling far transfer of learned material. Examining whether this technique does in fact induce elaboration in the form of mindful abstraction is needed. Since analogical references did not aid in near transfer, future research should examine why this technique does not improve this type of transfer. Salomon and Perkins (1989) suggest that since the main principle is abstracted it becomes difficult to see the

applicability of the principle to a near transfer situation. While the results appear to support this statement, future research could specifically look at whether this is in fact what occurs.

This study only examined one type of interpretive tour (audio tour), using three interpretive techniques (advance organizer, analogical references and personalization), at one type of site (heritage district). Further research should compare different types of tours (audio, guided and self-guided), interpretive techniques (questions and signalling) and different sites (natural sites or rural sites) and their affect on learning transfer.

Beyond interpretive message design, other variables related to learning transfer should also be explored in future research. Adding additional visitor characteristics, social and cultural variables to future studies would also help to better understand learning transfer in free-choice environments. Variables such as learning motivation, goal orientation, and perception of the site in relation to one's own heritage could prove useful for understanding differences in the ability to transfer learning

Examining learning transfer in tourism settings should not be limited to formal learning opportunities. While interpretation is a common technique used to provide learning opportunities at destinations, informal learning is also common. Qualitative studies could reveal how informal learning in tourism contexts is transferred to other situations.

Finally, this was the first study to use Moreno and Mayer's technique for measuring transfer in a free-choice learning setting. While the this measure fit

well with the design of this study, future research should compare the results of providing people in a compulsory learning setting and a free-choice learning setting with the same lesson and transfer test. This would help determine if the learning setting impacts the results of transfer tests.

Conclusion

Past research has indicated that visitors to heritage sites are interested in learning (MacKay, Andereck, & Vogt, 2002; Poria, Butler, & Airey, 2004; Zeppel, 2002). While no research exists to specifically identify the type of learning visitors want (rote vs. meaningful), it seems reasonable to assume that meaningful learning is an outcome desired by visitors. Interpretation specifically involves providing meaningful learning opportunities for visitors and is provided at heritage sites for various reasons. Interpretation is used to educate visitors about the site, enhance visitor satisfaction, manage visitor behaviour, and garner visitor support for the continued preservation of the site (Moscardo, 1996; Timothy & Boyd, 2003). While meaningful learning is valued by both visitors and interpreters, past research has not examined specific meaningful learning outcomes from interpretation. Since learning transfer is a measurable outcome of meaningful learning, this study examined learning transfer from interpretive audio tours. Interpretive messages are within the control of the destination and can easily be manipulated to achieve different learning outcomes; therefore a basic message was designed and manipulated with techniques intended to induce learning transfer. This study revealed that it is possible to manipulate interpretive messages to enhance both near and far transfer. While adding advance organizers

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did not affect transfer, personalization affected both near and far transfer and analogical references affected far transfer. This research provides a necessary first step to examining learning transfer in free-choice learning environments.

APPENDICES

Appendix A

Experimental Treatments

Basic Message No Advance Organizer

Every year, the Winnipeg Fringe Festival floods the Historic Exchange District with thousands of excited Fringers. This area has served as the home to the Fringe since 1987 but has been a hub of activity for generations. The 20 block exchange district gains its unique character from the covered alleys, narrow streets, and massive stone and brick warehouses. The preservation of these unique features contributes to the charm of this neighbourhood, which was named a National Historic Site in 1997. The exchange was given this title because it represents a significant stage in the development of Canada; it played a key role as a centre of trade, finance and manufacturing at the turn of the century. Winnipeg's Exchange is one of only 16 historic districts to receive this designation. Districts have been recognize for qualities like their exceptional design, their connection with important people or events, their commemoration of a way of life, or their overall importance in the development of Canada. Surprisingly, national designation does not offer any legal protection from destruction; however this honor does help conservation efforts by creating awareness of these exceptional spaces. While aesthetic beauty and historic significance are vital to preserving sites like the Exchange, their functional role is just as crucial to their continued survival; The Winnipeg Exchange District continues to thrive today because of the mix of locally run businesses, a vibrant arts community and carefully preserved heritage buildings.

Welcome to the Winnipeg Exchange District introductory audio tour. This audio tour will give insight into the qualities a place must have in order to be considered for National Historic Site designation; This tour will highlight how this designation affects historic sites and how more than just physical preservation is needed to ensure a successful historic district. Every year, the Winnipeg Fringe Festival floods the Historic Exchange District with thousands of excited Fringers. This area has served as the home to the Fringe since 1987 but has been a hub of activity for generations. The 20 block exchange district gains its unique character from the covered alleys, narrow streets, and massive stone and brick warehouses. The preservation of these unique features contributes to the charm of this neighbourhood, which was named a National Historic Site in 1997. The exchange was given this title because it represents a significant stage in the development of Canada; it played a key role as a centre of trade, finance and manufacturing at the turn of the century. Winnipeg's Exchange is one of only 16 historic districts to receive this designation. Districts have been recognize for qualities like their exceptional design, their connection with important people or events, their commemoration of a way of life, or their overall importance in the development of Canada. Surprisingly, national designation does not offer any legal protection from destruction; however this honour does help conservation efforts by creating awareness of these exceptional spaces.   While aesthetic beauty and historic significance are vital to preserving sites like the Exchange, their functional role is just as crucial to their continued survival; The Winnipeg

Exchange District continues to thrive today because of the mix of locally run businesses, a vibrant arts community and carefully preserved heritage buildings.

Personalized Message

Every year, the Winnipeg Fringe Festival floods the Historic Exchange District with thousands of excited Fringers like you. This area has served as the home to the Fringe since 1987 but has been a hub of activity for generations that were here before us. As you look around you will notice that the 20 block exchange district gains its unique character from the covered alleys, narrow streets, and massive stone and brick warehouses. The preservation of these unique features contributes to the charm of this neighbourhood, which was named a National Historic Site in 1997. When you think about why the exchange was given this title you might be aware that it is because this area represents a significant stage in the development of Canada; it played a key role as a centre of trade, finance and manufacturing at the turn of the century. Did you know that Winnipeg's Exchange is one of only 16 historic districts to receive this designation? Districts have been recognized for qualities like their exceptional design that we admire, their connection with important people or events that have shaped the world you live in, their commemoration of a way of life that came before you, or their overall importance in the development of the Canada that we see today. You might be surprised to find out that national designation does not offer any legal protection from destruction; however this honour does help conservation efforts by making us aware of these exceptional spaces.   While aesthetic beauty and historic significance are vital to preserving sites like the

Exchange, their functional role is just as crucial to their continued survival; When you look around you will notice that the Winnipeg Exchange District continues to thrive today, this is because of the mix of the locally run businesses, vibrant arts community and carefully preserved heritage buildings that surround you.

Personalized Message with Advance Organizer

We are glad you joined us for the Winnipeg Exchange District introductory audio tour. You might already know that this neighbourhood is federally recognized as a National Historic Site but you may not be aware of the qualities a site has to have in order to be considered for this designation. You will also find out about how this designation affects historic sites and why more than just physical preservation that is needed to ensure a successful historic district. Every year, the Winnipeg Fringe Festival floods the Historic Exchange District with thousands of excited Fringers like you. This area has served as the home to the Fringe since 1987 but has been a hub of activity for generations that were here before us. As you look around you will notice that the 20 block exchange district gains its unique character from the covered alleys, narrow streets, and massive stone and brick warehouses. The preservation of these unique features contributes to the charm of this neighbourhood, which was named a National Historic Site in 1997. When you think about why the exchange was given this title you might be aware that it is because this area represents a significant stage in the development of Canada; it played a key role as a centre of trade, finance and manufacturing at the turn of the century. Did you know that Winnipeg's Exchange is one of only 16 historic districts to receive this designation? Districts have been recognized

for qualities like their exceptional design that we admire, their connection with important people or events that have shaped the world you live in, their commemoration of a way of life that came before you, or their overall importance in the development of the Canada that we see today. You might be surprised to find out that national designation does not offer any legal protection from destruction; however this honour does help conservation efforts by making us aware of these exceptional spaces. While aesthetic beauty and historic significance are vital to preserving sites like the Exchange, their functional role is just as crucial to their continued survival; When you look around you will notice that the Winnipeg Exchange District continues to thrive today, this is because of the mix of the locally run businesses, vibrant arts community and carefully preserved heritage buildings that surround you.

Analogical Reference Message

Every year, the Winnipeg Fringe Festival floods the Historic Exchange District with thousands of excited Fringers. This area has served as the home to the Fringe since 1987 but has been a hub of activity for generations. The 20 block exchange district gains its unique character from the covered alleys, narrow streets, and massive stone and brick warehouses like the ArtSpace building and the Kelly Building on Bannantyne. The preservation of these unique features contributes to the charm of this neighbourhood, which was named a National Historic Site in 1997 joining the ranks of sites like Victoria's Chinatown. Like other historic sites across the country, the exchange was given this title because it represents a significant stage in the development of Canada; specifically it played

a key role as a centre of trade, finance and manufacturing at the turn of the century. Winnipeg's Exchange is one of only 16 historic districts from East Coast towns to West Coast harbors to receive this designation. Districts have been recognized for qualities like ; their exceptional design whether it be buildings or boardwalks, the sites connection with important people or events from the distant past or more recent times, the sites commemoration of a way of life whether common or unusual, or the sites overall importance in the development of Canada whether in the North or South. Surprisingly, national designation does not offer any legal protection from alteration or destruction; however this honor does help conservation efforts by creating awareness of these exceptional spaces.   While aesthetic beauty and historic significance are vital to preserving sites like the Exchange District, their functional role whether as business districts like in the case of the exchange or fishing piers at historic harbors, is just as crucial to their continued survival; The Winnipeg Exchange District continues to thrive today because of the mix of locally run businesses, a vibrant arts community and carefully preserved heritage buildings.

Analogical Reference Message with Advance Organizer

Welcome to the Winnipeg Exchange District introductory audio tour. This audio tour will give insight in to the qualities that allow areas across Canada, like the Winnipeg Exchange District and Victoria's China Town to get National Historic Site designation. This tour will highlight how this designation affects various historic sites and how more than just physical preservation is needed to ensure the success of diverse historic districts. Every year, the Winnipeg Fringe

Festival floods the Historic Exchange District with thousands of excited Fringers. This area has served as the home to the Fringe since 1987 but has been a hub of activity for generations. The 20 block exchange district gains its unique character from the covered alleys, narrow streets, and massive stone and brick warehouses like the ArtSpace building and the Kelly Building on Bannantyne. The preservation of these unique features contributes to the charm of this neighbourhood, which was named a National Historic Site in 1997 joining the ranks of sites like Victoria's Chinatown. Like other historic sites across the country, the exchange was given this title because it represents a significant stage in the development of Canada; specifically it played a key role as a centre of trade, finance and manufacturing at the turn of the century. Winnipeg's Exchange is one of only 16 historic districts from East Coast towns to West Coast harbors to receive this designation. Districts have been recognized for qualities like ; their exceptional design whether it be buildings or boardwalks, the sites connection with important people or events from the distant past or more recent times, the sites commemoration of a way of life whether common or unusual, or the sites overall importance in the development of Canada whether in the North or South. Surprisingly, national designation does not offer any legal protection from alteration or destruction; however this honor does help conservation efforts by creating awareness of these exceptional spaces. While aesthetic beauty and historic significance are vital to preserving sites like the Exchange District, their functional role whether as business districts like in the case of the exchange or fishing piers at historic harbors, is just as crucial to their continued survival; The

Winnipeg Exchange District continues to thrive today because of the mix of

locally run businesses, a vibrant arts community and carefully preserved heritage

buildings.

Appendix B

Survey Distribution Script

Hello, I am Graduate Student in the Parks, Recreation and Tourism Management Department at Clemson University. Would you be willing to participate in a study that is being done to understand what people think of an audio tour and how visitors learn at historic sites. If you are interested you will be given a CD player to listen to a 3 minute segment from an audio tour, then you will fill out a questionnaire that should take about 15 minutes to finish. Are you interested in participating? You are free to stop participating in this study at any time.

Once finished the audio tour

Please take a few minutes to complete this questionnaire. Your responses to this questionnaire will remain confidential.

Once finished the questionnaire

Thank you again for your help. Here is a Festival show pass, it will get you into one fringe show for free, please read the rules on the back.

Questionnaire

Audio-Tour Questionnaire

THE WINNIPEG FRINGE THEATRE FESTIVAL — CLEMSON UNIVERSITY

Thank you for agreeing to participate in this study. The information you provide will be used for a Clemson University study that will help us understand visitors' experience with audio tours and learning while visiting heritage sites. If you have any questions or concerns about this study please contact: *Christine Van Winkle, Graduate Research Assistant, 263 Lehotsky Hall, Clemson, SC, USA, 29634-2226 | e-mail: winklev@clemson.edu*

Please enter your audio tour # in the box: [ ]

SECTION 1 This section will help us understand your thoughts and opinions about audio tours. (4 Questions)

1) While visiting a historic district, how Unlikely or Likely would you be to... (Please check one box per row only.)

	EXTREMELY UNLIKELY	UNLIKELY	NEITHER LIKELY NOR UNLIKELY	LIKELY	EXTREMELY LIKELY	DON'T KNOW
...call an audio cell phone tour from your own cell phone?	☐	☐	☐	☐	☐	☐
...take part in a guided tour?	☐	☐	☐	☐	☐	☐
...take part in a head set audio tour?	☐	☐	☐	☐	☐	☐
...take part in a MP3 player audio tour?	☐	☐	☐	☐	☐	☐
...take part in a self-guided tour?	☐	☐	☐	☐	☐	☐

2) Please indicate how much you disagree or agree with the following statements: (Please check one box per row only.)

	STRONGLY DISAGREE	DISAGREE	NEITHER AGREE NOR DISAGREE	AGREE	STRONGLY AGREE	DON'T KNOW
This audio tour was informative.	☐	☐	☐	☐	☐	☐
This audio tour was interesting.	☐	☐	☐	☐	☐	☐
This audio tour was entertaining.	☐	☐	☐	☐	☐	☐
I learned something valuable from this audio tour.	☐	☐	☐	☐	☐	☐

3) Please rate your existing knowledge about these topics from Not at all Knowledgeable to Extremely Knowledgeable: (Please check one box per row only.)

	NOT AT ALL KNOWLEDGEABLE	SOMEWHAT KNOWLEDGEABLE	KNOWLEDGEABLE	VERY KNOWLEDGEABLE	EXTREMELY KNOWLEDGEABLE	DON'T KNOW
The History of the Winnipeg Exchange District	☐	☐	☐	☐	☐	☐
Historic District Designation	☐	☐	☐	☐	☐	☐
Historic Preservation	☐	☐	☐	☐	☐	☐

4) Please rate your interest in the following topics from Extremely Uninterested to Extremely Interested:
(Please check one box per question only.)

	EXTREMELY UNINTERESTED	UNINTERESTED	NEITHER INTERESTED NOR UNINTERESTED	INTERESTED	EXTREMELY INTERESTED	DON'T KNOW
The History of the Winnipeg Exchange District	☐	☐	☐	☐	☐	☐
Historic District Designation	☐	☐	☐	☐	☐	☐
Historic Preservation	☐	☐	☐	☐	☐	☐

2

SECTION 2 This section is intended to help us understand your ideas about issues facing National Historic Sites and Districts across Canada. Please write down any ideas or comments you have when responding to these questions. (6 Questions)

1) A turn of the century trade district, located in Toronto, has a rich history. A community group is working towards preserving the area. What should they keep in mind if they want their preservation efforts to be successful?

_____
_____
_____
_____
_____
_____
_____

2) If you were asked to decide whether a 150 year old farming community should be considered a "National Historic District," what qualities would you look for?

_____
_____
_____
_____
_____
_____
_____

3) In rural Saskatchewan, there are many small towns that have historic value because of their involvement in the Canadian Grain Exchange. Why do you think preservation of these areas has been unsuccessful?

_____

_____

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_____

_____

_____

4) An early Catholic Church in a small town in rural Quebec was recently torn down. How is this possible since it had National Historic Site Designation?

_____

_____

_____

_____

_____

_____

_____

5) An early trade and manufacturing district in St. John's, Newfoundland recently applied for National Historic Site Designation. For what reasons could this area qualify for this designation?

_____

_____

_____

_____

_____

_____

6) A 100 year old Warehouse, in a Historic District in Ottawa, was designated a National Historic Site by the Canadian Government. This site has recently been sold and the new owner intends to turn the site into a parking lot. Do you think they can do this? Why or why not?

_____

_____

_____

_____

_____

SECTION 3 – This section will help us to understand more about you. (7 Questions)

1) **Do you own a cell phone? Yes or No** (Please circle one.)

2) **If you owned a cell phone, is there anything that would prevent you from using it to take a cell phone audio tour?** (Please list anything that comes to mind.)

_____

3) **Do you own an MP3 player? Yes or No** (Please circle one.)

4) **If you owned an MP3 player, is there anything that would prevent you from using it to take an audio tour?** (Please list anything that comes to mind.)

_____

5) **Are you: Male or Female** (Please circle one.)

6) **What is your age?** _____

7) **What is the highest level of education you have achieved?** (Please check one answer only.)

☐ Less than High School   ☐ High School   ☐ Vocational / Technical College Diploma
☐ University Undergraduate Degree   ☐ University Graduate Degree

Thank you for taking the time to complete this questionnaire.

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OPTIONAL

Please enter any additional comments here:

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Appendix D

Summary of Experiment Provided to Participants

Thank you for taking the time to listen to the audio tour and respond to the questionnaire. The purpose of this study was to examine how visitors learn from audio tours. In total 6 different tours exist and each participant only hear one of the tours. Each of the 6 tours has different qualities that are believed to affect your ability to learn from what you heard. One of the tours uses personalized language. For example, it says; "As **you** look around **you** will notice that the 20 block exchange district gains its unique character from the covered alleys, narrow streets, and massive stone and brick warehouses". While one of the other segments uses multiple examples when it says; "The 20 block exchange district gains its unique character from the covered alleys, narrow streets, and massive stone and brick warehouses **like the ArtSpace building and the Kelly Building on Bannantyne.**" The questions in section 2 of the questionnaire that ask about other historic areas were used to find out if people are able to apply what they learned to new situations. We believe that the way the audio segment is worded will affect your ability to apply your knowledge to a new situation.   If you have any further questions about this research please contact: Christine Van Winkle, Graduate Research Assistant, Parks, Recreation and Tourism Management Department, Clemson University, winklev@clemson.edu.

Appendix E

Correlations

Table 20

Correlations Between Learning Transfer and Opinion About Audio Tour

		1	2	3	4	5	6
1. Inverse of							
far transfer	r	1.00	-0.43	-0.07	-0.06	0.00	0.05
	p		0.00	0.36	0.46	0.99	0.52
	N	171.00	169.00	168.00	169.00	167.00	165.00
2. Log of							
near transfer	r	-0.43	1.00	-0.04	-0.09	-0.12	-0.09
	p	0.00		0.59	0.23	0.11	0.24
	N	169.00	170.00	167.00	168.00	166.00	164.00
3. Informative	r	-0.07	-0.04	1.00	0.61	0.40	0.49
	p	0.36	0.59		0.00	0.00	0.00
	N	168.00	167.00	175.00	174.00	173.00	171.00
4. Interesting	r	-0.06	-0.09	0.61	1.00	0.56	0.55
	p	0.46	0.23	0.00		0.00	0.00
	N	169.00	168.00	174.00	176.00	174.00	172.00
5. Entertaining	r	0.00	-0.12	0.40	0.56	1.00	0.33
	p	0.99	0.11	0.00	0.00		0.00
	N	167.00	166.00	173.00	174.00	174.00	171.00

Table 20

Correlations Between Learning Transfer and Opinion About Audio Tour

Continued

6. Learned	*r*	0.05	-0.09	0.49	0.55	0.33	1.00
	p	0.52	0.24	0.00	0.00	0.00	
	N	165.00	164.00	171.00	172.00	171.00	172.00

Table 21

Correlations Between Learning Transfer and Knowledge

		1	2	3	4	5
1. Inverse of						
Far Transfer	*R*	1.00	-0.43	-0.02	0.10	0.10
	P		0.00	0.78	0.20	0.18
	N	171.00	169.00	169.00	168.00	169.00
2. Log of						
Near Transfer	*R*	-0.43	1.00	0.00	-0.06	-0.10
	P	0.00		0.96	0.47	0.22
	N	169.00	170.00	168.00	167.00	168.00
3. Knowledge						
Exchange	*R*	-0.02	0.00	1.00	0.61	0.59
	P	0.78	0.96		0.00	0.00
	N	169.00	168.00	176.00	175.00	175.00

Table 21

Correlations Between Learning Transfer and Knowledge Continued

4. Knowledge

Designation	R		0.10	-0.06	0.61	1.00	0.82
	P		0.20	0.47	0.00		0.00
	N		168.00	167.00	175.00	175.00	174.00

5. Knowledge

Preservation	R		0.10	-0.10	0.59	0.82	1.00
	P		0.18	0.22	0.00	0.00	
	N		169.00	168.00	175.00	174.00	176.00

Table 22

Correlations Between Learning Transfer and Interest

		1	2	3	4	5
1. Inverse						
Far Transfer	R	1.00	-0.43	-0.08	0.06	-0.06
	P		0.00	0.31	0.46	0.43
			169.0	167.0	166.0	166.0
	N	171.00	0	0	0	0
2. Log						
Near Transfer	R	-0.43	1.00	0.08	0.03	0.13
	P	0.00		0.32	0.72	0.10
				170.0	166.0	165.0	165.0
	N	169.00	0	0	0	0
3. Interest in the						
exchange district	R	-0.08	0.08	1.00	0.60	0.49
	P	0.31	0.32		0.00	0.00
			166.0	170.0	169.0	169.0
	N	167.00	0	0	0	0

Table 22

Correlations Between Learning Transfer and Interest Continued

4. Interest in

Historic Designations		1	2	3	4	5
	R	0.06	0.03	0.60	1.00	0.62
	P	0.46	0.72	0.00		0.00
	N	166.00	165.00	169.00	169.00	169.00

5. Interest in Historic

Preservation		1	2	3	4	5
	R	-0.06	0.13	0.49	0.62	1.00
	P	0.43	0.10	0.00	0.00	
	N	166.00	165.00	169.00	169.00	169.00

Table 23

Correlations Between Learning Transfer and Demographic Variables

		1	2	3	4
1. Log of					
Near Transfer	r	1.00	-0.43	-0.08	0.07
	p		0.00	0.30	0.34
	N	170.00	169.00	164.00	166.00
2. Inverse of					
Far Transfer	r	-0.43	1.00	0.10	-0.14
	p	0.00		0.19	0.06
	N	169.00	171.00	165.00	167.00
3. Age	r	-0.08	0.10	1.00	0.35
	p	0.30	0.19		0.00
	N	164.00	165.00	171.00	171.00

Table 23

Correlations Between Learning Transfer and Demographic Variables

4. Highest level					
of education	*r*	0.07	-0.14	0.35	1.00
	p	0.34	0.06	0.00	
	N	166.00	167.00	171.00	173.00

Appendix F

Effect of Each Treatment on Near and Far Transfer

Table 24

Tests of Between-Subjects Effects for the Six Interpretive Message

Source	df	F	η	*p*
Log Near Transfer	5	2.67	0.08	0.02
Inverse Far Transfer	5	2.78	0.08	0.02
S within-group error				
Log Near Transfer	162	(0.05)		
Inverse Far Transfer	162	(0.09)		

Note. Values enclosed in parentheses represent mean square errors. *S* = subjects.

Table 25

LSD Multiple Comparisons for the Six Interpretive Messages

Dependent Variable	Audio Tour Number (I)	Audio Tour Number (J)	Mean Difference (I-J)	Std. Error	*p*	95% Confidence Interval Lower Bound	Upper Bound
Log of Near Transfer							
	1	2	0.10	0.06	0.10	-0.02	0.21
		3	-0.10	0.06	0.08	-0.22	0.01
		4	0.03	0.06	0.55	-0.08	0.15
		5	-0.03	0.06	0.57	-0.15	0.08

Table 25

LSD Multiple Comparisons for the Six Interpretive Messages Continued

	6	-0.03	0.06	0.59	-0.15	0.08
2	1	-0.10	0.06	0.10	-0.21	0.02
	3	-0.20	0.06	0.00	-0.32	-0.08
	4	-0.06	0.06	0.29	-0.18	0.05
	5	-0.13	0.06	0.03	-0.25	-0.01
	6	-0.13	0.06	0.03	-0.24	-0.01
3	1	0.10	0.06	0.08	-0.01	0.22
	2	0.20	0.06	0.00	0.08	0.32
	4	0.14	0.06	0.02	0.02	0.25
	5	0.07	0.06	0.24	-0.05	0.19
	6	0.07	0.06	0.23	-0.04	0.19
4	1	-0.03	0.06	0.55	-0.15	0.08
	2	0.06	0.06	0.29	-0.05	0.18
	3	-0.14	0.06	0.02	-0.25	-0.02
	5	-0.07	0.06	0.26	-0.18	0.05
	6	-0.07	0.06	0.27	-0.18	0.05
5	1	0.03	0.06	0.57	-0.08	0.15
	2	0.13	0.06	0.03	0.01	0.25
	3	-0.07	0.06	0.24	-0.19	0.05
	4	0.07	0.06	0.26	-0.05	0.18
	6	0.00	0.06	0.97	-0.11	0.12

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Table 25

LSD Multiple Comparisons for the Six Interpretive Messages Continued

6	1	0.03	0.06	0.59	-0.08	0.15
	2	0.13	0.06	0.03	0.01	0.24
	3	-0.07	0.06	0.23	-0.19	0.04
	4	0.07	0.06	0.27	-0.05	0.18
	5	0.00	0.06	0.97	-0.12	0.11

Inverse of Far
Transfer

1	2	-0.05	0.08	0.52	-0.20	0.10
	3	0.14	0.08	0.07	-0.01	0.30
	4	0.06	0.08	0.46	-0.10	0.21
	5	0.19	0.08	0.02	0.04	0.35
	6	0.14	0.08	0.08	-0.02	0.29
2	1	0.05	0.08	0.52	-0.10	0.20
	3	0.19	0.08	0.02	0.04	0.35
	4	0.11	0.08	0.17	-0.05	0.26
	5	0.24	0.08	0.00	0.08	0.40
	6	0.19	0.08	0.02	0.03	0.34
3	1	-0.14	0.08	0.07	-0.30	0.01
	2	-0.19	0.08	0.02	-0.35	-0.04
	4	-0.08	0.08	0.28	-0.24	0.07
	5	0.05	0.08	0.54	-0.11	0.21
	6	-0.01	0.08	0.94	-0.16	0.15

Table 25

LSD Multiple Comparisons for the Six Interpretive Messages Continued

4	1	-0.06	0.08	0.46	-0.21	0.10
	2	-0.11	0.08	0.17	-0.26	0.05
	3	0.08	0.08	0.28	-0.07	0.24
	5	0.13	0.08	0.09	-0.02	0.29
	6	0.08	0.08	0.32	-0.08	0.23
5	1	-0.19	0.08	0.02	-0.35	-0.04
	2	-0.24	0.08	0.00	-0.40	-0.08
	3	-0.05	0.08	0.54	-0.21	0.11
	4	-0.13	0.08	0.09	-0.29	0.02
	6	-0.05	0.08	0.49	-0.21	0.10
6	1	-0.14	0.08	0.08	-0.29	0.02
	2	-0.19	0.08	0.02	-0.34	-0.03
	3	0.01	0.08	0.94	-0.15	0.16
	4	-0.08	0.08	0.32	-0.23	0.08
	5	0.05	0.08	0.49	-0.10	0.21

Note. 1= basic, 2= advance organizer basic, 3= analogical reference, 4= advance organizer with analogical reference, 5= personalization and 6= advance organizer with personalization.

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