A Study of the Perceived Outcomes of Participation in a Gatineau Park Interpretive Program

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ABSTRACT

This study, patterned on Benton's (2009) model of the four conceptions of interpretation which includes connecting visitors to resources through use of interpretive techniques, conveying mission and influencing behaviour, encouraging environmental literacy, and promoting recreational outcomes (modified from Benton's use of tourism outcomes), took a comprehensive approach to examine the recreational and environmental outcomes of participation in interpretive programs at Gatineau Park (N = 78). The findings included significant correlations between the interpretive techniques and environmental literacy (n = 73, r = .711, p = .000), pro-environmental behavioural intentions (n = 70, r = .267, p = .025), and recreation satisfaction (n = 67, r = .419, p = .000) outcomes. There was also a significant correlation between recreation satisfaction and environmental literacy (n = 66, r = .518, p = .000). Path analysis indicated the direction of these relationships with environmental literacy directly influencing recreation satisfaction and interpretive techniques indirectly influencing recreation satisfaction through environmental literacy, revealing that environmental literacy mediated the relationship between the interpretive techniques used and recreation satisfaction.

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Chapter 1: INTRODUCTION

While interpretation has many goals including those of personal growth and inspiring passion in people, another goal of major concern to park management is convincing visitors to appreciate nature by engaging in activities with minimal environmental impact in order to preserve the landscape. This chapter introduces a study, patterned on a modified version of Benton's (2009) model of the four conceptions of interpretation, that investigated the environmental and recreational outcomes of a park interpretation program. A description of Benton's model and how it was modified to suit this study is discussed along with the study's purpose, research questions, key concepts, and significance.

Interpretation

The term interpretation has many definitions and there has been much controversy over the term amongst those who practice and study interpretation (Beck & Cable, 2011). The following definition presented by Beck and Cable (2011) is a comprehensive one that includes the main components of this activity.

> Interpretation is an educational activity that aims to reveal meanings about our culture and natural resources. Through various media –including talks, guided tours, and exhibits –interpretation enhances our understanding, appreciation, and, therefore, protection of historic sites and natural wonders. Interpretation is an informational and inspirational process that occurs in our natural parks, forests… interpretation can add to a fuller understanding of their beauty and meaning, as well as protect their integrity. (p. xvii)

The National Association for Interpretation (NAI, 2007) defines interpretation as "a mission based communication process that forges emotional and intellectual connections between the interests of the audience and the meanings inherent in the resource" (para 1). Based on these

definitions, interpretation is meant to be an informational and inspirational activity that allows individuals to develop a better understanding of, and a deeper appreciation for the place so that in turn, they may come to protect it.

> Interpretation is driven by a philosophy that charges interpreters to help audiences care *about* park resources so they might support the care *for* park resources. Interpretation establishes the value of preserving park resources by helping audiences discover the meanings and significance associated with those resources (National Park Service, 2007, p. 1).

According to the National Park Service (2007), the purpose of interpretation is:

> to help visitors discover and understand the meanings of these sites [national parks]. For those visitors that already relate to the site, interpreters offer opportunities to discover a broader understanding, to see the site with new eyes. The meaning that sites provide can help to inspire and rejuvenate – perhaps leading to an appreciation for the richness and complexity of life. (p. 7)

While the above definitions of interpretation are inclusive of both nature and cultural interpretation, the focus of this study was on nature interpretation. Cultural interpretation focuses on historic sites including historic structures, monuments, events, or people that are part of the local or national heritage (National Association for Interpretation, 2007). According to Beck and Cable (2011) "cultural sites celebrate the drama of human conduct" (p. xxv). Cultural interpretation programs help participants enhance their understanding of the local or national history (Beck & Cable, 2011). Conversely, nature interpretation focuses on the on-going natural processes of the natural world (National Association for Interpretation, 2007). Nature

interpretation helps connect the participants with the beauty found in nature and provides a greater understanding of the splendour and wonders of the natural world (Beck & Cable, 2011).

There are two ways of providing interpretation: personal interpretation and nonpersonal interpretation. According to Beck and Cable (2011) "personal interpretation refers to programs in the form of talks, demonstrations, puppet shows, living history, storytelling, nature walks, and tours" (p. xxii). This type of interpretation requires an actual interpreter to deliver the program and provide opportunities for the visitors to interact with the interpreter in person (National Park Service, 2007). Conversely, nonpersonal interpretation requires no interpreter as the visitor is self-guided by interacting independently with interpretive exhibits, signs/plaques, brochures, or interactive audio/visual devices (Beck & Cable, 2011). The current research focused on personal interpretation programs delivered by an interpreter.

In personal interpretation, the role of the interpreter is very important. According to Mills (1920/1990) an interpreter is a "naturalist who can guide others to the secrets of nature" (p. 6). Additionally, the role of the interpreter in nature interpretation is to translate the physical environment into a language that may aid visitors to develop meanings associated with these places (National Park Service, 2007). According to the National Park Service (2007) interpreters could also be called "visitor experience specialists" (p. 2) as they "provide orientation, information and inspiration in the right amounts and at the right times so that visitors will have more enjoyable, meaningful and complete experiences" (p. 2). An effective interpreter is someone who can reveal what may be unseen and inspire people to make connections to their larger surroundings. It is the interpreter's responsibility to educate and inform but also to connect the visitors to the resource by helping the visitors gain a sense of place. Additionally, it is the

interpreter's responsibility to provide an enjoyable and optimal outdoor recreation experience (Beck & Cable, 2011).

Benton's Model - Four Conceptions of Interpretation

Benton (2009) noted that in the field of interpretation there are several different goals. He stated that as "interpretive staff seeks to connect visitors to resources, they may want to positively influence behaviour toward fragile areas, they may convey environmental messages, and they may use tourism ideas to appeal to visitors' travel interest" (p. 8). Based on these four goals of interpretation and their associated outcomes, Benton (2009) created a model that included four conceptions of interpretation (see Table 1).

Benton's (2009) first conception of interpretation is connecting visitors to resources through the use of appropriate techniques. Benton explained that "the primary goal is for interpreters to use their special knowledge of nature, culture, and history and their communication and artistic skill to reveal what is not readily apparent to peoples' emotion, intellect, and spirit" (p. 8). This conception is concerned with techniques used in an interpretive program and the interpreter's ability to make connections between the visitors and the resource. Benton explained that in order to successfully connect visitors to the resource there are three main variables to be considered. The first variable is knowledge and short-term attention factors; it is the ability to capture and hold the visitors' attention. The second variable is the use of successful techniques for interpretation to deliver the program effectively. The third variable is long-term memory of the program; it is the ability to provide a memorable program and content that the visitors will be able to retain. These three variables are indicators of successful interpretive techniques used to connect visitors to resources.

Table 1
Benton's (2009) Model of Interpretation
Four conception model in narrative form.

	One - Connecting visitors to resources	Two - Influencing visitor behavior	Three - Encouraging environmental lit.	Four - promoting tourism outcomes
Terms/ Concepts	Understand	Conserve	Appreciate	Visit
	Appreciate	Protect	Aware/Know	Destination
	Knowledge	Preserve	Deplete	Travel
	Information	Keep	Drought	Gifts
	Imagination	Change/Stop	Famine	Time
	Visualize	Do/Do not	Natural Resource	Spend
	Picture	Public	Relationships	Buy
Conceptual Emphasis	Experience culture	Attitude/Behavior	Culture & Nature	Economic
	Intellectual	Local resource	Human impact	Market
	Emotional	Visitor activity	Scarcity/Ecology	Hospitality
	Physical	Agency mission	Social processes	Future plans
	Spiritual	Generations	Preservation	Local business
	Inspiration	Respect	Adaptation	Memories
Additional terms and ideas	Beauty/Wonder	Beliefs/Motives	Stewardship	Highway near
	Awe/Meanings	Rules/Vandalism	Attitudes/Issues	Souvenir
	Relate to/Empathy	Common sense	Problems/Science	Replica/Books
	Pay attention	Respect/Persuasion	Behavior back home	Camping

Source: Benton, G. M. (2009). From principle to practice: Four conceptions of interpretation. *Journal of Interpretation Research*, *14*(1), p. 13.

Benton's (2009) second conception of interpretation is conveying mission and influencing behaviour. Benton explained that interpretation needs "to carry a positive image of the agency to the public and to influence visitors' resource behavior" (p. 10). This conception is concerned with the interpretive program's ability to communicate an agency's mission to the public and get its message across. This conception is also concerned with the program's ability to influence visitors' behaviours. Benton argued that depending on the effectiveness of the interpretative program, the changes in visitors' behaviour can be organized into three categories: cognitive change (increase and retain knowledge), affective change (changes in emotion or sentiment), and behavioural change (actual changes of actions). This conception reflects the ability of the interpretive program to put forth a valuable message and influence visitors' pro-environmental behaviours and intentions.

Benton's (2009) third conception of interpretation is encouraging environmental literacy. Benton explained that interpretation "seeks to introduce people to ecological relationships" (p. 10), and "move visitors through the stages of awareness, appreciation, knowledge, skill, and motivation resulting in environmentally responsible behaviour" (p. 12). This conception is essentially concerned with the interpretive program's ability to enhance the visitors' environmental literacy by increasing their environmental knowledge, by facilitating an awareness of environmental issues, and by fostering an appreciation for the natural resource. Ideally, encouraging the visitors to become environmentally literate should motivate the participants to become environmentally responsible park visitors.

Finally, Benton's (2009) fourth conception is promoting tourism outcomes. This conception is concerned with the use of "travel ideas to appeal to visitors' leisure interests and to promote spending as a means of improving the economic benefits of natural and cultural

tourism" (Benton, 2009, p. 10). To operationalize this conception Benton examined questions such as where the interpretative visitors were traveling from, reasons for visiting the interpretive site, and if interpretive programs encouraged participants to spend money at the site. Since the sites examined in Benton's (2009) study were frequently visited by tourists (70% of the participants in Benton's study indicated that they were tourists from outside the region) examining tourism outcomes was appropriate for his study; however, this is not the case for the site (Gatineau Park) in the current study. In Gatineau Park the majority of park visitors are local residents with tourists from outside the National Capital Region comprising only 7.4% of the 2.7 million visitors per year which is approximately 200,000 visitors (Environics Research Group, 2012). Since tourism outcomes are less relevant and therefore less applicable to the current study, Benton's fourth conception was modified to reflect the related outcome of recreation satisfaction rather than tourism outcomes. Recreation satisfaction was chosen as the fourth outcome because it is an important part of the participant's interpretive experience. According to Beck and Cable (2011) interpretive activities are meant to be meaningful, educational and recreational, therefore it is important to examine the participants' satisfaction with their recreation experience. This conception is concerned with the interpretive program's ability to provide a positive and enjoyable recreation experience. Ideally, a positive recreation experience will engage the participants and enhance the environmental outcomes by providing a pleasurable and memorable experience.

This study was patterned on Benton's (2009) model and four of the specific research questions were based on a modification of Benton's four conceptions. In summary, the four conceptions used in this study were: (1) connecting visitors to resources through the use of interpretive techniques; (2) conveying agency mission and influencing intentions of pro-

environmental behaviour; (3) encouraging environmental literacy; and (4) promoting recreation satisfaction.

Conception One: Interpretive Techniques

The interpretive techniques mentioned in Benton's first conception refer to the methods and practices used in a successful interpretation program to connect visitors to resources. Beck and Cable (2011) provided the following list of 15 guiding principles for successful interpretation.

1. To spark an interest, interpreters must relate the subject to the lives of people in their audience.
2. The purpose of interpretation goes beyond providing information to reveal deeper meaning and truth.
3. The interpretive presentation—as a work of art—should be designed as a story that informs, entertains, and enlightens.
4. The purpose of the interpretive story is to inspire and to provoke people to broaden their horizons.
5. Interpretation should present a complete theme or thesis and address the whole person.
6. Interpretation for children, teenagers, and seniors---when these comprise uniform groups—should follow fundamentally different approaches.
7. Every place has a history. Interpreters can bring the past alive to make the present more enjoyable and the future more meaningful.

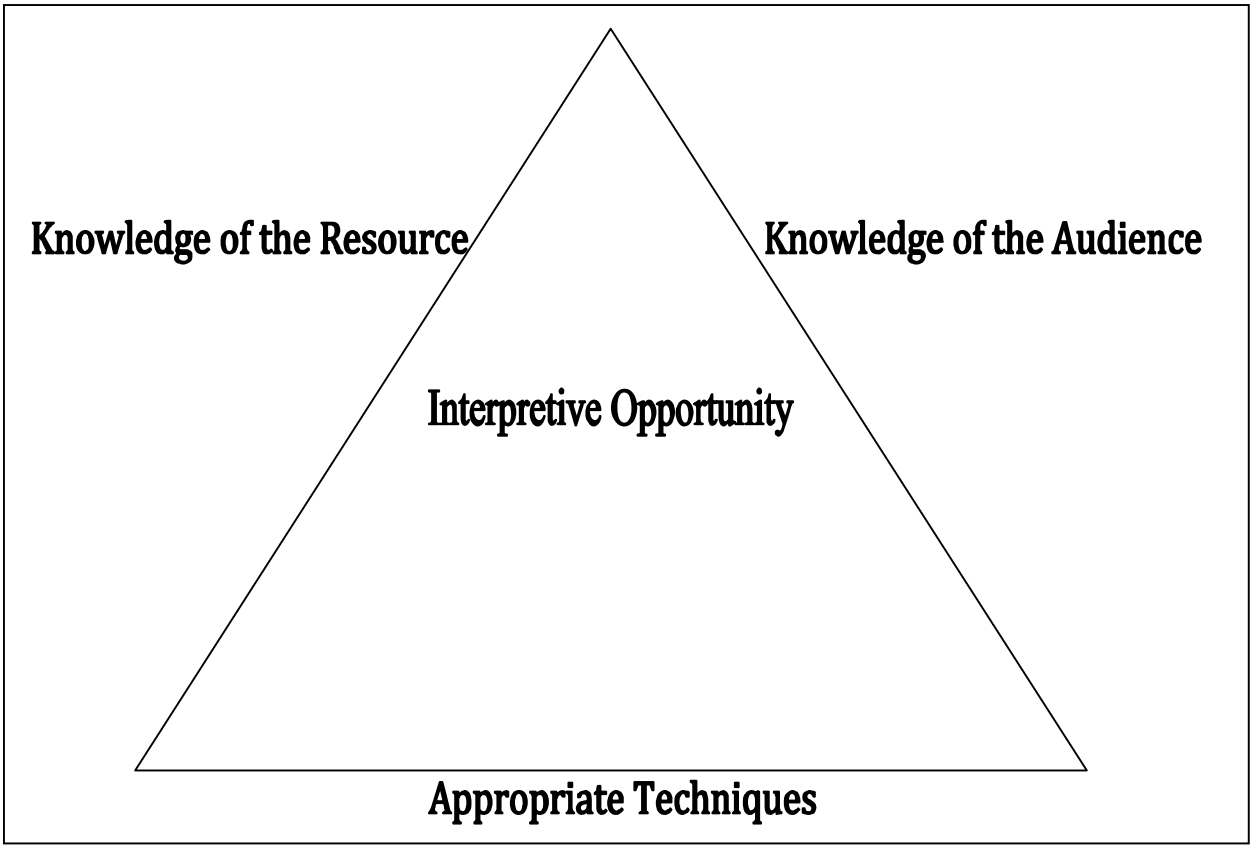
8. Technology can reveal the world in exciting new ways. However, incorporating this technology into the interpretive program must be done with foresight and thoughtful care.
9. Interpreters must concern themselves with the quantity and quality (selection and accuracy) of information presented. Focused, well-researched interpretation will be more powerful than a longer discourse.
10. Before applying the arts in interpretation, the interpreter must be familiar with basic communication techniques. Quality interpretation depends on the interpreter's knowledge and skills, which must be continually developed over time.
11. Interpretive writing should address what readers would like to know, with the authority of wisdom and its accompanying humility and care.
12. The overall interpretive program must be capable of attracting support—financial, volunteer, political, administrative—whatever support is needed for the program to flourish.
13. Interpretation should instill in people the ability, and the desire, to sense the beauty in their surroundings—to provide spiritual uplift and to encourage resource preservation.
14. Interpreters can promote optimal experiences through intentional and thoughtful program and facility design.
15. Passion is the essential ingredient for powerful and effective interpretation—passion for the resource and for those people who come to be inspired by it. (Beck & Cable, 2011, p. xxiv)

These 15 guiding principles are consistent with the U.S. National Park Service's (2007) interpretive equation, which is as follows:

> (KR + KA) AT = IO. An interpreter's knowledge of the resource (KR), combined with their knowledge of the audience (KA), can be shared through an appropriate technique (AT) to provide an interpretive opportunity (IO). The better the interpreter's knowledge of the resource and audience, and the more appropriate their techniques for presenting their knowledge to that audience, the more likely an opportunity will [be] offered for the visitors to form their own personal connections with the resource. (p. 10)

This interpretive equation has been depicted as an interpretive triangle (see Figure 1). Interpreters may use Beck and Cable's (2011) 15 principles as appropriate techniques to convey their knowledge of both the resource and the audience, thereby creating the ideal opportunity for successful interpretation.

Figure 1*: The Interpretive Triangle*



Source: National Park Service. (2007). *Foundations of interpretation.* Washington, DC: U.S. Department of the Interior: Author.

Conception Two: Pro-environmental Behaviour/Intentions

Pro-environmental behaviour refers to behaviour that is environmentally responsible, and is one way to consider whether interpretation is conveying the mission of the agency (e.g., a park agency) that is providing the program and influencing behaviour. Defined as behaviour that "consciously seeks to minimize the negative impact of one's actions on the natural and built world" (Boland & Heintzman, 2009, p. 31), pro-environmental behaviour is a desired outcome of nature interpretation that can include actions related to energy conservation, resource preservation, park protection, and park preservation (Knapp, Volk, & Hungerford, 1997). Since pro-environmental behaviours are difficult to measure, research studies often measure visitors' intentions to engage in environmentally responsible behaviour (pro-environmental intentions).

Conception Three: Environmental Literacy

According to Benton (2009) encouraging environmental literacy involves introducing people to ecological relationships and moving them "through levels of awareness, appreciation, understanding, ownership, and motivation to take responsible action to reduce human impacts on the environment" (p. 10). The first stage of environmental literacy is awareness, which refers to concern for the environment or an "awareness of environmental problems and a commitment to the protection of valued recreation sites" (Berns & Simpson, 2009, p. 81). To reach this stage, visitors must be provided with sufficient knowledge to become aware of the environmental issues at the site as well as the agency's management policies and goals (Knapp et al., 1997).

The second stage of environmental literacy is appreciation. The appreciation stage refers to attachment and empathy for the natural area. In order to arrive at this stage, visitors must be provided with sufficient information as well as experiences that "promote an empathetic perspective toward the resource site" (Knapp et al., 1997, p. 30).

The third stage of environmental literacy is understanding. The understanding stage refers to comprehension of the information provided about the natural area. To reach this stage, visitors must be provided with "experiences that promote an understanding/comprehension of resource site information" (Knapp et al., 1997, p. 30).

The fourth stage of environmental literacy is ownership. The ownership stage refers to a cognitive awareness and understanding of "how visitors and their collective actions may influence the quality of the natural resource site" (Knapp et al., 1997, p. 30). To arrive at this level, visitors must be provided with "the knowledge necessary to permit visitors to investigate and evaluate natural resource site issues" (Knapp et al., 1997, p. 30).

The final stage of environmental literacy is motivation. The motivation stage refers to the empowerment of the individual to make environmentally responsible decisions and actions. In order to reach this final stage, visitors must develop the skills necessary "to take positive/responsible environmental actions in regard to resource site issues" (Knapp et al., 1997, p. 30).

Conception Four: Recreation Satisfaction

According to Karlis (2004) recreation as personal experience refers to "the understanding that recreation extends beyond activity to include a state of being and a way of life…recreation is an experience or activity that is self-defined and self-determined" (p. 37). In this understanding, recreation is based on feelings and emotions such as satisfaction, intrinsic motivation, freedom, and pleasure (Karlis, 2004). Since this type of recreation is described as a personal experience, the level of satisfaction of the experience is of the utmost importance. In order for the visitors to be satisfied with their recreation experience, their recreation needs must be met throughout the experience.

Purpose of Study

The purpose of this study was to determine if the interpretation programs provided by Gatineau Park and Friends of Gatineau Park had a significant impact upon visitors' environmental and recreational outcomes. This study investigated whether the interpretive programs were successful in: connecting participants/park visitors to the resource through the use of effective interpretive techniques (conception one); conveying the agency's message and influencing visitors' behavioural intentions towards the natural environment (conception two); providing knowledge and increasing environmental literacy (conception three); and offering a satisfying recreation experience (conception four).

Main Research Questions

General research question:

- What are the perceived environmental and recreation outcomes of park interpretive programs?

Specific research questions:

- To what extent are park interpretive programs able to connect visitors to the resource through the use of interpretive techniques?
- What is the perceived impact of park interpretive programs upon pro-environmental intentions?
- What is the perceived impact of park interpretive programs upon environmental literacy?
- To what extent is participation in park interpretive programs perceived as a satisfying recreation experience?

- Is there a relationship between the visitors' assessment of interpretive techniques and the interpretive outcomes (environmental and recreation)?
- Is there a relationship between environmental and recreation outcomes?

Need for Study

This study is needed for various reasons. Primarily, this study examines several desired environmental outcomes of interpretive programs rather than just one. According to Munro, Morrison-Saunders, and Hughes (2008), most evaluations of interpretation programs only really measure changes in the visitors' knowledge. This study goes beyond that to include not only the interpretive program's ability to encourage environmental literacy, but pro-environmental intentions as well. Furthermore, the ability of the interpretive program to connect visitors to the resource using appropriate interpretation techniques is measured using Beck and Cable's (2011) 15 guiding principles for successful interpretation. Thus this study is unique not only because it examines two environmental outcomes, but it also has the potential to contribute to the existing literature on the effects of interpretation as well as the literature on interpretive principles.

The use and modification of Benton's (2009) model of the four conceptions of interpretion allows this study to test a recently developed model as well as give it a unique twist by modifying the last conception. The inclusion of the visitors' recreation satisfaction adds an interesting new element to the research. Moreover, Benton's (2009, 2011) studies examined cultural interpretation while this study examines nature interpretation. In summary, this study is important because it builds on the current literature in the interpretation field, and it offers several unique elements to set it apart from other studies that make it both a beneficial and valuable contribution to the existing interpretation literature.

Finally, this study is needed because while there has been much natural science research

on several features of the Gatineau Park landscape, very little research has been conducted on Gatineau Park visitors (Heintzman, 2010). A recent exception is a study on "human health and well-being motivations and benefits associated with protected area experiences" that included Gatineau Park visitors in the sample (Lemieux et al., 2012, p. 71). This park is also important to study due to several unique features (Heintzman, 2010). First, it is neither a national park nor a provincial park but rather is managed and operated by the National Capital Commission (an agency of the Canadian federal government). Second, unlike other large natural parks in Eastern Canada this park is adjacent to a large urban area in the National Capital Region. Third, this park has recently undergone changes in purpose and is in the process of changing from a nature park (in which conservation and recreation were balanced) to a conservation park (in which conservation is a first priority).

Significance for Research and Practice

The results of this study will hopefully contribute to the current body of knowledge on the interrelationships between interpretive techniques and the interpretive outcomes of environmental literacy, pro-environmental behaviour intentions and recreation satisfaction within the context of nature interpretation programs offered in park settings. The study may contribute to the practice of interpretation in general, by enhancing practitioners' understanding of the interrelationships between interpretive techniques and interpretive outcomes, and also through the provision of a tool for the evaluation of interpretive programs. More specifically, the results of the study will provide feedback for interpretive staff who implement the interpretation programs in Gatineau Park. Study results may be used to enhance the programs' environmental and recreational outcomes. To some extent this feedback may be used to enhance current interpretation programs or develop new interpretation programs in similar nature settings

Chapter 2: LITERATURE REVIEW

Within the literature regarding parks, outdoor recreation, and interpretation, it is abundantly clear that park staff are having a great deal of difficulty attempting to balance the protection of natural resources and ecological integrity with high quality recreation opportunities (Marion & Reid, 2007). While this issue is being managed by a variety of different strategies, interpretation programs are sometimes overlooked as potential management techniques. According to a report by Hvenegaard (2011),

> In general, there is a small but growing body of research on visitors' awareness and use of interpretive programs on a park or system-wide basis. Moreover, additional research is needed on the effectiveness and impact of current interpretive programming on public attitudes and actions. (p. 3)

Essentially, "the management goals of interpretation in the context of natural areas focus on change to low-impact behavior and ultimately long-term conservation behavior" (Kim, Airey, & Szivas, 2011, p. 322).

This chapter begins with a discussion of the effectiveness of nature interpretation in relation to the use of rules and regulations in park management. Then empirical studies on the environmental and recreational outcomes of interpretation programs will be presented. Additionally, difficulties in evaluating interpretation programs will be discussed, and frameworks and models for evaluating interpretation programs will be presented.

Interpretation versus Rules and Regulations

In relation to Benton's (2009) conception concerning interpretation's goal of influencing behaviours, park managers often enforce rules and regulations in efforts to deter visitors from engaging in environmentally damaging behaviours; however, undesired behaviours often

continue to occur regardless of the rules and regulations. Marion and Reid (2007) reviewed 21 empirical studies that examined visitor knowledge and behaviour, and found that while rules and regulations might deter some, they are not always effective in deterring environmentally destructive behaviour. They stated that rules and regulations are not always effective because of the negative focus on what activities are not allowed in the park. Based on the findings from the empirical studies they reviewed, Marion and Reid suggested that visitor education would be a better response to deter environmentally harmful behaviour, because visitors often do not know that their activities are harmful to the environment. Providing visitors with educational opportunities may encourage them to participate in minimal impact activities. For example, a U.S. study conducted by Stern, Powell, Martin, and McLean (2012) on interpretive best practices for natural and cultural interpretation that included 3,603 surveys from 376 live programs at 24 different National Park Service Units discovered that "programs that explicitly addressed the costs of undertaking a potential behavior were generally more successful at influencing behavior change intentions than others" (p. 31). Based on the study's findings Stern et al. (2012) suggested that interpretation "should not be expected to change behaviour unless a specific behavior is explicitly targeted and communication is designed to address attitudes relevant to that behavior" (p. 38). Therefore it is important that interpretive programs specifically address minimal impact behaviour in order to successfully influence visitors' pro-environmental behaviours or intentions. Another study conducted by Powell and Ham (2008) examined visitor knowledge, behaviour, experience, and attitude following an ecotourism interpretation program at Galapagos National Park in Ecuador. They found that "general environmental behavioural intentions...appeared to be significantly influenced" (p. 478) after participating in the national park's interpretation program. In the same study, the authors also found a "6% increase in pro-

conservation attitudes" in park visitors following participation in the interpretive program (Powell & Ham, 2008, p. 478). The interpretation program was able to change the behavioural intentions as well as increase positive attitudes towards conservation in some of the park visitors. According to Stern et al.'s (2012) study on interpretive program best practices, behavioural intentions were not always influenced by participation in interpretive programs, however approximately 40% of participants reported changes in their pro-environmental intentions after program participation. This finding indicates that the programs had some success in increasing pro-environmental intentions in their participants. Based on findings from Littlefair's (2003, 2004) studies at Lamington National Park in Australia which investigated the effects of interpretive tours with and without minimal impact information, Buckley and Littlefair (2007) concluded that "minimal-impact education can indeed reduce actual visitor impacts" (p. 324). In addition, they suggested that education can only reduce certain impacts and that different approaches to education can result in reduction of different impacts.

Much of the empirical literature reveals that educating park visitors on the environmental impacts of their activities can be beneficial in reducing some of the harmful environmental impacts caused by park visitors and can change some undesirable behaviours (Marion & Reid, 2007; Powell & Ham, 2008; Buckley & Littlefair, 2007); however, there is much less empirical literature on the importance of different approaches to this education because, as Buckley and Littlefair (2007) found, these approaches can result in different impacts. For example, a study conducted by Gramann and Vander Stoep in 1986 (as cited by Marion & Reid, 2007), evaluated the effectiveness of delivering a message related to reducing environmentally depreciative behaviour in Shiloh National Military Park in the U.S. through the use of interpretation. The same message was given three different ways, each with a different rationale for behaving

appropriately. The three rationales included resource preservation, awareness of consequences, and the provision of incentives (Marion & Reid, 2007). The researchers found that all messages were effective; however, awareness of consequences was the most effective, as most depreciative behaviour was found to be recognized as uninformed behaviour (Marion & Reid, 2007). It would seem that many undesired behaviours can be eliminated by educating visitors and providing them with explanations of the consequences for their negative behaviour; however, it is important to note that more persuasion is required for an impact on more severe destructive behaviours.

Interpretation and Environmental Outcomes

Both short-term and long-term behavioural changes can be derived from nature interpretation programs based on the type of technique used to persuade visitors to modify their actions. Kim et al. (2011) conducted a study that examined the weaknesses and strengths of site-based interpretation in terms of influencing visitors' attitudes and behavioural intentions. According to Kim et al., there are two routes to persuasion: the peripheral route to persuasion and the central route to persuasion. The peripheral route to persuasion is effective for short-term modifications of behaviours as it occurs when the recipient is either unmotivated or incapable of understanding the logical argument within the message (Kim et al., 2011). As a result, this type of persuasion may be used to eliminate immediate, short-term destructive behaviours. Conversely, the central route to persuasion "relies on visitor attention, consideration and internalisation of the message" (Marion & Reid, 2007, p. 11). After careful consideration, the values are internalised and become part of the individual's belief system, which results in long-term behavioural changes (Kim et al., 2011; Marion & Reid, 2007). While both short-term and long-term behaviour changes are important, interpretive programs aim to persuade their

participants to make long-term changes to their behaviour or lifestyles, so that the values are internalized and become important to the individual.

Based on the above literature (Marion & Reid, 2007; Kim et al., 2011), it is clear that interpretation can be successful in raising environmental awareness, producing short-term behavioural changes such as decreasing immediate negative behaviours, and educating visitors to reduce uninformed, destructive behaviours. However, in order to produce more long-term behavioural changes, new attitudes and beliefs must be adopted by individuals to ensure their ongoing commitment to the preservation of the landscape. Benton (2009) argued that encouraging environmental literacy would generate a deeper understanding and appreciation of the landscape and lead to environmental awareness and long-term conservation values; however, it appears that persuading visitors to adopt these long-term values through interpretation can be difficult. According to the study conducted by Kim et al. (2011), the weakness of interpretation is that it has limited effectiveness in promoting long-term conservation behaviour. Thus, different strategies should be considered for different types of interpretation and "managers need to go one step further and evaluate the effects of different interpretive strategies" (Kim et al., 2011, p. 331). Kim et al. suggested that there are a number of considerations in addition to the strategy chosen:

> the level of engagement, the direct and relative impacts of the type of media, the quality of programs offered, or the intensity and affective reactions to the persuasive message, will validate effective techniques that might be useful to improve the design of interpretive programs. (p. 332)

Focusing on the intensity and affective reactions to the message may be a beneficial tool in determining how intense the interpreter must be. Munro et al.'s (2008) review of 21 empirical

studies that aimed at evaluating nature interpretation, found that "more intense interpretation…has a greater probability of influencing the visitor. For example, interpersonal interpretation is usually ascribed as having greater intensity (and thus influence) than non-personal interpretation" (Munro et al., 2008, p. 2). Despite the numerous difficulties involved with influencing behaviour, personal interpretation programs do have the potential to be successful and influential. According to a report by Hvenegaard (2011) on interpretive programs in Miquelon Lake Provincial Park, Alberta, most of the participants suggested that the interpretive program had an impact on their future "interest, learning, awareness of environmental issues, appreciation for protected areas, and a desire to help the environment" (p. 13). The findings of this report indicated that interpretive programs can educate and still have the potential to inspire action and long-term appreciation. However, it is also important to recognize that in most cases park visitors are participating in these activities during their leisure time and if they feel they are being lectured, they may not enjoy the experience, and as a result, may not participate or return to the park again. It is important for visitors to enjoy their visit because if they have a positive experience, they are more likely to support management strategies and accept the park's values (Kuo, 2002).

Interpretation and Recreation Outcomes

As previously mentioned, in most cases interpretive program participants choose to attend these programs and participate in them as a recreational or leisure activity. Therefore, the programs must be entertaining and provide an enjoyable recreation or leisure experience. Since the two major defining characteristics of leisure experience, when studied from a psychological perspective, are perceived freedom and intrinsic motivation (Neulinger, 1974; Iso-Ahola, 1980) it is important that an interpretive program have some element of choice and is an intrinsically

rewarding experience. Additionally it is important that a program inspires people to be intrinsically motivated to engage in pro-environmental behaviours and come to see these actions as freely chosen and not obligatory activities that they have been extrinsically pressured to engage in. Intrinsic motivation is meant to come from within the individual, however, an interpretation program could help awaken these desires within people by providing enough stimulus that the participants reach an optimum level of arousal or interest, that they internalize the values and become intrinsically motivated (Iso-Ahola, 1999).

In Powell and Ham's (2008) study of ecotourism interpretation programs in Galapagos National Park, visitor experience and satisfaction was included as a variable. Powell and Ham stated that enjoyment and satisfaction were important variables for evaluating the interpretation programs, as well as for understanding and predicting visitor behaviour. They wrote:

> If tourists do not find the transmission of information enjoyable, they are unlikely to pay attention to its content…enjoyment is one of the key components of successful interpretation and is thought to mediate the effectiveness or likelihood of influencing behavioural outcomes. (p. 475)

Powell and Ham's study revealed that the participants had high levels of enjoyment and satisfaction during their interpretive experience. While their study did not suggest that the interpretive experience could be considered a recreation experience, enjoyment and satisfaction are elements that are also conducive to a recreational experience.

Furthermore, according to the report on interpretive programs at Miquelon Lake Provincial Park, the top two reasons for visiting the park were to spend time with family and friends, and for recreation (Hvenegaard, 2011). This means that people visit the park for recreational purposes, to enjoy themselves, or spend time with their family. Moreover, while the

greatest motivation for participating in interpretive programs was that the visitors felt it would be good for the other members in their group (e.g., family, friends), the motivations with the second and third highest mean scores for participating in interpretive programs at the park were entertainment followed by education (Hvenegaard, 2011). This finding suggests that park visitors participated in interpretive programs primarily for entertainment and enjoyment to satisfy their recreation needs, and to a lesser extent for education purposes to increase their knowledge. This finding further indicates that interpretive programs, in addition to being educational, must be fun and entertaining recreation experiences in order to attract participants. Interpretive programs could include both recreation and education to increase their probability of success.

Ultimately, it is important that recreational outcomes are included in the evaluation of interpretation programs because if participants do not enjoy their experience it is not likely that they will gain anything significant from the program nor is it likely that they will return or change their environmental behaviours. This point is further emphasized by Ham and Weiler's (2007) study on the role of interpretation in a satisfying experience which found that participation in interpretive programs positively influences visitors' overall satisfaction. Interpretation programs have to do more than educate, they have to entertain and enlighten through the provision of enjoyable and satisfying recreation experiences. Unfortunately there is still only a small but increasing amount of research on the recreational outcomes of interpretive programs.

Difficulties in the Evaluation of Interpretation Programs

As previously mentioned, Kim et al. (2011) suggested the importance of evaluating the quality of the program offered. A high quality program with high quality interpretation would be most effective in raising environmental awareness and reaching park visitors to instil

conservation values in them. Determining what makes a high quality program can be problematic since there are no universally recognized criteria for evaluating interpretation programs. Since there are no standardized evaluation criteria, there is a lack of consistency amongst the elements evaluated in various studies. According to Munro et al. (2008), most evaluations of interpretation programs only really measure changes in the visitors' knowledge and attitudes. Actual behaviour changes are rarely measured and thus one of the main purposes of interpretation programs is not included in these evaluations (Munro et al., 2008). According to a literature review by Munro et al. (2008), out of 21 studies conducted that evaluated interpretation programs, only two of the studies "focused on behaviour change as a primary evaluative criterion" (p. 7), while the rest focused on knowledge gained and attitude changes. Of course it may be hypothesized that knowledge gained and changes in attitudes can ultimately lead to changes in behaviour; however, most of the studies examined by Munro et al. did no follow up with the participants and as a result did not evaluate the interpretation program in terms of actual changes in behaviours. Furthermore, it is also important to note even when the focus is on behaviour change, that actual changes in behaviour are rarely measured; rather research studies often investigate self-reported behaviours, which are the participants' perceptions of their own behaviours or intended behaviours (Camargo & Shavelson, 2009). In order to measure actual behaviours, observations of the participants are usually required but this method is often found to be unfeasible or too time-consuming (Camargo & Shavelson, 2009). However, a recent study by Stern et al. (2012) on interpretive best practices did examine changes in participants' behavioural intentions and found that 40% of participants reported changes in their behavioural intentions.

Additionally, according to Stern et al. (2012) "most evaluations of live interpretation assessed the outcomes of a single program…" and "no study has yet isolated the impacts of

different interpretive practices and approaches upon visitor outcomes" (p. 6). Since most interpretive evaluations only examine the outcomes of one individual program, more research is needed to examine the outcomes of several varied interpretive programs to identify the effects of different methods and techniques.

There is clearly a gap in the literature regarding the evaluation of interpretation programs, specifically regarding the lack of research on multiple interpretive programs offered by one park, and changes in the participants' behaviours. Knapp et al. (1997) suggested that the difficulties in evaluating and measuring changes in behaviours is a result of the lack of "a substantiated framework of goals that educators might use to guide this behavior change programmatically" (p. 24). Since there are no standardized evaluations or criteria to follow, it is difficult to accurately evaluate interpretation programs.

Frameworks and Models to Evaluate Interpretive Programs

Knapp et al. (1997) suggested that while there may be several documents that offer guiding principles of interpretation such as Tilden's (1957) or Beck and Cable's (2011), there is still "a major difficulty in evaluating the effectiveness of interpretation" because there is a lack of "clearly articulated objectives" (p. 25). With regards to objectives, according to Knapp et al. a widely used textbook in the field by Sharpe (1982) provided three major objectives of environmental interpreters. These three objectives are as follows: "a) to assist visitors in developing a keener awareness, appreciation, and understanding of the areas they are visiting; b) to accomplish management goals; and c) to promote public understanding of an agency's goals and objectives" (p. 25). Despite these objectives, the problem of evaluating the effectiveness of interpretation still prevails because both these objectives as well as the principles outlined by

Tilden or Beck and Cable "have come under scrutiny because they are based on individual insight rather than a developed theory or appropriate research" (Knapp et al., 1997, p. 25).

Recently, however, Benton (2009) developed a model to help fill this need. Benton's model of the four conceptions of interpretation, as outlined in chapter 1, can be used as a tool to measure four specific sets of goals and objectives of interpretive programs. Unlike the principles and objectives offered by Sharpe (1982), Tilden (1957), and Beck and Cable (2011), Benton supported his model with empirical research. First, in 2009 Benton conducted a study at three national protected sites in the United States (Bandelier National Monument, Fort Smith National Historic Site, and Ocmuglee National Monument) in which he examined cultural interpretive programs for evidence of principles and objectives from foundational texts such as those written by Sharpe, Tilden, and Beck and Cable. The data for this study was gathered from three sources: audio-recordings of the interpretive programs were transcribed to provide documentation of the programs goals, on-site interviews with the staff to discuss the goals of the programs, and phone interviews with the visitors 30 days after the program on what they recalled about the program. The findings of the study supported "the premise that interpretive programs were effective in conveying four different goal sets" (Benton, 2009, p. 18). Later, Benton (2011) used his model in a study at a state park (Lake Fort Smith State Park), rather than in national protected sites as in his 2009 study, and found that while there was evidence of all four conceptions in the interpretive programs, the programs did not effectively convey all four sets of goals (conceptions) to the visitors. Benton (2011) found that the first two conceptions (interpretive techniques and pro-environmental behaviours) were conveyed effectively, however, the visitors did not retain the information related to conceptions three (environmental literacy) and four (tourism outcomes). The data for this study was collected from five sources, which included the

same three sources from the first study (audio-recordings of the programs, staff interviews, post-program visitor phone interviews) as well as information gathered from the state park's mission and interpretive plan, and from speeches made by park officials. Benton (2009) was the first to attempt this type of study in the field of interpretation, and with further study, his model of the four conceptions of interpretation may become a valuable contribution to the field.

Conclusion

Based on the above review of literature it can be concluded that nature interpretation programs can guide people to make environmentally conscious decisions and engage in environmentally responsible behaviour, however, it cannot be said that interpretation programs will always lead to environmentally responsible behaviour. The studies in this field have tended to measure the participants' intentions towards environmentally friendly behaviour following interpretive programs and not their actual behaviours. The limitations of these studies are that very few do any follow-up with their participants, nor have they monitored their participants long-term to gauge if any actual changes in behaviour have occurred (Munro et al., 2008). Furthermore, many of the studies are of a qualitative nature and focus more on the in-depth responses of each individual making it difficult to make generalizations derived from the participants' responses alone. Having said this, the limitation of the quantitative studies is that they tend to focus solely on the perceived effects of nature interpretation (outcomes) but fail to examine why or how these effects are derived (processes). Nevertheless, nature interpretation is important and if successful should increase the possibility that participants will become environmentally conscious and environmentally responsible.

The current study will answer the call to further investigate Benton's (2009) model as a framework for evaluating interpretive programs and also explore the use of Beck and Cable's

(2011) 15 guiding principles of interpretation as a framework to measure interpretive techniques. Additionally, this study will examine the relationship between interpretation and recreation experience, which has received little research attention in the past. Finally, this research will contribute to the existing literature on the environmental outcomes of interpretation programs.

Chapter 3: METHODOLOGY

The general research question for this study was "What are the perceived environmental and recreation outcomes of participation in park interpretive programs?" Several specific research questions related to Benton's (2009) four conceptions of interpretation as well as potential relationships have been identified in Chapter One. This chapter will present the methodology used to investigate these research questions. The research design, the data collection process, the instrument, sample, and data analysis used in the study will be presented. Since this study took place in Gatineau Park this chapter will begin with an introduction to Gatineau Park, the Friends of Gatineau Park, and the nature interpretation programs provided in the park.

Gatineau Park

About Gatineau Park

Gatineau Park is a conservation park located in Gatineau, Quebec that is only two kilometers away from the Parliament Buildings situated in the heart of Canada's National Capital Region. Gatineau Park is 36,131 hectares, which accounts for 7.7% of the National Capital Region (NCC, 2010). The park is managed by the National Capital Commission (NCC), which is a crown corporation of the Government of Canada (NCC, 2012a). Gatineau Park's mission is

> to welcome Canadians and other visitors, to allow them to discover Canada's natural environment, to visit sites that bear witness to the country's history, and to engage in outdoor activities. The Park's natural environment must therefore be preserved as an element of Canada's culture and heritage within the National Capital. (NCC, 2005, p. 18)

Furthermore, there are three priority orientations that flow from the park's mission (NCC, 2005):

> To preserve and develop the unique natural and cultural heritage making up the Park…

> To offer high quality recreational experiences that are respectful of the natural environment…To inspire all Canadians, Capital visitors and residents to respect conservation values and the need to resolve issues related to the protection of natural areas in order to ensure the survival of the Park. (NCC, 2005, p. 19)

Reflective of being the capital's conservation park, 76% of the park is designated as conservation areas that are dedicated to the protection of natural environments, while recreation is concentrated in other areas of the park (NCC, 2005). The park "has a rich biodiversity and a wide range of protected habitats and ecosystems" (NCC, 2012b, para. 1). Gatineau Park also offers the opportunity for visitors to engage in several activities throughout the year including hiking, cycling, mountain biking, swimming, rock climbing, cross-country skiing, and snowshoeing. The park has 165 kilometers of hiking trails in the summer, over 200 kilometers of cross-country ski trails in the winter, as well as 32.5 kilometers of scenic parkways (NCC, 2012d). As a result, the park receives 2.7 million visits per year (NCC, 2012d).

Friends of Gatineau Park

The Friends of Gatineau Park is a registered charity that works cooperatively with the NCC to manage the park. Their mission is to "foster understanding, appreciation, enjoyment and stewardship of the Park's natural and human heritage" (Friends of Gatineau Park, 2012). The Friends of Gatineau Park offer activities such as group interpretation sessions and outings that complement the activities provided by the park. This organization also helps the park by providing education material and raising money for research grants (Friends of Gatineau Park, 2012).

Interpretation programs at Gatineau Park

Interpretive programs are provided by both Gatineau Park as well as the Friends of Gatineau Park. There are several seasonal interpretive programs offered in both French and English throughout the year. Additionally, an interpretive tour can be booked for a private group or organization. While most of the interpretive programs offered by Gatineau Park are free, some of the interpretive programs offered by the Friends of Gatineau Park have a small fee. The programs are led by an experienced naturalist and last approximately two hours in duration. The winter, spring, and fall programs often begin with an indoor presentation inside the Gatineau Park Visitor Centre. Following the indoor presentation, the group moves outdoors to one of the nearby trails for the remainder of the interpretative program (NCC, 2012c). The summer programs occur deeper within the park at the Lac Philippe campground and the entire program occurs outdoors.

The programs included in this study are:

NCC Programs

Animal Tracking on Snowshoes: This is a guided snowshoe tour with a nature interpreter to discover a winter forest full of life. This winter program begins with an indoor presentation followed by an outdoor snowshoe hike to look for animal tracks and signs of animal life. This program is free and is offered in both French and English.

Spring Flowers have Sprung: This is a guided walk with an experienced naturalist to learn about what makes spring flowers unique. This spring program begins with an indoor presentation followed by an outdoor walk on the universally accessible Sugarbush trail to observe the spring flowers. This program is free and offered in both French and English.

Sights and Sounds of Birds: This is a guided walk with an experienced naturalist to learn how to identify birds by their songs. This spring program begins with an indoor presentation followed by an outdoor walk along the Sugarbush trail to look and listen for birds. This program is free and offered in both French and English.

Secrets of the Park's Night Life: This is a guided evening hike along the shores of Lac Philippe to learn how nature is transformed at night and to demystify what park animals do to adapt at night. This summer program occurs at the Lac Philippe campground, is bilingual, and is free of charge.

Follies of the Fall Forest: This is a guided walk with an experienced naturalist to learn how to identify trees and why the leaves change colours in autumn. This fall program begins with an indoor presentation followed by an outdoor walk on the universally accessible Sugarbush trail to observe the many different types of trees. This program is free and offered in both French and English.

Friends of Gatineau Park Programs

Snowshoe Under the Stars: This is an evening snowshoe program with an experienced naturalist to learn how animals and plants face the many challenges of winter survival. This winter program occurs near the visitor centre, is bilingual, and has a small fee.

Owl Prowl: An experienced birdwatcher provides an indoor presentation on the owls that live in Gatineau Park, including their unique features, behaviours, and calls. Following this presentation the group moves outside near the visitor centre and listens for answers to their owl calls. This winter program is offered in French and English and has a small fee.

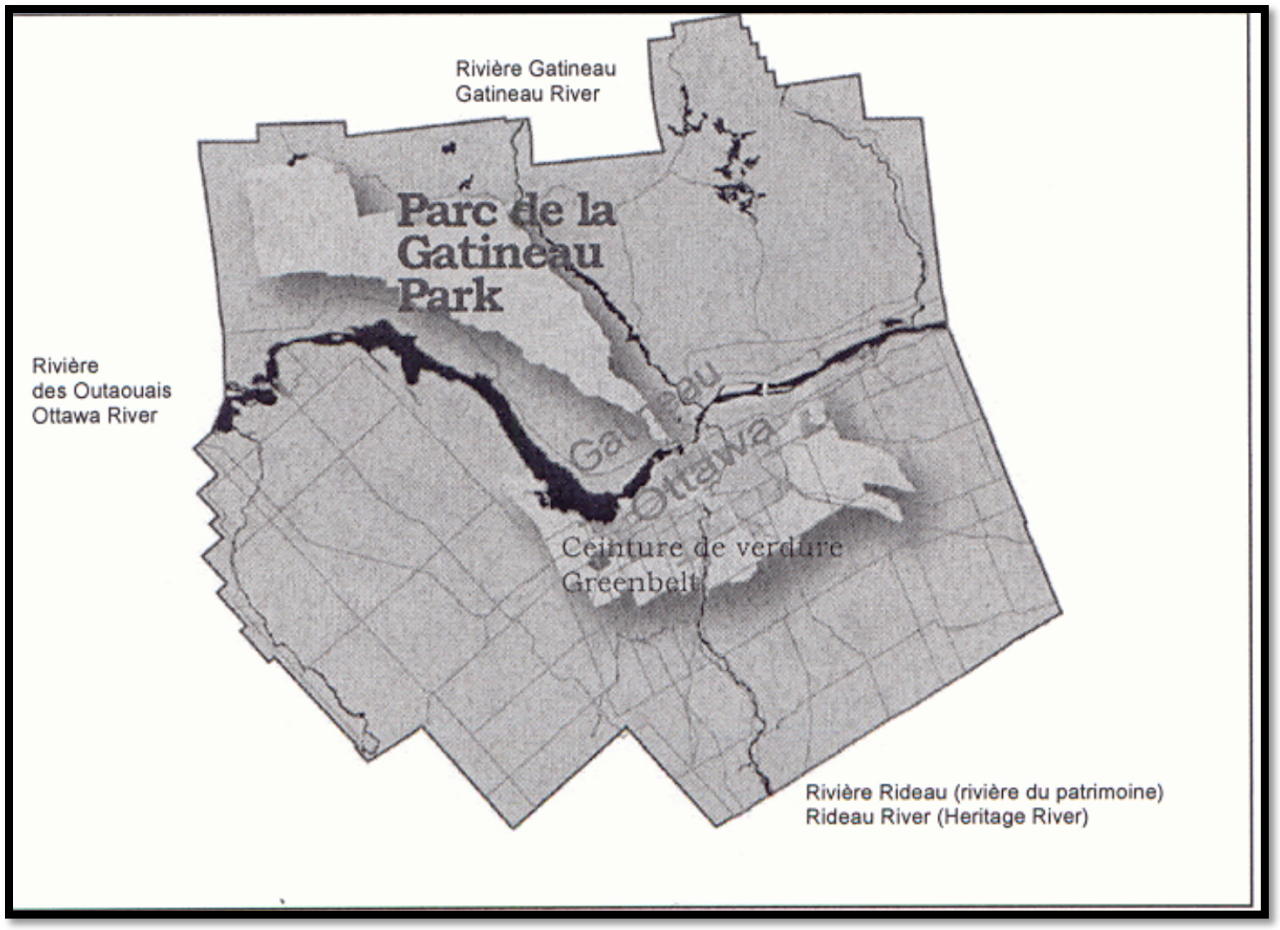
Frog Chorus: An experienced amphibian specialist provides an introduction to the frogs, toads, and salamanders of Gatineau Park. This program begins with an indoor presentation in the visitor centre, on the amphibians and their calls followed by a walk to a nearby pond to listen to the frog

chorus and identify the amphibians. This spring program is offered in English and bilingually (in which the presenter alternates between French and English), and has a small fee.

Figure 2: *Gatineau Park Visitor Centre*

Source: Bonjour Québec, 2014. Quebec Original. Retrieved January 17th 2014, from http://www.bonjourquebec.com/qc-en/attractions-directory/municipal-and-regional-park-nature-interpretation-centre/gatineau-park_3214624.html

Figure 3: *Map of Gatineau Park*



Source: National Capital Commission. (2005). *Gatineau Park Master Plan.* Ottawa, ON: Author, p. 4.

Research Design

The methodology chosen to conduct this research was survey research methodology. According to Babbie (2001), "survey research is perhaps the most frequently used mode of observation in the social sciences" (p. 234). Survey research is a popular methodology that is most often associated with quantitative research (Gratton & Jones, 2004) and can be used for "descriptive, explanatory, and exploratory purposes" (Babbie, 2001, p. 234). Survey research methodology involves asking people questions as plainly as possible to gather information, often

through the use of self-administered questionnaires (either given in person, through mail, or electronically) (Gray & Guppy, 1999).

According to both Babbie (2001) and Gratton and Jones (2004), survey research is especially useful when examining large populations because it makes the gathering of information more feasible. Survey research also allows for substantial flexibility with regards to data analysis because the researcher may ask several questions on one particular topic (Babbie, 2001). Furthermore, Gratton and Jones (2004) suggested that the creation of well-designed, standardized questions reduces the possibility of biased results.

Survey research was the methodology of choice for this study. According to Babbie (2001), survey research is often "used in studies that have individual people as the units of analysis" (p. 234). Since this research was focused on individual visitors' experience of a park interpretation program, the researcher felt that survey research was applicable to this study.

Sample

The sample frame for this study falls into the second general class of sampling schemes as described by Fowler (2002) where,

> sampling is done from a set of people who go somewhere or do something that enables them to be sampled...in these cases, there is not an advance list from which sampling occurs, the creation of the list and the process of sampling may occur simultaneously. (p. 12)

The sample population of this study were the people who attended selected interpretive programs at Gatineau Park from February to October of 2013. Programs were selected based on appropriateness for the study (e.g., programs for children were excluded), and the schedule of the researcher. All adult visitors who took part in the selected programs had equal opportunity to

participate in the study and complete the survey questionnaire, as everyone over age 18 attending the programs were offered the opportunity to participate in the study. Originally surveys were to be distributed from January to August 2013. The total number of program participants (i.e., the study population) during this eight month period was approximately 570 people. For a confidence level of 95% and an accuracy of plus or minus 5, the sample sized needed would have been 230. Unfortunately, ethics approval for the study was not received until February and therefore data collection was one month later than planned. By the end of August, 60 participants had completed the survey. As a result data collection was extended until October 2013, and the final sample size was 78 participants.

Instrument

The survey questionnaire was comprised of six parts: interpretive techniques; pro-environmental behavioural intentions; environmental literacy; recreation satisfaction; demographic and other background information, and a few open-ended questions (see Appendix 3).

Interpretive Techniques

In this section of the questionnaire there were 15 questions corresponding to Beck and Cable's (2011) 15 guiding principles of interpretation. Participants were asked to respond to the questions based on a nine-point Likert scale. These questions measured the skills, techniques, and ability of the nature interpreter to connect visitors to the resource.

Pro-environmental Behavioural Intentions

In order to measure pro-environmental intentions following participation in the interpretive program, a modification of Walker and Chapman's (2003) pro-environmental intention scale was used where respondents rated certain behaviours (using a nine-point Likert-

type scale) in terms of how likely or unlikely they would be to practice these behaviours in the future. The modification of Walker and Chapman's scale included items specifically related to Gatineau Park and its relatively new conservation focus (e.g., Engage in less environmentally damaging recreation activities [e.g., hiking instead of climbing], Not participate in recreation in non-designated areas [e.g., protected areas]).

Environmental Literacy

In this section the participants' environmental literacy as a result of the interpretation program was measured. In order to measure this outcome participants were asked to respond using a nine-point Likert scale to a series of questions related to the five stages of environmental literacy as explained by Benton (2009).

Recreation Satisfaction

In this section the extent to which the interpretive program provided a satisfying recreational experience was measured. In order to measure the participants' level of satisfaction, Backlund and Stewart's (2012) modification of Driver, Tinsley, and Manfredo's (1991) Recreation Experience Preference (REP) scale was used. The REP scale allows visitors to rate items "in terms of their importance or the degree to which they added to the respondents satisfaction" (Backlund & Stewart, 2012, p. 395). Participants were asked to respond to a series of questions related to the satisfaction of their recreation experience using a nine-point Likert-type scale.

Socio-Demographic and Other Information

In this section of the questionnaire participants were asked to respond to questions on socio-demographic characteristics and their previous park visitation. Participants were asked to report on items such as their age group, gender, number of previous interpretive programs

attended, and frequency of visits to the park. This data was analysed to determine any possible relationships between the outcomes and both socio-demographic and park visitation variables.

Open-Ended Questions

Finally there were three open-ended questions relating to the participants' general overall experience of the program, how the program influenced their environmental concern, and their satisfaction with their recreation experience.

Data Collection

Data was collected for this study through a survey questionnaire. Participants had the opportunity to complete the questionnaire on site using a paper copy or at home either online or using a paper copy that was to be returned by mail (a stamped, self-addressed envelope was provided). The questionnaire included an information letter describing the details of the study as well as instructions on how to complete and submit the survey. Announcements were made about the research project at the beginning or end of selected interpretive programs and information letters were handed out. For those who chose to complete the online survey the website and instructions were indicated on the information letter. Most participants (72) chose to complete the survey online, a few participants (six) filled out paper copies on site following the program, and five participants chose to take the survey home and return it by mail however these surveys were never returned. The survey questionnaire and supporting documents were available in both English and French.

Data Analysis

A variety of statistical analyses, including descriptive, parametric and non-parametric statistical analyses were conducted on the data collected to examine the relationships between the independent variable (interpretive techniques) and dependent variables (environmental and

recreational outcomes). Also, the relationships between the various outcomes were investigated. The relationships between the dependent variables (outcomes) were investigated because previous literature seemed to suggest that there may be associations between outcomes. For example, Beck and Cable (2011) stated that interpretive programs are meant to be both educational and recreational which suggested to the researcher that perhaps the educational outcomes (environmental literacy and pro-environmental behavioural intentions) could be associated with recreation satisfaction. Furthermore, Powell and Ham (2008) stated that enjoyment and satisfaction with the interpretive experience were key elements of successful interpretation which further emphasizes the possibility of a relationship between recreation satisfaction and environmental outcomes. Finally, Sharpe (1982) mentioned that interpretation helps increase environmental literacy by fostering an appreciation for a natural area which suggests to the researcher that environmental literacy might be associated with pro-environmental behaviours because once participants develop an appreciation for an area they may adjust their behaviours as well.

To begin, the survey responses were collected and stored using the online survey tool Fluid Surveys. The data were then exported from Fluid Surveys to SPSS (Statistical Product and Service Solutions) which was used to perform the statistical analysis. Descriptive statistics included calculations of the mean scores for the items in the interpretive techniques, pro-environmental behavioural intentions, environmental literacy, and recreation satisfaction scales. Furthermore, prior to calculating the mean scores for the Pro-environmental Behavioural Intentions Scale items, five of the items had to be recoded. Since the five particular items were considered “negative” behaviours they were reverse coded in order to conduct the calculations. The five negative items were likeliness to: litter, feed the wildlife, continue to visit a favourite

spot even if it needs to recover from environmental damage, participate in recreation in non-designated areas (e.g., protected areas), and pick flowers and remove dead tree branches. Therefore in the results the word "not" has been placed in front of the "negative" items (for example, likelihood to "litter" became likelihood to "not litter," likelihood to "feed the wildlife" became likelihood to "not litter.") Secondly, frequencies were calculated for the socio demographic information such as gender, age, level of education, previous visits to the park, previous interpretive program participation etc. Thirdly, overall scores for each of the four scales (interpretive techniques, environmental literacy, recreation satisfaction, and pro-environmental behavioural intentions) were calculated by determining the mean of all the individual items on each scale so that the overall scores could be used in subsequent analysis. Fourthly, two-tailed Pearson coefficient correlations were conducted to determine if any relationships existed between any of the four main groups of variables. Fifthly, all of the winter programs were grouped together and all of the spring programs were grouped together. Then independent t-tests were conducted to determine if there were any significant differences between the mean scores of the winter and spring programs. Further independent t-tests were conducted to compare differences between the mean scores of the winter and fall interpretive programs. Additionally, Spearman rank order correlations were also completed for differences in mean scores based on frequency of visits to the park. Finally, one-way ANOVAs were completed to test for significant differences in mean scores based on the frequency of previous interpretive program participation.

Data from the open-ended questions were systematically analyzed through a combination of two techniques. To begin, the data were grouped together based on question (questions 1, 2, & 3 of the open-ended questions). Then for each question the responses were colour coded based on which interpretive program the participant attended (blue=Animal Tracking on Snowshoes,

light blue=Snowshoe Under the Stars, brown=Owl Prowl, green=Frog Chorus, pink=Spring Flowers have Sprung. red=Sights and Sounds of Birds, grey=Secrets of Park Night-Life, orange=Follies of the Fall Forest) Subsequently, an enumeration technique (Henderson & Bialeschki, 1995) was used for each individual question to group and place responses into positive, negative, and neutral categories. Then each response was reduced to only a word or a few words that acted as a descriptive code. Next, the coded responses in each category were examined for common themes and contradictions by using a constant comparison technique (Henderson & Bialeschki, 1995). Finally, once emergent themes were determined, tables were created to display the data. Each table provided a list of the coded responses according to theme and the number of responses. The tables were then used as a summarizing tool for the researcher to determine categories and themes based on the responses to the three open-ended questions.

Although participant observation was not a planned component of the data collection and analysis, the researcher was present for most of the selected interpretive programs included in this study and could not help but observe the interpreters, the program components, and the participants' engagement in the programs. Therefore, some of the researcher's reflections on these observations have been included in the results and discussion (Chapters 4 and 5).

Feedback to participants

A summary of the findings of this study will be e-mailed or mailed to all participants who indicated that they would like to receive a copy of the results. A summary of the findings will also be offered to both Gatineau Park managers and the Friends of the Gatineau Park.

Chapter 4: RESULTS

As outlined in Chapter 3, survey questionnaires were distributed to participants at selected interpretive programs. The survey questionnaire gathered information on the participants' perceptions of: the program's use of specific interpretive techniques, the program's impact on pro-environmental behavioural intentions and environmental literacy, and the interpretive program as a satisfying recreation experience. The survey also gathered participants' responses to three open-ended questions relating to their interpretive experience, some socio-demographic information, and information on previous interpretive program participation and park visitation. Seventy-eight Gatineau Park interpretive program participants responded to the survey questionnaire. Tables 2, 3 and 4 summarize the number of participants by season, program, and agency. Six participants did not complete the last section of the questionnaire and therefore the program they participated in is unknown. This chapter is a descriptive review of the results from the survey questionnaire responses.

Table 2
Number of Participants by Season

Season	Number of Participants
Winter	29
Spring	23
Summer	2
Fall	18
Unknown	6

Table 3
Number of Participants per Program

Program	Number of Participants
Animal Tracking on Snowshoes	26
Snowshoe Under the Stars	3
Owl Prowl	6
Frog Chorus	3
Spring Flowers have Sprung	6
Sights and Sounds of Birds	8
Secrets of the Park's Night Life	2
Follies of the Fall Forest	18
Unknown	6
Total	78

Table 4
Number of Participants per Agency (NCC or Friends of GP)

Agency	Number of Participants
NCC	60
Friends of Gatineau Park	12
Unknown	6

Socio-Demographic Findings

The socio-demographic findings revealed that approximately 62% of participants were female. The largest age group was the 25-34 years group with approximately 24% of respondents while the second and third largest age groups were the 35-44 age group with nearly 22% of respondents, and the 45-54 age group with nearly 20% of respondents. Seventy-nine percent of respondents indicated that they had a college or university degree or some higher level of education. Eighty percent (n = 60) indicated that they live in the National Capital Region. For approximately 22% of respondents (n = 17) this was their first visit to Gatineau Park, 78% of respondents (n = 59) visit the park at least 1-2 times per year or more, while nearly 13% (n = 10) visit the park 21 or more times per year. Only 9 (12%) out of the 75 participants who responded to the question of whether or not they are a member of the Friends of Gatineau Park, indicated they were. It is interesting to note that 71% of participants (n = 54) had indicated that they had previously participated in an interpretive program, however for 68% of participants (n = 52), this was their first interpretive program at Gatineau Park. Seventy percent (n = 53) indicated that they intend to participate in another interpretive program at Gatineau Park, while 28% (n = 21) indicated that they may attend another interpretive program at the park. Finally, 88% of respondents (n = 65) planned to come back and visit the park again.

Interpretive Techniques

The Interpretive Techniques Scale measured the use of 15 specific techniques (Beck & Cable, 2011) during the nature interpretation programs. The highest mean score on the Interpretive Techniques Scale was shared by two items. The first was "the interpretive program sparked my interest" (8.24 on a nine point scale, *SD* = 1.33) with all 78 participants responding to this question (see Table 5). This item refers to the interpretive program's and the interpreter's ability to provide topics of considerable interest to the visitors, to capture their attention and attract them to the program. The second item on the Interpretive Techniques Scale that tied for the highest score was "the interpretive program encouraged me to sense the beauty of nature" (8.24, *SD* = 1.32). This item refers to the program's and the interpreter's success in promoting the natural beauty of the park while fostering the ability of the participants to discover the beauty of nature on their own. The item with the third highest score (8.18, *SD* = 1.45) was "the interpretive program had an interpreter who communicated effectively." This item refers directly to the interpreter's communication skills and techniques and whether the interpreters in the programs studied were able to successfully communicate with their audiences. Interestingly, the item on the Interpretive Techniques Scale "the interpretive program presented a distinct theme" had the fifth highest mean score (8.04, *SD* = 1.51); while this item is still high it is lower than expected as all of the interpretive programs had a specific theme (e.g., birds, spring flowers, frogs, owls etc.). As expected, the item on the Interpretive Techniques Scale with the lowest mean score (5.88, *SD* = 2.00) was "the interpretive program brought the past alive" as the programs selected for this study were nature interpretation programs rather than historical, cultural or heritage interpretation. Furthermore, 26 of the participants checked the "Not Applicable" response for this item.

The mean scores for all items on the Interpretive Techniques Scale were above the midpoint on the nine-point scale and ranged between 5.88 and 8.24. Eight out of the 15 items on this scale obtained a mean score of 8.00 or higher, two items obtained a score in the seven range, four obtained a score in the six range, and only one obtained a score in the five range. Overall these are very positive scores, which suggests that the selected interpretive programs and interpreters at Gatineau Park use effective interpretive techniques in the delivery of their programs.

Table 5
Mean Scores and Standard Deviations for Interpretive Techniques Scale

The interpretive program:	*N*	*M*	*SD*
Sparked my interest	78	8.24	1.33
Encouraged me to sense the beauty of nature	75	8.24	1.32
Had an interpreter who communicated effectively	73	8.18	1.45
Was a very positive experience for me	75	8.13	1.48
Presented a distinct theme	76	8.04	1.51
Was suitable for my age group	78	8.03	1.68
Made me feel passion for nature	76	8.01	1.40
Was meaningful to me	77	8.00	1.55
Provided the right amount of information – enough information but not too much	77	7.88	1.65
Inspired and provoked me to broaden my horizons	78	7.14	1.83
Had written materials that were helpful[1]	56	6.86	2.41
Incorporated technology in an appropriate manner[1]	57	6.63	2.13
Motivated me to support the park (e.g., donating money, volunteering, etc.).	73	6.25	2.09
Was presented as a story	70	6.09	2.29
Brought the past alive[1]	52	5.88	2.00

Note. Mean scores based on scale (Strongly Disagree = 1 to Strongly Agree = 9).
Note. N = number of participants; M = mean; *SD* = standard deviation.
[1]There were a large number of "Not Applicable" responses to these items.

Pro-Environmental Behavioural Intentions

The Pro-environmental Behavioural Intentions Scale (Walker & Chapman, 2003) measured the participants' intentions to engage in certain behaviours related to the environment in the park, based on their participation in the interpretive program. The item on the Pro-

environmental Behavioural Intentions Scale with the highest mean score (8.47 on a nine point scale, *SD* = 1.75) was likelihood to "not litter" (see Table 6). It is important to note that half (five) of the items on this scale were behaviours that are considered to be negative; therefore these five items have been reverse coded. For example, the behaviour of littering is considered negative therefore it has been reverse coded. Accordingly, the mean score of 8.47 would suggest that after participating in the interpretive program it is unlikely that the participants will litter (they do not intend to litter). This refers to the program's effectiveness in strengthening or reinforcing the intent not to litter in the park. The item on the Pro-environmental Behavioural Intentions Scale with the second highest mean score (8.25, *SD* = 1.42) was likelihood to follow the park's "rules and regulations for recreation activities." Following the park's rules and regulations for recreation activities is a positive behaviour therefore this item refers to the program's ability to influence participants to follow the rules and regulations for recreation activities in the park after participating in the interpretive program. Similarly, the item on the Pro-environmental Behavioural Intentions Scale with the third highest mean score (8.23, *SD* = 1.73) was likelihood to "leave wildlife alone." In this case, since leaving wildlife alone is a positive behaviour, this item refers to the program's ability to effectively communicate the importance of not interfering with the wildlife within the park and influencing participants to leave the wildlife in the park alone after participating in the interpretive program. Surprisingly, the item with the second to last lowest mean score (5.46, *SD* = 3.13) was likelihood to "not continue to visit a favourite spot even if it needs to recover from environmental damage." This finding is surprising because it refers to the program's ability to deter participants from visiting certain areas that need to recover from damage; the mean is so close to the mid-range on the

scale which could suggest that participants may continue to visit an area in the park regardless of the fact that their visitation may not allow the area to recover from environmental damage.

The mean scores for this scale are all above the midpoint on the nine-point scale and range between 5.27 and 8.47. While the mean scores are all above the midpoint on the scale there is still a considerable amount of variation. Three out of the ten items on this scale obtained a mean score of 8.23 or higher, three items obtained a score in the seven range with scores of 7.21 or higher, one obtained a score in the six range, and three obtained a score in the five range. Overall these are generally positive scores with a few items near the midpoint or more neutral portion of the scale. These scores suggest that the interpretive programs and interpreters of the selected Gatineau Park programs have some impact in promoting more pro-environmental behaviours.

Table 6
Mean Scores and Standard Deviations for Pro-Environmental Behavioural Intentions Scale

How likely are you to:	*N*	*M*	*SD*
Not litter	75	8.47	1.75
Follow the rules and regulations for recreation activities	75	8.25	1.42
Leave wildlife alone	77	8.23	1.73
Not feed the wildlife	76	7.76	2.09
Not pick flowers and remove dead tree branches	76	7.39	2.58
Engage in less environmentally damaging recreation activities (e.g., hiking instead of climbing)	77	7.21	2.27
Not participate in recreation in non-designated areas (e.g., protected areas)	77	6.68	2.90
Write a letter/e-mail to support the park	77	5.58	2.45
Not continue to visit a favourite spot even if it needs to recover from environmental damage	74	5.46	3.13
Volunteer to help with park projects	77	5.27	2.42

Note. Mean scores based on scale (Extremely Unlikely = 1 to Extremely Likely = 9).
Note. N = number of participants; M = mean; SD = standard deviation.

Environmental Literacy

The Environmental Literacy Scale measured changes in the five stages of environmental literacy identified by Benton (2009), based on participation in the interpretive program. The item on the Environmental Literacy Scale with the highest mean score (7.55 on a nine point scale, *SD* = 1.62) was "after participating in the interpretive program my understanding (knowledge) of the environment has increased" (see Table 7). This item on the Environmental Literacy Scale refers to a program's effectiveness in providing information about the resource to the audience so that participants may develop a better understanding of the natural environment. While understanding is generally considered the third stage of environmental literacy it is still an important step on the way to being motivated to protect natural environments. The item on the Environmental Literacy Scale with the second highest score (7.45, *SD* = 1.49) was "after participating in the interpretive program my appreciation of nature has increased." This item refers to a program's ability to help visitors develop an appreciation for the park and empathize with the natural environment by teaching the audience to appreciate what the park has to offer and to understand how fortunate it is that such a place exists for people to visit. Finally the item with the third highest score (7.31, *SD* = 1.50) was "after participating in the interpretive program my attachment to nature has increased." This item refers to the program's effectiveness in helping visitors build a relationship with the park and with nature. Success in developing this fourth stage of environmental literacy would suggest that after participating in the interpretive program visitors feel attached to the park and may begin to take ownership of it by making connections between their own actions, actions of others, and the natural environment of the park. This is a fundamental step leading to the final stage of motivation and taking action to protect their park.

The mean scores for this scale are all above the midpoint on the nine-point scale and range between 6.84 and 7.55. There are only five items on this Environmental Literacy Scale and the range of mean scores is rather small. In addition to the mean scores being quite close together, the items on this scale all have relatively positive scores. Overall these findings suggest that the interpretive programs have the potential to successfully promote and encourage the development of environmental literacy to their audience members.

Table 7
Mean Scores and Standard Deviations for Environmental Literacy Scale

After participating in the interpretive program:	*N*	*M*	*SD*
My understanding (knowledge) of the environment has increased	76	7.55	1.62
My appreciation of nature has increased	76	7.45	1.49
My attachment to nature has increased	75	7.31	1.50
My motivation to make environmentally responsible decisions has increased	74	7.00	1.89
My awareness of environmental issues has increased	76	6.84	1.98

Note. Mean scores based on scale (Strong Disagree = 1 to Strongly Agree = 9).
Note. N = number of participants; M = mean; SD = standard deviation.

Recreation Satisfaction

The Recreation Satisfaction Scale (Backlund & Stewart, 2012) measured the extent to which certain recreation experience items contributed to or detracted from a satisfying recreation experience. The item on the Recreation Satisfaction Scale with the highest mean score (8.29 on a nine point scale, *SD* = 0.93) was "being in a nature setting" (see Table 8). This item on the Recreation Satisfaction Scale refers to the interpretive program's success in getting people out into nature as an important factor contributing to a highly satisfying recreation experience. This would suggest the greatest success of these programs in terms of recreation satisfaction is simply getting people outdoors and interacting with the natural world. The item with the second highest mean score (8.24, *SD* = 1.26) was "enjoying the sounds of nature." This item suggests that once the interpretive program gets the participants outside, the next contributing factor to a satisfying

recreation experience is that the participants get to stop and listen to the sounds of nature. This item refers to the program's flexibility and the interpreter's willingness to allocate time to stop and allow participants to listen to all of the sounds of nature and wildlife in the park. Similarly, the item with the third highest mean score (7.91, *SD* = 1.25) on the Recreation Satisfaction Scale was "enjoying the smells of nature." This item refers to the idea that once the interpretive program gets the participants outside, they have the opportunity to breathe the fresh air and take in the natural smells of their surroundings. As expected, the item on the Recreation Satisfaction Scale with the lowest mean score (6.53, *SD* = 1.74) was "having thrills." This item refers to characteristics typically associated with thrills such as levels of exhilaration and excitement experienced during the interpretive program. The item "getting away from crowded situations" had a relatively high mean score (7.69, *SD* = 1.46), which is interesting because, while one can understand that getting away from crowds could certainly add to a satisfying recreation experience, the programs themselves sometimes involved large groups and the trails were often busy and somewhat crowded on the weekends.

The mean scores for this scale were all above the midpoint on the nine-point scale and range between 6.53 and 8.29. Two out of the 18 items on this scale obtained a mean score of 8.24 or higher, 11 items obtained a score in the range of 7.15 to 7.91, and five obtained a score in the 6.53 to 6.83 range. Overall these are very positive scores, which suggest that the selected interpretive programs at Gatineau Park are providing opportunities for highly satisfying recreation experiences. It seems that simply getting people outdoors into nature is half the battle because the data from this scale suggests that just being out in a nature setting is the most important contributing factor of a satisfying recreation experience.

Table 8
Mean Scores and Standard Deviations for Recreation Satisfaction Scale

Recreation Satisfaction Items:	*N*	*M*	*SD*
Being in a nature setting	72	8.29	0.93
Enjoying the sounds of nature	75	8.24	1.26
Enjoying the smells of nature	75	7.91	1.25
Experiencing peace and calm	75	7.89	1.21
Studying nature	75	7.79	1.23
Developing my outdoor skills	75	7.73	1.24
Learning about the park's natural wonders	75	7.72	1.40
Getting away from crowded situations	74	7.69	1.46
Doing something with my family	75	7.61	1.44
Being with others who enjoy the same things I do	74	7.58	1.28
Bringing my family closer together	75	7.41	1.67
Encountering wildlife	73	7.41	1.58
Releasing or reducing some built-up tensions	72	7.15	1.63
Learning what I am capable of	75	6.83	1.60
Learning about the park's history	74	6.82	1.73
Meeting other people	74	6.76	1.50
Reflecting on my spiritual values	75	6.71	1.73
Having thrills	75	6.53	1.74

Note. Mean scores based on scale (Strongly Detracts = 1 to Strongly Adds = 9).
Note. N = number of participants; M = mean; *SD* = standard deviation.

Overall Scores for all Four Scales

Overall scores for each of the four scales (interpretive techniques, pro-environmental behavioural intentions, environmental literacy, and recreation satisfaction) were calculated by determining the mean of all the individual items on each scale (see Table 9).

Table 9
Overall Scores

Scale	*N*	*M*	*SD*
Interpretive Techniques	78	7.68	1.17
Pro-Environmental Behavioural Intentions	70	6.99	0.95
Environmental Literacy	73	7.20	1.49
Recreation Satisfaction	67	7.46	0.90

Note. N = number of participants; M = mean; *SD* = standard deviation.

Relationships between Interpretive Techniques and Interpretive Outcomes

Pearson correlation analysis was conducted between the overall Interpretive Techniques Scale scores and each of the overall interpretive outcomes scores (see Table 10). It is important to note that the three items on the Interpretive Techniques Scale for which the "Not Applicable" responses were more than 20 (bringing the past alive, incorporating technology, and written materials) were not included in the correlations. These items were not included in the correlations because the large number of 'not applicable' responses would have reduced the group size dramatically. For the other items any "Not Applicable" responses were replaced by each of the item's mean score. Environmental literacy and recreation satisfaction were both significantly correlated with interpretive techniques at the $p < .01$ level, while pro-environmental behavioural intentions was significantly correlated with interpretive techniques at the $p < .05$ level. It should also be noted that environmental literacy was the interpretive outcome most strongly correlated with the Interpretive Techniques Scale scores.

Table 10
Pearson Correlation Coefficients for the Relationship Between Interpretive Techniques and Interpretive Outcomes (Environmental and Recreational)

Outcomes	Interpretive Techniques		
	N	*r*	*p*
Pro-Environmental Behavioural Intentions	70	.267	.025*
Environmental Literacy	73	.711	.000**
Recreation Satisfaction	67	.419	.000**

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

Further Pearson correlation analyses were conducted between the individual items on the Interpretive Techniques Scales and the overall scores for the interpretive outcomes (environmental and recreational) to determine if any specific interpretive techniques were

correlated with the interpretive outcomes. Several correlations were found (see Table 11). Nearly all of the items on the Interpretive Techniques Scale were correlated with environmental literacy at the $p < .01$ level, except for the item "the interpretive program was presented as a story" which was significantly correlated at the $p < .05$ level, and the item "the interpretive program had an interpreter who communicated effectively" which had no significant correlation with environmental literacy. It should be noted that the item "the interpretive program made me feel passion for nature" was the item most strongly correlated with environmental literacy. Furthermore, two items on the Interpretive Techniques Scale were correlated with pro-environmental behavioural intentions at the $p < .01$ level ("the interpretive program presented a distinct theme" and "the interpretive program had an interpreter who communicated effectively"), and two items on the Interpretive Techniques Scale were correlated with pro-environmental behavioural intentions at the $p < .05$ level ("the interpretive program sparked my interest" and "the interpretive program was suitable for my age group"). The item "had an interpreter who communicated effectively" was the item most strongly correlated with pro-environmental behavioural intentions. Finally six items on the Interpretive Techniques Scale were correlated with recreation satisfaction at the $p < .01$ level (the interpretive program: "sparked my interest," "had written materials that were helpful," "motivated me to support the park," "encouraged me to sense the beauty of nature," "was a very positive experience for me," and "made me feel passion for nature"), and three items on the Interpretive Techniques Scale were correlated with recreation satisfaction at the $p < .05$ level (the interpretive program: "was suitable for my age group," "brought the past alive," and "provided the right amount of information—enough information but not too much"). The interpretive technique item most

strongly correlated with recreation satisfaction was “the interpretive program made me feel passion for nature.”

Table 11
Pearson Correlation Coefficients for the Relationship Between Interpretive Techniques Items and Interpretive Outcomes (Environmental and Recreational)

Interpretive Techniques	Pro-Environmental Behavioural Intentions			Environmental Literacy			Recreation Satisfaction		
	N	*r*	*p*	*N*	*r*	*p*	*N*	*r*	*p*
Sparked my interest	70	.260	.030*	73	.226	.000**	67	.362	.003**
Was meaningful to me	70	.143	.238	73	.388	.001**	67	.174	.160
Was presented as a story	70	.038	.753	73	.284	.015*	67	.090	.470
Inspired and provoked me to broaden my horizons	70	.182	.131	73	.648	.000**	67	.220	.073
Presented a distinct theme	70	.315	.008**	73	.308	.008**	67	.509	.636
Was suitable for my age group	70	.253	.034*	73	.368	.001**	67	.286	.019*
Brought the past alive	50	-.057	.694	51	.388	.005**	46	.341	.020*
Incorporated technology in an appropriate manner	52	.025	.861	54	.523	.000**	48	.274	.060
Provided the right amount of information – enough information but not too much	70	.231	.054	73	.332	.004**	67	.307	.011*
Had an interpreter who communicated effectively	70	.341	.004**	73	.217	.065	67	.168	.173
Had written materials that were helpful	50	.067	.646	54	.396	.003**	48	.385	.007**
Motivated me to support the park (e.g., donating money, volunteering, etc.).	70	.105	.388	73	.398	.000**	67	.404	.001**
Encouraged me to sense the beauty of nature	70	.176	.144	73	.634	.000**	67	.382	.001**
Was a very positive experience for me	70	.217	.072	73	.631	.000**	67	.403	.001**
Made me feel passion for nature	70	.192	.112	73	.732	.000**	67	.452	.000**

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

Relationships between Interpretive Outcomes

Further Pearson correlation coefficients were conducted for the relationship between recreation satisfaction and the environmental outcomes (environmental literacy and pro-environmental behavioural intentions). Environmental literacy was significantly correlated with recreation satisfaction at the $p < .01$ level (N = 66, $r = .518$, $p = .000$). Pro-environmental behavioural intentions did not have a significant correlation with recreation satisfaction (see Appendix 4). Pearson correlations were also conducted between the environmental outcomes (environmental literacy and pro-environmental behavioural intentions), however no significant correlations were found (included in Appendix 4).

Path Analysis

In order to further explore the relationships that linked the use of interpretive techniques with the environmental and recreation outcomes, path analysis was conducted. Path analysis is defined as a "causal model for understanding relationships between variables" which provides a graphic picture of relationships among independent, intervening and dependent variables (Babbie, 1992, p. 441). In addition to diagramming a network of relationships among variables, path analysis illustrates the strengths of these relationships. Path coefficients represent the strengths of the relationships between two variables when the effects of all the other variables in the model are kept constant. Thus path analysis is a comprehensive strategy, which allows for a simultaneous examination of the relationships between interpretive techniques and the interpretive outcomes.

From the correlational analysis it was observed that there were significant relationships between interpretive techniques and all of the interpretive outcomes (environmental literacy, pro-environmental behavioural intentions, recreation satisfaction). It was also observed that there

was a significant relationship between environmental literacy and recreation satisfaction. It was hypothesized that the relationship between interpretive techniques and environmental literacy may be indirectly influenced by recreation satisfaction or the relationship between interpretive techniques and recreation satisfaction may be indirectly influenced by environmental literacy.

A number of path analyses were conducted using the variables of interpretive techniques, environmental literacy, environmental behavioural intentions and recreation satisfaction and only one indirect relationship was found and this was in the case of recreation satisfaction as the dependent variable. In the first regression analysis with recreation satisfaction as the dependent variable, a significant relationship was revealed between environmental literacy and recreation satisfaction ($n = 62$, $\beta = .472$, $p = .005$). The second regression analysis involved eliminating recreation satisfaction from the analysis and conducting the analysis with environmental literacy as the dependent variable. There was found to be a significant positive relationship between interpretive techniques and environmental literacy ($n = 67$, $\beta = .729$, $p = .000$) (see Figure 4). Thus interpretive techniques indirectly influences recreation satisfaction through environmental literacy, and therefore environmental literacy mediates the relationship between the interpretive techniques and recreation satisfaction.

Figure 4: Path Analysis

Season of Program

Selected interpretive programs were categorized into two groups: winter (Animal Tracking on Snowshoes and Snowshoe Under the Stars), and spring (Owl Prowl, Frog Chorus, Spring Flowers have Sprung, and Sights and Sounds of Birds). These groups were suitable for testing because they were comparable in size (winter with 29 participants and spring with 23 participants) yet the programs themselves differed. These two groups were selected for comparison based on the researcher's observations of the two types of programs. The winter programs involved an outdoor component that included a hike on snowshoes, which also allowed participants to go off the normal trails and experience more interesting terrain. Conversely, the spring programs (with the exception of the Frog Chorus program) were mostly confined to the Sugarbush trail (e.g., Spring Flowers have Sprung, and Sights and Sounds of Birds programs) and nearby parking lots (e.g., Owl Prowl program). It was the researcher's hypothesis that the winter programs involved more elements of recreation and would therefore have higher ratings on the Recreation Satisfaction Scale than the spring programs. Since the winter programs offer more in terms of a sense of adventure (going off the normal spring/summer trails) and learning a new recreation skill (learning how to use snowshoes) in addition to education on how animals survive winter, the researcher felt that the winter programs provided more opportunities for the participants to have fun or a satisfying recreation experience. The researcher hypothesised that while the spring programs, to a lesser extent, also provided opportunities for satisfying recreation experiences, they possessed more qualities related to environmental literacy and pro-environmental behavioural intentions. As a result the two groups were compared using independent sample t-tests.

The results of the t-tests offered little support for the hypothesis of the researcher. While the data suggested the mean scores for the winter group were higher for 13 of the 18 scale items, the t-test results between these two groups for recreation satisfaction revealed only two variables that were significantly different between the winter and spring programs (see Table 12). Significant differences (at $p < .05$) were found between the winter and spring groups for: "enjoying the smells of nature" at $t(49) = 2.25$, $p = .029$, and "experiencing peace and calm" at $t(49) = 3.62$, $p = .001$. In both instances, the winter programs received higher reported levels for each of these recreation satisfaction items. It is surprising to the researcher that these two items in particular were the two for which the winter programs had the higher mean scores. First, there are typically fewer smells in nature during the winter unless participants are perhaps referring to the cool crisp winter air. Secondly, experiencing peace and calm can be difficult during the NCC programs since they occur on weekends when the park is usually quite busy. Nevertheless, this finding suggests that while all of the selected programs had the potential to be considered satisfying recreation experiences, the winter programs may have had slightly more opportunity for satisfying recreation experiences since they had more elements of fun and recreation (as observed by the researcher). Additional independent t-tests were also completed for pro-environmental behavioural intentions, which revealed only one significant difference (at $p < .05$) (see Table 13). The spring programs received higher reported levels for likelihood to volunteer with park projects at $t(50) = -2.63$, $p = .011$.

Finally, independent t-tests were completed according to season for interpretive techniques, in which 12 out of the 13 mean scores were higher for the spring interpretive programs (see Appendix 5). Similar t-tests for environmental literacy revealed that five out of the six items also had higher mean scores for the spring interpretive programs (see Appendix 6);

however no items were found to be significantly different (at $p < .05$). T-tests were also conducted for season of program (winter/spring) with the overall scores of the four scales and no significant differences were found.

Table 12
Independent t-test Results for Recreation Satisfaction by Season of Program (Winter/Spring)

Variable	Winter			Spring				
	n	*M*	*SD*	*n*	*M*	*SD*	*t*(*df*)	*p*
Enjoying the sounds of nature	29	7.97	1.52	22	8.41	1.05	-1.17(49)	.248
Developing my outdoor skills	29	7.76	1.09	22	7.64	1.33	.36(49)	.720
Learning about the park's history	29	6.83	1.73	21	6.14	1.42	1.48(48)	.145
Releasing or reducing some built-up tensions	28	7.07	1.41	21	6.90	1.55	.39(47)	.696
Studying nature	29	7.59	1.40	22	7.82	.91	-.68(49)	.503
Doing something with my family	29	7.38	1.47	22	7.27	1.45	.26(49)	.798
Learning about the park's natural wonders	29	7.48	1.62	22	7.73	1.12	-.61(49)	.547
Getting away from crowded situations	28	7.71	1.61	22	7.23	1.44	1.11(48)	.272
Experiencing peace and calm	29	8.24	.87	22	7.18	1.22	3.62(49)	.001**
Enjoying the smells of nature	29	8.00	1.16	22	7.18	1.44	2.25(49)	.029*
Learning what I am capable of	29	6.83	1.49	22	6.36	1.59	1.07(49)	.290
Having thrills	29	6.59	1.62	22	6.32	1.91	.54(49)	.590
Bringing my family closer together	29	7.28	1.53	22	7.00	1.98	.56(49)	.577
Reflecting on my spiritual values	29	6.45	1.76	22	6.50	1.60	-.11(49)	.914
Being with others who enjoy the same things I do	28	7.86	1.21	22	7.36	1.09	1.49(48)	.142
Meeting other people	28	6.96	1.40	22	6.82	1.01	.41(48)	.682
Encountering wildlife	28	7.18	1.93	21	7.76	1.09	-1.24(47)	.219
Being in a nature setting	27	8.33	1.07	21	8.05	.80	1.02(46)	.315

Note. Mean scores based on scale (Strongly Detracts = 1 to Strongly Adds = 9).
Note. N = number of participants; M = mean; *SD* = standard deviation; *df* = degrees of freedom.
*Denotes groups that were significantly different from each other at $p < .05$.
**Denotes groups that were significantly different from each other at $p < .01$.

Table 13
Independent t-test Results for Pro-environmental Behavioural Intentions by Season of Program (Winter/Spring)

Variable	Winter			Spring				
	n	*M*	*SD*	*n*	*M*	*SD*	*t*(*df*)	*p*
Not litter	28	8.89	.32	22	8.59	1.50	1.04(48)	.304
Not feed the wildlife	29	7.76	1.92	23	7.52	2.27	.41(50)	.686
Volunteer to help with park projects	29	4.38	2.37	23	6.09	2.28	-2.63(50)	.011*
Write a letter/e-mail to support the park	29	5.31	2.70	23	5.91	2.43	-.84(50)	.408
Not continue to visit a favourite spot even if it needs to recover from environmental damage	28	5.68	3.22	21	5.19	3.20	.53(47)	.601
Follow the rules and regulations for recreation activities	29	8.48	0.83	21	8.24	0.83	1.03(48)	.309
Leave wildlife alone	29	8.31	1.20	23	8.17	1.80	.33(50)	.745
Not participate in recreation in non-designated areas (e.g., protected areas)	29	6.72	2.88	23	6.17	3.10	.66(50)	.511
Engage in less environmentally damaging recreation activities (e.g., hiking instead of climbing)	29	7.34	2.27	23	7.43	1.80	-.16(50)	.877
Not pick flowers and remove dead tree branches	28	7.07	2.60	23	7.22	2.83	-.19(49)	.849

Note. Mean scores based on scale (Extremely Unlikely = 1 to Extremely Likely = 9).
Note. N = number of participants; M = mean; *SD* = standard deviation; *df* = degrees of freedom.
*Denotes groups that were significantly different from each other at $p < .05$.

Further t-tests were conducted comparing the winter (Animal Tracking on Snowshoes, Snowshoe Under the Stars) and fall programs (Follies of the Fall Forest) for the same reason the t-tests were conducted for the winter and spring programs. Based on the researcher's observations, the NCC fall programs were similar to the NCC spring programs in that they also walk along the Sugarbush Trail and follow the same general style as the spring programs. As a result, the researcher felt that the previous hypothesis (winter programs have more elements related to recreation and would therefore have higher ratings on the Recreation Satisfaction Scale than the fall programs, and that the fall programs have more elements related to environmental literacy and pro-environmental behavioural intentions) would also be applicable to these two

seasonal programs. The findings from the t-tests did not support the researcher's hypothesis, in fact the findings suggest the opposite.

Table 14 illustrates the independent t-test results for recreation satisfaction according to season of the program (winter and fall). The fall group had higher mean scores than the winter group on 14 of the 18 scale items. A couple of these differences between the winter and fall groups were statistically significant (at $p < .05$): "learning about the park's natural wonders" at $t(45) = -2.19$, $p = .034$, and "doing something with my family," at $t(45) = -2.19$, $p = .034$. In both instances, participants from the fall programs reported higher scores for each of these items on the Recreation Satisfaction Scale. The difference in scores for "learning about the park's natural wonders" is likely due to the fact that in the fall programs, as observed by the researcher, the interpreter discussed many current and ancient uses for various parts of certain trees; this is both an unveiling of one of the many wonders of nature and an interesting historical element that the winter programs did not possess. The reason for the second item "doing something with my family" is less clear, as many of the interpretive programs were attended by families. The only element that comes to mind that distinguished the fall programs from the winter programs, was at the beginning of the fall programs (while still indoors) the interpreter invited all the children to the front of the room to participate in an experiment to help explain why the leaves change colour. Involving the children in such a way may lead participants to feel like this program is more inclusive of children and therefore a more family oriented program. In contrast to the findings from the t-tests that examined the winter and spring programs, this finding suggests that while again it is likely that all of the selected programs had the potential to be considered satisfying recreation experiences, the fall programs in this case may have had slightly more opportunity for satisfying recreation experiences.

Independent t-tests were also completed for environmental literacy and pro-environment behavioural intentions, and while the fall group had higher mean scores on all of the environmental literacy items (see Appendix 7), and on most of the pro-environmental behavioural intentions in comparison to the winter group (see Appendix 8), none of the differences were statistically significant. Furthermore, when independent t-tests were completed according to season for interpretive techniques, the fall group had higher means on 12 of the 15 items, however there were only three variables that were significantly different (at $p < .05$): "the interpretive program had written materials that were helpful" at $t(29) = -2.95$, $p = .006$, "the interpretive program motivated me to support the park (e.g., donating money, volunteering, etc.)" at $t(45) = -2.59$, $p = 0.13$, and "the interpretive program encouraged me to sense the beauty of nature" at $t(45) = -2.30$, $p = .026$ (see Table 15). In all instances, participants from the fall interpretive programs reported higher scores for each of these items on the Interpretive Techniques Scale. The first two items "the interpretive program had written materials that were helpful" and "the interpretive program motivated me to support the park (e.g., donating money, volunteering, etc.)" make perfect sense to the researcher. Firstly, according to the researcher's observations during the NCC fall programs (Follies of the Fall Forest) a sheet was handed out to participants to use as a tool to help them identify certain trees, this handout was used for the first couple of activities and therefore was very helpful for participants as it allowed them to fully participate in the program and identify trees on their own. Written materials were not used in any of the other selected interpretive programs except for the NCC Spring Flowers have Sprung program. Secondly, based on the researcher's observations, like the NCC spring interpretive programs, at the beginning of the NCC fall interpretive programs the interpreter announced upcoming events in the park as well as current and upcoming opportunities to volunteer with the

park. The reason for the higher mean score for the third item, "the interpretive program encouraged me to sense the beauty of nature," during the fall program is likely due to the colourful autumn foliage to view during the fall programs. Many visitors come to Gatineau Park in the fall to admire the beauty of the leaves changing colour and it is likely that during the fall programs it is much easier, than in winter, to admire the beauty in nature when the forest is saturated in gorgeous golden yellow, bright orange and deep red hues. Overall, these findings suggest that the fall interpretive programs used some interpretive techniques that the winter programs may not have used. Finally, t-tests were also conducted for the overall scores of the four scales by season of program (winter/fall) and no significant differences were found.

Table 14

Independent t-test Results for Recreation Satisfaction by Season of Program (Winter/Fall)

	Winter			Fall				
	n	*M*	*SD*	*n*	*M*	*SD*	*t(df)*	*p*
Enjoying the sounds of nature	29	7.97	1.52	18	8.28	1.18	-.74(45)	.462
Developing my outdoor skills	29	7.76	1.09	18	7.72	1.45	-.10(45)	.922
Learning about the park's history	29	6.83	1.73	18	7.78	1.35	-1.98(45)	.054
Releasing or reducing some built-up tensions	28	7.07	1.41	17	7.29	2.08	-.43(43)	.671
Studying nature	29	7.59	1.40	18	8.06	1.39	-1.12(45)	.269
Doing something with my family	29	7.38	1.47	18	8.28	1.18	-2.19(45)	.034*
Learning about the park's natural wonders	29	7.48	1.62	18	8.39	.85	-2.19(45)	.034*
Getting away from crowded situations	28	7.71	1.61	18	8.06	1.26	-.76(44)	.450
Experiencing peace and calm	29	8.24	.87	18	7.83	1.42	1.22(45)	.228
Enjoying the smells of nature	29	8.00	1.16	18	8.33	.91	-1.03(45)	.307
Learning what I am capable of	29	6.83	1.49	18	7.28	1.67	-.96(45)	.342
Having thrills	29	6.59	1.62	18	6.50	1.76	.17(45)	.864
Bringing my family closer together	29	7.28	1.53	18	7.89	1.41	-1.37(45)	.176
Reflecting on my spiritual values	29	6.45	1.76	18	7.00	1.72	-1.05(45)	.298
Being with others who enjoy the same things I do	28	7.86	1.21	18	7.39	1.50	1.17(44)	.250
Meeting other people	28	6.96	1.40	18	6.50	1.42	1.09(44)	.282
Encountering wildlife	28	7.18	1.93	18	7.17	1.46	-.02(44)	.982
Being in a nature setting	27	8.33	.91	18	8.33	.91	-.00(43)	1.000

Note. Mean scores based on scale (Strongly Detracts = 1 to Strongly Adds = 9).
Note. N = number of participants; M = mean; *SD* = standard deviation; *df* = degrees of freedom.
*Denotes groups that were significantly different from each other at $p < .05$.

Table 15
Independent t-test Results for Interpretive Techniques by Season of Program (Winter/Fall)

	Winter			Fall				
	n	*M*	*SD*	*n*	*M*	*SD*	*t(df)*	*p*
Sparked my interest	29	8.24	1.40	18	8.39	.61	-.42(45)	.676
Was meaningful to me	29	8.24	1.35	18	7.83	1.65	.92(45)	.361
Was presented as a story	29	6.29	1.28	18	6.51	2.38	-.40(45)	.690
Inspired and provoked me to broaden my horizons	29	7.03	1.70	18	7.22	1.99	-.34(45)	.732
Presented a distinct theme	29	8.10	1.05	18	8.17	1.69	.16(45)	.877
Was suitable for my age group	29	8.17	1.56	18	8.11	1.28	.14(45)	.889
Brought the past alive	17	5.76	1.48	13	6.15	1.52	-.71(28)	.486
Incorporated technology in an appropriate manner	16	6.31	2.02	14	6.93	1.49	-.94(28)	.357
Provided the right amount of information – enough information but not too much	29	7.82	1.56	18	8.00	1.57	-.38(45)	.709
Had an interpreter who communicated effectively	29	8.39	1.18	18	8.59	.48	-.69(45)	.497
Had written materials that were helpful	14	5.93	2.43	17	7.94	1.30	-2.95(29)	.006**
Motivated me to support the park (e.g., donating money, volunteering, etc.).	29	5.55	2.06	18	7.00	1.50	-2.59(45)	.013*
Encouraged me to sense the beauty of nature	29	8.05	1.18	18	8.72	.46	-2.30(45)	.026*
Was a very positive experience for me	29	8.05	1.40	18	8.56	.62	-1.45(45)	.155
Made me feel passion for nature	29	7.79	1.40	18	8.33	.91	-1.46(45)	.152

Note. Mean scores based on scale (Strongly Disagree = 1 to Strongly Agree = 9).
Note. N = number of participants; M = mean; *SD* = standard deviation; *df* = degrees of freedom.
*Denotes groups that were significantly different from each other at $p < .05$.
**Denotes groups that were significantly different from each other at $p < .01$.

Number of Visits to the Park

Additionally, Spearman rank order correlations were conducted examining survey responses from participants based on their number of visits to the park per year, in relation to the interpretive outcomes. The survey responses were ranked in order of frequency of visits to the park ranging from 1 (this was my first visit) to 7 (21 or more times per year). It was the researcher's hypothesis that those who frequently visit the park would have higher mean scores on the Pro-environmental Behavioural Intentions Scale because it is likely that frequent visitors already have an attachment to the park and could more easily be influenced to engage in pro-environmental behaviours, and that those who visit the park less frequently would have higher mean scores on the Environmental Literacy Scale since it is more likely that they would be

learning new information about the park that they may have not known before (increase in knowledge).

Table 16 illustrates the significant Spearman rank order correlation results among survey participants for items on the Pro-Environmental Behavioural Intentions Scale, and items on the Recreation Satisfaction Scale. The correlations revealed significant associations between the number of visits to the park and two of the items on the Pro-Environmental Behavioural Intentions Scale: "Volunteer to help with park projects" and "Write a letter/e-mail to support the park." The correlations also revealed significant correlations between number of visits to the park and some of the items on the Recreation Satisfaction scale including: "Studying Nature," "Having Thrills," "Encountering Wildlife," and "Being in a Nature Setting." Spearman rank order correlations were also conducted between number of visits to the park and both environmental literacy and interpretive techniques, however no significant correlations were found.

Table 16
Spearman Rank Order Correlations Between Number of Visits to the Park and Interpretive Outcomes

Scale	Item	Number of visits to the Park		
		N	*r*	*p*
Pro-Environmental Behavioural Intentions	Volunteer to help with park projects	76	.273	.017*
	Write a letter/e-mail to support the park	76	.251	.029*
Recreation Satisfaction	Studying nature	75	.310	.007**
	Having thrills	75	.255	.027*
	Encountering wildlife	73	.340	.003**
	Being in a nature setting	72	.249	.035*

*Correlation is significant at the $p < .05$ level.
**Correlation is significant at the $p < .01$ level.

Previous Interpretive Program Participation

A one-way ANOVA test was conducted to compare the survey responses of participants based on the number of previous interpretive programs they had participated in. The participants' survey responses were categorized into three groups: those who had never participated in an interpretive program before (this was their first program), those who had previously participated in two to five interpretive programs, and those who had previously participated in between six and 11 or more. These groups were suitable for testing because they were comparable in size (group one with 22 participants, group two with 27 participants, and group three with 27 participants). These three groups were selected for comparison based on the researcher's expectations that there would be significant differences between those who had never participated in an interpretive program before (group one) and those who had previously participated in several interpretive programs (group three).

The findings from the ANOVA test revealed no significant differences between any of the three groups for the items on the Interpretive Techniques Scale or for the items on the Environmental Literacy Scale. Significant differences were found between the three groups for two of the items on the Pro-environmental Behavioural Intentions Scale (at $p < .05$) for likelihood to "not litter" (groups two and three had higher mean scores than group one), and likelihood to "not continue to visit a favourite spot even if it needs to recover from environmental damage" (group three had a higher mean score than group one) (see Appendix 9). Significant differences were also found for three items on the Recreation Satisfaction Scale (at $p < .05$) for "learning about the park's natural wonders" (group two had higher mean scores than group three), "bringing my family closer together" (group two had higher mean scores than

group three), and "reflecting on my spiritual values" (group two had higher mean scores than group three) (see Appendix 10).

Finally, t-tests were also conducted for previous program participation with the overall scores of the four scales. A significant difference was found for the overall score of pro-environmental behavioural intentions with those who had participated in more interpretive programs (6-11 or more visits/group three) reporting a higher pro-environmental behavioural intentions score (see Appendix 11).

Open-Ended Questions

Comments on Interpretation Program

The first open-ended question asked participants the following question, "please write any comments you may have on the specific interpretive program that you attended." Out of the 78 participants in the study, there were 55 responses to this question, and many responses contained multiple comments on various aspects of the program for a total of 96 comments. When the comments were analyzed, several themes emerged that were common among many responses (see Table 17).

Twenty of the responses included positive comments about the interpreter by stating *how excellent or knowledgeable the interpreter was*. A comment of high praise for the interpreter was the most common theme that emerged in the responses to this first open-ended question. Some examples include:

"Outstanding Guide full of information and lots of energy."

"I thought the interpretive guide was great. She was friendly and knowledgeable. She provided interesting facts that related to the audience"

"The guide was excellent; very knowledgeable."

"It was a fantastic presentation, very knowledgeable interpreter…about nature, the environment and Gatineau Park. She made the entire experience very interesting and memorable."

"Tour guide was awesome! Great personality, passion, and engaging."

"Excellent interprète. L'interprète a très bien maîtriser le fait que le programme était bilingue. Bon équilibre entre les deux langues et transitions en douceur. L'interprète a une grande expertise et n'hésite pas à le dire lorsqu'il ne sait pas quelle est la réponse à une question." (Translation: "Excellent interpreter. The interpreter handled the fact that the program was bilingual very well. A good balance between the two languages with smooth transitions. The interpreter has extensive expertise and doesn't hesitate to say that he doesn't know the answer to a question")

Table 17

GENERAL COMMENTS ON INTERPRETIVE PROGRAM

THEME	# OF COMMENTS	THEME	# OF COMMENTS
GOOD INTERPRETER	20	GOOD PRESENTATION/ INTERPRETATION	4
LEARNING	13	CRITICISMS	(4)
INTERESTING	13	LACK OF EQUIPMENT	1
KID APPROPRIATENESS	(11)	CROWDED	1
GREAT FOR KIDS	4		
MOSTLY FOR KIDS	3	HIKE INTENSITY TOO LOW	1
NOT FOR KIDS	1	NO HANDOUT	1
NOT FOR YOUNGER KIDS	1	SOMETHING NEW	3
GOOD FOR OLDER KIDS	1	NO REASON FOR POSITIVE EXPERIENCE	3
YOUNG KIDS DISTRACTING	1	FREE	3
ENJOYABLE/FUN	8	LENGTH	(3)
HEARING/SEEING NATURAL BEAUTY	(5)	TOO SHORT	2
SEE FALL COLOURS	1	TOO LONG	1
HEARING SOMETHING	2	WELL ORGANIZED	3
NATURAL BEAUTY	2	BILINGUAL	2

TOTAL = 96

A second emergent theme was that of *education*; 13 responses included positive comments about learning something during participation in the program such as learning something new about how animals survive in winter or learning how to use snowshoes:

> "…learned quite a bit about the different animals in the park, their habitats and how to identify their tracks, and conservation efforts in the park."
>
> "…provided interesting facts that related to the audience, "like can you imagine if your tongue was as long as you are tall?" and then you learn that the [pileated] wood pecker has a cavity behind its eyes so its tongue can fit into its head."
>
> "The guide taught us alot about the animals and interpreting their tracks and food as well as plant life and their photosynthesis."
>
> "The snowshoe activity was excellent - first time on s[n]ow shoes and I plan to do this again in the future."
>
> "It was also a great opportunity to try snow shoeing for the first time. We now plan to buy snow shoes and return to the Gatineau Park trails in the winter."

Another major theme included comments by 13 participants on how *interesting* the program was, for example:

> "There were several interesting things about the animals that we learned that day that I still recall."
>
> "The information we were given was very interesting."
>
> "Very interesting subject."
>
> "It has sparked an interest in us to go again and we will be back to do a different trail and also in the winter for the snow activities provided. I found the programme very inter[e]sting and learnt a few things I had forgot[e]n."

"[The interpreter] made the entire experience very interesting and memorable."

"Intéressant." (translation: "Interesting")

Another common theme was the *level of appropriateness* of the interpretive program *for children*. Four participants from the Frog Chorus program and the Follies of the Fall Forest program commented on how great the program was for their kids. Similarly, a participant from the Animal Tracking on snowshoes program, a participant from the Secrets of the Park's Night-life program, and a participant from the Follies of the Fall Forest program felt that the "program [was] mostly for kids," "geared towards children," and "gears towards families with small children" respectively. Conversely, a participant from the Owl Prowl program felt the program was far too long and due to the lengthy indoor presentation was not designed for children. Additionally, one participant mentioned that he/she was somewhat distracted by the younger children "I found [it] distracting when I was trying to listen to [the interpreter] and the younger ones running around and making noise (not their fault) but their attention span was just short." Finally, one participant from the Follies of the Fall Forest program felt that the program was well suited for older children such as 10-12 years old as they could understand what the interpreter was trying to tell them but not for the younger children as they did not benefit as much.

The theme of *hearing or seeing something in the presence of nature's beauty* was also commonly commented on (five comments) as was expressed by a participant from the Animal Tracking on Snowshoes program, "Experiencing Gatineau Park through this interpretive program was to look at a place of natural beauty I already love through new eyes." Furthermore, of those who participated in the Owl Prowl program and the Sights and Sounds of Birds program, two made positive comments about *hearing* an owl or a bird respectively. Finally, one

participant from the Follies of the Fall Forest program commented on how great it was to see the beautiful fall colours of the leaves.

Furthermore some participants commented on the *length* of the program such as a participant from the Snowshoe Under the Stars program expressed that the excursion was too short, and that a longer program would have been better. Similarly, another participant mentioned that a longer program with opportunity to stop and have lunch would have been better. Another participant commented that the program was too long, especially the indoor portion (Owl Prowl program). Additionally, a few participants provided some further *criticisms* about the programs they attended, one participant commented on crowded trails with the following statement "…getting away from crowds is my objective, but of course that trail was very busy this past weekend…" One participant commented on the lack of a handout and felt that one would have been helpful (Animal Tracking). Another participant commented on the low intensity of the hike and would have preferred a higher intensity hike. Finally, one participant from the Frog Chorus program stated that participants in this program needed to be better notified about bringing proper equipment such as rain boots and a flashlight in order to be adequately prepared to participate in this program.

Other themes found for this question included having a *fun* or *enjoyable experience* as was expressed in eight comments such as "Enjoyed the experience and the time," "enjoyable and interesting," "Extremely fun and educational" and "Fun and Interactive;" a *good presentation or interpretation* and *easy to understand* (four comments) as illustrated by the comment "It was presented very professional and practical;" *experiencing something new* (three comments) or for the first time such as trying snowshoes for the first time as was mentioned in the comments by two participants. Three participants expressed how much they appreciated that the *programs*

were free (those who participated in the Gatineau Park NCC programs), for example: "I just can't bel[ie]ve it's free…" and "it was pretty awesome that it was both free, and provided snowshoes…" Three participants also expressed positive comments on how well the program was *organized* and had a good balance of walking and talking. Another two commented on the language used during the programs and appreciated that the programs were offered in both French and English or were *bilingual* programs, "I truly loved everything about it. The program was done in both official languages and I felt that the presenter dealt with that very well. I am English but understand some French and I had no problem following." Three participants positively commented on the overall program with short statements, however provided *no reason* for what specifically contributed to those positive remarks, for example "It as a great experience," "It was quite [d]elightful" and "They are all good."

Recreation Satisfaction

The second question asked participants to "please comment on your satisfaction with your recreation experience." Similar to the first open-ended question, there were 46 individual responses overall, however many responses included several different comments for a total of 59 comments. An overall look at the comments discovered several emergent themes (see Table 18).

The most common responses were those that expressed a *satisfying or enjoyable recreation experience* but provided *no reason*. For example:

"I enjoyed the experience."

"Very satisfied - great program."

"I was quite satisfied with the experience."

"Wonderful, I would recommend this to anyone."

"Great experience"

Table 18

COMMENTS ON RECREATION SATISFACTION			
THEME	# OF COMMENTS	THEME	# OF COMMENTS
SATISFYING OR ENJOYABLE RECREATION EXPERIENCE	(52)	DETRACTIONS FROM SATISFACTION	(7)
NO REASON	18	HIGHWAY TRAFFIC	2
LEARNING	5	COLD	1
GOOD INTERPRETER	6	LACK OF EQUIPMENT	1
FAMILY	4	CROWDED	1
NATURAL BEAUTY	3	NOT SUITED FOR DEMOGRAPHIC	1
INTERESTING	2	NO NEED FOR SNOWSHOES	1
FUN	2		
GOOD USE OF TIME	2		
GOOD WALK	2		
NICE ENVIRONMENT	2		
CHANGE ROUTINE	1		
SOMETHING NEW	1		
FREE	1		
EXERCISE	1		
HEARING SOMETHING	1		
NOT TOO LONG	1		
TOTAL = 59			

There were a total of 18 responses like the ones above that provided no reason for their positive recreation experience, only short statements indicating that they enjoyed their interpretive experience. Other participants provided some explanations for their satisfying recreation experience. For example, five respondents included *learning* as a main factor that contributed to their recreation satisfaction:

"I have enjoyed very much, and learned a lot."

"I found the recreation experience very satisfactory: I learned a lot"

"My family and I try and do this every year and every year we learn new things!"

Additionally, another six responses credited their *excellent interpreter* as the reason for their enjoyment of the program such as:

"Very interesting, very informed guide. It was a pleasure..."

"I really enjoy[ed] the interpret[e]r."

"[The interpreter] was very good, and full of information!! Very knowledgeable and friendly too."

"Tres agréable et bien interpreter." (Translation: Very agreeable and well interpreted)

Another four responses mentioned that participating in the program with their *family* contributed to their positive recreation experience:

"A nice way to spend an evening with your kid."

"It is always great to visit Gatineau Park, we go every weekend as a family"

"…being with family and same minded participants"

"Facile a comprendre et accessible a toute la famille." (Translation: "Easy to understand and accessible to the whole family")

Another contributing factor to a satisfying recreation experience was experiencing *nature's beauty* (three comments) as was expressed by a participant from the Animal Tracking on Snowshoes program:

"I was awestruck by the astounding natural beauty of the Park as always, but the interpretive event offered me an opportunity to gain more knowledge about the Park and enhanced my respect for Nature as well as programs such as these that raise awareness and appreciation of the beauty of the Park"

Other contributing items included: *enjoying the walk/hike* (two comments) such as "Love the walk, it [w]as great;" *the environment/atmosphere* (two comments) "It was a beautiful day, fresh snow,…it was a good way to have a taste of the park in the winter;" and trying something new like snowshoes (one comment) as was expressed in the following quote:

> *"I enjoyed my first snowshoeing experience. It gave me a comfort level where now I will feel confident in returning to the park with family and friends and rent snowsho[e]s. It also taught me about the park in general, the types of animals that live in the park and its many trails."*

Other minor themes included: *having fun* (two comments) such as "Really fun!" and "great fun;" *the interesting program* (two comments) such as "Was a very interesting and enjoyable experience;" and *a good use of time* (two comments) *"It was a good way to spend a Sat. afternoon! Very satisfied."* Other comments included the program being free (i.e., NCC Gatineau Park programs: Animal Tracking, Spring Flowers, Sights and Sounds of Birds, Secrets of the Park Night Life, Follies of the Fall Forest) (one comment), getting exercise (one comment), the program not being too long (one comment), hearing something (i.e., birds) (one comment), and changing one's daily routine (one comment).

Conversely, some participants also commented on *factors that detracted from satisfaction with their recreation experience*. A participant from the Frog Chorus program expressed that his/her experience would have been greatly improved had he/she been notified about bringing proper equipment such as a light and appropriate footwear to walk in the water. Further themes that arose in the participants' comments that contributed to detracting from the recreation experience included: the trail being too crowded, the program being ill-suited to his/her demographic, no need for snowshoes since the trail was so compacted, the weather being too cold to have so many lengthy stops, and the lack of traffic control when crossing the highway at the beginning of the excursion. For example, one participant wrote "Very nice program, but crossing the highway was awful and very much detracted from the experience ... there needs to be some kind of traffic control" (Animal Tracking on Snowshoes program). Another participant

from the Sights and Sounds of Birds program mentioned that the program "Could have been better if the path we were on was not near a busy road [that] kind of ruined the outdoor experience." Since the trail was near a busy road the sounds of vehicles detracted from the experience.

Environmental Concern

The final open-ended question stated "please comment on how participation in the interpretive program influenced your environmental concern." As was seen in the second open-ended question, there were 46 individual responses, however the comments in this section were much shorter than those for the previous two questions bringing the total number of comments for this section to only 50. When asked how the interpretive program influenced their environmental concern three major themes emerged: 28 responded that their environmental concern had increased, six responded that their current level of environmental concern was either enhanced or re-confirmed but had not necessarily increased, and 16 responded that no change had occurred in their level of environmental concern (see Table 19).

Out of the 28 responses that expressed an *increase in environmental concern*, the most common response (eight responses) related to an *increase in knowledge*, stating that the participants learned something about the environment such as "More knowledge about how fragile wildflowers are" and "not pick flowers and not to transfer wood from one place to another so as not to spread disease (when burning wood at a camp-fire)." Another common response expressed *concern for wildlife* and their habitats (five comments) as illustrated by the following examples:

> "It made me more aware of wildlife signs and habitats. I will aim to be more careful about how I live to preserve nature."

"Knowing more about the animals in the park makes me appreciate it more."

"The interpretive program influenced my concern on the enviro[n]ment by showing me the needs of owls in the environment, and therefore what I can do to help protect them."

Table 19

COMMENTS ON ENVIRONMENTAL CONCERN	
THEMES AND COMMENTS	# OF COMMENTS
UNCHANGED	(16)
ALREADY CONSCIOUS	10
NO REASON	6
INCREASED ENVIRONMENTAL CONCERN	(28)
INCREASED KNOWLEDGE	8
INCREASED AWARENESS	5
CONCERN FOR WILDLIFE	5
INCREASED INTEREST	3
PARK CONSERVATION	2
BE MORE CAREFUL	2
INCREASED ENTHUSIASM	2
CONCERN ABOUT STRUCTURES	1
HIGHLIGHTED CURRENT LEVEL OF CONCERN	(6)
ENHANCED CURRENT LEVEL OF CONCERN	4
CONFIRMS CURRENT LEVEL OF CONCERN	2
TOTAL	50

Three respondents indicated that their interest in the environment/nature increased as reflected in the following response: "It made me more interested about the environment. It was fun to learn about nature in an outdoor setting. It was a lot more interactive." Notably, five other responses mentioned an increase in environmental awareness as illustrated by the following statements: "It made me more conscious of my environmental impact" and "Increased my environmental concern…." Another two responses mentioned an increased appreciation for park conservation. A participant from the Follies of Fall Forest program stated that he/she would be more careful and refrain from transporting wood to and from campsites. A participant from the Frog Chorus program also expressed that he/she will now be more careful with his/her actions when near ponds, another participant from the same program expressed concern about the proximity of

human structures to ponds and how that affects the ecosystems. Finally, two more responses expressed an increase in enthusiasm by participants stating that they will practice what they have learned and spread the word to others such as "We are going to visit another area of the park and help to promote a positive attitude among our friends."

The next major emergent theme included participants' comments explaining that they were already fairly environmentally conscious however participating in the program *enhanced their current level of environmental concern,* or that participating in the program helped remind them of their environmental concern and *re-confirmed their environmental concern* as seen in the following examples:

> "just confirms my stand on the necessity to protect and provide access to parks such as this."
>
> "No change really but highlighted more."
>
> "I am very environmentally aware; this program only heightened my concern."
>
> "Experts are in a position to share information that I would otherwise never have come across. While we have always been respectful of nature, it is always nice to enhance your knowledge through these activities. Great experience, both relaxing and informative."
>
> "Well it's a good reminder of the precious animals that God entrusted to us so long ago in the garden of Eden. He still wants us to look after them now, that has never changed."

Finally, the responses from the last major theme could easily be divided into two sub-themes. The first sub-theme included those who expressed *no change in environmental concern*. Six respondents stated that the program had no impact on their environmental concern or influenced any change in their environmental concern, but provided no further reasons. For example:

"My environmental concern was mostly unchanged."

"I am at the same level I was coming in regarding my environmental concern."

"Not much."

"It didn't."

"Same."

The second sub-theme (consisting of ten responses) included those who stated that participation in the interpretive program had no influence on their environmental concern because they were *already very environmentally conscious/active/aware* prior to participation in the program. As a result these participants did not feel they needed to be influenced to become more environmentally conscious because they already felt that they are knowledgeable and aware. Examples of this category include:

"I am always environmentally concerned so do not need to be influenced…"

"I am already very interested in nature and the env[i]ronment - that is why I was there!"

"I'm already quite environmentally concerned, so the interpretive program didn't influence it."

"N/A already environmentally aware because have a background in bachelor of science."

Tables 17, 18, and 19 above display the themes, according to question, found in participants' responses to the open ended questions, along with the number of comments related to that theme. While the themes were initially analysed separately, when the themes for all three questions were looked at collectively there were several that overlapped across questions. For example, the prominent theme of *good interpreter* for the first question is also a theme of the second question. Additionally, the theme of *learning* is found in the responses from both question one and two, and is also connected to the theme of *increased knowledge* found in the

responses from the third question. Similarly, the theme *interesting* appeared in the analysis of the first two questions and the code *increased interest* emerged in the analysis of the third question. Comments relating to the program being free and fun were found in responses for both question one and question two. The ideas of doing or experiencing something new, hearing something, and being in the presence of natural beauty were also themes that were found in the responses to both questions one and two. Furthermore, responses related to lack of equipment, the trails being crowded, and the program being unsuitable for certain demographics (including responses related to the programs' appropriateness for various ages of children) were present in both the comments from question one and question two. Finally, some respondents provided no reason or explanation for their comments in the responses to all three questions.

Chapter 5: DISCUSSION AND CONCLUSIONS

This chapter discusses the findings from the survey questionnaire concerning the environmental and recreation outcomes of participation in selected Gatineau Park interpretive programs (as presented in Chapter 4). The first sections of this chapter are organized according to the specific research questions stated in Chapter 1:

- To what extent are park interpretive programs able to connect visitors to the resource through the use of interpretive techniques?
- What is the perceived impact of park interpretive programs upon pro-environmental intentions?
- What is the perceived impact of park interpretive programs upon environmental literacy?
- To what extent is participation in park interpretive programs perceived as a satisfying recreation experience?
- Is there a relationship between the visitors' assessment of interpretive techniques and the interpretive outcomes (environmental and recreation)?
- Is there a relationship between environmental and recreation outcomes?

In the last sections of the chapter, the researcher will consider the limitations of the study, along with the implications of the findings for further research and professional practice.

Interpretive Techniques

The high mean scores for the items on the Interpretive Techniques Scale suggest that overall the selected programs and interpreters at Gatineau Park are able to connect visitors to the resource through the use of several interpretive techniques. The programs and interpreters appear to be able to spark an interest in the participants and capture their attention as this item had the highest mean score of all the items on this scale. It is important to note that the ability to spark an

interest is the first guiding principle of interpretation according to Beck and Cable (2011). Furthermore, the findings suggest that the programs and the interpreters are connecting visitors to the park by encouraging participants to sense the beauty of nature. The high mean score of this item suggests that the interpreters have the potential to "instill in people the ability, and the desire, to sense the beauty in their surroundings…" (Beck & Cable, 2011, p. xxiv). Importantly, the high mean score on the communication item suggests that the selected interpreters are using effective communication techniques to extend their knowledge to their audiences. According to Beck and Cable (2011) "quality interpretation depends on the interpreter's knowledge and skills" (p. xxiv). This finding is important because the successful use of communication techniques is consistent with the findings from Benton's (2009) study where participants were able to recall specific communication techniques that helped connect them to the resource. Finally, the item on the scale with the lowest mean score ("the interpretive program brought the past alive") was expected to have a lower mean score because this item is typically more associated with cultural/historical interpretation.

The comments from the open-ended questions are particularly important since the answers to these questions help inform us as to which interpretive techniques are most commonly used and if participants feel they are effective, and which techniques may be absent or lacking that could be added to improve the effectiveness of the program. Based on the findings from the first open-ended question it is clear that the interpreters for these programs are knowledgeable and are effectively providing interesting information that is both educational and enjoyable. These qualities reflect some of the key guiding principles of interpretation, such as being knowledgeable, using effective communication skills, and providing the right amount of information that is both stimulating and meaningful as outlined by Beck and Cable (2011).

Furthermore, participants seem to appreciate that many programs are free of charge and offered in both official languages; these may be key selling points that make the program accessible and facilitate participation.

Based on the findings from the open-ended questions, there was a range of comments on the programs' appropriateness for children. Some felt that the programs were not suitable for children, others felt that the programs were great for their children, and others without children felt that the programs were too focused on children and not suitable for adults. As a result, it is clear that interpreters need to know how to gauge their audience and how to provide a program with participants across a wide age range. Focusing too much on children causes adults to feel bored, while focusing too much on adults, causes children to be overwhelmed or restless. Alternatively, perhaps the programs should be advertised as oriented to families, children, or adults so that park visitors can make informed decisions about their participation. According to Beck and Cable's (2011) principles of interpretation, principle six states that programs for seniors, children, and teenagers should follow fundamentally different approaches. Programs designed for specific age groups may be a more practical way to deliver programs that are stimulating for participants of all ages.

Pro-Environmental Behavioural Intentions

The high mean scores for the items on the Pro-environmental Behavioural Intentions Scale suggest that overall the selected programs at Gatineau Park have some potential to influence behavioural intentions. While this study may have had a relatively small sample size of 78 participants, 73% of these participants indicated changes in their pro-environmental intentions (a score of six or higher on the nine-point scale) after program participation compared to the 40% of interpretive programs participants that reported changes in behavioural

intentions from Stern et al.'s (2012) study, which had 3,603 participants. The item on the Pro-Environmental Behavioural Intentions Scale regarding following the rules and regulations of activities in the park received a relatively high mean score, which suggests that the interpretive programs are effectively promoting the rules and regulations of the park and perhaps information on the environmental consequences if the regulations are not followed. Furthermore, the researcher observed rules and regulations being enforced by certain interpreters during some of the spring and fall interpretive programs; this likely also influenced participants' intentions to follow the rules and regulations of the park. Furthermore, some of the items on the Pro-environmental Behavioural Intentions Scale that received lower mean scores such as "writing a letter/e-mail to support the park" and "volunteering to help with park projects" suggest that some of the interpretive programs may not be providing sufficient information on opportunities to support the park, or may not be providing sufficient reasoning as to why the park needs support. This finding is also consistent with the findings from the Interpretive Techniques Scale as the item "motivated me to support the park (e.g., donating money, volunteering, etc.)" also received a mean score on the lower end of the scale. As a result, it would seem that some of the selected interpretive programs may not be proactively encouraging participants to support the park and therefore have little influence on participants' intentions to support the park. Having said this, the researcher did observe some interpreters particularly during the spring and fall programs encouraging participants to volunteer at the park.

Furthermore, the findings from the Spearman rank order correlations examining the relationship between pro-environmental behavioural intentions and number of visits to the park per year revealed some significant associations. Significant correlations were found between

frequency of park visitation and the Pro-environmental Behavioural Intentions Scale items of "volunteer to help with park projects," and "write a letter/e-mail to support the park." It could be suggested that participants, who frequently visit the park, already have some sort of attachment to the park and could be more easily influenced to volunteer or write a letter to support the park as they might be more willing. These findings could suggest that the interpretive programs may have more success in influencing pro-environmental behavioural intentions in participants who visit the park more frequently because it is more likely that these visitors might change their behavioural intentions to better protect the park that they are attached to.

Similar to the results from the t-tests regarding frequency of visits to the park, the results from the one-way ANOVA tests also revealed significant differences for those who had previously participated in several interpretive programs (between six-11 or more), and those who had participated in some previous interpretive programs (between two and five) compared to those who had never previously participated in an interpretive program (this was their first program). Both items with significant differences (littering and continuing to visit a favourite spot even if it needs to recover from environmental damage) were negative behaviours, which suggest that the participants who had previously attended interpretive programs may be more receptive to the program's influence, and may be less likely to engage in negative environmental behaviours. Those who have participated in previous interpretive programs may be more comfortable and at ease during the program because they have an idea of what to expect and therefore may be more receptive and focused on the interpretive information which could influence their behavioural intentions. Furthermore, those who enjoy participating in nature interpretive programs may already have an attachment to nature and therefore may be more easily influenced regarding their environmental behaviours.

Despite some significant results, overall the data revealed only some evidence of the interpretation programs significantly influencing participants' pro-environmental behavioural intentions. However, it is important to note that these findings are consistent with the findings from Benton's (2009) study. Benton also found less evidence supporting conceptions two (influencing behaviour) and three (environmental literacy) than conception one (the use of interpretive techniques), and found that participants tended to only recall: some common park rules that were conveyed during the program, seeing other visitors being asked not to do certain things, and reminders not to pick anything up and to stay on the trail.

Environmental Literacy

Based on the findings from the third open-ended question it is evident the programs are positively influencing some participants with regards to their environmental literacy (e.g., increased knowledge and awareness). This finding is consistent with the findings from Benton's (2009) study where participants were able to recall some messages related to environmental literacy (human impact upon the environment) and therefore the interpretive programs were able to convey some messages related to conception three. Moreover, as was stated in the literature review, interpretation can be an effective method of raising environmental awareness (Buckley & Littlefair, 2007; Powell & Ham, 2008; Kim et al., 2011); however, some may already be environmentally conscious and consider themselves to be highly environmentally literate, and therefore do not need an interpretive program to raise their awareness. This finding is further emphasized by the results of the descriptive statistics in which the item "after participating in the interpretive program my awareness of environmental issues has increased" received the lowest mean score of the items on this scale. The low mean score of this item could either be due to the fact that the program may not have provided enough information regarding environmental issues

or it could be that participants felt they already have an extensive awareness of environmental issues and therefore the interpretive program had no influence on their environmental awareness. Additionally, many participants only wrote short statements in response to the third open-ended question expressing that participation in the interpretive program had no effect on their environmental concern with no further reason or explanation. The fewer and shorter responses to question three may reflect the same views as those who expressed that their environmental concern did not change because they are already environmentally aware, however since the program had no effect on them these participants may not have felt the need to elaborate. Alternatively, perhaps the responses for the third open-ended question were much shorter than the others because it was the final question on the survey questionnaire and perhaps participants were tired of writing and no longer wanted to elaborate. It is possible that these short responses could have been avoided if the question had asked participants to "please explain your response," however if participants were tired of writing or didn't feel like elaborating it may not have made a substantial difference.

Nevertheless, several participants commented on their increased environmental awareness or literacy and included comments about an increase in knowledge, increase in interest, increase in enthusiasm, support for park conservation, intentions to be more careful, and increased concern for wildlife. These responses are supported by results of the descriptive statistics in which the item "after participating in the interpretive program my understanding (knowledge) of the environment has increased" received the highest mean score. This suggests that the interpretive programs are providing information to their audiences so that participants can develop a better understanding of the environment in the park. Moreover, the finding regarding the item referring to nature appreciation suggests that participation in the interpretive

program helps participants develop an appreciation for nature in the park. Perhaps the information provided during the program enables the participants to gain knowledge and develop an understanding of nature in the park, so that they may come to appreciate it more than they would have prior to participation in the interpretive program. Finally, the finding relating to the item "after participating in the interpretive program my attachment to nature has increased" suggests the programs may be able to help participants develop a relationship with the park which somewhat confirms the overall findings from the Interpretive Techniques Scale suggesting that interpretation could have the potential to connect visitors to the resource or help participants develop attachments to nature in the park.

Overall it is clear that nature interpretation programs can be successful in influencing environmental concern and increasing environmental literacy as suggested by the relevant literature; however, interpretation seems to have little impact upon the environmental concern of those who feel they are environmentally conscious. There is a significant gap in the literature related to the impact on environmental awareness for the environmentally aware. It is important that this research gap be addressed in order to improve these types of programs or perhaps even to develop new programs that cater to the wide range of park visitors. Further research is needed to determine how to provide programs that are more effective (Munro et al., 2008) in engaging those who are already environmental conscious, and the types of programs that could help these participants further their environmental awareness.

Alternative ways to measure levels of environmental concern also need to be considered because there is something to be said for the reinforcement of current levels of concern or the expansion of existing concern. Perhaps a "pre" and "post" program measurement of environmental literacy would be a better way of gauging the effectiveness of the program.

According to Munro et al. (2008) "studies based on post-experience testing alone are methodologically less reliable in that they fail to accurately assess prior attitudes" (p. 7). As a result, "[t]he use of before and after testing enables a clear assessment of changes in visitor variables such as attitudes or knowledge that may then be associated with the intervening experience" (Munro et al., 2008, p. 7). Some examples of studies in the field that included paired pre and post experience tests are Brody and Hall (2002), Hughes and Morrison-Saunders (2002), and Novey and Hall (2007); all these studies found increases in knowledge between the pre and post tests, however these particular studies all examined the impact of nonpersonal interpretation (i.e., trailside signs and brochures) rather than personal interpretation (which was the focus of this study).

Recreation Satisfaction

It is interesting to note, based on the findings from the descriptive statistics, that four out of the first five items that received the highest mean scores on the Recreation Satisfaction Scale were related to simply being in the nature (i.e., being in a nature setting, enjoying the sounds of nature, enjoying the smells of nature, and studying nature). This suggests that the factors that most likely contribute to a satisfying recreation experience are the outdoor components of the interpretive programs. The fact that most of the interpretive program occurs outdoors is likely the element that most enhances a satisfying recreation experience.

It is also noteworthy to mention the five items that received the lowest mean scores on the Recreation Satisfaction Scale (i.e., learning what I am capable of, learning about the park's history, meeting other people, reflecting on my spiritual values, and having thrills). As previously mentioned, the low mean score for "having thrills" was expected since the interpretive programs studied had few characteristics typically associated with thrills. Similarly,

"learning what I am capable of" refers to more outdoor challenge or adventure programs in which the participants' strengths and skills are put to the test. Since the outdoor component of these interpretive programs is relatively low intensity with few physical skills required, this finding was also predictable. The lower mean score of the item "learning about the park's history" was also anticipated because as previously discussed, the selected nature interpretation programs seldom refer to the history of the park, as this is more common in cultural or historical interpretation. The lower mean score of the item referring to reflection on spiritual values was also not surprising since spiritual reflection in nature is usually considered to be a solitary activity in which one often requires a calm and quiet space. Since many of the selected programs were group activities that occurred on the weekends when the park was busy and crowded, opportunities for spiritual reflection were significantly reduced. Finally, the item referring to meeting other people also received a lower mean score, which initially was somewhat surprising because the researcher had thought that programs such as these might be an opportunity to meet others with similar interests; however, based on the researchers observations, most participants attended the programs with either members of their family, as couples, or with friends, while very few participants attended the programs alone.

As mentioned in chapter 1, according to Beck and Cable (2011) not only is promoting optimal experiences one of the 15 guiding principles of interpretive practice but interpretation should "be recreational, educational, and deeply meaningful" (p. xxv). Therefore recreation is an important element of interpretation. Based on the findings from the second open-ended question, the interpretive programs are certainly offering many opportunities for participants to have a highly satisfying recreation experience; however, there are several factors that can detract from the recreation experience that should be addressed. For example, it is important that every effort

is made to notify participants if any equipment such as appropriate footwear, clothing, flashlights, binoculars may be needed for full participation in the program. According to Beck and Cable (2011), if technology or specific equipment is introduced into a program, it must be done carefully and thoughtfully. Following this advice would ensure that all participants are adequately informed and have the opportunity to participate and fully experience the program. If participants are inadequately dressed or equipped for the programs it certainly detracts from a satisfying recreation experience. Another factor that can detract from a satisfying recreation experience is logistical difficulties such as crossing busy roads. Perhaps creating crosswalks in high traffic areas to help reduce the risk to pedestrians and allow people to cross quickly and safely would eliminate this detracting factor. Alternatively, in order to reduce the occurrence of the logistical factors as well as noise disruption factors (as a result of the passing vehicles on the busy roads), perhaps programs could be arranged at a time when there is less traffic or use a trail that is not quite so close to the road. Loud traffic noises can certainly detract from a satisfying recreation experience, especially during a nature interpretation program. According to Beck and Cable (2011), in order to promote optimal experiences the interpreter must design the program thoughtfully with the surroundings in mind. Also, as mentioned previously, the interpreter needs to be able to gauge his/her audience. If a significant problem arises such as poor weather conditions, the interpreter must alter the program to suit the needs of the participants; for example very cold weather can detract from a satisfying recreation experience so perhaps it is best for the interpreter to stop for shorter periods of time in order to keep the group moving as much as possible.

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Additionally, the findings from the Spearman rank order correlations examining the relationship between recreation satisfaction and number of visits to the park per year revealed some significant associations. Significant correlations were found between items on the Recreation Satisfaction Scale and frequency of park visitation for: "studying nature," "having thrills," "encountering wildlife," and "being in a nature setting." It is interesting to note that all of these items are related to being outdoors during the program. It could be suggested that these items were associated with frequency of park visitation because it is likely that frequent park visitors visit the park to engage in outdoor recreation activities. These visitors visit Gatineau Park because they enjoy the outdoor elements of their recreation activities in the park (e.g., the natural setting, the sounds of nature, wildlife etc.). These findings suggest that participation in outdoor nature interpretation programs may be more likely to be perceived as satisfying recreation experiences for those who visit the park more frequently possibly because they are familiar with, and are comfortable in the park.

Ultimately, it is clear that participation in interpretive programs can be a satisfying recreation experience. While there has not been a significant amount of research done on the perception of interpretive programs as recreation experiences, there is some previous research that suggests that recreation is an important component of interpretation. A positive recreation experience facilitates more absorption of the program's content making the program more effective and influential (Powell & Ham, 2008). Conversely, it is important to note that seemingly minor factors can easily detract from a satisfying recreation experience so it is important for an interpreter to gauge their audience as best they can and design the program thoughtfully, just as Beck and Cable (2011) explained in their sixth (interpretation for seniors, teenagers, and children should follow different approaches) and fourteenth (promote optimal

experiences through intentional and thoughtful program design) guiding principles of interpretation. Lastly, it is important that Beck and Cable's (2011) 15 guiding principles are followed so that interpreters continue to communicate effectively, provide meaningful knowledge in a fun and effective fashion, and share their passion with others while inspiring people. The findings of this study revealed that many of the guiding principles are being followed, however some are not, and making these few changes could positively impact the overall recreation experience of the program.

Relationships Between Interpretive Techniques and Interpretive Outcomes

There were significant positive correlations between the overall scores for interpretive techniques and the overall scores for the interpretive outcomes (both environmental and recreational). These findings further emphasize some of the previous literature including Sharpe's (1982) comments regarding interpretation fostering an appreciation for natural areas (environmental literacy), and both Beck and Cable's (2011) and Powell and Ham's (2008) comments regarding the importance of the interpretive recreation experience (recreation satisfaction). Furthermore, the weaker correlation with pro-environmental behavioural intentions also reflects the difficulties presented in previous literature regarding influencing behaviour/intentions, especially the comments made by Stern et al. (2012) that changes in behaviour should not be expected unless "specific behaviour is explicitly targeted" (p. 38).

Additionally, the findings from the Pearson correlation analysis of the relationships between individual items on the Interpretive Techniques Scale and the overall scores from the outcomes (environmental and recreational) revealed that some interpretive techniques have stronger correlations with interpretive outcomes than others. The strongest correlation overall was between "the interpretive program made me feel passion for nature" and environmental

literacy, although this item was also the item most strongly correlated with recreation satisfaction. This finding suggests the importance of interpreters facilitating a passion for nature in the participants. All interpretive techniques items were significantly correlated to at least one of the interpretive outcomes. Additionally, two items on the Interpretive Techniques Scale ("sparked my interest" and "was suitable for my age group") were found to be correlated with all three outcomes. Also, it is interesting to note that there were fewer correlations with pro-environmental behavioural intentions (four) than with environmental literacy (14) and recreation satisfaction (nine). This finding is interesting because the t-tests for the overall scores of all four scales revealed significant differences for pro-environmental behavioural intentions for both those who visit the park more frequently and for those who had previously participated in several interpretive programs. Perhaps, implementation of the interpretive techniques is important for environmental literacy and recreation satisfaction outcomes, while frequency of park visitation and participation in interpretive play a large role in environmental behaviour outcomes.

Summary of Major Findings

This study found that specific interpretive techniques outlined in Beck and Cable's (2011) guiding principles of interpretation are associated with specific interpretive outcomes (pro-environmental behavioural intentions, environmental literacy, and recreation satisfaction), which suggests that these principles could be used for future interpretation program development as well as an evaluative tool for interpretation programs. Furthermore, this study found a significant relationship between the interpretive outcomes of environmental literacy and recreation satisfaction. This relationship was further developed through the use of path analysis, which revealed that environmental literacy influenced recreation satisfaction and environmental literacy mediated the relationship between interpretive techniques and recreation satisfaction.

This is a major finding of this study because based on the previous literature (Ham & Weiler, 2007; Powell & Ham, 2008; Hvenegaard, 2011) it was expected that recreation satisfaction would influence environmental literacy. This finding suggests that participants had a satisfying recreation experience as a result of their increases in environmental knowledge, awareness, appreciation, and attachment. In short this finding suggests that it is the educational component that leads to a satisfying recreation experience. Finally, the study provides support for Benton's (2009) model of interpretation and its four conceptions.

Limitations

The sample size (78 participants) in this study was much smaller than expected (230 participants). Recruiting participants for this study proved to be very difficult. The reasons for such a small sample size and low participation rate could be due to a number of reasons. Firstly, most of the programs finished outside and did not return indoors so most people did not want to stay to fill out a paper copy of the survey, as they were eager to return to their vehicles especially in the winter months. Secondly, those who did take a paper copy home with them (with self addressed, stamped envelope) did not return the survey to the researcher. Thirdly, attempts to gather e-mails so that the survey information could be sent to participants was met with resistance as many were hesitant to provide their e-mails for fear of being sent continuous e-mails or receiving advertisements. Fourthly, recruitment notices were distributed encouraging participants to contact the researcher if they would like to participate, unfortunately that proved to involve too many steps as participants were unwilling to be troubled with having to contact the researcher first or perhaps they had forgotten about it even if they had intended to. Fifthly, information letters were distributed with all the details of the study and the actual link to the online survey, which did make it easier for some to complete the survey, however the number of

responses was still low. It seems many may have intended to complete the survey online, but when they arrived home forgot about it or lost the information letter. Others may have taken an information letter or recruitment notice to seem interested and avoid disappointing the researcher while not really intending to complete the survey. Sixthly, it could be suggested that perhaps the questionnaire was too long as it did take approximately ten minutes to complete and contained three open ended questions, or perhaps the participants did not believe that it really would only take ten minutes and expected it would take much longer. Seventhly, maybe the incentive for participation was not enough as the incentive was entry into a draw to win a 50-dollar gift card to Mountain Equipment Co-op (in addition to helping scholarly research and providing feedback to the interpreters of Gatineau Park). Finally, making announcements and distributing the information letters/recruitment notices proved to be difficult in some cases due to a lack of co-operation from the interpreters; some interpreters did not want their programs interrupted to make announcements, or did not want to risk making the program participants uncomfortable by allowing the researcher to speak to them individually. This lack of support and enthusiasm from some of the interpreters may have influenced the program participants to not participate in the study.

Another limitation of this study was the difficulty of measuring changes in behaviours. Although this study examined changes in the behavioural intentions of participants, these intentions were self reported and according to Stern et al. (2012) “self reported behaviours and behavioural intentions may not reflect actual behaviours” (p. 42). This suggests that although participants may have indicated that they intend to change their behaviours based on their participation in the interpretive program, they may not. Furthermore, the findings of this study are limited by the lack of a “pre” experience test to measure the participants’ pro-environmental

behavioural intentions and levels of environmental literacy prior to participating in the program. The use of a "pre" experience test would have allowed the researcher to better gauge the impact of the interpretive program on the environmental outcomes. Furthermore, despite the fact that the questions on the survey questionnaire began with "based on the interpretive program that you participated in…" participants who did not intend to litter prior to participating in the program may still have indicated that they were unlikely to litter after the program (simply because they know that littering is a negative behaviour); not only would this reflect no change in intentions, it also may not be a result of participation in the program. Therefore the use of both "pre" and "post" experience tests would have been beneficial to examine changes in behavioural intentions and changes in levels of environmental literacy. Nevertheless, given the difficulties of recruitment for the current study, recruiting and scheduling participants for a paired pre-post test study would have been even more difficult and impractical. Additionally, a follow-up with the participants, after a certain length of time (e.g., one month), would have also been valuable to determine what participants recalled from the program regarding the interpretive techniques used, messages related to environmental literacy, their recreation experience, and anything from the program that influenced their pro-environmental behavioural intentions in any way and if they resulted in any actual changes in behaviour (although it would still be self-reported). Not only would these additional findings be interesting and worthy of study, it would also create more consistency with the methodology used in Benton's (2009) study that included phone interviews with the participants one month after their participation in the interpretive program.

Another limitation of this study might include the general content of some of the survey items. Some of the survey items were more general because they were going to be used for a variety of interpretive programs, as a result some of the items may not reflect the content of each

of the interpretive programs (e.g., such as having written materials that were helpful, or learning about the history of the park). Items such as these led to many "not applicable" responses on three of the Interpretive Techniques Scale items. As a result the researcher has learned that it is best to avoid these types of responses by eliminating the "not applicable" option. Perhaps choosing to examine several interpretive programs rather than just one program may also be a limitation because it can be difficult to compare programs that are fundamentally different (e.g., the winter and spring programs from this study); however, Stern et al. (2012) did state that a limitation of most studies that evaluate interpretive programs is that they only "assessed the outcomes of a single program" (p. 6). Therefore including several programs in this study may have been beneficial.

Another possible limitation of this study could be the influence of a Hawthorne effect, meaning that the presence of the researcher at the interpretive programs could have influenced the characteristics of the program (Babbie, 1992; Stern et al., 2012). Since the interpreters were aware of the presence of the researcher, they may have altered the delivery of the program as a consequence.

Implications for Practice

While the implications for interpretive practice based on the findings of this study have been mentioned throughout this chapter a summary of the researcher's suggestions include the following:

1. Interpreters need to know how to gauge their audiences and how to provide a program with participants across a wide age range. Focusing too much on children causes adults to feel bored, while focusing too much on adults causes children to be overwhelmed or restless. Alternatively, perhaps the programs could be advertised as oriented to families,

children, or adults so that park visitors can make informed decisions about their participation. Programs designed for specific age groups may be a more practical way to deliver programs that are stimulating for participants of all ages.

2. Interpreters need to be able to gauge their audiences. If a significant problem arises such as poor weather conditions, the interpreter should alter the program to suit the needs of the participants; for example very cold weather can detract from a satisfying recreation experience so perhaps it is best for the interpreter to stop for shorter periods of time in order to keep the group moving as much as possible.
3. Some more advanced programs could be developed for those who feel they are already environmentally knowledgeable. Advanced programs could be designed to have a higher intensity, that is more detailed information and more interaction. This may provide the participants with more learning opportunities to expand their knowledge or other opportunities for growth and further development.
4. Every effort should be made to notify participants if any equipment such as appropriate footwear, clothing, flashlights, and/or binoculars may be needed for full participation in the program.
5. Logistical difficulties such as crossing busy roads can significantly detract from the experience. Creating crosswalks in high traffic areas to help reduce the risk to pedestrians and allow people to cross roads quickly and safely would eliminate this detracting factor.
6. In order to reduce the occurrence of the logistical factors as well as noise disruption factors as a result of the passing vehicles on the busy roads, programs could be arranged at a time when there is less traffic or could use a trail that is not quite so close to the road.

Implications for Research

The modified version of Benton's (2009) model of interpretation used as a framework in this study, suggests that interpretation has goals related to connecting visitors to resources through the use of interpretive techniques, influencing pro-environmental behavioural intentions, encouraging environmental literacy, and creating opportunities for satisfying recreation experiences. Based on the findings from the socio-demographic portion of the survey questionnaire, the majority of participants (80%) indicated that they were from the National Capital Region (as was predicted in Chapter 1). Therefore, modifying Benton's model by removing tourism outcomes as the fourth conception and replacing it with recreation satisfaction made sense, since only a small percentage of participants were tourists from outside the region. Furthermore, although Benton had created his model for cultural interpretive programs and tested it on cultural/heritage interpretation programs (Benton, 2009, 2011), the findings of this research suggest that his model is also applicable to nature interpretive programs, and could even be used unmodified (i.e., with tourism outcomes as the fourth conception) with interpretation in a park or protected area with higher tourism visits. Thus the framework is also useful for examining the multiple goals of nature interpretation programs. Also, Benton's study was qualitative while this study was quantitative, therefore (based on the findings of this study) Benton's model is also applicable to quantitative studies.

A further implication for research is related to the following statement made by Munro et al. (2008) regarding the lack of evaluative techniques:

> Evaluation of interpretation programmes is sporadic amongst natural resource management organisations. This is perhaps partly owing to the apparent diversity of evaluative techniques and the subsequent complexity of selecting and applying evaluation

> to an interpretive programme. Publication of robust evaluative studies…in the public literature may function to provide a loose grouping of techniques that managers may apply. This will also facilitate replication and transferral of effective evaluative techniques. (p. 11)

The findings of this study suggest that the 15 interpretive principles (techniques) that Beck and Cable (2011) recommend could be used as an interpretive program evaluation tool. Beck and Cable's set of 15 guiding principles is often referred to as a foundational text but is neglected to be considered an evaluative tool. Based on the findings of this study, the interpretive principles (techniques) are correlated with specific environmental and recreational outcomes. Furthermore, the principles or the items on the Interpretive Techniques Scale could be modified based on the type of interpretation program and the feasibility of techniques being used. For example, for nature interpretation programs the item relating to bringing the past alive could be removed; the same could be done for any items that are not applicable to the particular program. The findings of this study suggest that Beck and Cable's 15 guiding principles could be used as an effective evaluative technique and is worthy of further study.

Another implication for future research might include further study on the relationships between the frequency of participating in interpretive programs and their environmental and recreational outcomes as well as frequency of park visitation and these same outcomes. While this study examined responses of individuals based on their participation in one interpretive program, further study on participants who visit the park frequently and participate in several interpretive programs would be beneficial. Additionally, examining the participants' responses to the survey items in general (e.g., not based on the program that they just attended) may also be of

some value to determine participants' levels of environmental literacy and pro-environmental behaviours.

Finally, as previously mentioned further research is needed to determine how to provide effective and engaging programs for those who are already environmental conscious. What types of programs could engage and help these participants further their environmental awareness? Furthermore, alternative ways to measure environmental awareness or environmental literacy need to be developed that are sensitive enough to detect more subtle changes that might occur in participants with high levels of environmental literacy.

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Appendix 1: Information Letter to Participant

Letter of Information to Participant

Title of the study: **The Perceived Outcomes of Participation in a Gatineau Park Interpretive Program**.

Principle Researcher: Sarah Padbury
Masters Student
School of Human Kinetics
University of Ottawa
Ottawa, ON

Supervisor: Dr. Paul Heintzman
Assistant Professor
School of Human Kinetics
University of Ottawa
Ottawa, ON

Invitation to Participate: I would like to invite you to participate in this study by kindly filling out a 10 - 15 minute questionnaire, either on-line or on paper. And, if you do, you can be entered into a draw to win a gift card from Mountain Equipment Co-op!

How to Participate: You may go to the following weblink : www.fluidsurveys.com/s/outcomesofinterpretation and you will be directed to the secure survey site. By going to the weblink to access the survey, you consent to participate in this study. If you prefer, I can gladly provide you with a paper copy of the survey, along with a stamped, self-addressed envelope to return it to me. Please contact me (Sarah Padbury) or my supervisor Dr. Paul Heintzman for paper copies of the survey.

Purpose of the Study: I am researching environmental and recreation outcomes of participation in a park interpretative program for my Masters of Arts thesis in Human Kinetics at the University of Ottawa. The information gathered will, I hope, help park interpreters understand if and how their programs can lead to specific environmental effects and better recreation experiences.

The questionnaire asks about:

- the interpretive techniques used during a park program you attended;
- your environmental knowledge and awareness;
- your environmental behavioural intentions;
- your recreation experience during the interpretive program; and
- demographic information.

You would be asked to rate how much you agree or disagree with statements regarding your experience. You would be welcome to omit any question you prefer not to answer.

Confidentiality and Anonymity: This study will be conducted under the research ethics procedures set out by the University of Ottawa. Your involvement would be entirely voluntary and anonymous. All information you provided would remain completely confidential. Reports and publications resulting from this study will not contain any personally identifiable information.

Conservation of data: If you chose to complete the survey on-line, all information you entered would be protected and certified 'secure' by the site provider, FluidSurveys. If you choose to complete the paper copy the surveys will be kept in a locked filing cabinet in the office of the supervisor at the University of Ottawa. Only the researchers will have access to the aggregate data. All data will be conserved for 5 years.

Compensation: To thank you for your contribution to the research project, you will be given the option to enter your name in a draw to win a gift card to Mountain Equipment Co-op valued at $50. At the end of the online survey you will be directed to a second separate questionnaire in which you will have the option to provide

your e-mail if you want to enter the draw. Alternatively, you may contact the researcher to enter the draw. The draw is open to all research participants who enter their name in the draw, regardless of whether they decide to withdraw from further participating in the research project.
Upon completion of data collection a name will be randomly selected amongst those who have entered and the person whose name is drawn will be notified by either e-mail or telephone. To win the prize, the person must correctly answer a skill testing question. If the person cannot be reached within 14 days from the date of the draw, the prize will be awarded to the second name that is randomly selected and so on until the prize has been awarded. The odds of winning the prize will depend on the number of eligible entries received. The prize must be accepted as awarded or forfeited and cannot be redeemed for cash.
Your contact information that you provide when you enter the draw is collected for the purposes of contacting you if you are is selected in the draw. Your name and the contact information you have provided will be kept confidential and then destroyed once the prizes have been awarded.
The draw is governed by the applicable laws of Canada.

Voluntary Participation: You are under no obligation to participate and if you choose to participate, you are free to withdraw from the study at any time, and you may decline to answer any questions that you do not want to answer. Please note that because participation is completely anonymous, if you choose to withdraw from the study it would be impossible to single out and destroy any submitted information. **Completion and return or submission of the questionnaire by you implies consent.**

Information about the Study Results: Copies of the findings will be available upon request. Upon completion of the online survey you will be directed to a second separate survey in which you will have the option to provide your e-mail to receive copies of the findings. Alternatively, you may contact the researcher or supervisor and request copies of the results.

If you have any questions or concerns about this study, or would like additional information before reaching a decision about participation, please contact Sarah Padbury. In addition, you may contact my supervisor, Dr. Paul Heintzman.

If you have any questions with regards to the ethical conduct of this study, you may contact the Protocol Officer for Ethics in Research, University of Ottawa, Tabaret Hall, 550 Cumberland Street, Room 154, Ottawa, ON K1N 6N5, tel.: (613) 562-5387 or ethics@uottawa.ca.

Please keep this form for your records. (Note: if you complete the questionnaire online you may make a copy of this document for your file).

Thank you for your time and consideration.

Yours Sincerely,

Sarah Padbury

Appendix 2: Recruitment Notice

Recruitment Notice

Dear Interpretive Program Participant,

As a graduate student in the School of Human Kinetics at the University of Ottawa, I am conducting my Masters thesis on the topic of the Perceived Outcomes of Participation in a Park Interpretive Program. Specifically, my thesis is focused on the environmental and recreational outcomes of participating in an interpretive program at Gatineau Park. Since you have recently participated in an interpretive program at Gatineau Park, I am writing to invite you to participate in this research study.

By participating in this study, you will also be given the opportunity to enter your name in a draw to win a gift card to Mountain Equipment Co-op valued at $50.

If you would like to participate in this study, or if you would like additional details, you may contact me, or you may contact my supervisor Dr. Paul Heintzman.

Thank you for your consideration.

Sincerely,

Sarah Padbury, M.A. candidate

Appendix 3: Questionnaire

Perceived Outcomes of Participation in an Interpretive Program

Completing the online questionnaire or completing the paper copy and then returning it to me will indicate that you freely consent to participate in this study. This means that you have been informed of the requirements of the research, understand that you have the opportunity to ask questions and discuss this study, and have been assured that your information will remain confidential.

PART 1: INTERPRETIVE TECHNIQUES

(Please check the most appropriate box. If you think a question is not applicable to the event you attended, please check the "not applicable" box.) Please rate the extent to which you agree or disagree with the following statements based on the scale provided.

The interpretive program

	Strongly Disagree	Disagree	Moderately Disagree	Mildly Disagree	Neutral	Mildly Agree	Moderately Agree	Agree	Strongly Agree	Not Applicable
Sparked my interest	O	O	O	O	O	O	O	O	O	O
Was meaningful to me	O	O	O	O	O	O	O	O	O	O
Was presented as a story	O	O	O	O	O	O	O	O	O	O
Inspired and provoked me to broaden my horizons	O	O	O	O	O	O	O	O	O	O
Presented a distinct theme	O	O	O	O	O	O	O	O	O	O
Was suitable for my age group	O	O	O	O	O	O	O	O	O	O
Brought the past alive	O	O	O	O	O	O	O	O	O	O
Incorporated technology in an appropriate manner	O	O	O	O	O	O	O	O	O	O
Provided the right amount of information – enough information but not too much	O	O	O	O	O	O	O	O	O	O
Had an interpreter who communicated effectively	O	O	O	O	O	O	O	O	O	O

	Strongly Disagree	Disagree	Moderately Disagree	Mildly Disagree	Neutral	Mildly Agree	Moderately Agree	Agree	Strongly Agree	Not Applicable
Had written materials that were helpful	O	O	O	O	O	O	O	O	O	O
Motivated me to support the park (e.g., donating money, volunteering, etc.).	O	O	O	O	O	O	O	O	O	O
Encouraged me to sense the beauty of nature	O	O	O	O	O	O	O	O	O	O
Was a very positive experience for me	O	O	O	O	O	O	O	O	O	O
Made me feel passion for nature	O	O	O	O	O	O	O	O	O	O

PART 2: BEHAVIOURAL INTENTIONS

(Please check the most appropriate box) Based on the interpretive event that you participated in please rate how likely you are to practice the following behaviours when at the park in the future. Please rate based on the scale provided.

How likely are you to

	Extremely Unlikely	Unlikely	Moderately Unlikely	Mildly Unlikely	Neutral	Mildly Likely	Moderately Likely	Likely	Extremely Likely
Litter	O	O	O	O	O	O	O	O	O
Feed the wildlife	O	O	O	O	O	O	O	O	O
Volunteer to help with Park projects	O	O	O	O	O	O	O	O	O
Write a letter/e-mail to support the park	O	O	O	O	O	O	O	O	O

	Extremely Unlikely	Unlikely	Moderately Unlikely	Mildly Unlikely	Neutral	Mildly Likely	Moderately Likely	Likely	Extremely Likely
Continue to visit a favourite spot even if it needs to recover from environmental damage	O	O	O	O	O	O	O	O	O
Follow the rules and regulations for recreation activities	O	O	O	O	O	O	O	O	O
Leave wildlife alone	O	O	O	O	O	O	O	O	O
Participate in recreation in non-designated areas (e.g. protected areas)	O	O	O	O	O	O	O	O	O
Engage in less environmentally damaging recreation activities (e.g. hiking instead of climbing)	O	O	O	O	O	O	O	O	O
Pick flowers and remove dead tree branches	O	O	O	O	O	O	O	O	O

PART 3: ENVIRONMENTAL LITERACY

(Please check the most appropriate box) Please rate the extent to which you agree or disagree with the following statements based on the scale provided.

After participating in the interpretive program

	Strongly Disagree	Disagree	Moderately Disagree	Mildly Disagree	Neutral	Mildly Agree	Moderately Agree	Agree	Strongly Agree
My awareness of environmental issues has increased	O	O	O	O	O	O	O	O	O
My appreciation of nature has increased	O	O	O	O	O	O	O	O	O
My understanding (knowledge) of the environment has increased	O	O	O	O	O	O	O	O	O

	Strongly Disagree	Disagree	Moderately Disagree	Mildly Disagree	Neutral	Mildly Agree	Moderately Agree	Agree	Strongly Agree
My attachment to nature has increased	O	O	O	O	O	O	O	O	O
My motivation to make environmentally responsible decisions has increased	O	O	O	O	O	O	O	O	O

PART 4: RECREATION EXPERIENCE

(Please check the most appropriate box) Please evaluate the degree to which each of the following items either added or detracted (took away from) from your satisfaction with your recreation experience during the interpretive program. Please rate based on the scale provided.

	Strongly Detracts	Detracts	Moderately Detracts	Mildly Detracts	Neither Adds or Detracts	Mildly Adds	Moderately Adds	Adds	Strongly Adds
Enjoying the sounds of nature	O	O	O	O	O	O	O	O	O
Developing my outdoor skills	O	O	O	O	O	O	O	O	O
Learning about the park's history	O	O	O	O	O	O	O	O	O
Releasing or reducing some built-up tensions	O	O	O	O	O	O	O	O	O
Studying nature	O	O	O	O	O	O	O	O	O
Doing something with my family	O	O	O	O	O	O	O	O	O
Learning about the park's natural wonders	O	O	O	O	O	O	O	O	O
Getting away from crowded situations	O	O	O	O	O	O	O	O	O

	Strongly Detracts	Detracts	Moderately Detracts	Mildly Detracts	Neither Adds or Detracts	Mildly Adds	Moderately Adds	Adds	Strongly Adds
Experiencing peace and calm	O	O	O	O	O	O	O	O	O
Enjoying the smells of nature	O	O	O	O	O	O	O	O	O
Learning what I am capable of	O	O	O	O	O	O	O	O	O
Having thrills	O	O	O	O	O	O	O	O	O
Bringing my family closer together	O	O	O	O	O	O	O	O	O
Reflecting on my spiritual values	O	O	O	O	O	O	O	O	O
Being with others who enjoy the same things I do	O	O	O	O	O	O	O	O	O
Meeting other people	O	O	O	O	O	O	O	O	O
Encountering wildlife	O	O	O	O	O	O	O	O	O
Being in a nature setting	O	O	O	O	O	O	O	O	O

PART 5: DEMOGRAPHIC AND OTHER INFORMATION

Gender (Please check)

- O Male
- O Female

Age (Please check your age range)

- ○ 18-24
- ○ 25-34
- ○ 35-44
- ○ 45-54
- ○ 55-64
- ○ 65 or Above

Highest Level of Education Achieved (Please check)

- ○ High School
- ○ Some University or College
- ○ College Graduate
- ○ University Graduate
- ○ Some Graduate School
- ○ Graduate Degree Completed
- ○ Other, please specify... _____

Current Occupation (Please indicate your occupation)

Do you live in the National Capital Region (Ottawa/Gatineau)? (Please check)

- ○ Yes
- ○ No

Are you a member of the Friends of Gatineau Park? (Please check)

- ○ Yes
- ○ No

How many Nature Interpretation programs, at any location, have you participated in? (Please check)

- ○ None, this was the first
- ○ Between 2-5
- ○ Between 6-10
- ○ 11 or more

How many Nature Interpretation programs have you participated in at Gatineau Park? (Please check)

- ○ None, this was the first
- ○ Between 2-5
- ○ Between 6-10
- ○ 11 or more

How often do you visit Gatineau Park? (Please check)

- ○ This was my first visit
- ○ 1-2 times per year
- ○ 3-5 times per year
- ○ 6-10 times per year
- ○ 11-15 times per year
- ○ 16-20 times per year
- ○ 21 or more times per year

Do you plan to participate in another interpretive program? (Please check)

- ○ Yes
- ○ No
- ○ Maybe

Do you plan to return and visit Gatineau Park again? (Please check)

- ○ Yes ○ Maybe
- ○ No

Please indicate the date of the interpretive program that you attended. (Please write)

Please indicate the topic of the interpretive program that you attended. (Please write)

Please write any comments you may have on the specific interpretive program that you attended.

(Please write in the space provided)

Please comment on your satisfaction with your recreation experience.
(Please write in the space provided)

Please comment on how the participating in the interpretive program influenced your environmental concern.
(Please write in the space provided)

Appendix 4

Pearson Correlation Coefficients for the Relationship Between Recreation Satisfaction and Environmental Outcomes

Environmental Outcomes	Recreation Satisfaction			Environmental Literacy		
	N	*r*	*p*	*N*	*r*	*p*
Pro-Environmental Behavioural Intentions	63	-.050	.698	67	-.024	.848
Environmental Literacy	66	.518	.000**			

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

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

Appendix 5

Independent t-test Results for Interpretive Techniques by Season of Program (Winter/Spring)

Variable	Winter			Spring				
	n	*M*	*SD*	*n*	*M*	*SD*	*t(df)*	*p*
Sparked my interest	29	8.24	1.40	23	8.30	.87	-.19(50)	.852
Was meaningful to me	29	8.24	1.35	23	8.09	1.04	.45(50)	.654
Was presented as a story	29	6.29	1.27	23	5.44	2.33	1.67(50)	.101
Inspired and provoked me to broaden my horizons	29	7.03	1.70	23	7.39	1.67	-.76(50)	.453
Presented a distinct theme	29	8.10	1.05	23	8.26	1.10	-.53(50)	.599
Was suitable for my age group	29	8.17	1.56	23	8.26	1.10	-.23(50)	.819
Brought the past alive	17	5.76	1.48	15	5.93	2.66	-.22(30)	.823
Incorporated technology in an appropriate manner	16	6.31	2.02	21	7.43	1.63	-1.86(35)	.071
Provided the right amount of information – enough information but not too much	29	7.82	1.56	23	7.91	1.34	-.22(50)	.828
Had an interpreter who communicated effectively	29	8.39	1.17	23	7.92	1.41	1.30(50)	.201
Had written materials that were helpful	14	5.93	2.43	18	6.83	2.43	-1.04(30)	.305
Motivated me to support the park (e.g., donating money, volunteering, etc.).	29	5.55	2.06	23	6.53	1.80	-1.80(50)	.078
Encouraged me to sense the beauty of nature	29	8.05	1.18	23	8.39	.99	-1.11(50)	.273
Was a very positive experience for me	29	8.05	1.40	23	8.09	1.38	-.10(50)	.920
Made me feel passion for nature	29	7.79	1.40	23	8.22	.95	-1.24(50)	.220

Note. Mean scores based on scale (Strongly Disagree = 1 to Strongly Agree = 9).
Note. N = number of participants; M = mean; *SD* = standard deviation; *df* = degrees of freedom.
*Denotes groups that were significantly different from each other at $p < .05$.

Appendix 6

Independent t-test Results for Environmental Literacy by Season of Program (Winter/Spring)

Variable	Winter			Spring				
	n	*M*	*SD*	*n*	*M*	*SD*	*t*(*df*)	*p*
My awareness of environmental issues has increased	29	6.62	2.04	23	6.70	2.20	-.13(50)	.900
My appreciation of nature has increased	29	7.31	1.87	23	7.48	1.28	-.37(50)	.715
My understanding (knowledge) of the environment has increased	29	7.10	2.09	23	7.70	1.06	-1.24(50)	.223
My attachment to nature has increased	28	7.18	1.54	23	7.09	1.47	.22(49)	.830
My motivation to make environmentally responsible decisions has increased	28	6.64	2.31	22	6.82	1.47	-.31(48)	.758

Note. Mean scores based on scale (Strongly Disagree = 1 to Strongly Agree = 9).
Note. N = number of participants; M = mean; *SD* = standard deviation; *df* = degrees of freedom.
*Denotes groups that were significantly different from each other at $p < .05$.

Appendix 7

Independent t-test Results for Environmental Literacy by Season of Program (Winter/Fall)

	Winter			Fall				
	n	*M*	*SD*	*n*	*M*	*SD*	*t(df)*	*p*
My awareness of environmental issues has increased	29	6.62	2.04	18	7.22	1.73	-1.04(45)	.305
My appreciation of nature has increased	29	7.31	1.87	18	7.56	1.20	-.50(45)	.623
My understanding (knowledge) of the environment has increased	29	7.10	2.09	18	7.94	1.39	-1.51(45)	.139
My attachment to nature has increased	28	7.18	1.54	18	7.61	1.58	-.92(45)	.362
My motivation to make environmentally responsible decisions has increased	28	6.64	2.31	18	7.78	1.48	-1.85(44)	.071

Note. Mean scores based on scale (Strongly Disagree = 1 to Strongly Agree = 9).
Note. N = number of participants; M = mean; *SD* = standard deviation; *df* = degrees of freedom.
*Denotes groups that were significantly different from each other at $p < .05$.

Appendix 8

Independent t-test Results for Pro-Environmental Behavioural Intentions by Season of Program (Winter/Fall)

	Winter			Fall				
	n	*M*	*SD*	*n*	*M*	*SD*	*t(df)*	*p*
Not litter	28	8.89	.32	18	8.33	1.85	1.54(44)	.122
Not feed the wildlife	29	7.76	1.92	17	8.35	1.32	-1.13(44)	.266
Volunteer to help with park projects	29	4.38	2.37	18	5.44	1.89	-1.62(45)	.113
Write a letter/e-mail to support the park	29	5.31	2.70	18	5.61	1.91	-.41(45)	.682
Not continue to visit a favourite spot even if it needs to recover from environmental damage	28	5.68	3.22	18	5.28	3.06	.42(44)	.667
Follow the rules and regulations for recreation activities	29	8.48	.83	18	8.61	.85	-.51(45)	.612
Leave wildlife alone	29	8.31	1.20	18	8.44	1.89	-.30(45)	.766
Not participate in recreation in non-designated areas (e.g., protected areas)	29	6.72	2.88	18	7.39	2.81	-.78(45)	.441
Engage in less environmentally damaging recreation activities (e.g., hiking instead of climbing)	29	7.34	2.27	18	7.39	2.15	.07(45)	.948
Not pick flowers and remove dead tree branches	28	7.07	2.60	18	8.39	1.46	-1.96(44)	.057

Note. Mean scores based on scale (Extremely Unlikely = 1 to Extremely Likely = 9).

Note. N = number of participants; M = mean; *SD* = standard deviation; *df* = degrees of freedom.

*Denotes groups that were significantly different from each other at $p < .05$.

Appendix 9

ANOVA Results for Pro-Environmental Behavioural Intentions by Previous Interpretive Program Participation

Pro-Environmental Behavioural Intentions Items		*n*	*M*	*SD*
Not litter	First	22	7.73	2.62
	Between 2-5	26	8.92	.27
	6-11 or more	26	8.92	.27
Not feed the wildlife	First	22	7.59	2.28
	Between 2-5	26	7.81	1.79
	6-11 or more	27	7.96	2.08
Volunteer to help with park projects	First	22	5.59	2.26
	Between 2-5	27	4.74	2.40
	6-11 or more	27	5.41	2.52
Write a letter/e-mail to support the park	First	22	6.00	2.29
	Between 2-5	27	4.96	2.59
	6-11 or more	27	5.74	2.36
Not continue to visit a favourite spot even if it needs to recover from environmental damage	First	22	4.18	2.84
	Between 2-5	26	5.54	3.11
	6-11 or more	25	6.60	3.00
Follow the rules and regulations for recreation activities	First	22	8.23	1.60
	Between 2-5	26	8.04	1.80
	6-11 or more	26	8.46	.65
Leave wildlife alone	First	22	8.36	1.18
	Between 2-5	27	7.85	2.21
	6-11 or more	27	8.48	1.58
Not participate in recreation in non-designated areas (e.g., protected areas)	First	22	6.09	3.07
	Between 2-5	27	6.56	2.99
	6-11 or more	27	6.96	2.88
Engage in less environmentally damaging recreation activities (e.g., hiking instead of climbing)	First	22	6.55	2.61
	Between 2-5	27	7.63	1.96
	6-11 or more	27	7.26	2.23
Not pick flowers and remove dead tree branches	First	21	7.48	2.50
	Between 2-5	27	7.07	2.64
	6-11 or more	27	7.81	2.42

Note. Mean scores based on scale (Extremely Unlikely = 1 to Extremely Likely = 9).

1. Significant differences at the $p < .05$ level were found for the following items:
   "Not litter"—Between 2-5 (group 2), 6-11 or more (group 3) > First (group 1)
   "Not continue to visit a favourite spot even if it needs to recover from environmental damage"—6-11 or more (group 3) > First (group 1).

Appendix 10

ANOVA Results for Recreation Satisfaction by Previous Interpretive Program Participation

Recreation Satisfaction Items		*n*	*M*	*SD*
	First	22	8.27	1.20
Enjoying the sounds of nature	Between 2-5	27	8.33	1.18
	6-11 or more	26	8.12	1.42
	First	22	7.82	1.26
Developing my outdoor skills	Between 2-5	27	7.96	1.19
	6-11 or more	26	7.42	1.27
	First	22	7.00	1.72
Learning about the park's history	Between 2-5	27	7.00	1.86
	6-11 or more	25	6.48	1.61
	First	22	7.18	1.79
Releasing or reducing some built-up tensions	Between 2-5	27	7.56	1.48
	6-11 or more	23	6.65	1.58
	First	22	7.64	1.26
Studying nature	Between 2-5	27	8.19	1.08
	6-11 or more	26	7.50	1.30
	First	22	7.73	1.42
Doing something with my family	Between 2-5	27	8.00	1.33
	6-11 or more	26	7.12	1.48
	First	22	7.73	1.39
Learning about the park's natural wonders	Between 2-5	27	8.22	1.05
	6-11 or more	26	7.19	1.58
	First	21	8.05	1.07
Getting away from crowded situations	Between 2-5	27	7.89	1.31
	6-11 or more	26	7.19	1.77
	First	22	8.09	1.11
Experiencing peace and calm	Between 2-5	27	8.11	1.16
	6-11 or more	26	7.50	1.30
	First	22	7.95	1.09
Enjoying the smells of nature	Between 2-5	27	8.26	1.10
	6-11 or more	26	7.50	1.45
	First	22	7.23	1.66
Learning what I am capable of	Between 2-5	27	7.04	1.45
	6-11 or more	26	6.27	1.59
	First	22	6.55	1.76
Having thrills	Between 2-5	27	6.85	1.59
	6-11 or more	26	6.19	1.86
	First	22	7.68	1.43
Bringing my family closer together	Between 2-5	27	7.85	1.46
	6-11 or more	26	6.73	1.89
	First	22	7.09	1.80
Reflecting on my spiritual values	Between 2-5	27	7.11	1.70
	6-11 or more	26	5.96	1.51
	First	22	7.50	1.41
Being with others who enjoy the same things I do	Between 2-5	27	7.81	1.14
	6-11 or more	25	7.40	1.32

Appendix 11 Continued

Recreation Satisfaction Items		*n*	*M*	*SD*
Meeting other people	First	22	6.86	1.52
	Between 2-5	27	6.85	1.63
	6-11 or more	25	6.56	1.39
Encountering wildlife	First	22	7.50	1.37
	Between 2-5	26	7.38	1.86
	6-11 or more	25	7.36	1.50
Being in a nature setting	First	21	8.05	1.16
	Between 2-5	26	8.50	.76
	6-11 or more	25	8.28	.84

Note. Mean scores based on scale (Strongly Detracts = 1 to Strongly Adds = 9).

1. Significant differences at the $p < .05$ level were found for the following items:
   "Learning about the park's natural wonders"—Between 2-5 (group 2) > 6-11 or more (group three) "Bringing my family closer together"—Between 2-5 (group 2) > 6-11 or more (group 3) "Reflecting on my spiritual values"—Between 2-5 (group 2) > 6-11 or more (group 3).

Appendix 11

Independent t-test Results for Overall Scores of all Four Scales by Previous Interpretive Program Participation

	First			6-11 or more				
	n	*M*	*SD*	*n*	*M*	*SD*	*t(df)*	*p*
Interpretive Techniques	22	7.8778	.68	27	7.5454	1.18	1.17(47)	.248
Pro-Environmental Behavioural Intentions	21	6.7810	.96	24	7.3750	.75	-2.34(43)	.024*
Environmental Literacy	22	7.3909	1.4	24	6.7000	1.86	1.41(44)	.166
Recreation Satisfaction	20	7.5361	.96	22	7.0177	.85	1.86(40)	.071

Note. Mean scores based on nine point scales.

Note. N = number of participants; M = mean; *SD* = standard deviation; *df* = degrees of freedom.

*Denotes groups that were significantly different from each other at $p < .05$.