

**Environmental Behaviour, Place Attachment and Park Visitation: A case  
study of visitors to Point Pelee National Park**

**by**

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**A thesis  
presented to the University of Waterloo  
in fulfilment of the  
thesis requirement for the degree of  
Doctor of Philosophy  
in  
Recreation and Leisure Studies**

**Waterloo, Ontario, Canada, 2006**

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**AUTHOR'S DECLARATION FOR ELECTRONIC SUBMISSION OF A THESIS**

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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## Abstract

This thesis explores the relationship between place attachment and pro-environmental behaviour expressed by visitors to Point Pelee National Park. Place attachment, the functional, cognitive and emotional bond with a place, may play a role in promoting environmentally responsible behaviours. This may be especially true of place-specific pro-environmental behaviours; however place attachment may also have a “carry-over” effect in that its impact on individuals’ self identity may also foster pro-environmental behaviour in individuals’ every day lives.

An exploration of these relationships was achieved, first by measuring the intensity of place attachment and pro-environment behavioural intentions expressed by visitors to Point Pelee National Park. This was followed by an examination of the relationship between these two constructs using correlation analysis and structural equation modeling. Data was collected with a mail-based self-completed questionnaire. A quota sample of visitors to Point Pelee National Park was utilized. A response rate of 32% ( $n = 355$ ) was achieved.

The relationship between place attachment and pro-environmental intentions was explored further through the measurement of several related variables. These factors include place satisfaction (based on an appraisal of nature, social and activity-based environments), motivation for visiting the park (related to social interaction and nature observation, as well as activity-based and learning opportunities), distance between the park and visitors’ residences, membership in environmental organizations, and visitation patterns including visitation to the park during childhood, length of affiliation with the park, length of visit to the park, and frequency of visitation to the park. Theoretical and empirical research suggests that these factors may affect place attachment, pro-environment behavioural intentions, and/or the relationship between these two constructs.

Study results found positive associations between place attachment and all of these variables with the exception of visitation motives associated with learning and engaging in a favourite activity. The strongest predictive relationships were observed with anti-substitution (the inability of an individual to substitute the park for another destination because of a lack of resources such as time or money or a lack of awareness of comparable sites) followed by frequency of visits to the park; park commitment (based on Friends group membership and donations of time and money to the Friends group); Friends of Point Pelee (FoPP) membership; and park relationship (which was based on visitation to the park as a child and length of affiliation); and, satisfaction with the park.

Results support the proposition that place attachment has a strong positive association with both park-specific pro-environment behavioural intentions (e.g., Write letters in

support of Point Pelee N.P. and similar protected areas) as well as general pro-environment behavioural intentions (e.g., Pay extra for transportation if it is environmentally-friendly). Place attachment strongly predicted park-specific, and moderately predicted general pro-environmental intentions. A number of other variables had an indirect effect on park-specific intentions; notable effects were demonstrated by frequency of visits; park relationship; visitation to the park as a child; place satisfaction; social satisfaction; FoPP membership; and, park commitment; anti-substitution. These affects were mediated by place attachment. After place attachment the strongest predictors of park-specific intentions were anti-substitution; frequency of visits; park commitment; and, general environmental commitment (which was based on membership in an environmental organization and donations of time and money to that organization).

Place attachment was not the only direct predictor of general pro-environmental intentions; general environmental commitment and membership in an environmental organization also directly predicted general pro-environmental intentions. Notable indirect effects, mediated by place attachment were produced by frequency of visits; park relationship; FoPP membership; park commitment; and anti-substitution. The strongest predictors of general pro-environmental intentions were general environmental commitment, followed by place attachment, membership in an environmental organization, and frequency of park visitation.

These findings correspond with much of the literature published on place attachment formation and the development of pro-environmental behaviours. The most notable contribution of this study is its comparison of place attachment's impact on general versus place-specific behaviours, and the role that several related variables play in this relationship.

## Acknowledgements

The completion of this thesis was facilitated by the contribution of many individuals and institutions. I attempt to list some of them here, but I will no doubt miss a few in this brief description, so a special note of thanks to all who helped along the way.

First I would like to acknowledge the support and encouragement of my advisor Dr. Paul Eagles for welcoming me back into academia and providing me with sound support and much needed connections to practitioners and agencies. Also, thanks to my committee members and reviewers, Dr. Roger Mannell, Dr. Troy Glover, Dr. Ron McCarville, Dr. Daniel Scott and Dr. Jerry Vaske for their advice and thoughtful questions. Thanks also to Dr. Steve Smith, Dr. Geoff Wall and Dr. Mark Havitz for additional assistance early on in my dissertation studies. Finally, the completion of this thesis was also facilitated by guidance provided by Dr. Eric Woody, and the Statistical Consulting Service provided by York University, and Erin Harvey.

Additional support was provided by several institutions. First the University of Waterloo, Faculty of Applied Health Science, Department of Recreation and Leisure, the Social Science and Humanities Research Council, Ontario Graduate Assistantship program, and Parks Canada all provided financial support of this thesis and/or my studies. A special thanks to the staff of Parks Canada; this includes Greg Danchuk, Sarah Rupert, Tammy Dobbie, Heather Rolf, Trevor McFadyen, Marian Stranak, and especially Monique Oltrope. Thanks also to Friends of Point Pelee, and its executive director Janice Sarkis.

Thank you to my fellow students at the Department of Recreation and Leisure Studies, and to the remaining professors and administrators at the department who I have not yet listed. An environment of collegiality and scholarly excellence has and continues to be fostered by my fellow students and the professors and administrators of the department. Thank you for contributing to a learning environment which helped shape me as a researcher, this thesis in particular, and the future studies that I will conduct.

Finally, thanks to friends and family outside of the University of Waterloo, especially to the Halpennys, Selbergs, and David and Caleb for keeping me sane, well fed, and ensuring I never lost sight of the most important things in life.

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## Chapter 1: Introduction

Significant and increasing rates of environmental decline across the planet are being witnessed by both scientists and the public. Unprecedented rates of species extinction, catastrophic flooding, and rapid alteration of landscapes and whole ecosystems are observed daily. Humans, while aware of this crisis (Schultz & Zelezny, 1998), fail to make choices and engage in activities that benefit the planet's environment or at least minimize negative environmental impacts. These actions, in this study called environmentally responsible or pro-environmental behaviours, can be defined as the actions of an individual or group that advocate and/or result in the sustainable use of natural resources (after Sivek & Hungerford, 1989/90).

Increasingly individuals and communities state support for the protection of nature, professed pro-environmental attitudes and demonstrated deepening environmental knowledge (Fransson & Garling, 1999; Schahn & Holzer, 1990; Schultz, 2000). Despite this, humans continue to contribute to the destruction of the planet's health. Researchers are striving to understand this disconnect between attitudes, awareness, and behaviour. Part of this process has been devoted to the identification and study of factors that may affect pro-environmental behaviour. There are many variables that encourage and/or stifle environmentally responsible behaviour. Several of these factors are explored briefly later in this study, but range from financial and time constraints to values and belief systems (Blake, 2001; Dietz, Kalof, & Stern, 2002; Hines, Hungerford, & Tamera, 1987; Kaiser & Shimoda, 1999; Newhouse, 1990; Schultz, 2000). One understudied factor that may affect individuals' environmentally responsible behaviour is attachment to a particular place.

A place is a spatial location that is assigned meanings and values by society and individuals. Place can be tangible or intangible, and over time its significance and meaning varies between individuals, groups and even cultures. Research may assist in predicting the actions which individuals or groups take, based on the feelings,

meanings and values that they assign to a place, especially when that place is under threat (Eisenhauer, Krannich, & Blanha, 2000; Williams & Stewart, 1998). This is particularly true when an individual or group is positively attached to a place (Mesch & Manor, 1998; Stedman, 2003a).

An attachment to a particular place, also called place attachment, has been defined as a positive emotional bond with a particular place (Low & Altman, 1992). Some place theorists have expanded Altman and Low's definition of place attachment to embrace a broader description that also incorporates functional and psychological attachments (Williams, Patterson, Roggenbuck, & Watson, 1992). In this study place attachment is defined as an emotional, cognitive and functional bond with a place.

Planners and managers charged with protecting cultural and natural resources are interested in determining what factors affect peoples' decisions to support the conservation of landscapes and natural resources. Positive attachments to a place may be linked to individuals' willingness to participate in the protection of that place (Relph, 1976; Schultz, 2000; Tuan, 1977; Walker & Chapman, 2003). There may also be a link between an individual's place attachment and behaviour that supports environments that lie outside the boundaries of that particular place. In other words, it is speculated that a positive attachment to a place, particularly a nature-based setting such as a park, may be strongly linked to an individual's performance of behaviours that benefit the global environment (Vaske & Korbin, 2001). However, this "carry-over effect" which may characterize the link between place attachment and general pro-environmental behaviour is less clear than the relationship between place attachment and place-specific pro-environmental behaviour.



## ***Study Purpose***

The central purpose of this study is to explore the relationship between an individual's place attachment and his or her: 1) place-specific pro-environment behavioural intentions, and 2) general pro-environment behavioural intentions. The former objective has rarely been studied (Kaltenborn, 1998; Stedman, 2002; Uzzell, Pol, & Badenas, 2002; Walker & Chapman, 2003) and the latter has been explored only once before (Vakse & Korbin, 2001).

Intentions are studied here rather than actual behaviours as it is the encouragement of pro-environmental behaviour in the future that is of interest. Additionally, studying behaviours directly is difficult and costly. Behavioural intentions have proven to be effective indicators of future behaviours (Ajzen, 1980; Fishbein & Ajzen, 1975; Krause, 1995).

In this study place attachment is hypothesized as a factor that is related to and predictive of pro-environment behaviour. As mentioned previously other factors also play a role in affecting pro-environmental behaviour, however, the scope of this study does not allow an exploration of all of these variables. Through a mail-based survey of recent visitors to Point Pelee National Park factors relating to place attachment and pro-environmental behaviour are investigated. It is anticipated that each of these factors may play a role in the relationship between place attachment and pro-environment behavioural intentions. These factors include:

a) Characteristics of visitation to Point Pelee Nation Park, including:

- frequency of visits;
- duration of visit;
- length of affiliation; and,
- visitation to the Park during childhood;

b) satisfaction with the Park;

- c) membership in an environmental organization, especially one related to the Park;
- d) distance of residence from the Park;
- e) substitution of Point Pelee National Park with another destination; and,
- f) motivation for visiting the Park.

These variables were identified through a review of many sources of literature including: environmental psychology (Low & Altman, 1992; Canter, 1997); community sociology (Manzo, 2003; Mesch & Manor, 1998; Shumaker & Taylor, 1983); geography (Relph, 1976; Ryden, 1993; Sack, 1992; Tuan, 1977); tourism and recreation (Lee & Allen, 2000; McCool & Martin, 1994; Moore & Graefe, 1994; Stokowski, 2002); resource management (Eisenhauer, Krannich, & Blahna, 2001; Stedman, 2003b; Williams & Patterson, 1996). The relationship between these variables, place attachment and pro-environment behavioural intentions is expanded on later in the next chapter of this thesis.

## ***Study Setting***

Study results are based on data collected through self-completed, mail-based questionnaires. The survey instruments were sent to individuals who had visited Point Pelee National Park within the last four years. Point Pelee National Park is an internationally significant migratory site for birds and important ecological sanctuary for Carolinian species. The park also contributes to the healthy functioning of the Great Lakes system through the protection of one of the lakes' last remaining great marshes. The park was chosen as the study setting, in part, because of its ecological role and the importance of understanding how pro-environmental protection may be encouraged amongst visitors to the park. The park was also chosen because of the mix of visitors who travel to Point Pelee, as a heterogeneous sample was desirable in order to examine many of the study's questions. The managing agency of the park, Parks Canada, was a cooperative partner in collecting study data, supplying many forms of support. This is elaborated on further in the methods section.

## ***Significance of the Study***

The concept of place “offers a framework for integrating environmental meanings into ecosystem management. Place constitutes a concrete focal point where natural forces, social relations, and human meanings overlap and can be integrated in theory and practice” (Williams & Patterson, 1996, p. 507). Understanding place attachment and the factors that contribute to it can enable natural and cultural heritage stakeholders a greater opportunity to identify shared and contested meanings and values assigned to a particular place. This is an important step toward negotiating management of these places (Mitchell, Force, Carroll, & McLaughlin, 1993; Schroeder, 1996; Williams & Stewart, 1998). The study contributes to researchers’ understanding of the relationships between place attachment and the factors that may affect it. Many researchers have called for further clarification of these factors (e.g., Beckley, 2003; Kyle, Graefe, Manning, & Bacon, 2004b; Shumaker & Taylor, 1983; Stedman, 2003a).

This study may also facilitate understanding of place attachment through an exploration of its dimensionality. An attitudinal conceptualization of place attachment is employed to guide this (i.e., emotion or place affect, cognition or place identity, and conation or place dependence). This is a much needed contribution to the ongoing exploration of place attachment (Stedman, 2003b; Williams & Vaske, 2003).

It will also address the call made by researchers for increased insight into the effects of place attachment on human behaviour (Payton, Fulton, & Anderson, 2005; Stedman, 2003a; 2003b; Vaske & Korbin, 2001; Williams & Vaske, 2003). The specific effect studied here is place attachment’s relationship with pro-environmental behaviour. Also studied will be the possible effect of several other factors on pro-environment behavioural intentions and the potential mediating role of place attachment may play in these relationships.

For protected area managers, the concept of place attachment may be useful in managing the behaviours of visitors to parks (Walker & Chapman, 2003) and in encouraging park advocacy efforts amongst the public. An increased understanding of the factors that foster place attachment amongst the public will be invaluable in this effort.

Observations from this study could also help park management understand the forces that affect customer loyalty and the travel choice behaviour of different groups of park visitors (Lee & Allen, 1999; Raymond, 2000). As Moore and Graefe (1994) suggest “an understanding of how recreationists perceive, choose, and relate to various settings is essential for researchers attempting to understand recreation behaviour and managers attempting to provide opportunities for satisfying recreation experiences” (p. 18). The provision of recreational experiences and facilitation of tourism in parks is often an objective of park agencies. Not only does this visitation encourage support for parks, but it is also increasingly tied to park agency revenue streams (Eagles, 2002; Halpenny, in press). High, yet sustainable visitation levels are key elements in maintaining functional park systems; understanding place attachment’s role in this is a further contribution of this study.

Finally, in addition to generating an increased understanding of place attachment’s role in fostering pro-environmental behaviours; the study of pro-environmental behaviours themselves as expressed by visitors to Point Pelee National Park is another important outcome. The comparison of general and park-specific pro-environment behavioural intentions documented by the study provides unique comparative opportunities. Additionally the chance to explore pro-environmental behaviours’ relationship with other park visitor variables (e.g., frequency of visitation) contributes greater understanding of the factors that affect the adoption of pro-environmental behaviour, particularly those factors that are linked with visitation and attachment to natural areas.

## ***Study Objectives***

There are four study objectives. These are listed in order of priority.

- A. Measure the intensity of place attachment expressed by visitors to Point Pelee National Park.
- B. Measure pro-environment behavioural intentions expressed by park visitors.
- C. Explore the relationships between place attachment and environmentally responsible behavioural intentions toward 1) a place and 2) the environment in general.
- D. Explore the relationship between place attachment, pro-environment behavioural intentions and the following external variables: place satisfaction; environmental group membership; distance travelled; substitution; motivation of visit; visitation patterns (length of affiliation, childhood interaction, duration of visit, frequency of visitation); and socio-demographic variables (gender, age, household income, and education).

The following chapter outlines literature which formed the theoretical foundation for this study and helped identify the methods that were utilized to carry it out. These methods are elaborated on in Chapter 3. Specific decisions regarding methodological choices made for this study and the challenges associated with these are outlined there. Chapter 4 follows documenting the results of the study and how the analysis of data was performed. A comparison of this study's findings with a priori expectations and previously published studies is outlined in Chapter 5. The concluding chapter, Chapter 6, highlights the significance of selected findings, identifies weaknesses and strengths with the study, and calls for future research in a number of substantive areas related to this study including some alternative methodological approaches.

## **Chapter 2: Literature Review**

To understand the importance of place attachment, particularly its relationship with and potential advancement of pro-environmental behaviour, it is first necessary to review previous research on these subjects. This will be accomplished through a brief overview of place attachment empirical and theoretical research. This overview is framed by definitions of key place-related concepts. A short review of research that explores the dimensionality of place attachment is also provided.

This is followed by a brief overview of environmentally-related attitude-behaviour research and discussion of an overarching theoretical framework that guides much of this research, attitude theory and the theory of reasoned action (Fishbein & Ajzen, 1975). A definition of pro-environmental behaviour is also supplied.

Research that has specifically addressed the link between pro-environment behaviour and place attachment is highlighted and opportunities for further study are identified. Finally, a number of other factors that may affect place attachment and pro-environment behavioural intentions are identified and discussed.

### ***Objective A - Measuring place attachment, place identity, place affect and place dependence***

This section of the literature review is devoted to highlighting previous efforts which examine place attachment and factors that are strongly related to this concept. The following concepts will be used to help guide an investigation of park visitors' place attachment.

*Sense of place* is an overarching concept that encompasses the general way an individual feels about a place (Kaltenborn, 1998; Manzo, 2003; Stokowski, 2002; Williams et al., 1992), how he or she senses it, and assigns meaning and values to it (Brandon & Carroll,

1995; Galliano & Loeffler, 1999). These meanings, feelings and values can be associated with an individual's interaction with a place or through cultural and social influences (Low & Altman, 1992; Stokowski, 2002; Young, 1999). Sense of place can be negative or positive, tangible or intangible, and is dynamic in nature (Beckley, 2003; Manzo, 2003). It is highlighted here because sense of place is an important overarching phenomenon, in which place attachment can be situated. Sense of place is addressed here as it is one of the dominant concepts within place-based research, and is useful to consider when exploring individuals' attachment to place and pro-environmental behaviours towards those places. It will not be the focus of this research, but will be returned to briefly in the discussions section of this thesis.

*Place attachment* is the main concept of study in this study. Definitions for place attachment include: 1) a positive emotional bond between individuals and groups and their environment (Low & Altman, 1992); 2) a state of psychological well-being resulting from accessibility to a place or a state of distress upon separation or "remoteness" from a place (Giuliani, 1991); 3) an emotional investment with a place (Hummon, 1992); and 4) "the extent to which an individual values and identifies with a particular environmental setting" (Moore & Graefe, 1994, p. 17). Place attachment, like sense of place, "involves an interplay of affect and emotions, knowledge and beliefs, and behaviours and actions in reference to a place" (Low & Altman, 1992, p. 5). For this study place attachment is defined as an emotional, cognitive and functional bond with a place (Jorgensen & Stedman, 2001).

Place attachment and related concepts such as sense of place have received extensive theoretical examination during the last three decades (viz., Tuan, 1977; Relph, 1976; Low & Altman, 1992). In the last 15 years attempts were made to explore these concepts empirically. Much of this empirical research focuses on measuring the intensity of attachment. Many researchers now call for an expanded research lens with a more diverse set of questions. Further research should centre attention beyond an examination of the strength of an individual's attachment and focus instead on: 1) *what* one senses and is attached to (Stedman, 2003b; Williams & Stewart, 1998); 2) what factors *affect* the formation of place attachment including the impact of physical settings versus social

relationships (Stedman, 2002; 2003a; 2003b; Kaltenborn, 1997), behaviour (Stedman, 2003b; Walker & Chapman, 2003); and, activity orientation (Bricker & Kerstetter, 2000; Kyle, Bricker, Graefe & Wickham, 2004a); and 3) what *effect* place attachment has on an individual's attitudes, level of satisfaction, behavioural intentions and behaviours towards a particular place (Stedman, 2002; 2003b; Walker & Chapman, 2003) or the environment in general (Vaske & Korbin, 2003).

This study focuses on the third issue listed above, the affect of place attachment, and more specifically its impact on pro-environment behaviour intentions. This is the central contribution of this study. Few studies have attempted to study this relationship. An overview of these studies follows later in this chapter.

As stated above place attachment, while defined in a multitude of ways, in this study is treated as an attitude toward a specific place. An individual's attitude toward a specific place is examined by measuring an individual's emotional, cognitive and activity-based reactions to and evaluations of a specific place (Jorgensen & Stedman, 2001). Place attachment is usually conceptualized as having two dimensions, place identity and place dependence. In addition to these psychological and functional bonds, in this study place attachment is also considered a positive emotional bond with a place<sup>1</sup>. These sub-dimensions of place attachment are defined next.

*Place dependence* is described as functional attachment to a place, based on its importance as a setting for specific activities (Stokols & Shumaker, 1981; Williams & Roggenbuck, 1989). In this study place dependence conceptually represents the conative domain and embodies the actions or behavioural tendencies of an individual regarding, in this study, a place (Borden & Schettino, 1979).

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<sup>1</sup> It is recognized that a bond with a place can be negative and positive, and perhaps both for the same individual. For example an individual may be "stuck" in a forestry community because he or she lacks the financial resources or skills to secure employment elsewhere (negative attachment). At the same time the individual may also be positively attached to the community because s/he has a social network there that is emotionally fulfilling (Beckely, 2003; Manzo, 2002). However, because this study is focused on positive feelings held for a particular natural area or park and the pro-environment behavioural intentions that this may elicit, a characterization of place attachment that emphasizes positive emotional reactions or ties to a place is used in this study.



Proshansky (1978) defines *place identity* as “those dimensions of self that define the individual’s personal identity in relation to the physical environment by means of a complex pattern of conscious and unconscious ideas, beliefs, preferences, feelings, values, goals and behavioural tendencies and skills relevant to this environment” (p.155). In short, place identity is one factor that contributes to an individual’s self identity and helps individuals structure their experiences with various physical environments (Proshansky, 1978; Shumaker & Taylor, 1983). It is also described as the symbolically important connection between an individual and a setting (Stedman, 2002) and a psychological investment with a setting that has developed over time (Williams & Patterson, 1999). Proshansky, Fabian and Kaminoff (1983) suggest that place identity is another aspect of identity, comparable to social identity, that describes an individual’s socialization with the physical world. Extensive interaction with a place due to place dependence may lead to place identity (Moore & Graefe, 1994). Place identity can be both cognitive and affective; yet it is unclear how these separate factors operate in defining place identity (Proshansky, 1978). An important contribution of this present study is to explore further the role of these two factors in the composition of place attachment.

In past recreation research a person’s emotional bond with a place has been incorporated into place attachment measurement scales, but was usually combined with measures of place identity rather than treated as a separate sub-dimension. In keeping with the study’s conceptual division of place attachment into three attitudinal components (affective, cognitive and functional) a third sub-dimension, *place affect*, measures emotional or affective attachment.

The usefulness of a three-dimensional place attachment scale as a measure of individuals’ attitude toward a place is explored. In a few previous studies one singular construct called place attachment or sense of place<sup>2</sup> emerged (Jorgensen & Stedman, 2001; Stedman, 2002;

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<sup>2</sup> It should be reiterated here that sense of place is considered an overarching concept in this study which subsumes place attachment. Confusion is generated when reporting from previous place studies because both concepts are often measured using the same items and scales. For this study place attachment, assumed to be a less complex concept that can be measured using quantitative methods such as attitudinal scales, will be the focus of this study. Due to its complex and intangible nature sense of place is perhaps best examined using methods based in the interpretivistic and qualitative traditions.

Williams & Vaske, 2003). The majority of studies identify a two dimension construct (e.g., Kyle et al., 2004a; 2004b; Moore & Graef, 1994; Vaske & Korbin, 2001; Williams et al., 1992; Williams & Vaske, 2003). Further still, in a few studies place attachment emerged as a multi-dimensional construct (Bricker & Kerstetter, 2000; Kyle & Mowen, 2005; Kyle, Mowen, & Tarrant, 2004d; Nanistova, 1998).

In their comprehensive review place attachment measurement and psychometric testing of the scales used to measure place attachment, Williams and Vaske (2003) found that place dependence and place identity constitute distinct dimensions of a single general construct of place attachment. In contrast, Jorgensen and Stedman (2001), using very similar scale items, found a combined measure of place attachment (see Figure 2.3) that included behavioural, emotional and cognitive measures was more explanatory of observed responses demonstrated by study participants than three separate uni-variate dimensions (see Figure 2.2) or a single dimensional measure of human-place relations (see Figure 2.1). This could be due to the singular setting and population of Jorgensen and Stedman’s study; the study surveyed lakeshore property owners in northern Wisconsin. Williams and Vaske’s (2003) study compared observations from four separate study settings, making their observations more generalizable.

Figure 2.1:

*Uni-dimensional model of place attachment (called sense of place in Jorgensen & Stedman’s (2001) study).*

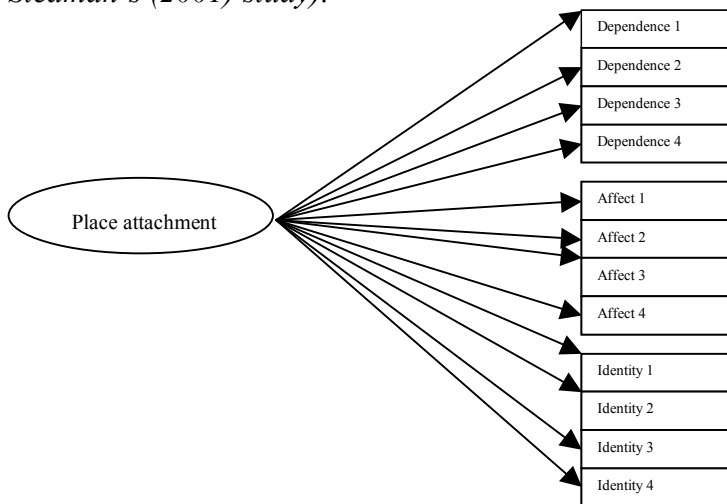
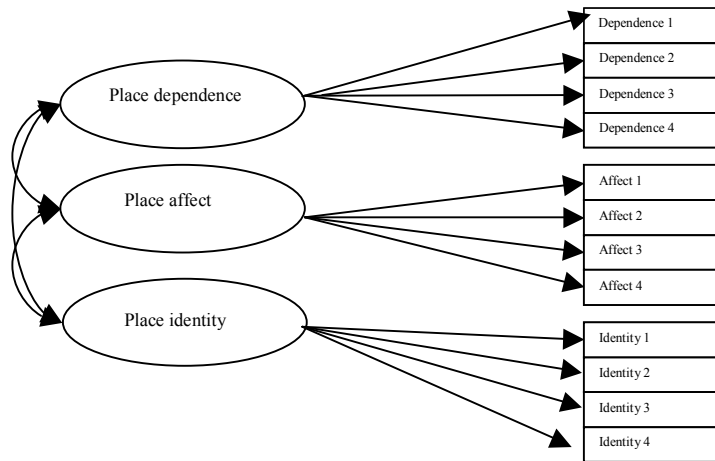


Figure 2.2:

*Three-factor model of place attachment*



The debate lingers within the place literature regarding the dimensionality of place attachment; additional study of place attachment as a psychological construct is needed if reliable and valid measures are to be agreed upon (Williams & Vaske, 2003). An examination of this construct is a secondary objective of this study.

While place identity and place dependence are often measured as separate dimensions only once has place affect, the emotional bond with a place, been modeled and measured as a separate sub-dimension of place attachment (Jorgensen & Stedman, 2001). Jorgensen and Stedman (2001) found that place affect may be a weaker explanatory category than place identity or place dependence. They suggest that place affect displayed shared variability with the general construct of place attachment and therefore of the three dimensions was most synonymous with the generalized construct place attachment (see Figure 2.3).

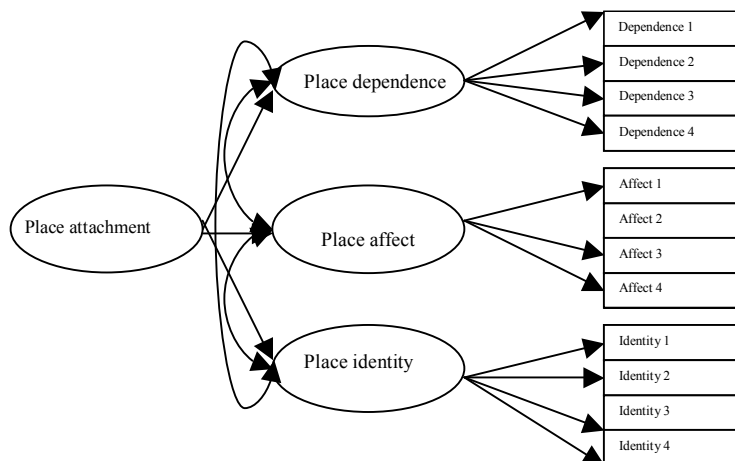
Discussions within the attitude-behaviour literature reinforce the importance of studying cognition and affect separately. Researchers examining the relationship between attitudes and behaviours theorize that cognition and emotion combine to indicate a well thought out attitude (Krause, 1995). Consistency between affective components (e.g., a positive or negative feeling toward the same object) and cognitive components (e.g., beliefs about an

object) are associated with high attitude-behaviour correspondence. Understanding sources of this consistency is important in encouraging pro-environmental behaviour

Based on these two studies, and observation from previous research, it is anticipated that all three sub-dimensions of place attachment would be observed in the study's results. However, it was also expected that: a) Place identity and place dependence may demonstrate greater explanatory power than place affect; and, b) when all sub-dimensions were combined in an overall construct of place attachment, that this overarching measure would have the greatest explanatory power in studying participants' relationship with and intentions towards the study's setting. This relationship is modeled in Figure 2.3.

Figure 2.3:

*Combined place attachment model*



Despite the mixed findings regarding the usefulness of place affect as a sub-dimension, a second reason exists for incorporating its measurement into this study. Research supports the idea that emotion has a strong influence in determining people's actions toward attitude objects. For example, from the field of environmental education several researchers found that messages that build emotive ties to a setting or object have a greater chance of increasing environmentally-responsible behaviour and environmental activism compared with knowledge-based messages on their own (Pooley & O'Connor, 2000). Emotion appears to assist with information retrieval (e.g., environmental knowledge) and in

motivating individuals to work for an issue that is important to them (e.g., the protection of a favourite park) (Vining & Tyler, 1999). Kals, Schumacher, & Montada (1999) found that environmentally-responsible behaviour can be motivated by positive feelings toward nature. In discussing the importance of emotion in affecting pro-environmental behaviour Russell (2002) suggests, a “strong affective component [is] essential to effecting the transition from caring *about* to caring *for* the environment” (p.485, emphasis from original). Due to the importance of emotion as a tool in efforts to promote more environmentally-responsible behaviour it is useful to measure the level of emotional attachment that individuals have for the study setting separately from other factors. This leads us to the other main subject of study in this proposed dissertation thesis, understanding study participants’ pro-environment behavioural intentions.

### ***Objective B - Measuring pro-environment behavioural intentions***

It is widely acknowledged that global environmental health has been declining for some time, driven in large part by human activity. Publications such as Rachael Carson’s (1962) *Silent Spring* and Carl Safina’s (1997) *Song for a Blue Ocean* alerted many individuals to our ecological crisis. This decline in environmental health is acknowledged as a serious problem in many different countries and cultures (Castro & Lima, 2001; Corral-Verdugo, Bechtel, & Fraijo-Sing, 2002; Gruber, 1996; Kaiser & Wilson, 2000; Kasapogule & Ecevit, 2002; Schultz & Zelezny, 1998).

Despite the increased awareness that problems with the environment exist, and that human activities are often the cause of these problems, individuals frequently fail to choose behaviours that will help lessen the impact on the environment (Dunlap & Scarce, 1991; Howell & Laska, 1992). During the past several decades researchers attempted to understand this disconnect between environmental awareness and pro-environmental behaviour. Part of this study focuses on the relationship between environmental attitudes and behaviours. This is based, in part, upon the theory that attitudes towards 1) objects and 2) the behaviours that affect them shape the desire to perform the behaviour. An *attitude* is a

belief and feeling about an object that predispose one to behave in a consistent manner toward the object (Fishbein & Ajzen, 1975; Weigel, 1983).

Unfortunately, only modest correlations between environmental attitudes and behaviours have been reported (Buttel, 1987; Scott & Willits, 1994; van Liere & Dunlap, 1981). This may be due to several factors including: a) a reliance on poor measurement tools, (e.g., a lack of congruence or specificity between the attitudinal and behaviours measures may characterize some survey instruments) and b) failure to recognize the influence of external factors on behavioural prediction (Tarrant & Cordell, 1997; Tarrant & Green, 1999; Corral-Verdugo, Bechtel, & Fraijo-Sing, 2003).

Environmental attitude-behaviour researchers have devoted significant effort to investigating the factors that affect the relationship between environmental attitude and behaviour. These factors include: motivations (de Young, 2000; Hartig, Kaiser, & Bowler, 2001); values (Stern, Dietz, Abel, Guagnano, & Kalof, 1999; Shultz & Zelenzy, 1999; Vaske & Donnelly, 1999); environmental awareness and perspective taking (Shultz, 2000; Walker & Chapman, 2003); contextual factors (Boldero, 1995; McMenzie-Mohr, Nemiroff, Beers, & Desmarais, 1995); socio-demographic characteristics (Klineberg, McKeever, & Rotherbach, 1998; Schahn & Holzer, 1990; Tarrant & Cordell, 1997; Virden & Walker, 1999); normative behaviours (Karp, 1996); general attitudes (Kaiser, Wolfing, & Fuhrer, 1999; Mainierie, Barnett, Valdero, Unipan, & Uskamp, 1997); specific attitudes (Corral-Verdugo et al., 2003), social interactions and group membership (Manzo & Weinstein, 1987); and, direct experience or participation with the attitude object (Ajzen & Fishbein, 1980; Fazio, 1986; Tarrant & Cordell, 1997; Zanna, Olson, & Fazio, 1980). This study explored the relationship of place specific attitude (i.e., place attachment) with a) place-specific and b) general pro-environmental behavioural intentions. It also examined the relationship of place attachment with other external factors such as frequency of visitation and length of affiliation and their possible effects on the place attachment-pro-environment behavioural intentions relationship (see Objective D).

*Pro-environment behaviour* is an action of an individual or group that promotes and/or results in the sustainable use of natural resources (Sivek & Hungerford, 1989/90). This definition is also applicable to *environmentally responsible behaviour*, a phrase that also appears frequently in the environmental literature and is used inter-changeably in this thesis with the term pro-environmental behaviour. These phrases can be contrasted with a third common term in the environmental behaviour literature: environmentally significant behaviour. While the former terms denote positive intentions and outcomes, and latter suggests that either negative or positive impacts could arise from an individual's or society's actions.

Stern (2000) makes an important distinction between two definitions for *environmentally significant behaviour*. He states that environmentally significant behaviour can be impact oriented in two distinct ways: 1) directly by “the extent to which it changes the availability of materials or energy from the environment or alters the structure and dynamics of ecosystems or the biosphere itself”... (e.g., sorting waste or clearing forests), or 2) “indirectly, by shaping the context in which choices are made that directly cause environmental change” (p. 408) (e.g., protests of international development policies or lectures advocating the virtues of the General Agreement on Tariffs and Trade (GATT) in a university classroom). He also highlights that possibility that even though an individual's intention is to benefit the environment through some action, the possibility of failing to have an impact, and especially a positive impact may still result.

### ***Objective C – Exploring relationships between place attachment and environmentally responsible behavioural intentions toward 1) a place and 2) the environment in general***

Place theorists speculate that a “field of care” develops for a place through ongoing interaction with it (Tuan, 1977). Relph (1976) suggests that places can foster a sense of commitment and responsibility. Environmental behaviouralists also theorize that increased knowledge about a place as well as an emotional connection will increase the likelihood that

individuals will demonstrate place-protective behaviours (Schultz, 2000; Walker & Chapman, 2003).

Only a few empirical studies explore the link between place attachment and pro-environmental intentions and behaviours. Commonalities can be observed in the community attachment literature which highlights a link between place attachment and protective action. For example, Sampson and Groves (1989) found that individuals who demonstrate higher levels of neighbourhood attachment were more likely to develop a set of norms and undertake actions that reduce crime. Mesch (1996) found that residents with higher levels of neighbourhood attachment were more likely to fight against attempts to change the social and physical nature of their neighbourhood. Guest and Lee (1983) observed that sentiment, indicated by the degree to which respondents would miss an area after moving away from it, affected the probability of individuals' moving and taking political action to defend their community. Shumaker and Taylor (1983) provide a review of similar findings. Williams et al. (1992) also note from the community attachment and forced migration literature that "strong emotional ties to recreation settings will reduce the willingness to substitute settings and increase the level of concern regarding how a place is used and managed" (p. 33). However they fail to cite specific studies that support these observations.

Empirical research from the field of resource management also supports the link between interaction with natural environment and care for or support of those same environments. For example, in a study exploring attitudes of forest recreationists towards oil and gas development Langenau, Peyton, Wickham, Caveney and Johnston (1984) found that personal contact with natural landscapes contributed to environmental sentiment. In a second study, Borrie and Roggenbuck (2001) employed experience sampling method and observed that "care for the wilderness" was higher amongst park visitors at the end of their visit to a US wilderness area than at their entry, suggesting the prolonged interaction with the wilderness served to raise individuals' attachment to the environment.

Within the recreation literature several studies identify a possible link between place attachment and environmental behaviour. For example, Kyle et al. (2004b) note from a



study of hikers on the Appalachian Trail that as place identity increased, perceptions of negative environmental conditions became more problematic. Bricker and Kerstetter (2000) report that place-dependent recreationists are generally more concerned with resource development and maintenance; whereas recreationists displaying high tendencies towards place identity are more often associated with resource preservation and maintaining primitive settings.

Five studies from the fields of resource management and community sociology have dealt specifically with the link between place attachment and pro-environmental behaviour. These are summarized in Table 2.1.

Kaltenborn (1998) produced one of the first studies to examine the link between place attachment<sup>3</sup> and pro-environment behavioural intentions. Kaltenborn utilized a scale developed by Shamai (1990) rather than the Williams and Roggenbuck (1989) inspired place attachment scale to study local residents' relationship with their home archipelago in the Norwegian Arctic. He grouped respondents into three clusters based on the intensity of their place attachment. Next he compared the groups' self-reported environmental intentions by providing different environmental impact scenarios and asking residents to indicate how these impacts would affect their recreational choices and pro-environmental actions. The study shows that place attachment did play a role in residents' reactions to environmental impacts. A stronger attachment was associated with a lower tolerance of increased tourism, a smaller likelihood of choosing a different location to recreate in when threatened with small amounts of shoreline oil pollution, and increased likelihood of getting involved with solutions to environmental problems. Kaltenborn's use of Shamai's scale should be repeated elsewhere. Studies that look at transient populations' attachment to places, in addition to resident's attachments as Kaltenborn investigated, also need to be explored future; this latter challenge is addressed in this study.

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<sup>3</sup> Like Jorgensen & Stedman (2001), Kaltenborn used the phrase sense of place; but for comparative purposes in this study the term place attachment is inserted to maintain consistency. Admittedly Kaltenborn (1998) was measuring a slightly different phenomenon due to the nature of Shamai's (1990) sense of place scale; however, similarities are strong enough to warrant inclusion here.

Table 2.1:  
*Selected place attachment studies that address pro-environmental behaviour*

Study	Conceptualization of Place Attachment or Sense of Place <sup>4</sup>	Scale of place	Threat to place	Behaviours / actions / intentions	Population
Kaltenborn, 1998	Sense of Place– 1 dimension (Shamai’s 1991 scale – grouped into three levels of intensity; $\alpha = .90$ )	Group of islands	Small to large oil spill on coast; littering at campsites; insufficient supervision of natural areas; increased ship traffic, tourism, helicopter traffic & air pollution	<i>Place specific &amp; Specific actions:</i> e.g., choose alternative recreation site; Choose alternative activities; Contribute to solution; no reaction	Local residents
Vaske & Korbin, 2001	Place attachment – two dimensions (place identity and place dependence; 8 items; $\alpha = .83; .82$ )	n.a.	General environment	<i>General outcomes &amp; Global environment:</i> e.g., learn what I can do; talk to others; convince friends; talk to parents <i>Specific actions &amp; Global environment:</i> e.g., join community effort; sort waste; conserve water	Youth in resource management project (14-17 years old)
Stedman, 2002	Sense of Place – one dimension (7 items; $\alpha = .94$ )	Lake district	Increase in number of home; proposed condo development; water quality decline; recreational crowding	<i>Place Specific &amp; Specific Actions:</i> e.g., voting; join or form a group against	Lake district seasonal and year round residents
Walker & Chapman, 2003	Sense of Place – one dimensional (6 items; $\alpha = .84$ )	National Park	Litter; poaching; wildlife feeding; site impacts	<i>Place specific &amp; Specific actions:</i> e.g., volunteering; moderating actions of self and others; voting; fees; visiting a site less	National Park visitors
Uzzell, Pol & Badenas, 2002	Place-related social identity (based on social cohesion, place satisfaction and place identification)	Community level	n.a.	<i>General outcomes &amp; Place specific and Global environment:</i> e.g., sense of responsibility to place and community Specific: Purchasing decisions	UK neighbourhood residents

<sup>4</sup> Three of the five studies cited here use the term sense of place in their report; but for comparative purposes with this study the term place attachment is sub-planted to explain their findings and reduce reader confusion. With the exception of Kaltenborn’s (1998) and Uzzell et al.’s (2002) studies the indicators used to measure place attachment in these studies are a close match to how place attachment is measured in this study.

Vaske and Korbin (2001) take a much different approach to studying the effect of place attachment on pro-environmental behaviour. They chose to explore the affects of place attachment sub-dimensions place dependence and place identity on general environmental behaviours. They found that a) as place dependence increased, place identity increased; b) as place identity increased, self-reported pro-environment behaviour increased; and c) place identity mediated the relationship between place dependence and general self-reported pro-environment behaviours. This is currently the only study that looks at place attachment's affect on general pro-environment behaviour rather than place-specific behaviour. The study's sample is taken from a population of youth involved with a resource management program. This focus on place attachment's relationship with general environmental behaviour should be repeated with an adult population, a task that was undertaken in this study. The measures used in Vaske and Korbin's study to capture the student's environmental behaviours were also very general in nature, and not tied to a particular place. This current study of visitors to Point Pelee National Park utilized both place-specific and general environmental behaviour measures.

One of the other unique contributions by Vaske and Korbin's study was its delineation of different types of pro-environmental behaviour into two groups, specific actions and general behaviours. An example of a specific action is participation in community cleanups or conserving water by turning off the tap while brushing teeth; general behaviours are broader in scope and include activities such as discussing environmental issues with friends or learning about environmental issues. The importance of measuring specific versus general environmental actions is debated within the environmental behaviour literature (Corral-Verdugo et al., 2003). In Vaske and Korbin's study the results from the specific and general behaviour measures were combined and treated as one factor due to outcomes produced through exploratory factor analysis; a Cronbach alpha of 0.89 was achieved for the combined measure. Vaske and Korbin call for further verification of this single environmental behaviour construct. Using a number of specific and general environmental behavioural activities this can be explored in the data collected in this study.

Treating place attachment as a single-dimensional construct based on measures from Williams and Roggenbuck's (1989) place attachment scale, Stedman (2002) examined the impact of place attachment on pro-environment behavioural intentions. He found that a positive emotional and identity-based attachment to a place strongly influenced seasonal and full-time lake district residents' intentions to engage in place-protective behaviours. These place-protective behaviours included voting for laws and joining or forming groups that would help protect the lake against threats such as increased home development or decreased water quality. An important additional contribution from Stedman's study is the finding that place satisfaction (i.e., how satisfied a respondent is with their lake's social and environmental qualities) also exerted influence on residents' intentions to perform pro-environment behaviours. Both place attachment and satisfaction exerted independent influences; however positive feelings of place attachment and negative levels of place satisfaction appeared to positively influence place-specific protective behavioural intentions.

This study attempts to duplicate Stedman's findings by measuring place satisfaction amongst park visitors. While Stedman measured the attitudes and behavioural intentions of both residents and seasonal visitors, this study of visitors to Point Pelee National Park explores a significantly different population of recreationists. Some of the Point Pelee National Park visitors are frequent visitors of the park, often using it as a convenient source for recreation opportunities. Other visitors come to the park only once or twice a year for very specialized recreational activities (e.g., birding). Both groups of visitors differ from Stedman's study as they do not own land within the park.

Walker and Chapman (2003) surveyed visitors to a Canadian national park. Like many other place studies they used Williams and Roggenbuck's place attachment scale to measure place attachment. They examined the relationship of place attachment with park-specific pro-environment behavioural intentions. Only six place attachment items were used to produce their scale. These included both place identity and place dependence measures. The authors did not explore the dimensionality of place attachment (G. Walker, personal communication, Oct. 2004); rather they only report that two of the original eight place attachment items were dropped to achieve an acceptable scale for measuring place

attachment. This modification produced a Cronbach's alpha of 0.84 for the place attachment scale. Walker and Chapman's chief contribution is their typology of environmental intentions. These include: 1) Self-focused non-depreciative intentions (e.g., I will not feed wildlife in the park); 2) other-focused non-depreciative intentions (e.g., I will pick up litter left by other people); 3) volunteering intentions (e.g., I will volunteer with park projects); 4) poaching reduction intentions (e.g., I support paying higher entrance fees in order to prevent poaching in the park); and 5) site-specific intentions (e.g., I will voluntarily visit a spot less if it needed to recover from environmental damage). Unlike Vaske and Korbin's (2001) study, all behavioural intention scale items were specific activities and did not include generalized behaviours. All of the study's behavioural intention items were also place-specific, related to the park setting. The importance of this difference between generalized versus specific behaviours and place versus general context items is outlined in more detail in the methodology chapter.

Walker and Chapman report that nearly all pro-environment behavioural intentions appeared to be significantly affected by place attachment. The only class of pro-environmental intention indicators that did not appear to be influenced by place attachment were self-focused, non-depreciative intentions. The authors believe this may be because these items were reversed coded. A modified version of these behavioural intentions categories was added to the Point Pelee study but with the additional comparative dimension of incorporating general pro-environment behavioural intention indicators in addition to park-specific ones. Additionally, much more information is recorded regarding the visitor characteristics of Point Pelee National Park than was reported in the Walker and Chapman study, thereby facilitating a greater understanding of other factors that may be affecting park visitor's relationships with a specific protected area and in particular the relationship of place attachment with pro-environmental behaviour.

Finally, Uzzell, Pol and Badenas' (2002) study differs significantly in its focus from the other studies described here in that its operational definition of place and attachment to place is based largely on social identity. Residents of two UK communities were asked to indicate their sense of satisfaction with their neighbourhoods as places to live, name and describe the

geographic location of their communities (place identification), and describe the social cohesion or sense of community togetherness that they felt. The relationships of these social identity factors with residents' self-reported environmental knowledge, attitudes and behaviours were examined. Attitudes toward environmental behaviours were measured at a general level; residents were asked to indicate their level of sense of responsibility and involvement for the state and care of the common environment (e.g., "Is the cleaning and management of the neighbourhood your responsibility or the responsibility of the local authority?" p. 32). A more specific measure of environmental behaviour consisted of questions designed to measure the pro-environmental nature of residents' purchase decisions (e.g., "When you go shopping, to what degree do you buy products according to the...low energy consumption" p. 47).

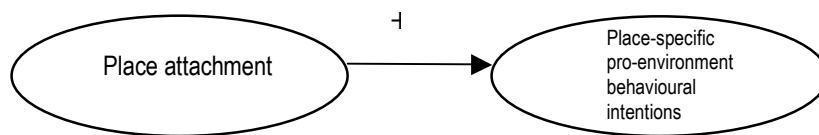
While residents claimed a degree of pro-environmental concern, their actions did not appear to always follow. This was especially true when personal sacrifice was called for. For example, they often chose price above environmentally-sustainable production of a product as a leading variable in making purchasing decisions. The authors report that within one case study village those with a strong sense of social cohesion and social identity with the neighbourhood expressed increased intention to engage in general pro-environmental behaviours. Members of the other case study village expressed a much weaker and negative association between social identity and environmentally sustainable behaviours. Based on these mixed results one could speculate that a positive association between place attachment and pro-environment behavioural intentions may be observed in park visitors who demonstrate frequent visitation and socially-oriented motivations for visiting Point Pelee National Park; however given the lack of a clear outcome in Uzzell's *et al.*'s study this may prove to be an incorrect proposition. One of the factors that could have contributed to the confusing results of Uzzell, *et al.*'s study is the lack of congruence between the village-specific social identity measures and the environmental behaviour measures which were based on general purchasing decisions unconnected with the two case-study sites.

After reviewing in-depth these five studies, and additional research on place attachment and environmental behaviour, it is proposed in this current study of visitors to Point Pelee

National Park that place attachment is strongly related to an individual's stated pro-environment behavioural intentions towards the place of attachment, in this case a park. This relationship is envisioned in Figure 2.4. It is anticipated that place attachment will have a positive association with pro-environment behavioural intentions. In other words, place attachment is expected to have a positive effect on place-specific pro-environment behaviour; as attachment increases, so should expressions of pro-environment behavioural intentions.

Figure 2.4:

*The positive effect of place attachment on pro-environment behavioural intentions*



One can also explore the nuances of the relationship between place attachment and pro-environment behavioural intentions by using different measures for behavioural intentions. An overview of recreation, resource management and environmental literature reveals that most studies examine the link between attachment to a specific place and intentions or actions to protect that place. In contrast, it is also important to continue the work begun by Vaske and Korbin (2001) that explores the relationship between place attachment and behavioural intentions towards the environment in general. They suggest that the place attachment sub-dimensions of place identity and place dependence may affect general pro-environment behaviour. Citing Williams and Patterson's (1999) paper which highlighted place identity as an influence on specific environmentally responsible behaviour in a particular setting, Korbin and Vaske suggest that the connection between place identity and self may result in the "carry over" of specific sustainable place-related behaviours to influence environmentally responsible behaviour in other aspects of an individual's life. Aside from this one study, no other studies have been specifically designed to compare the links between place-attachment and general or globally-oriented environmentally

responsible behaviours. This study attempts to replicate Korbin and Vaske's findings by examining environmentally responsible intentions at both the local and global scales.

Finally, it is also anticipated that the relationship of place attachment with pro-environment behavioural intentions is affected by other factors. These factors are described next.

### ***Objective D – Exploring the relationship between external variables, place attachment and pro-environmental behaviour***

Overviews of factors that lead to the creation of place attachment include Shumaker and Taylor (1983) from the field of community sociology, and Beckley (2003), Stedman (2003b), and Moore and Graefe (1994) from resource management. However, all researchers appear to agree that much more work needs to be conducted on factors that foster and maintain place attachment (Stedman, 2003b; Beckley, 2003; Manzo, 2003). As described earlier, a similar call has been made in the environmental behaviour literature; further understanding of the factors that foster environmentally responsible behaviours is needed (Dietz, Stern, & Guragnano, 1998; Hines et al., 1987; Norlund & Garvill, 2002; Tarrant & Cordell, 1997).

This study addressed this as a secondary objective by testing the relationship between several external variables, place attachment and pro-environment behavioural intentions. These external variables were selected, not only because of their expected relationship with place attachment, but also because they it is anticipated that they may play a direct or indirect role in affecting pro-environmental behaviours. These external variables, labelled external because they lie outside the direct relationship between place attachment and pro-environment behavioural intentions, are divided into two categories (see Table 2.2). These categories are: a) background variables and b) other external variables.



Table 2.2

*Variables External to the Relationship between Place Attachment and Pro-environment Behavioural Intentions*

<b>Background</b>	<b>Other External Variables</b>
<ul style="list-style-type: none"> <li>• Age</li> <li>• Gender</li> <li>• Income</li> <li>• Education</li> </ul>	<ul style="list-style-type: none"> <li>• Visitation Patterns               <ul style="list-style-type: none"> <li>-duration of visit</li> <li>-length of affiliation</li> <li>-frequency of visitation</li> <li>-childhood interaction</li> </ul> </li> <li>• Place satisfaction</li> <li>• Membership</li> <li>• Distance between residence and park</li> <li>• PPNP substitution</li> <li>• Motivation</li> </ul>

Background variables are aspects of individuals' backgrounds that may influence other variables but will not be influenced by them (Vogt, 1999). Background variables are usually demographic characteristics. Variables measured in this study that may be classified as background variables include gender, age, education, and, income (see Table 2.2). An argument can be made that only age and gender are background variables in the truest sense of the term because they can not be affected by other variables. For example, income could be contingent upon the age and gender of an individual. However, for the sake of expediency these four variables are classified as background variables.

**Socio-economic variables**

There are no definitive conclusions about the relationship of these four background variables with either place attachment or pro-environment behavioural intentions. *Gender* is shown to be important in the formation of environmental attitudes. Women often express higher levels of concern, but fail to demonstrate similar levels of environmental behaviour (Blake, 2001; Hines et al., 1987; Klineberg et al., 1998; Schahn & Holzer, 1990; Vorkinn & Riese, 2001). Other environmental researchers suggest that women do indeed demonstrate higher levels of pro-environmental behaviour (Zelezny, Chua, & Aldrich, 2000). Overall, gender appears to have no predictable relationship with pro-environment behaviour. The same can be said of place attachment and gender. Although gender has been included as a variable in

some place attachment studies (e.g., Moore & Graefe, 1994) a strong relationship between gender and place attachment has not always been observed. The community attachment literature has noted that women more commonly express higher levels of place attachment. For example, Hidalgo and Hernandez (2001) report that women were characterized by high levels of place attachment than men in a study which examine special ranges of residential attachment.

In some studies a strong relationship between *age* and pro-environmental behaviours has been highlighted. For example, several studies report that younger people (i.e., less than 35 years of age) may report higher levels of pro-environmental behaviour than others. However, this pattern is not universal (Hines et al., 1987; Klineberg et al., 1998). Age as a factor that affects environmentally responsible behaviour may depend more on the behaviours that are being considered in the study (Corral-Verdugo, 2001 cited in Berenguer, Corraliza, & Martin, 2005). A few studies have identified a relationship between age and place attachment. The affect of age is more evident in long term users or residents of a particular setting than for occasional visitors (Mesch & Manor, 1998; Shumaker & Taylor, 1983, Williams et al., 1992). However the affects of age can vary with scale of the place of attachment (e.g., neighbourhood vs. home; Hidalgo & Hernandez, 2001). Frequent use also appeared to mediate the affect of age in Moore & Graefe's (1994) study of rail-trails users. Visitors to Point Pelee are anticipated to vary in terms of frequency and length of affiliation. It is anticipated that older adults, who have also had a longer affiliation with the park, may demonstrate higher levels of place attachment than younger visitors. As in Moore & Graefe's study, frequency of visitation may also play a role in the relationship between place attachment and age, however support for this can be described as tenuous at best and will be treated in an exploratory fashion. The same can be said for place attachment and pro-environmental behaviours.

*Education* appears to have a strong relationship with pro-environmental behaviour, but this is also inconclusive (Hines et al., 1987; Klineberg et al., 1998). One study, which is particularly relevant to this investigation, was conducted by Syme, Nancarrow and Jorgensen (2002) who identified education as the strongest predictor of individuals'

perceived responsibility for the environment *outside* their own neighbourhood. This suggests that education could play a role in fostering pro-environmental attitudes and behaviours outside one's immediate location and place of attachment. In a contrasting study of place attachment and environmental concerns regarding a hypothetical hydro-electric development Vorkinn and Riese (2001) did not find education to be a significant predictor of environmental concern. Many other studies have found mixed results regarding the impact of education on environmental attitudes and behaviours.

A similar lack of certainty exists in the place attachment literature. For example, in a study of trail users Williams et al. (1992) identified a link between lower levels of education and higher levels of place attachment. Mesch and Manor (1998) report an opposite finding, a positive association between education and neighbourhood attachment. This was measured via the level of pride individuals' expressed for their neighbourhoods. Citing Vorkinn and Riese's (2001) study, education was also not found to be significant predictors of place attachment. Again, due the inconclusive results for in both the place attachment literature and environmental behavioural literature no definitive hypotheses were made regarding the relationship between these variables. Instead, the examination of education's impact on the main constructs under investigation was treated in an exploratory fashion.

A final background variable, *income* is often associated with higher levels of pro-environmental behaviour (Hines et al., 1987; Kaiser et al., 1999). An example from Klineberg et al. (1998) illustrates the complexity of examining the relationship between household income pro-environmental behaviours. They identified how wealthy individuals demonstrated higher pro-environmental actions (i.e., donations) but not necessarily environmental concern. Place attachment studies report far fewer results on the relationship of income and place attachment. Williams et al. (1992) report a link between lower levels of income and higher levels of place attachment. One explanation for this could be due to the impact of lower levels of mobility experienced by these individuals due to financial constraints, which in turn may increase place dependence on local trails for recreation opportunities. Due the lack of conclusive results on income's ability to predict either place

attachment or pro-environmental behaviours, the examination of income's relationship with these two constructs was conducted in an exploratory fashion.

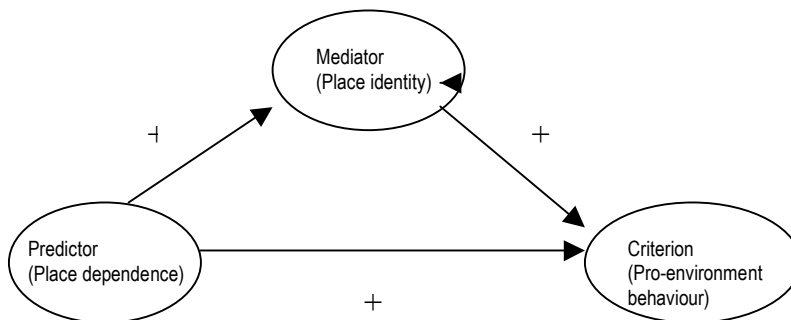
In summation, few if any conclusions can be drawn regarding the impact of these four background variables on the place attachment or pro-environment behavioural intentions. As such, no expectations or hypotheses are proposed. Instead their relationship with these constructs were treated in an exploratory manner during the data analysis stage of this study.

However, sufficient research has been conducted on the other external factors related to place attachment and pro-environmental intentions (see Table 2.2). These relationships are described next. This is guided by the provision of a definition for mediating variables. This is supplied because the effect of each of these external variables on pro-environmental intentions may be mediated by place attachment.

A mediating variable, also called an intervening variable, is “part of a casual chain that is affected by a prior variable and in turn affects a subsequent variable” (Kline, 1998, p. 55). In short, they are variables that transmit effects to other variables (Vogt, 1999). These variables are always endogenous, or variables that are part of a casual chain and are caused by other variables. An example of this is highlighted in Vaske and Korbin's (2001) study; place identity is identified as a mediating factor in the relationship between place dependence and environmentally-responsible behaviour (see Figure 2.6).

Figure 2.6:

*Mediator effect of place identity (Vaske & Korbin, 2001)*



Three conditions are required for a mediation effect to occur (Baron & Kenny, 1986; James & Brett, 1984): a) a significant relationship between the predictor (e.g., place dependence) and the mediator (e.g., place identity); b) a significant relationship between the criterion (e.g., pro-environmental behavioural intentions) and the mediator; and, c) strength of relations between the predictor and the criterion is non significant and reduced or even zero, if the effect of the mediator is controlled. It is rare to achieve perfect mediation in social-psychological research (where the predictor is reduced to zero with the introduction of the mediator). In most cases, a variable may be labelled as a mediator if it accounts for a significant portion of the variance in both the predictor and the criterion and the effect of the predictor on the criterion is reduced when the mediator is introduced (i.e., when the predictor and mediator are both included as independent variables in the regression equation) (Tarrant & Green, 1999).

In short many theoretical relationships between the factors examined in this study can be theorized and modeled. Some may be supported by the data collected; their effects may be mediated by place attachment. Potential relationships, based on theory and previous empirical studies, are described next for each external variable.

### **Visitation patterns**

The relationship of visitation pattern variables with place attachment and pro-environmental behaviour are detailed first. *Frequency of visitation* to the park may indicate high place attachment (Moore & Graefe, 1994; Moore & Scott, 2003; Walker, 2002). Frequent visits to the park may foster and/or indicate place dependence, which in turn can lead to place identity (Moore & Graefe, 1994). Frequent visitation to the park is likely related to distance between respondents' place of residence and the park. A caution should be noted here, that although some survey respondents may appear strongly attached to the park, this attachment may be largely based on a functional attachment related to the park's convenient location for local recreationists. This attachment may not be the more enduring form that is characterized by place identity (Kyle & Mowen, 2005; Moore & Graefe, 1994).

Frequency of visitation is also expected to have a strong relationship with place-specific pro-environmental behaviours directly or indirectly through an individual's place attachment.

This is based upon the notion that an individual who frequents a place is also more likely to protect it if it is under threat. Altruistic and self interested motives drive individuals' attempts to ensure the quality of a place that they frequent is maintained.

It is unknown what frequency of visitation to Point Pelee National Park would have on general environmental behaviours. But one could postulate that there could be a positive association between these two factors. This is based on two separate and related ideas. The first is that frequent visitation may result in frequent exposure to the environmental education messaging that is delivered by park staff. This in turn may inform and inspire frequent visitors to implement some of these pro-environmental lessons in their everyday lives (Madin & Fenton, 2004; Moscardo, 1996; 1999). The second phenomenon which may encourage environmentally responsible behaviour in respondents' every-day lives may be that individuals who visit a protected area like Point Pelee frequently may be already very aware of environmental issues and demonstrate a slightly higher tendency to perform pro-environmental behaviours on a regular basis (Vorkinn & Reise, 2001). In summary general pro-environmental behaviours may be inspired in individuals as a result of the visitation or may already be present in individuals with a pre-disposed interest in nature and environmental issues. The proposed relationships between place attachment, behavioural intentions and frequent park visitation are depicted in Figures 2.8a and 2.8b. Solid lines depict relationships that are expected to appear based on findings in previous literature; dotted lines draw on theory-based speculation and are exploratory in nature.

Figure 2.8a

*Frequency of visitation predicts place attachment and behavioural intentions*

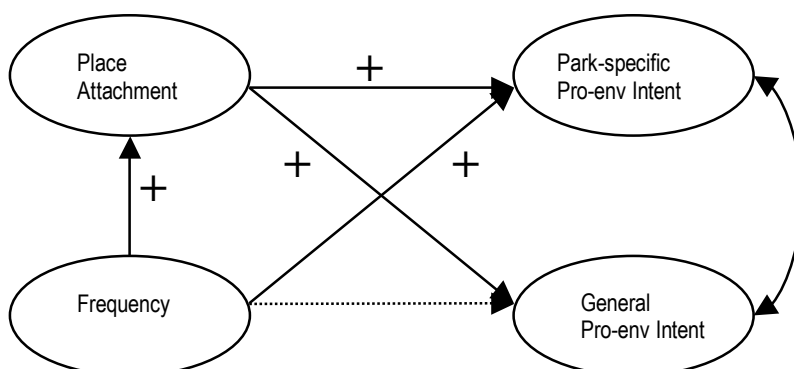
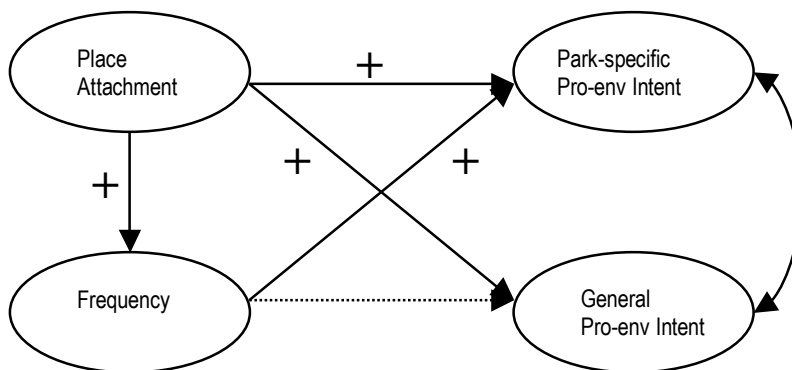


Figure 2.8a depicts the most commonly described relationship between place attachment and frequency of visitation to a place: Frequency predicts place attachment. However, one could also suggest that place attachment could be a predictor of frequent visitation to Point Pelee National Park; the more attached an individual is the more frequently an individual will visit the park. This frequency could be motivated by place dependency – the park may be the most conveniently located public space for recreation, or place identity which encompasses the longing to return to a special place that holds great meaning to an individual.

Figure 2.8b

*Place attachment predicts frequency of visitation and behavioural intentions*



### Length of visit

The *duration* or *length of a visit* may also be related to place attachment; however this connection is somewhat vague. Williams et al. (1992), in a study of US national forest, wilderness, and national recreation area users, reported no significant relationship between length of stay and place attachment; however an exception was respondents who stayed longer than two nights. These users demonstrated higher levels of place attachment. When clarifying this finding the authors suggested “wishful thinking” was affecting respondents’ statements; while visitors’ *actual* length of stay was unrelated to place attachment, their perception of their *typical* length of stay was. It seems tenuous at best to suggest that there may be a relationship between length of stay and place attachment. One could argue that

even a very short trip of a few hours might foster some level of attachment based on familiarity and created memories derived from the visit to a park like Point Pelee National Park. This is particularly true of national parks which already have a strong, if abstract bond with the Canadian public. Nevertheless this relationship of length of visitation with place attachment was explored. An attempt was made to measure both the length of typical stay as well as actual stay.

Length of stay could also be related to pro-environment behavioural intentions, however no studies could be identified which explored this issue, and therefore this relationship is depicted as speculative in nature in Figure 2.9. Perhaps if length of trip was extraordinarily long, for example a three month hiking trip on the Appalachian Trail or a one month volunteer tourism expedition to a Costa Rican park, then trip length could play a more important role in fostering both place attachment and pro-environment behavioural intentions. Visitation patterns to Point Pelee National Park would indicate that this is not the best park to test this theory at. Instead an exploration of actual versus typical trip length will be examined.

Figure 2.9a

*Length of stay predicts place attachment and behavioural intentions*

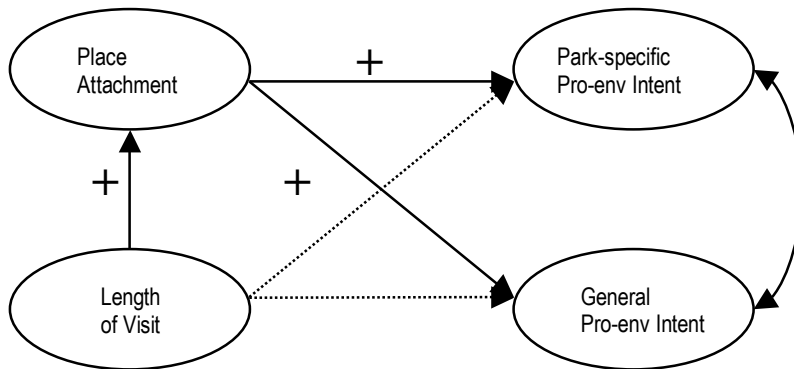


Figure 2.9a suggests that length of visit could predict level of place attachment, as was identified in Williams et al.'s (1992) study. Longer stays would predict higher levels of attachment. Figure 2.9b depicts an equally feasible relationship: high levels of place attachment predict longer stays at or near the park. The latter relationship would be strongly

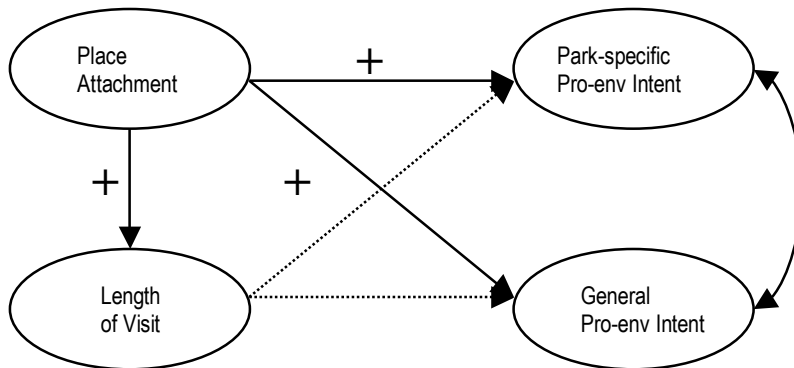


affected by contextual factors such as number of holidays available to an individual or distance the respondent must travel to the park.

Dotted lines represent the potential prediction of place attachment and length of stay on pro-environmental intentions. In this case, longer stays may indicate greater interest in and commitment to the environment, resulting in higher levels of pro-environmental intentions. However, no evidence exists in the literature to support this. Some multi-phasic recreation studies have observed increasing awareness of and care for the natural environments exhibited by recreationists as they progressed through trips to natural areas (e.g., Borrie & Roggenbuck, 2001; Patterson, Watson, Williams, & Roggenbuck, 1998). This lends support for the potential predictive ability of length of trip on place attachment and pro-environmental intentions; however no claims can be made as to the longevity of this ethic of care for nature arising from just one trip. Nor does environmental concern or pro-environmental attitudes necessarily lead to pro-environmental behaviour.

Figure 2.9b

*Place attachment predicts length of visit and behavioural intentions*



### **Length of affiliation**

Several studies report a link between *length of affiliation* and place attachment (Lee & Allen, 2000; Mesch & Manor, 1998; Moore & Graefe, 1994; Riley, 1992; Talbot & Kaplan, 1995). This has been found for neighbourhoods and communities as well as recreation and tourism based settings. Fishwick and Vining (1992) observed that past experience with

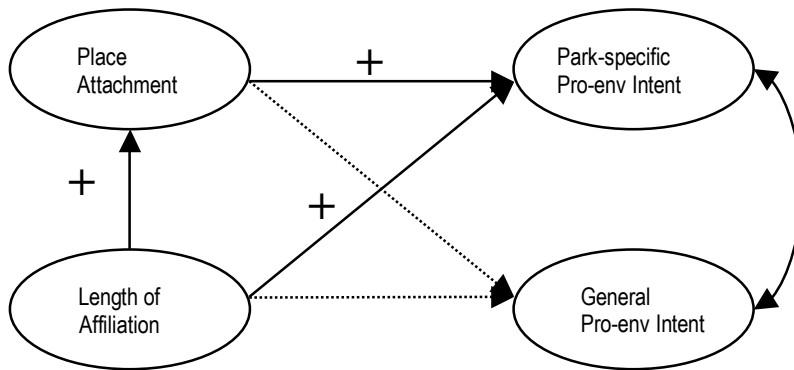
recreational places affected individuals' identification with natural versus developed contexts. The routines, settings, landscapes and rituals experienced through previous place interaction heavily influenced person-place relationships. Previous experience with Point Pelee, and similar nature areas has likely played a major role in the formation of individuals' attachments to the park. In Williams et al.'s (1992) study respondents' length of affiliation (a.k.a. use history) was positively associated with place attachment. Lee and Allen (2000) reported that Myrtle Beach visitors' place attachment was related to past experience with the sun, sand and beach destination. However affiliation failed to play a role in visitors' attachments to two other South Carolina destinations: Charleston and Hilton Head Island. Kaltenborn and Williams (2002) reported similar findings; previous experience did not appear to significantly effect tourists' place attachment. In Moore and Graefe's (1994) study affiliation was positively associated with place identity, but not with place dependence; this demonstrates the link between long term relations with a place and the development of more complex cognitive and emotive associations. Utilizing meta-analytic techniques and the data from 10 place-related studies Backlund and Williams (2004) found that synthesized associations between common measures of past-experience and place identity and place dependence were weak to moderate.

When individuals incorporate or base part of their identity or sense of self on their relationships with a place they may be more willing to act to protect it (Stedman, 2002; Tuan, 1974). Based on these studies it is proposed that while it is possible that a direct relationship between length of affiliation and park-specific pro-environmental intentions may exist, it may be more likely that the affect of affiliation is indirect, mediated by a construct such as place attachment. The emotional and cognitive components of this construct should be especially important in this relationship. With the exception of a few studies (i.e., Backlund and Williams, 2004; Lee & Allen, 2000; Moore & Graefe, 1994), few studies have explored the impact of length of affiliation using a "higher level of measurement statistics" (Backlund & Williams, 2004, p. 320). An examination of the effect of this important variable was a key focus of this study.

No concrete expectations are held for a relationship between general pro-environment behavioural intentions, however like many of the previously described relations, a lengthy relationship with a natural area may inspire an individual to engage in environmentally responsible behaviours in their day-to-day activities. This is the carry-over effect that Vaske and Korbin (2001) highlighted in their study. Because of the tentative nature of this proposition, this relationship is depicted as a dotted line in Figure 2.11.

Figure 2.11

*Proposed relationship between place attachment, behavioural intentions and length of affiliation*



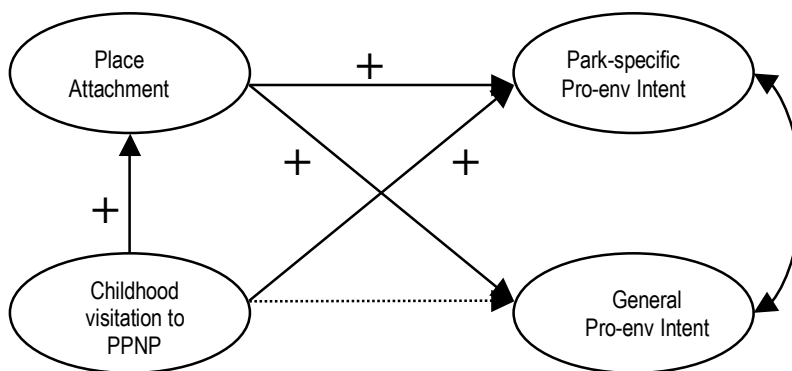
### Visitation during childhood

A small number of studies have attempted to measure the impact of *childhood interaction with a place* on place attachment. A positive association was identified in these studies (Chawla, 1992; Chipeniuk, 1998; Lee & Allen, 1999). Like length of affiliation and frequency of visitation, it is proposed that childhood interaction likely has an indirect relationship with place-specific pro-environmental intentions which is mediated by place attachment. Interviews with environmentalists regarding the main influences in their commitment to the environment revealed that one of the main sources was many hours spent outdoors in a keenly-remembered, wild or semi-wild place during childhood or adolescence (Chawla, 1992; Palmer, 1998). Childhood interaction may also have a direct impact; however this may be less likely as attachments to specific places serve to focus individuals' memories and embed values and beliefs, which in turn forms an environmentally-based sense of self. Extended, involved, place-intensive experiences may served to engrain a

sense of identity (Stokols & Shumaker, 1981) rooted in an environmental ethic (Norton & Hannon, 1997). Both relationships will be tested for as indicated in Figure 2.12 below. Also present in the figure is a proposed relationship between childhood visitation and general pro-environment behavioural intentions. This is based on environmental literature that suggests that childhood visitation to parks and nature areas fosters environmental awareness, and potentially, environmentally responsible behaviour (Chipeniuk, 1995; Harvey, 1989). However this relationship is more likely mediated by the formation of emotional and cognitive bonds with nature-based places, even attachments to specific places, and therefore an indirect effect on general environmental intentions is depicted as being more likely by the solid line.

Figure 2.12

*Proposed relationship between place attachment, behavioural intentions and childhood visitation*



## Satisfaction

*Place satisfaction* can be defined as a multidimensional summary judgement of the perceived quality of a setting (Stedman, 2002). Mesch and Manor (1998) observed in the context of neighbourhoods, “it is possible to be satisfied with where one lives and to not be particularly attached to that place” (p. 509). This may also be true for transient populations such as tourists and recreationists, especially those who have only visited the setting once (Hay, 1998; Lee & Allen, 2000). A reverse relationship between place attachment and place satisfaction may also be true. One can be attached to a place, but not satisfied with that place. This is discussed next.

Satisfaction with a setting has been identified as a potential building block of place attachment. For example, Lee and Allen (2000) found that Myrtle Beach visitors' destination attachment was related to satisfaction with the sun, sand and beach destination. However, satisfaction failed to play a role in visitors' attachments to two other South Carolina destinations: Charleston and Hilton Head Island. In studies related to specialized recreation activities and place attachment specific site based attributes have been identified as important contributors to the development of place attachment (Bricker & Kerstetter, 2001; Kyle, et al., 2004a). This satisfactory level of site attributes facilitates opportunities to perform favourite activities, which in turn creates the opportunities for other positive outcomes such as social interactions, skills testing, the achievement of personal goals, and the acquisition of memories. All of these factors combine to foster the development of place dependence, affect and identity (Kyle et al., 2004d; Moore & Graefe, 1994). In short, satisfaction can be an antecedent for place attachment. However, it has also been suggested that once place attachment is achieved, that attachment to a place will remain even when an individual becomes dissatisfied with changes in the quality of that place. This is especially true for place identity which is intimately bound with one's self of self identity (Proshansky, 1983), This has been documented in the community sociology literature; for example long term residents of a community may be highly bonded with a place, but may be dissatisfied with current changes or developments in their region. This could also be true for recreationists and tourists who have visited a particular destination over a number of years (Hay, 1998; Kaltenborn, 1997; Lee & Allen, 2000; Stedman, 2002).

As was illustrated by Stedman's (2002) study, place satisfaction may play an important role in affecting pro-environment behavioural intentions, especially if an individual is highly attached to a place. This is expected to be true for place-specific pro-environment behavioural intentions. This is supported by community attachment literature that links neighbourhood satisfaction, place attachment and willingness to protect a neighbourhood against negative impacts such as increased crime activity (Shumaker & Taylor, 1984). The study mentioned earlier by Guest and Lee (1983) found that satisfaction with a community,

combined with sentiment toward the community, to affect the probability of individuals moving away from their community and taking political action to defend their community.

One could argue that general pro-environment behavioural intentions may also be significantly related to place satisfaction. In other words, if respondents equated or transferred their evaluations of Point Pelee National Park's environment to the larger global environment, then the variable place satisfaction might demonstrate individuals' overall concern for the global environment and serve as a useful indicator by which the relationship with general pro-environment behavioural intentions can be investigated. However this is unlikely as the scale or congruency of these measures is not really a good, or valid match. As a result, place satisfaction is unlikely to have any relationship with general pro-environmental intentions.

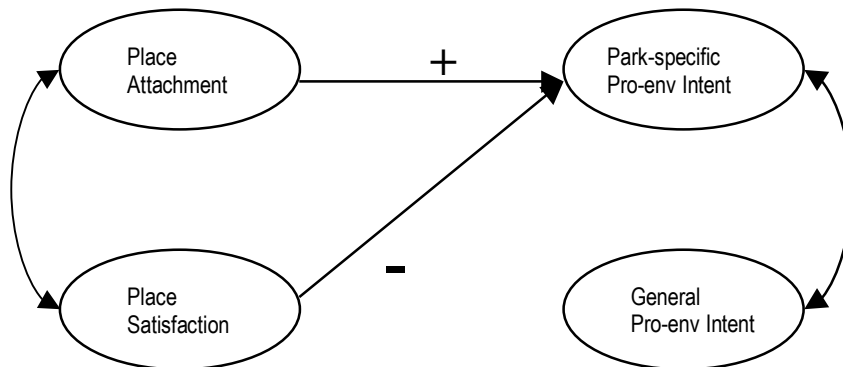
Satisfaction can be based on a number of indicators. Social criteria have been observed as important in both the recreation and community sociology literature (Eisenhauer et al., 2000; Jonas, Stewart, & Larkin, 2003; Kyle et al., 2004a, 2004d; Meech & Manor, 1998; Stedman, 2003a). Opportunities to engage in a favourite activity is also a common contributor to place satisfaction for recreationists (Bricker & Kerstetter, 2001; Kyle et al. 2004a; Manning, 1999). Finally ecological or environmental conditions help shape satisfaction with a setting (Eisenhauer et al., 2000; Kaltenborn, 1998; Kyle, 2004a, 2004b; Stedman, 2002; 2003a). These factors, natural, social, and activity based attributes and opportunities have, as described earlier, been identified as building blocks for place attachment. The relationship between satisfaction with these attributes and place attachment is demonstrated in Williams et al.'s (1992) study. When examining how influential specific social and physical resource conditions were to defining the quality of a wilderness trip Williams et al. (1992) found that place attachment was associated with sensitivity to ecological impacts such as litter and vegetation loss.

Figure 2.13a depicts a proposed relationship between place satisfaction, place attachment and pro-environment behavioural intentions. This is based largely on Stedman's (2002)

finding that dissatisfaction with place conditions combined with high levels of place attachment predicts place specific pro-environmental behaviours.

Figure 2.13a

*Proposed relationship between place attachment, behavioural intentions and place satisfaction*



Unlike Stedman’s study, this study examines the prediction of place attachment by place satisfaction and vice versa. It is the latter relationship that most place attachment researchers have focused on. However, place attachment could affect place satisfaction. For example, an individual’s strong affection for a place could cloud their assessment of a setting’s environmental conditions. In short, their evaluation of a setting may be tinted by “rose-coloured glasses,” leading to a perpetual positive assessment of a place. Alternatively, an individual’s extensive experience with a destination, which has contributed to the formation of intense place attachment, has also provided thorough knowledge of the setting’s previous conditions and expected state. This expected state is linked to an individual’s sense of identity and sense of right and wrong. This can result in a highly critical assessment of the setting’s environment. Both reactions are possible. Analysis may shed some light on how place attachment may affect place satisfaction.

## **Membership**

*Membership* in environmental organizations, and in particular Friends of Point Pelee, may be significantly linked to place attachment and pro-environmental behaviour. Place

researchers have posed questions related to membership including: “Do forms of social organization related to natural resources...increase attachment to place?” and “Are attachments due to social ties, or ecological ties, or both?” (Beckley, 2003). While social ties and organization may indeed foster place attachment (Mesch & Manor, 1998), attachments to place most certainly also foster membership in place-related organizations such as park Friends groups and neighbourhood crime prevention organizations (Shumaker & Taylor, 1983). Additionally membership in general environmental organizations may be a good predictor of individual’s interests in parks, and in particular attachments to places like Point Pelee National Park. Interestingly membership in recreation and environmental organizations was not found to be a significant predictor of environmental concern or place attachment in Vorkinn & Riese’s (2001) study. In contrast Williams et al. (1992) found that wilderness attachment was linked with organizational membership and suggested that formal opportunities to interact with conservation and wilderness enthusiasts could foster wilderness attachment. They also found that membership was not a factor in recreationists’ attachment to non-wilderness nature areas and suggested that this group of respondents may develop their attachments through more informal interactions with friends, neighbours and co-workers.

It should be noted that membership may not be an infallible indicator of strong place attachment or pro-environmental intentions associated with the park or the environment in general. Active membership may be a more useful indicator rather than passive membership (Olli et al., 2001). For example, some members of the park’s Friends group may be members simply to gain discounts on certain products that the Friends group sells, rather than to express a genuine interest in the park itself.



Figure 2.14a

*Membership predicts attachment and behavioural intentions*

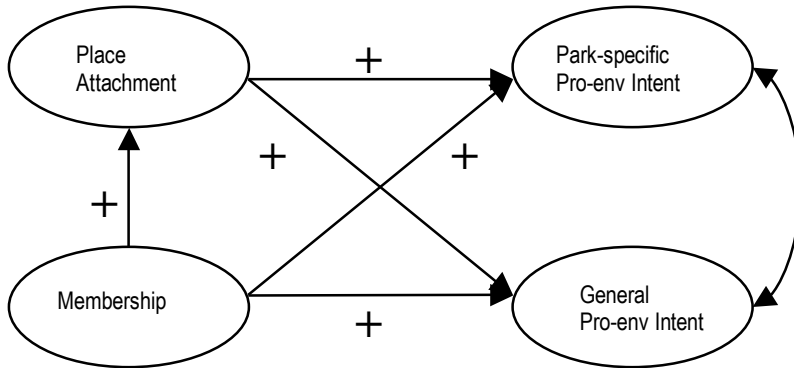
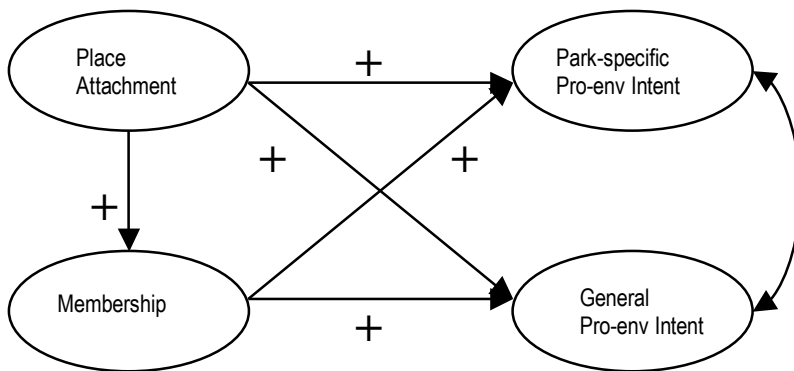


Figure 2.14b

*Place attachment predicts membership and behavioural intentions*



Based on several studies membership is proposed as an important indicator of pro-environmental intentions. For example, in a study of factors affecting individuals' pro-environmental behaviour McFarlane and Boxall (2003) found that membership in an environmental organization provided greater explanatory power than socio-demographic or social-psychological factors. Olli et al. (2001) found further support for a relationship between environmental group membership and pro-environmental behaviours. It is proposed that membership in an environmental organization, especially active membership and membership in Friends of Point Pelee will have a strong positive association with place attachment, place-specific pro-environment behavioural intentions, and even general pro-

environment behavioural intentions. Membership with Friends of Point Pelee is expected to display the strongest positive association with place attachment and place-specific pro-environment behavioural intentions. Figure 2.14a illustrates membership's prediction of place attachment and behavioural intentions. Figure 2.43b depicts an alternative explanation of the interaction between these factors; in these figures place attachment maybe an outcome of membership or antecedent of membership.

### **Distance of residence from park**

*Distance of residence* from the park may also play a role in how attached and committed an individual is to the park. Individuals whose residence is near the park may display higher levels of place attachment and in particular place dependence, as the park can be used as a conveniently located place of recreation. For example, Moore and Graefe (1994) found for rails-trails users that place identity and place dependence were negatively affected by distance of users' residence from the trail. However this affect may also be negated by local resident's awareness of alternative sites for recreation and their ability to substitute Point Pelee National Park for another similar site. This is discussed next. Alternatively because proximity to the park facilitates the involvement in park-related pro-environmental activities such as volunteering in the parks' Friends' group or participating in planning meetings, respondents who live close to the park may demonstrate higher levels of park specific pro-environmental behaviours. While this may be related to place-specific pro-environment behavioural intentions it is expected to play little or no role in affecting pro-environmental intentions to the environment in general. Figure 2.15a depicts expected relationships between these constructs. The directionality of the relationship may also be reversed between place attachment and distance traveled to the park. In Figure 2.15b place attachment becomes a predictor of distance individuals will travel to the park.

Figure 2.15a

*Distance of residence from park predicts place attachment, behavioural intentions*

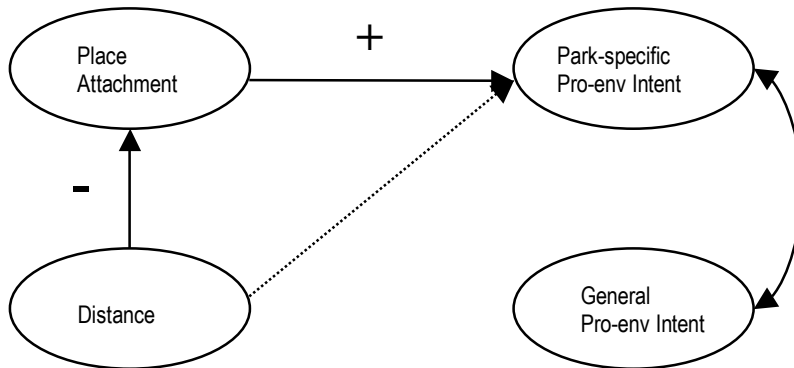
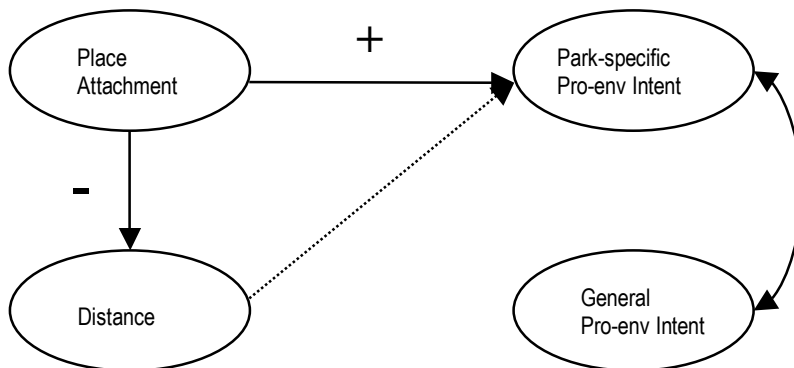


Figure 2.15b

*Place attachment predicts distance and behavioural intentions*



### **Substitution of Point Pelee National Park**

Substitutability is “the interchangeability of recreational experiences such that acceptably equivalent outcomes can be achieved by varying one or more of the following: the timing of the experience, the means of gaining access, the setting, and the activity” (Brunson and Shelby, 1993, p. 69). In this study an examination of setting substitution is the focus.

Brunson and Shelby (1993) suggest that the relationship between place attachment and resource substitution needs further examination. One can theorize that if an individual is attached to the park, s/he will be less likely to substitute the park as a place to visit with

another destination. Several studies have found support for this (Kaltenborn, 1998; Williams et al., 1992; Korpela, Hartig, Kaiser, & Fuhrer, 2001).

For substitution to take place a potential visitor must be *aware* of the existence of an alternative site that offers similar features and opportunities; *able* to travel to the alternative site, they possess adequate resources (e.g., time and money to get there); and be *willing* to travel to the alternative site. Several studies have examined how recreationists assess alternative sites in comparison with their regular or favoured place of recreation when making choices about future recreation trips (e.g., Manfredi & Anderson, 1982 cited in Hammitt et al., 2004; Shelby & Vaske, 1991). Decisions not to substitute were often based on constraints such as a lack of time or money to visit the alternative site, or the inability to locate to a site with a similar attributes of equal or better quality. This latter finding was reinforced in Williams et al.'s (1992) study which suggested that wilderness users found it difficult to find other natural areas that were equivalent to their current place of recreation. In other words the unique attributes of a wilderness site appeared to inhibit wilderness users' ability to identify alternative sites. The unique attributes that characterize Point Pelee National Park may also contribute to some survey respondents' reluctance to substitute Point Pelee for other sites. Upon review of these studies Hammitt, Backlund and Bixler (2004) suggest two other reasons which result in recreationists' choice to not engage in substitution: habitual use patterns and affective bonds. The latter explanation is explored in this study through place affect and the larger construct place attachment; cognitive assessments about site qualities described earlier can be considered to be part of place identity.

If an individual perceives a favourite destination's environment has become degraded, too restrictive due to overregulation, or too expensive, s/he could choose another destination, or, engage in place-protective behaviours such as getting involved with management committees or clean up campaigns. Decisions not to return to a destination, such as Point Pelee National Park, may be especially prevalent amongst locals who have a greater knowledge of local alternative sites. Park user fee studies have identified this pattern of behaviour; when higher fees were proposed or implemented in protected areas park users, especially nearby residents, chose alternative destinations (Schroeder & Louviere, 1999;

Williams, Vogt, & Vitterso, 1999). This “flight or fight” choice as characterized by Stedman (2000) can be strongly affected by place attachment. For example, Kaltenborn’s (1998) study of residents of a Norwegian archipelago highlighted the importance of place attachment in mediating the effect of environmental degradation in resident’s choices to visit alternative locations to recreate. Those residents who demonstrated weak levels of what Kaltenborn called “sense of place” were more likely to relocate to another recreation site when the current site was hypothetically exposed to several environmental stressors such as oil spills or inadequate management supervision of natural areas.

To explore this issue, awareness of alternative sites for participation in favourite activities and ability to visit alternative sites (i.e. freedom from constraints) was measured. It is expected that the combination of awareness of substitutes and ability to substitute will have a strong relationship with place attachment.

Based on previous place-based research place attachment will have a direct affect on substitution levels (see Figure 2.16a). However it could also be argued that substitution could be a good predictor of place attachment (Figure 2.16b). Low awareness of substitutes may be a good indicator of high place attachment. Resulting from this place attachment will likely mediate the the affect of substitution on park-specific pro-environmental behaviours. However, there is also a possibility that substitution may have a direct affect on park-specific environmentally responsible behaviours. As this is less likely, this relationship is depicted with a dotted line in Figures 2.15a and 2.15b. No relationship between the substitution variables and general pro-environmental behavioural intentions is anticipated.

Figure 2.16a

*Place attachment predicting behavioural intentions and substitution*

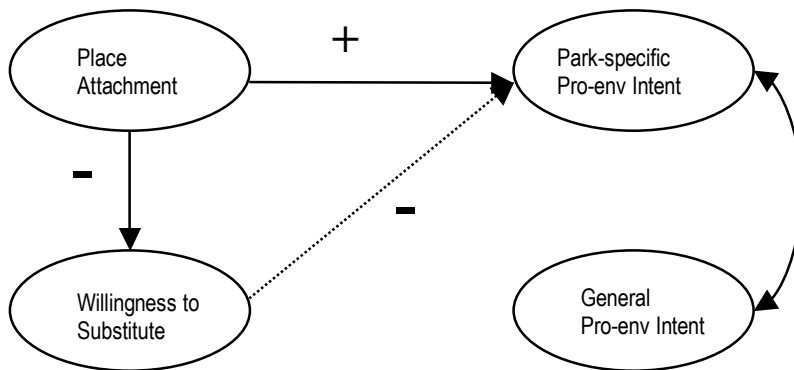
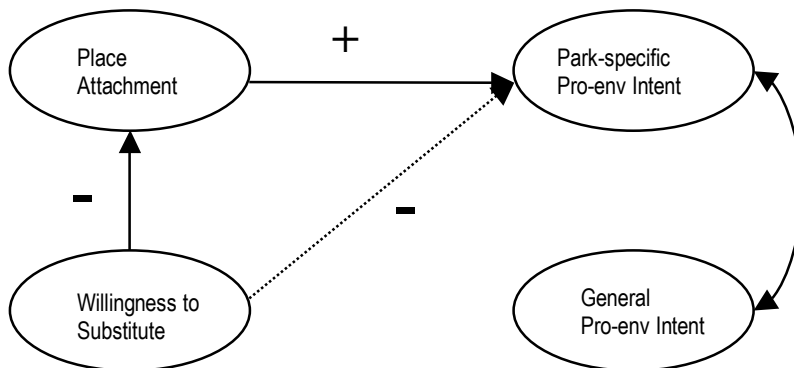


Figure 2.16b

*Substitution predicts behavioural intentions and substitution*



## Motivation

A motive can be defined as phenomenon that “impels people to action and gives direction to that action once it is aroused or activated” (Mannell & Kleiber, 1997, p. 188). Motives are characterized biologically or physiologically based *drives*, and socially or physiologically learned *needs* (Mannell & Kleiber, 1997). An individual who is seeking to fulfill a specific need, either consciously or unconsciously may choose to travel to Point Pelee National Park to address that need.

*Motivation* for visiting the park may be related to an individual's place attachment and their pro-environment behavioural intentions. While many motivations for travel, recreation and spending time in a favourite place have been identified (Harrill & Potts, 2002; Kim, Lee, & Klenosky, 2003; Lee, O'Leary, Lee, & Morrison, 2002; Mannell & Kleiber, 1997) most of these can be categorized within the following three overarching categories: 1) to enjoy the social environment, spending time with friends and family; 2) to enjoy the natural environment, observing and interacting with natural landscapes and wildlife; and 3) to partake in a favourite activity (Williams et al., 1992). Some studies suggest that individuals whose primary motivation is centered on participating in a favourite activity (i.e., functional attachment) may be less attached to the specific place than individuals who exhibit high levels of place identity. The exception to this is those individuals who are involved in activities such as water rafting (Bricker & Kerstetter, 2000; Kyle et al., 2004a) that may be dependent on unique site resources. Williams et al. (1992) found that those individuals who focused primarily on the physical setting of a park displayed higher levels of place attachment than those with activity or social orientations. However, this may be associated with the wilderness setting of their study, and should be re-examined in other nature-based contexts. This is another reason for selecting Point Pelee National Park as the study's setting. Point Pelee N.P. is not a wilderness park and offers the investigator the opportunity to study attachment to a highly urbanized, developed park setting.

Warzecha and Lime (2001) observed in a study of recreational users of the Green and Colorado Rivers that individuals with higher levels of place attachment demonstrated greater interest in visiting the rivers to enjoy nature; experience wildlands; escape physical pressures (e.g., experience solitude, be away from other people); achieve goals or practice skills; learn; and engage in introspection. Respondents with lower place attachment scores indicated family togetherness as a more important motivation for visiting the rivers. While this is not the whole list of indicators used by Warzech and Lime, the sample provided here does illustrate a pattern amongst the river users: nature-oriented rather than socially-oriented users appeared to possess higher place attachment in the context of the Green and Colorado Rivers. The exception to this was illustrated in the similar responses to the item "meet similar people" expressed by both high and low place attachment visitors. Overall,

like Williams et al.'s (1992) study the link between nature-motivation and higher levels of place attachment may be due to the "wilderness" settings in which these studies took place.

In contrast to these studies, an increasing number of community attachment and recreation studies have identified the importance of social interactions in the formation of place attachment (Eisenhauer et al., 2000; Hidalgo & Hernandez, 2001; Kaltenborn, 1997; Kyle, & Mowen, 2005; Mesch & Manor, 1998; Stedman, 2003a). Findings from these studies suggest that motives linking park visitation with opportunities to spend time with friends and family may be very important predictors of high levels of place attachment.

Individuals who indicate the main reason for visiting the park is to experience the park's natural environment may be more inclined to engage in pro-environmental behaviour, especially if the park's natural environment is under threat (Kaltenborn, 1998; Vorkinn & Reise, 2001) or perceived to be in decline (Stedman, 2002). Socially-motivated visitors may display varying levels of place-specific pro-environmental intentions. If the socially-motivated visitor has a recurrent relationship with the park or a particular site in the park (e.g., they have a cottage lease hold, or traditionally use the same site each year for birding with a group of friends or a family picnic) then they may demonstrate higher levels of place-specific pro-environmental intentions. Other socially-motivated tourists may be interested in the park only as a recreational setting; they would easily engage in their social activities in another natural area if the park became degraded and probably would not engage in pro-environmental behaviours specific to the park.

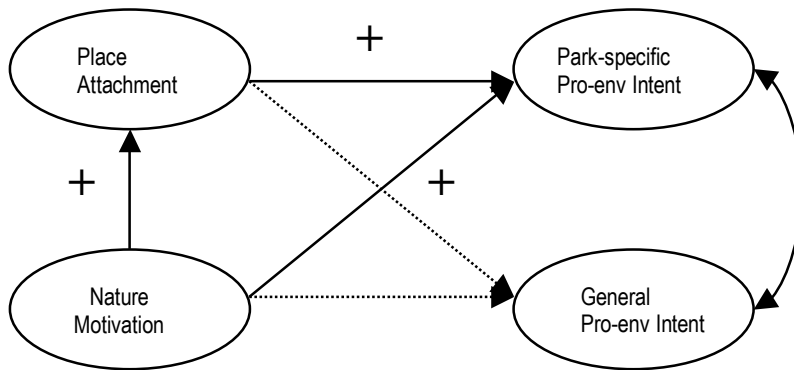
Individuals who state their primary motivation is to engage in an activity may display patterns previously described for social or nature-motivated visitors. Individuals engaged in highly specialized activities such as birding may display pro-environmental intentions and place attachment similar to nature-oriented visitors. Alternatively activity-motivated individuals primarily interested in beach recreation may display behavioural intentions and place attachments that are more similar to the latter hypothesized actions of socially-motivated visitors.



A model of the relationship proposed for nature-motivated visitors is depicted in Figure 2.17. In addition to the direct relationship between nature-motivation and place attachment, nature-motivation may also have a direct relationship with pro-environment behavioural intentions because of these visitor's interest in the environment and nature. An interest in nature may also predict higher levels of general pro-environmental intentions; however a dotted line reflects the highly speculative nature of this supposition.

Figure 2.17

*Proposed relationship between place attachment, behavioural intentions and nature-motivation*



In summary, in exploring the relationship between place attachment and pro-environment behavioural intentions there are many additional external factors which will be taken into account by this study. The challenge is discerning how best to observe and measure all these factors. This will be addressed next in the Methodology section.

## **Chapter 3: Methodology**

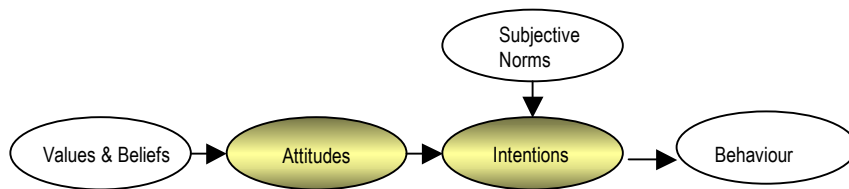
The preceding chapter reports on the possible relationships between place attachment, pro-environment behavioural intentions and several external factors. This chapter outlines a methodology used to explore these relationships. It begins with a brief description of the theoretical and methodological frameworks which guide this study, followed by a reiteration of research questions. The survey instrument that was used in this study is also presented, along with a brief overview of the research process including sampling, distribution of the survey instrument, data storage and data analysis. The chapter concludes with a short discussion of the ethical implications associated with this study.

### ***Theoretical Framework***

This study is rooted in the traditions of social-psychology, the study of individuals' behaviour and experience in social situations (Mannell & Klieber, 1997) and environmental psychology, the study of individuals' reaction to and appreciation of the environments around them and the groups they encounter there (Bonnes & Schiaroli, 1995). The study is guided, in part, by Fishbein and Ajzen's (1975) theory of reasoned action which posits that the best predictor of behaviour is the intention to perform the behaviour (see Figure 3.1). In turn, the intention to perform the behaviour is believed to be caused by the individual's attitude toward performing the behaviour and the individual's subjective norms about the behaviour. Finally, attitudes toward the behaviour are thought to be a function of the individual's beliefs about the behaviour. Each of the stages along this series of actions can be affected by various factors. In the case of exploring an individual's intention to perform environmentally responsible behaviours toward a) a specific place and b) the environment in general, these factors may be partially predicted by: a) an individual's previous experience with a place and b) the place attachment that develops from these experiences.

Figure 3.1

*Theory of Reasoned Action*



Fishbein & Ajzen, 1975

This study measures one facet of Fishbein and Ajzen’s model, the effect of attitudes toward a place (i.e., place attachment) on behavioural intentions (i.e., pro-environment behavioural intentions).

It is suggested that “attitude theory can provide a basis for conceiving...[place attachment]...as potentially encompassing cognitive, affective and conative reactions to a spatially based object” (Jorgensen & Stedman, 2004, p. 244). Conceptualization of place attachment as an attitude provides a second theoretical foundation for this study. Some researchers suggest cognitions, emotions and conations (purposive acts such as use of parks as recreation sites) are distinct factors that interact with one another to produce reactions to an attitude object (Bagozzi, Tybout, Craig, & Sternthal, 1979; Breckler, 1984; Breckler & Wiggins, 1989). In this process attitude is conceptualized as a multidimensional construct, however its domains can be characterized by different expressions of favour or disfavour. For example, a park may elicit high levels of functional favour because it is close to an individual’s residence and convenient to use, but it may also hold little emotional appeal. Behavioural or conative attachment is high while affective or emotional attachment is low. This evaluative conceptualization of attitudes frames the exploration of place attachment in this study.

## ***Methodological Framework***

A post-positivist approach was used to guide research efforts. Crotty (1998) describes a post-positivist approach to research as positivism that jettisons claims of objectivity, precision and certitude. It talks of probability, approximations of truth and degrees of objectivity, and challenges the notion that observer and observed are independent. It recognizes that validity and objectivity are not predetermined outcomes and that research findings may not be generalizable to other settings or populations. The usefulness of a post-positivistic theoretical perspective and the methodological approaches of survey research that are often employed to execute it have been highlighted by many place researchers (Stedman, 2003b; Beckley, 2003). However, this study also acknowledges some of the weaknesses of post-positivistic research including the potential shortcomings of tools such as self-administered questionnaires used to measure abstract, latent constructs like attitudes. Nevertheless, the researcher believes this methodological approach is appropriate for examining the relationships between place attachment and pro-environmental behaviours. The test of theories related to this relationship is enabled through quantitative surveys of a large sample of park visitors.

## ***Research Questions***

As described in the introductory chapter, the overarching purpose of this study is: To explore the relationship between place attachment and pro-environment behavioural intentions and to examine how this relationship is affected by selected external factors. More specifically, study objectives include:

- A. Measurement of the intensity of place attachment, and its sub-dimensions of place identity, place affect and place dependence;
- B. Measurement of the intensity pro-environment behavioural intentions, towards Point Pelee National Park, and the environment in general;

- C. Exploration of the relationship between place attachment and pro-environment behavioural intentions toward a) Point Pelee National Park and b) the environment in general; and,
- D. Exploration of the relationship between place attachment, pro-environment behavioural intentions and the following external variables:
  - a) Characteristics of visitation to Point Pelee Nation Park
    - frequency of visits;
    - duration of visit;
    - length of affiliation;
    - visitation to the Park during childhood;
  - b) satisfaction with the Park;
  - c) membership in an environmental organization, especially one related to the Park;
  - d) distance of residence from the Park;
  - e) substitution of Point Pelee National Park with another destination;
  - f) motivation for visiting the Park; and,
  - g) gender, age, education and household income.

Based on this general purpose and specific objectives, the following research questions are listed below.

1. What intensity of place attachment is expressed by study participants?
2. What pro-environment behavioural intentions do study participants express a) toward the park and b) toward the environment in general?
3. What is the relationship between place attachment and pro-environmental behaviour intentions a) toward the park and b) toward the environment in general?
4. What is the relationship of *frequency of visitation to the park* with place attachment and pro-environment behavioural intentions?
5. What is the relationship between *duration of visit* to the park and place attachment and pro-environment behavioural intentions?
  - a) average length of visit during past 12 months
  - b) actual length of most recent visit

6. What is the relationship of *length of park affiliation* with place attachment and pro-environment behavioural intentions?
7. What is the relationship of *childhood interaction with the park* with place attachment and pro-environment behavioural intentions?
8. What is the relationship between *place satisfaction* and place attachment and pro-environmental intentions?
9. What is the relationship between *membership* (in Friends of Point Pelee and/or an environmental membership organization), place attachment and pro-environmental intentions? Comparisons were based on:
  - a) membership commitment (financial and time contribution)
  - b) membership and non membership
10. What is the relationship of *distance of residence from park* with place attachment and pro-environment behaviour intentions?
11. What is the relationship of a) *awareness of alternative destinations* and b) *ability to substitute* (another park/nature area for Point Pelee N.P.) with place attachment and pro-environment behavioural intentions?
12. What is the relationship between the primary *motivation* for visiting the park (i.e. socializing, enjoying the natural environment, participation in favourite activity) and place attachment and pro-environment behaviour intentions?
13. What is the relationship between participant *socio-demographic characteristics* (i.e., age, gender, income, and education), place attachment and pro-environment behavioural intentions?

### ***Instrumentation and Operationalization***

Consistent with previous place attachment and environmental attitude-behaviour research, data for this study was obtained through self-administered questionnaires. Collection of data through quantitative survey research from a small group of individuals is an effective means of identifying attributes of a population too large to observe directly (Babbie, 1995). Babbie also suggests that surveys are excellent vehicles for measuring attitudes in a large population and supports the use of questionnaire-based surveys for the testing of theory, two main objectives of this study.

After determining that self-administered questionnaires would be a suitable method of data collection, a survey instrument (see Appendix A-3) was guided by approaches used in previous studies, and tailored to the Point Pelee National Park setting. The development of this survey instrument is detailed next. The questionnaire used in this study was prefaced by a letter of introduction (see Appendix A-1) that explained the project and assured study participants of anonymity and confidentiality. The questionnaire was developed by combining and modifying existing survey questions and scales related to each of the factors being studied.

### **Measuring place attachment**

The scale used to measure place attachment in this study is based on Williams and Roggenbuck's (1989) initial attempts to measure place attachment. Their scale was developed in part from Proshansky's (1978) conceptualization of place identity as a cognitive connection between self and a physical environment, and Stokols and Shumaker's (1981) focus on the functional value (place dependence) of a setting for individuals. Williams and Roggenbuck's scale was also influenced by Schreyer, Jacob and White's (1981) emphasis of the importance of place dependence and place identity; however, the latter concept was often described as an emotional-symbolic attachment thereby introducing the idea that both emotive and cognitive elements could be measured together.

As outlined previously, the study explores the power of conceptualizing place attachment as an attitude, composed of three distinct sub-dimensions: place identity, place affect, and place dependence (i.e., cognition, emotion and feelings, and behaviour) (Jorgensen & Stedman, 2001). To this end, the scale utilized in this study has three sets of items (see Question 3 in Appendix A-3), each containing between four to six items designed to measure one sub-dimension of place attachment. A preliminary test of the place attachment scale was administered to undergraduate students at the University of Waterloo. Results from this preliminary survey test are described in Chapter 4.

The preliminary test survey contained many more place attachment items than were present in the final survey instrument. Some were subsequently culled to create the final place attachment scale. Both scales were administered as Likert-type scales which provided survey participants a choice from one to five, “1” representing strongly disagree and “5” representing strongly agree. The majority of scale items were used in previous place attachment studies and have demonstrated good internal consistency or reliability and construct validity in measuring place attachment and its sub dimensions place identity and place dependence (Williams & Vaske, 2003). For example, in a recent comparative study of the dimensionality of place attachment, seven different applications of the same Roggenbuck and Williams’ inspired place attachment scale produced Cronbach’s alphas ranging from 0.81 to 0.94 (Williams & Vaske, 2003). According to DeVillis (2003), this range of reliability coefficients is very good.

While place attachment, place identity and place dependence measures demonstrate reliability and construct validity, separate measures of place affect are lacking. As mentioned earlier place attachment research generally combines emotive and cognitive measures together. A secondary objective of this study is to explore the dimensionality of place attachment, and in particular the utility of measuring emotions and cognitions separately. To this end, place attachment scale items found in both the preliminary and final survey instruments are designed to measure place affect, or the emotional bond with a place, separate from cognitive reactions to a place. Face validity, the degree to which a measurement tool, on the surface, appears to measure what it is intended to measure, was used to select those items from previous place attachment scales that best reflect emotional attitudes or reactions to a place. Jorgensen and Stedman (2001) used a similar approach to separate emotive from cognitive items in their study of full-time and seasonal residents of a Wisconsin lake district.

Affect descriptors such as happy and relaxed were taken from previous place attachment study scales (Jorgensen & Stedman, 2001; Virden & Walker, 1999; Walker & Chapman, 2003) or other social-psychological research (Morden, 2003; Watson, Clark, & Tellegen, 1988; Diener & Emmons, 1984; and Omodei & Wearing, 1990). Place affect item selection



was also influenced by Dick and Basu's (1994) division of affect into four categories: emotion, mood, primary effect and satisfaction. All four types of affect could be antecedents to place loyalty a characteristic of park visitors that demonstrates parallels with place attachment (Raymond, 2000).

However, on a cautionary note, Jorgensen and Stedman (2001) found that the explanatory power of place affect as a sub-dimension was relatively weak in the face of the greater explanatory power of place identity and place dependence, or the larger combined construct of place attachment. They speculate that this may have also been due to the measurement instrument used to quantify place affect. Place affect items in Jorgensen and Stedman's study, unlike the place identity and place dependence items, were all positively worded in an effort to reflect some theoretical discussions which emphasize a positive bond between individuals and their environment (e.g., Low & Altman, 1992; Williams et al., 1992). To explore this issue the preliminary survey test included a place attachment scale with neutral, positive and negatively worded measures of place affect to explore the possibility of this impact (e.g., "I feel no emotional bond with Park "X"; Park "X" is very special to me;" "I am unhappy when I am at Park "X." Table 3.1 provides a complete list of place attachment items used in the preliminary survey test.

The place attachment scale's construction was guided by additional considerations. For example, positively phrased items dominate the place attachment scale because it is theorized that positive attachments to a place may increase the frequency of pro-environment behavioural intentions expressed towards that place by study participants.

Positively phrased items also dominate the place attachment scale because of study's setting. In the preliminary test of the questionnaire's place attachment items, the use of neutral, negative and positive items was inspired by an increased awareness reported in place literature of the negative aspects of being "stuck" or bonded to a particular place; further study of both the negative and positive aspects of place attachment has been called for (Beckley, 2003; Manzo, 2003; Shumaker & Taylor, 1983; Stedman, 2003b). However, as

the study advanced, and based in part on research which highlights the positive attitudes people hold for national parks (Schreyer et al., 1981) and places of recreation and tourism

Table 3.1

*Place Attachment Items Used in the Preliminary Survey Test*

---

**Place Identity**

- a. I have a special connection to Park “X”<sup>a</sup> and the people who visit it
- b. Most of my friends are in some way connected with my use of Park “X”
- c. Visiting Park “X” says a lot about who I am
- d. You can tell a lot about a person by seeing them at Park “X”
- e. When I visit Park “X”, others see me the way I want them to see me
- f. I identify strongly with Park “X”
- g. I feel Park “X” is part of me
- h. I feel I can really be myself when I am in Park “X”
- i. Park “X” means a great deal to me
- j. Park “X” is very special to me
- k. I identify with the people and image associated with Park “X”

**Place Affect**

- l. I feel NO emotional bond with Park “X”
- m. I have NO particular feelings for Park “X”
- n. I get more satisfaction out of visiting Park “X” than any other park [satisfaction]<sup>b</sup>
- o. I feel strong, positive feelings for Park “X” [emotion]
- p. I really miss Park “X” when I am away too long [satisfaction/emotion]
- q. I feel relaxed when I am at Park “X” [mood]
- r. I am fond of Park “X” [emotion]
- s. I am attached to Park “X” [emotion]
- t. I feel UNHAPPY when I am at Park “X” [emotion/mood] (r)<sup>c</sup>
- u. Park “X” is my LEAST favourite place to be [satisfaction] (r)
- v. I have NEGATIVE feelings for Park “X” [emotion/satisfaction] (r)

**Place Dependence**

- w. The things I do at Park “X” I would enjoy doing just as much at a similar site (r)
  - x. I wouldn’t substitute any other area for doing the types of things I do at Park “X”
  - y. Point Pelee is the best place for what I like to do
- 

Note 1<sup>a</sup> Park “X” was a phrase used during the preliminary test of the survey instrument represent the name of a) the respondent’s favourite park and b) the park the respondent had most recently visited. In the preliminary test of the survey instrument the participants were asked to indicate their level of agreement with the place attachment scale items for the two categories of parks.

Note 2<sup>b</sup> Mood, emotion and satisfaction, measured by these place affect items, are different facets of affect suggested by Dick and Basu (1994); a remaining characteristic, primary affect, was not included in this scale.

Note 1<sup>c</sup> (r) Indicates these items were reverse coded prior to statistical analysis.

(Eisenhauer et al., 2000; Lee & Allen, 1999; Manning, 1999), it was anticipated that few of the survey participants would express little if any agreement with neutral and negative items. It was decided that a national park setting was an inappropriate setting in which to explore the utility of negatively or neutrally phrased items. This resulted in their removal from the place attachment scale following the completion of the preliminary test of the survey. See Table 3.2 for a list of place attachment items used in the final survey instrument. The development of this final list was based on the results of the preliminary survey test and a peer review process, described later in this chapter and in the Results Chapter.

Table 3.2

*Place Attachment Items Used in the Final Survey Instrument*

---

**Place Identity**

- a. Visiting Point Pelee N.P. says a lot about who I am
- b. When I visit Point Pelee N.P., others see me the way I want them to see me
- c. I identify strongly with Point Pelee N.P.
- d. I feel Point Pelee N.P. is part of me
- e. I feel I can really be myself when I am in Point Pelee N.P.
- f. Point Pelee N.P. means a great deal to me

**Place Affect**

- g. I feel strong, positive feelings for Point Pelee N.P.
- h. I really miss Point Pelee N.P. when I am away too long
- i. I feel relaxed when I am at Point Pelee N.P.
- j. I am fond of Point Pelee N.P.
- k. I feel happiest when I am at Point Pelee N.P.
- l. Point Pelee N.P. is my favourite place to be

**Place Dependence**

- m. I get more satisfaction out of visiting Point Pelee N.P. than any other park
  - n. The things I do at Point Pelee N.P. I would enjoy doing just as much at a similar site (r)<sup>a</sup>
  - o. I wouldn't substitute any other area for doing the types of things I do at Point Pelee N.P.
  - p. Point Pelee is the best place for what I like to do
- 

<sup>a</sup> (r) only one item was negatively phrase and require reversed coding during data input.

**Measuring pro-environmental intentions**

The second major objective of this study is to measure pro-environment behavioural intentions expressed by study participants. This section describes the factors considered when constructing a scale to achieve this objective. These include: a) incorporating approaches used in previous research, b) measuring a diversity of behaviours; c) ensuring

that specificity or congruence of attitudes and behaviours measures was achieved; d) selecting measures that were relevant the study context, and e) ensuring measures were applicable to the study population.

Researchers traditionally use two different approaches to measuring pro-environmental behaviours. These are a) on-site observation of individuals' actions, and b) self-reporting of behaviours by individuals in surveys. The former approach is time consuming, expensive and very challenging to accomplish in the field. The latter also has limitations. These include measurement instruments that fail to capture what they are designed to measure and social desirability bias which arises when respondents answer questions in a fashion that they believe is socially accepted rather than providing a more truthful description of their actual behaviours (DeVillis, 2003; Tarrant & Cordell, 1997).

There is no standardized scale for measuring pro-environment behaviour or behavioural intentions. The behavioural intentions scale used in this study is modeled after pre-existing environmental attitude-behaviour scales, but was modified to fit the current study objectives, setting and population. General pro-environment behavioural intention items were drawn from several environment attitude-behaviour studies (i.e., McKenzie-Mohr, Nemiroff, Beers, & Desmarais, 1995; Schultz & Zelezny, 1998; Smith-Sebato & D'Costa, 1995; Stern, Dietz, Abel, Guagnano, & Kalof, 1999; Van Liere & Dunlap, 1981; Vaske & Donnelly, 1999; Vaske & Korbin, 2001). Three dominant themes guided the selection of environmental behaviour measures: universality, diversity and specificity. These are described next.

Within this current study an effort was made to address the *universality* of environmental behaviour measures. For example, with the understanding that many people do not have the financial resources to purchase an automobile, instead of asking if an individual would purchase a fuel efficient automobile, they were asked if they would "Pay extra for transportation if it is environmentally-friendly (e.g., a fuel efficient car)."

In previous environmental behaviour studies, item selection has also been guided by themes. This was driven by a desire to reflect the *diversity* of environmental behaviours that exist. For example, environmental behaviours can be characterized by different levels of altruism or self-interested outcomes (Karp, 1996). To illustrate, an individual may walk to work to save money or get exercise rather than for reasons relating to the benefit of the collective good such as reducing fossil fuel-related emissions. Behaviours can also be characterized by frequency within the general population. For example, an environmental behaviour such as participating in a blue box recycling program may be classified as being normative because a majority of citizens do it. In contrast, participating in environmental protests may be considered more atypical because fewer individuals participate in this activity (Karp, 1996). This may be the result of contextual factors that affect pro-environmental behaviours such as institutionalization of programs (e.g., curb side pickup of recyclables) or constraints such as lack of time or monetary resources to participate in protest activities or purchase more expensive environmentally-responsible products. The latter activities cost the individual more resources and are therefore undertaken less frequently (Olli et al., 2001).

In summary, many factors drive pro-environmental behaviours. They are varied and cannot all be identified and accounted for in a single study. One must simply acknowledge that behavioural diversity exists, and that a range of behaviours may need to be included in a study in order to measure the pro-environmental behaviour of an individual.

To address this researchers use themes to identify and organize a range of environmental behaviours. For example, Vaske and Korbin (2001) used items which measured general environmental behaviours (e.g., “Talked to others about environmental issues) and items which measure specific environmental actions (e.g., “Joined in community clean up”). As reported earlier, their specific and general environmental behaviours failed to load as separate factors. Instead, a single-dimensional construct emerged with a Cronbach’s alpha of 0.89. In a second example Allen and Ferrand (1999) proposed five categories: a) recycling behaviours; b) purchasing behaviour; c) conservation behaviour; d) influencing others; and, e) educating self. They report the internal reliability of their combined scale as 0.92 and each specific category or dimension as also highly reliable (all alphas were greater

than 0.80). Olli et al. (2001), utilizing exploratory factorial analysis identified five pro-environmental behaviour sub-dimensions, but with low co-efficient alphas. These were: a) responsible consumerism ( $\alpha = 0.64$ ); b) resource conservation ( $\alpha = 0.54$ ); c) use of nature ( $\alpha = 0.55$ ); d) antitoxic [purchases] ( $\alpha = 0.39$ ); and, e) waste handling ( $\alpha = 0.49$ ).

In a fourth example of pro-environment behaviour categories Stern et al. (1999) measured activism with one item (i.e., participation in a demonstration in the last 12 months) and then utilized three categories of “non-activist” behaviour to organize the remaining scale items. These categories were: a) consumer behaviour (e.g., “How often do you make a special effort to buy fruits and vegetables grown without pesticides or chemicals...”), b) willingness to sacrifice (e.g., “I would be willing to accept cuts in my standard of living to protect the environment” and, c) environmental citizenship (e.g., “[Have you] written a letter or called your member of Congress or another government official to support strong environmental protection”). Stern et al. performed confirmatory factor analysis and found that the three categories of non-activist behaviour could be considered as three separate dimensions ( $\alpha = 0.72$ ;  $\alpha = 0.78$ ;  $\alpha = 0.77$ ) despite moderate inter-correlations (i.e.,  $r = 0.33$  and  $0.39$ ). The activist measure (participation in demonstrations) also appears to be a distinct factor (correlations with the other three categories ranged from  $r = 0.06$  to  $0.26$ ). What is somewhat disappointing about this study is the authors’ failure to report on the theoretical basis for choosing these distinct categories of “non-activist” environmentalist categories.

These different approaches to categorizing environmental behaviours and potential survey scale items are described here for two reasons. The first is to provide the reader with a broad understanding of the generous scope of environmental behaviours that researchers have attempted to measure. Second, it also helps to introduce some of the considerations that need to be made in creating the scale that was used to measure pro-environment behavioural intentions in this study.

Table 3.3 outlines items proposed for measuring pro-environment behavioural intentions. Each item was classified using behavioural categories which differentiate items based on context, level of specificity and level of difficulty. The researcher’s own judgement was

used to perform this segmentation. The first category was inspired, in part, by Walker and Chapman's (2003) place specific pro-environment behavioural intentions scale. Another dimension was added to their scale by incorporating measures of pro-environment behavioural intentions regarding the environment in general. This enabled an examination of the effect of place attachment on place specific versus general environmental behaviour, an understudied topic of research (Vaske & Korbin, 2001). The second category, which draws on Vaske and Korbin's (2001) study, differentiates behaviours according to degree of specificity (i.e., a specific action vs. a general/abstract behaviour). The third category is based on observations by Walker and Chapman (2003) and other environmental behaviour research (e.g., Stern, 1992) which has noted that individuals more readily engage in behaviours that they perceive to be easy. The categorizations of behavioural intentions into "specific versus general" and "difficult versus easy" guided the selection of pro-environmental intentions items, however the main comparison of categories that was examined for this dissertation thesis were park-specific versus general environmental intentions. Future analysis may involve a comparison of other categories of pro-environmental intentions such as difficult versus easy and specific versus general.

Many environmental behaviour studies have attempted to address the challenge of identifying the best measures of behaviour by addressing the concern of *specificity* or item congruency. Olli et al. (2001) provide a concise summary of this issue. They state "the observed relationship between attitudes and behaviours becomes statistically and empirically stronger when it is correctly measured at the same level of specificity" (p. 182). To illustrate, an attitude towards a specific object (i.e., a park: e.g., "'X' Park is my favourite place to be") should be thematically scaled to the same object that the behavioural intention is focused on (e.g., "I will write letters and sign petitions in support of 'X' Park"). Stern (1992) reports that correspondence between environmental attitudes and behaviours increase with specificity. Several studies have produced similar findings (Dunlap & Van Liere, 1978; Kaiser et al., 1999; Kraus, 1995; Vining & Ebero, 1992; Weigel & Weigel, 1978; Whittaker, Vaske, & Manfreda, 2004; Zinn, Manfreda, Vaske, & Wittman, 1998). In contrast, Hines et al.'s (1987) meta analysis of environment attitude-behaviour studies

reported only a slight difference between the strength of the correlations using specific attitude-behaviour measures versus general attitude-behaviour measures.

In this study pro-environment behavioural intentions were further categorized by type. Eight categories were proposed (see Table 3.3). The items that appear in each category of pro-environment behavioural intentions were adopted from previous environment attitude-behaviour research. This typology of pro-environment activities ensured a broad spectrum of behaviours was measured.

Table 3.3 depicts the items used in a preliminary test of the pro-environmental intentions scale. Slight modifications to the scale were performed after the preliminary test and are expanded on below and in the Results Chapter.

In selecting specific items it is important to compare the results of this study with previous studies, especially those that include place attachment as a focus of research. For example, six of the seven items used by Vaske and Korbin (2001) in their study of place attachment's impact on general environmental behaviour, were adapted for use in this current study of Point Pelee National Park visitors' attitudes and behaviours. A seventh item "Talked with parents about the environment" was dropped as the current study surveys adults rather than youth. Scale items were also adapted from Walker and Chapman (2003). Their study of park visitors includes behavioural intentions items such as: "Volunteer to stop visiting a favourite spot in the park if it needed to recover from environmental damage" and "Tell my friends not to feed the animals in the park." Walker and Chapman did not report on the overall reliability of their scale, but on sub-scales based on different intention categories ranging from volunteering intentions to other-focused non-depreciative intentions. Confirmatory factor analysis of these sub scales produced coefficient alpha measures ranging from 0.59 to 0.90. The sub-scale that produced the lowest internal reliability ( $\alpha = 0.59$ ) was not used because of its anti-poaching focus, an issue that is not relevant for Point Pelee National Park.



Table 3.3

*Categorization of Pro-Environmental Behavioural Intentions: Items used in the Preliminary Survey Test<sup>a</sup>*

<b>Categories of pro-environmental behaviours</b>	<b>Place vs. General</b>	<b>General vs. Specific</b>	<b>Difficult vs. Easy</b>
Place vs. general context: P = place; G = general			
General vs. specific actions: G = general; S = Specific			
Difficult vs. easy actions: D = difficult; E = easy			
<b>Purchasing Behaviours / Green Consumerism</b>			
Avoid buying products from companies with poor environmental records	G	G	D
Buy fruits and vegetables grown without pesticides or chemicals (i.e., organic food)	G	G	E
<b>Conservation Behaviours</b>			
Volunteer to reduce my use of a favourite spot in the park if it needs to recover from environmental damage	P	S	E
Volunteer to stop visiting a favourite spot in the park if it needs to recover from environmental damage	P	S	E
Reduce energy and water consumption	G	G	E
<b>Environmental Citizenship</b>			
Join in community clean up efforts	G	S	D
Volunteer my time to projects that help Park "X" <sup>b</sup> or similar parks and nature areas	P	S	D
Sort garbage into recyclable material and non-recyclables (when visiting the park)	G	G	E
Pick up litter at "X" park left by other people	P	G	E
<b>Activism/Advocacy</b>			
Sign petitions in support of Park "X" and similar protected areas	P	G	D
Write letters of support of Park "X" and similar protected areas	P	G	D
Participate in organized, peaceful environmental protests	G	G	D
<b>Influencing Others / Persuasive Action</b>			
Tell my friends not to feed the animals in Park "X" and similar parks	P	G	E
Encourage others to reduce their waste and pick up their litter when they are in "X" Park	P	G	E
Talk to others about environmental issues	G	S	E
<b>Educational Behaviours</b>			
Learn more about "X" Park's natural environment	P	G	E
Learn more about the state of the environment and how to help solve environmental problems	G	S	E
<b>Financial Behaviours</b>			
Pay increased park fees if they were introduced and used for park programs	P	G	D
Contribute donations to ensure protection of parks like Park "X"	P	G	E
Contribute money to environmental organizations	G	S	E
Pay extra taxes to ensure parks like Park "X" are protected <sup>c</sup>	G	G	D
Invest in companies that utilize green technologies	G	G	E
Pay extra for transportation if it is environmentally-friendly (e.g., a fuel efficient car)	G	G	E
<b>Political Behaviours / Civic Action</b>			
Vote for politicians who support Park "X" and parks like it <sup>d</sup>	P	G	E
Participate in a public meeting about managing Park "X" and parks like it	P	G	D
Talk to policy makers about environmental issues	G	S	D

<sup>a</sup> When presented to undergraduate students during the preliminary test, items in this scale were randomly placed within one scale rather than displayed in categories based on activity type or specificity.

<sup>b</sup> Park "X" was a phrase used during the preliminary test of the survey instrument to represent the name of the respondent's favourite park and most recently visited park.

<sup>c</sup> Item removed in final survey instrument

Two other studies that examine the relationship between place attachment and pro-environmental behaviour are Kaltenborn (1998) and Stedman (2002). However these authors use slightly different approaches for measuring pro-environmental behaviour. Both provide scenarios that describe declines in environmental health of the study participants' region of recreation or residence and ask respondents how likely it would be that they would take action (e.g., "Would vote for laws against... if water quality got a lot worse"). While these measures differ in format from the Likert-type scale proposed in this study, the intent and substantive content remains similar enough that comparisons can be made.

In summation, reliable and valid measures of pro-environment behavioural intentions were developed by paying attention to the study's context and population, as well as the specificity, generalizability and diversity of environmental behaviours included in the survey instrument. The success of these measures is discussed in Chapters 4 and 5.

### **Measuring external variables**

Measurement of external variables was performed using single and multiple questions. These external variables include: place satisfaction; park visitation patterns (length of affiliation, childhood visitation, duration of visit and frequency of visits); membership in an environmental organization; distance of residence from park; awareness of alternative sites to visit and willingness to substitute; motivation for visiting the park; and, socio-demographic characteristics.

*Place satisfaction* was measured with a scale drawn from several place attachment-related studies (i.e., Mesch & Manor, 1998; Stedman, 2002; Williams et al., 1992). As one of the objectives of this study is to examine the relationship between place attachment, place satisfaction and pro-environment behavioural intentions, items were developed that measure general satisfaction with the visitor experience: "On your most recent visit to Point Pelee N.P. how satisfied were you with: Your overall visitor experience at Point Pelee N.P.?" (see Question 1 in Appendix A-1). The question is based, in part, on approaches within recreation and tourism research designed to measure satisfaction (Hendricks, Schneider, &

Budruk, 2004; Manning, 1999; Tribe & Snaith, 1998; Wade & Eagles, 2003). This single item measures the holistic sense of satisfaction visitors had with their most recent visit to Point Pelee National Park. It is recognized that the usefulness of this measure may be contingent upon how recently individuals visited the park and their ability to recall their satisfaction with their visit. As the sample of park visitors includes visitors who have visited within the last four years, with most trips occurring in the last two years, recall is not anticipated to be a source of error.

In addition three other questions further explore the park visitor's experience (see Questions 1b), 1c), and 1d)). This is due, in part, to the emphasis of this study on park visitors and the impact that park visitation may have on pro-environmental behaviour. In an effort to develop a concise but theoretically relevant questionnaire, place satisfaction was measured using visitors' "mode of experience" (Williams, 1988; Williams et al., 1992) and motivation for visiting the park (Stedman, 2002). Three modes of experience items were designed to measure different aspects of satisfaction; these included: "the quality of the natural environment," "the quality of the social environment," and "opportunities to engage in favourite activities." They were modified from scale items used by Williams et al. (1992) and others (i.e., Mesch & Manor, 1998; Stedman, 2002). The limited number of modes of experience facilitates segmentation of park visitors into distinct benefit-based groups, an approach that is supported by recent park tourism satisfaction research (Hendricks et al., 2004). A more detailed series of questions could be utilized to measure different attitudes associated with these three modes of experience. However, to make the survey as concise as possible, the shorter list of questions was utilized.

Park visitation patterns were measured using several different approaches. *Length of affiliation* with the park was measured with Question 16: "What was the year of your first visit?" A more accurate measure of this variable would be "How many years have you been coming to Point Pelee N.P.?"; however, this was rejected because it was felt the former question was easier for respondents to estimate. *Duration of visit* was measured with Questions 13 and 21: "How long was your most recent visit to Point Pelee National Park?" and "How long was your average visit to Point Pelee in the last 12 months?" The former

question provides data for day visits and overnight visits, while the latter question determined the average length of overnight trips only. The second question was included in an attempt to address biases that may arise due to the time of year that the survey was distributed. It is anticipated that frequent visitors to the park (that may have visited in the fall or winter) may report shorter than usual visits to the park because of the weather during late autumn and winter. *Frequency of visitation* was measured by Question 17 which provides a list of frequency categories to choose from ranging from “Less than once in 3 years” to “At least once per month.” Frequency was also measured with Questions 18 and 21: “Approximately how many days have you spent at Point Pelee N.P. in the last 12 months” and “How many times in the last 12 months have you visited Point Pelee National Park: Day visits and overnight visits?” *Visitation during childhood* was measured with Question 19: “How regularly did you visit parks and protected areas as a child (16 years of age or under)?” This question featured response categories ranging from “1 – never”, to “4 – often”.

*Membership in environmental organizations* and Friends of Point Pelee was measured by an item in Question 5: “In the last 12 months did you participate in the following behaviours... f) I was a member of an environmental group” and through membership records provided by Friends of Point Pelee. This is followed by Questions 6 and 7 designed to measure the *level of commitment and activity as a member* in the Friends and other environmental groups. These questions recorded the number of days and amount of money donated in the last 12 months.

*Distance between the respondent’s residence and the park* was obtained through postal codes and zip codes provided by Point Pelee National Park’s database. These mailing locators were used to calculate driving distance between the park and each respondent’s place of residence.

*Awareness of other sites* and *ability to substitute* Point Pelee National Park for another destination were measured through Question 22, which featured two Likert-type scale questions ranging from “1– strongly disagree” to “5– strongly agree.” One of these

questions attempts to address the issue of constraints that can often inhibit a person from switching to another site for recreation or travel (e.g., lack of time, money, and transportation). The second question addresses another phenomenon, individuals' knowledge or awareness of an alternative site. While knowledge is an important component of this second question, the question also taps into more stable factors such as an individual's psychological commitment to a place, and their belief that they could achieve satisfaction in another place as well as they do in a current favoured location. The latter level of satisfaction can be strongly affected by specialization in particular activities (Shelby & Vaske, 1991; Brunson & Shelby, 1993). A third question that attempted to measure willingness to substitute would have been a very useful contribution to this study, however an overly long survey instrument prohibited this.

Question 20 measures *motivations* for visiting Point Pelee National Park. In its survey participants are asked to rank four different priorities for visiting the park. These categories are: "...to enjoy the natural environment and setting," "...participate in the outdoor activities I enjoy," "...spend time with my friends and family," and "...to learn about the park's natural environment." Selection of these categories was based on a similar set of questions used by Williams et al. (1992). The fourth category related to learning was suggested by Parks Canada staff. A fifth category was included in this question: Participants could indicate if a motivation category was "Not applicable" to them. It was deemed important to provide participants the opportunity to designate the non-importance of one or more of these motivations rather than force them to assign a value.

Several different socio-demographic variables were also collected by the survey instrument. These are located in the final section of the survey and include gender, age, education, and household income. In anticipation that some study participants would be from the United States, respondents were encouraged in the survey to convert reported income to Canadian dollars.

## **Ancillary variables**

A few other ancillary questions are included in the survey, but are not reported on further in this dissertation thesis. The variables these questions are designed to measure may help round out a profile of different groups of park visitors or help explain the relationship between the study's main constructs. These questions are: Question 11 (the importance of visiting Point Pelee N.P. on most recent trip); Question 12 (visitation-accommodation category); Question 14 (number of children and adults in travel party); Question 26 (preferred activity while at the park); Question 27 (knowledge about the park); and, Question 28 (rural/urban residence). The variables these questions measure have appeared in previous place attachment or pro-environmental studies; however conclusions about their relationship with place attachment or pro-environment behavioural intentions remain obscure. It is proposed that the main use of these measures may be in comparing different groups of visitors who display varying levels of place attachment and perhaps even differing levels of pro-environmental behaviour, however there is no direct theoretical support for this, and is therefore considered peripheral to the current study.

Some additional variables were also measured by the survey instrument; these include: environmental behaviours undertaken in the last 12 months (Question 5), general environmental attitudes (Question 4), attitudes toward pro-environmental behaviours (Question 9), and outdoor activities participated in during the last 12 months (Question 29). Data from these questions will be used in analysis subsequent to this dissertation study and are discussed briefly in Chapter 6.

## **Sampling**

Three key considerations guided the selection of a sample population. The first was identifying a population of park users who had visited the same park. The second consideration was to achieve a degree of diversity amongst the survey population (e.g., different motivations for visiting; different levels of participation in membership organizations) so that specific statistical analyses could be performed to address the proposed research questions. This reason informs the third consideration, obtaining an

adequate number of potential study participants and completed survey instruments. These issues are discussed below.

Although it would have been ideal to sample a representative population of park visitors, this was not possible. This is due in part to a) a lack of resources available to the researcher, b) the timing of data collection, and c) freedom of information constraints which inhibit government agencies from divulging client information and recent privacy protection policies which affect membership associations' ability to distribute member information. These issues are often present as challenges for tourism researchers who must attempt to survey transient and seasonal populations who are seeking leisure opportunities; this results in a high prevalence of convenience samples in tourism and travel research (Tian Cole, 2004).

In short, this study did not seek a representative sample of visitors to Point Pelee National Park, in part because of the challenges associated with such a task, but also because the study objectives did not require a representative sample. Instead, an adequate sample of visitors who have visited the same park, and who display sufficient diversity of specific characteristics was necessary.

Several guidelines were followed when determining what size of sample would be adequate for the study. According to Boomsma (1983), it is recommended that a sample size of at least 200 respondents is needed to perform "modeling of moderate complexity" (cited in Kelloway, 1998, p. 20). Another guideline for structural modeling suggested by Bentler (1993) and supported by Kline (2005) and others is that the ratio of sample size to the number of parameters needs to be at least 5:1, or preferably 10:1. Using these suggestions a sample size of at least 200 respondents was sought. In order to achieve this size of sample a total of at least 800 surveys needed to be distributed. An anticipated response rate of 30% would allow for analysis based on several dichotomous categories (e.g., members versus non members or local versus non-local visitors).

Park staff and Friends of Point Pelee assisted with the identification of survey recipients. A master list of names was generated by park staff using information from Parks Canada databases and Friends of Point Pelee's membership list. Only park visitors who had agreed to receive mailing from Point Pelee National Park, by indicating "yes" to the question: "Do you wish to be contacted by Point Pelee National Park," were included in the list of potential survey participants. The anonymity of these individuals was protected by a separation of survey results from the actual identities of the respondents through the use of unique identifier numbers on each survey instrument. One park administrator, an employee of Parks Canada, was charged with the management of the survey sample list.

The sample of survey participants was generated by selecting individuals who had visited Point Pelee National Park during the last four years. They were selected from eight exclusive visitor categories. It was anticipated that each category would generate different levels of place attachment and pro-environmental behaviour. For example members of the Park's Advisory Board and Friends of Point Pelee were expected to demonstrate high levels of place attachment and pro-environmental behaviours toward the park. However their pro-environmental behaviours toward the environment in general were proposed to be lower. Conversely, it was anticipated that first time visitors, selected from a list generated by visitors who completed a "Let's Keep in Touch" form, would present lower levels of place attachment and park-specific pro-environmental behaviours. Membership in Friends of Point Pelee was also used as a criterion for selection. The number of surveys sent to each group of visitors was based on the anticipated characteristics of individuals within these groups as well as each group's anticipated return rate. These return rates were based, in part, on respondents' estimated level of place attachment. Expected rates of return are described in Table 3.4.



Table 3.4

*Distribution of Survey to Quota Sample Groups*

Quota Sample Group	# Distributed	Anticipated Rate of Return (%)	% of Surveys Distributed to Sample Population	Anticipated Level of Place Attachment	Anticipated Level of Park-specific Pro-environmental behaviour
<b>Let's Keep in Touch – others</b>	177	20 %	15.9 %	M-L <sup>a</sup>	M
<b>Annual Pass Holders</b>	314	30 %	28.3 %	H-M-L	H-M-L
<b>Let's Keep in Touch – 1<sup>st</sup> timers</b>	236	20 %	21.2 %	L	L
<b>Friends of Point Pelee</b>	103	50 %	9.3 %	H	H
<b>Program Participants</b>	136	25 %	12.2 %	M	M
<b>Fundraiser Participants</b>	91	25 %	8.2 %	M-L	M-L
<b>Advisory Committee</b>	28	50 %	2.5 %	H	H
<b>Campers</b>	26	30 %	2.3 %	M	M
<b>Total</b>	1111 <sup>b</sup>		99.9 %		

<sup>a</sup> Each group was given a ranking of High (H), Medium (M) or Low (L) in terms of anticipated intensity of place attachment and park-specific pro-environmental behaviour.

<sup>b</sup> 1191 surveys were distributed; 80 were returned due to incomplete or out of date postal addresses.

An additional effort was made to match the percentage of US and Canadian visitors to the park. In 2000 Canadian residents made up 71% of park visitors, while US residents represented 24% of visitors (see Table 3.5). International and French speaking visitors were excluded from the sample due to financial considerations. These two groups make up approximately 7% of the total annual visitation to Point Pelee National Park (Parks Canada, 2000a). All current members of the park's Advisory Board and Friends of Point Pelee, as well as first time visitors who completed the "Let's Keep in Touch" form, and camping group representatives from the years 2001 to 2004 were sent surveys. Those who were not non-first time visitors and who completed the "Let's Keep in Touch" form, as well as annual pass holders and individuals who purchased fundraising tickets related to Point Pelee National Park were subjected to a random selection process. Initiated at a randomly determined point on these lists, every fourth person was sent a survey.

Table 3.5

*Country of Residence*

	# Distributed	Anticipated Rate of Return (%)	% of Surveys Distributed to Sample Population
<b>Canada Residents</b>	922	30 %	83 %
<b>U.S. Residents</b>	189	20 %	17 %
<b>Total</b>	1191	na	99.9 %

A constraint which may affect the quality of the data collected from this sample of park visitors was that no pre-screening of survey participants was performed. This would have been a useful in ensuring an adequate diversity of visitors' characteristics (e.g., distance of residence from park; high and low place attachment). As a partial solution, the quota sample was designed to generate a diverse group of survey respondents. Additionally an adequately sized sample also helped to address this issue ( $N = 1191$ ).

### ***Survey Distribution***

The survey was printed on both sides of legal sized (14" x 8") paper. Although two-sided surveys can cause confusion and increase the number of missing values in final data results, a two-sided format was utilized at the request of Parks Canada as the agency has received feedback about the importance of paper conservation from previous survey respondents.

The park survey administrator responsible for the survey mailing list was charged with the survey mailing. The researcher helped in the preparation of the survey mailing, in part to ensure quality control, however her access to the mailing labels was restricted to protect the anonymity of the survey recipients. Completed surveys were sent directly to the researcher at the University of Waterloo in a postage paid envelop. Individuals who lived in the US were an exception to this; they were provided an addressed envelope but no return postage. Of the initial 1191 surveys mailed, 80 were returned to the park because of incomplete or out-of-date mailing addresses.

A unique identifier number was used to keep track of which respondents returned surveys; those who had not returned their survey after a two week period were sent a reminder postcard by the park survey administrator (Appendix A-2). This method of follow-up is based on recommendations made by Dillman (2000) to increase mail-survey response rates. A third mailing suggested by Dillman, which would include a second copy of the survey instrument was not possible due to financial constraints. Kalafatis and Blankson (1996) found that the inclusion of identification numbers on survey instruments had a positive effect on response rates and had no effect on item omission. One respondent expressed discomfort at the presence of the identification number on his/her survey instrument and pleaded for confidentiality on the completed questionnaire. No other indicators of discomfort associated with the unique identification numbers were evident. Incentives, including the chance to win one of five annual passes to Point Pelee National Park (valued at \$63 each) and one of three \$30 gift certificates to purchase goods from the Friends of Point Pelee gift shop were also utilized to increase response rates.

The initial mailing was sent late in April 2005 and the follow up post card mailing was sent mid-May. Using the unique identifier numbers on the survey instruments winners of the annual pass and gift certificate prizes were drawn by the researcher early in June and sent notice of their prizes shortly thereafter by the park survey administrator.

## ***Data Analysis***

Statistical data were coded and stored as an SPSS data file. A number of statistical analysis methods were employed to examine the relationship between place attachment and pro-environmental intentions. These included basic descriptive statistics, correlation analysis, an examination of scale reliability, principle components analysis and structural equation modeling using AMOS 5.0. Survey respondents' comments added at the end of each questionnaire were also examined and used to inform the analysis of the data. This process is described next in the Results Chapter.

## ***Ethical Issues***

Singleton, Straits and Straits (1993) suggest three main concerns regarding the ethical treatment of research participants. These are informed consent, deception and harm. Informed consent was obtained from the study participants through the provision of an introductory letter attached to the survey instrument (see Appendix A-1). A decision regarding the delivery of this information was made in conjunction with the University of Waterloo's Office of Research Ethics, and Parks Canada.

The introductory letter described the general purpose of the study, the nature of information being collected, the uses to which the information would be put to, and how the data would be kept safe. By completing the survey and returning it to the researcher the participant agreed to participation in the study. No deception or harm was anticipated to result from the execution of this study. Efforts were made to make each participant safe and informed. This included confidential treatment of data. Details of these effects are elaborated on in the Results Chapter. A summary of the research findings will be posted in the Friends' group newsletter and/or park new bulletin.

## **Chapter 4: Results**

This chapter provides a summary of the data analysis. An overview of the treatment of data is followed by reports of results from a preliminary test of several of survey instrument's chief scales and how these results were used to prepare the final survey. Next the response rate is described and discussed, along with an explanation of checks for non-response bias.

A profile of survey respondents introduces the reader to the data. A detailed description follows of respondents' intensity of place attachment and pro-environment behavioural intentions. For place attachment this description includes an examination of place affect, place dependence and place identity. Pro-environment behavioural intentions are divided into park-specific and general intentions. Characteristics of several "external" factors are also reported.

An exploration of the relationship between the different variables studied in this project is detailed next. This is initiated with an examination of the relationship between the two central concepts of this study: place attachment and pro-environment behavioural intentions. This included principle component analysis of data collected from the study's main scales. Next, relations between external factors, place attachment and pro-environmental intentions are explored. This comparison includes an examination of variable means, variances, and correlations between variables.

The final section of the Results Chapter presents the findings of structural equation modeling (SEM), used to explore the relationships between place attachment, pro-environmental behavioural intentions, and various additional factors.

### ***Treatment of Data***

Data were entered and stored in a Statistical Package for Social Sciences 14.0 (SPSS) spreadsheet. The database was stored securely in the researcher's office during and after

data analysis. Comments made by the survey participants in an open-ended question at the end of the survey were recorded in an MS Word document and also safely secured. Comments made regarding the park experience or quality of park management were coded and entered into the SPSS dataset. All comments regarding the park were forwarded to park staff early in the data analysis process. To protect the anonymity of park visitors each survey identification number was removed from individual comments. Comments regarding the survey and challenges related to completing the survey were used to inform the analysis of the data.

Data analysis was initiated with a screening of the raw data. Anomalies related to data input errors and data characteristics that would result in statistical analysis challenges such as outliers and missing data were examined. Descriptive statistics (i.e., means, standard deviations, ranges) and frequencies were used to highlight errors. Two surveys were fully rejected. One was so incomplete that its exclusion was necessary. A second survey was eliminated due to obvious acquiesce bias.

A pattern of missing data appeared in several areas of the survey. At least six of the 16 items found in Question 3, the place attachment scale, were skipped in approximately 20 of the 355 returned surveys. This was especially prevalent for the place identity items. In the open-ended comment questions provided at the end of the survey instrument several survey participants commented on the highly personal and emotionally-based phrasing of these items. Several others commented on the scale's repetitive nature. It is speculated that the discomfort that these individuals expressed with the question's content provides a main reason for failing to complete all the scale's items. However, the majority of survey participants did complete this question thereby providing an adequate base from which to draw on.

Two other questions that were occasionally skipped by survey participants were questions related to financial and time donations (Questions 6, 7 and 15). Several respondents noted that they could not remember how much they had donated, but that they did know they had donated. These respondents were coded as missing data ( $n = 14$ ). Respondents who failed

to note any donation history or amounts were recorded as donating zero time or money to environmental causes in Questions 6 and 7 and having no intention to contribute money to Point Pelee National Park's programs in Question 15. Again, most respondents did complete these questions; therefore data from these questions was incorporated into the analysis.

Finally, a third cluster of questions were missed by eight survey respondents. It appears from the completion pattern of these questionnaires that the failure to answer questions located on pages 2, 4 or 5 was not intentional but an artefact of the questionnaire's double-sided format. No bias is anticipated from this missing data.

In total, factors such as data entry errors, missing data and acquiescence bias were deemed to be minor and data analysis proceeded. Further support of moving forward was rooted in the understanding that programs such as SPSS 14.0 and AMOS 5.0 are adept at handling challenges such as missing data.

Skewness and kurtosis were not anticipated to be a major issue with a data set over 200 cases; however the shape of distributions (histograms) from key variables were examined as recommended by Tabachnich and Fidell (2001). Procedures for checking the normality of the distributions of scores are provided later in this chapter when different statistical analysis tools are introduced.

Once initial preparation of the data was complete, a series of treatments were used to analyze the data. Descriptive statistics were conducted to highlight the various characteristics of the park visitors. Correlation coefficients were calculated for each of conceptual scales used in the study and an examination of the dimensionality of place attachment and pro-environment behavioural intentions was also conducted using principle components analysis. Correlation analysis was performed to examine potential relationships between the study's variables. In the final stages of the data analysis structural equation modeling (SEM) was used to test several different models of place attachment and pro-environmental intentions relations.

## ***Scale Development***

The main scales used in the study were refined in a two step process. This involved a preliminary test of components of the survey instrument in a classroom setting, followed by a peer review of the full survey instrument.

The preliminary test of the place attachment and pro-environment behaviour scales was administered to one second year outdoor recreation and one fourth year park management class enrolled at the University of Waterloo. The student-based sample ( $N = 80$ ), represented a broad range of fields of study and years of study, however students studying parks, resource management and outdoor recreation predominated. The preliminary test of the survey scale items (see Appendix A-4) asked respondents to complete a 25 item place attachment scale and a 26 item pro-environment behavioural scale<sup>5</sup>. The items, drawn from previous place attachment and pro-environment behaviour research, were ordered randomly within the two scales. Respondents were also asked a series of descriptive questions ranging from respondent's gender to favourite activity.

The preliminary test of the scales was more about testing comprehension and the overall utility of the survey instrument, rather than testing the reliability of the scales as each scale and their items had been used in many previous studies and were found to be reliable tools. However, reliability was also examined in the testing process as a form of verification. Unfortunately, the sample size of 80 students used to test the scales was too small to make an accurate assessment of the scales' utility. According to Tinsley and Tinsley (1987) at least five respondents per scale item are needed for such a process. Therefore the actual sample size should have been at least 130 students to test the pro-environmental behaviour scale and 125 students to test the place attachment scale. Comrey (1988) suggests similar

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<sup>5</sup> The place attachment scale was part of a larger 47 item scale devoted to measuring other place related phenomenon including place history, place familiarity, place bonding, and place commitment (Hammitt, Backland, & Bixler, 2004; Kaltenborn, 1997). These items will be used in data collection and analysis subsequent to this dissertation thesis. Two other scales designed to measure attitudes towards pro-environmental behaviours and perceptions of responsibility and efficacy related to promoting pro-environmental behaviour were also included in the preliminary survey to help inform a study separate from this thesis.



limits (i.e., a sample of 100 respondents is considered “poor” for scale testing, and should be larger) (cited in DeVillis, 2003). However even though a sample this size precludes certainty of results, the results were still used, albeit with extreme caution, to guide final item selection.

For the place attachment scale students were asked to identify the park they had most recently visited and their favourite park and then answer the scale twice using their relationships with these two parks to inform their level agreement with the scale items. It was theorized that students’ answers regarding their most favourite park would exhibit high place attachment. Students answering questions about the park they had most recently visited, provided it was not the same as their favourite park, would demonstrate moderately lower levels of place attachment. For the pro-environment behavioural intentions scale students were asked to think about their relationship with their favourite park when completing the scale. Four students commented that while this park may have been their favourite, they had never visited the park.

The preliminary test of the survey was useful in informing the final revisions to the questionnaire that was administered to visitors to Point Pelee National Park in April 2005. The test provided confirmation of the scales’ reliability and guidance in the reduction of the number of scale items for the place attachment and pro-environmental behaviours scales. This evaluation featured several stages including an examination of descriptive statistics (frequency distributions, means, and standard deviations), correlation analysis, scale reliability tests, and principle factor analysis. A limited description of results from these tests follows. Student feedback about the formatting of the surveys and specific items was also taken into consideration. Finally, as was mentioned previously, statistical outcomes, especially those related to factor analysis were treated with extreme caution due to the small preliminary test sample size.

Cronbach’s alpha coefficients were calculated to evaluate the reliability of the preliminary test’s place attachment scale (Favourite park:  $\alpha = .893$ ,  $n = 74$ ; Park most recently visited:  $\alpha = .909$ ,  $n = 77$ ). Only 23 of the 47 items that appeared in the preliminary test were used to

calculate this statistic (see the highlighted items in Appendix A-4, Question 3). The three negative items were reverse coded and the two neutral items were eliminated. The three sub-scales intended to measure the sub-dimensions of place attachment were also assessed. The eleven items of place identity sub-scale (Favourite park:  $\alpha = .838$ ,  $n = 77$ ; Park most recently visited:  $\alpha = .844$ ,  $n = 77$ ); eight items of the place affect sub-scale (Favourite park:  $\alpha = .836$ ,  $n = 76$ ; Park most recently visited:  $\alpha = .856$ ,  $n = 78$ ); and, four items of the place dependence sub-scale (Favourite park:  $\alpha = .504$ ,  $n = 79$ ; Park most recently visited:  $\alpha = .675$ ,  $n = 78$ ) were determined to be reliable measures of each concept.

The item, Q.3jj “I get more satisfaction out of visiting Park “X” than any other park” was removed from the place affect sub-scale and incorporated into the place dependence sub-scale to improve its reliability for final preliminary test results. Earlier in the study this item was conceptually linked to the place affect sub-scale as some theorists assign satisfaction as one of four characteristics of affect (Dick & Basu, 1994). However previous place attachment research has also identified this satisfaction-related item as a better predictor of place dependence (Hammit, et al., 2004; Moore & Graefe, 1994; Vaske & Korbin, 2001; Williams, 2000). The correlation coefficients between this item and the place dependence items are much stronger than with other items in the place attachment scale (i.e., two of three place dependence items demonstrated significant relationships at the  $p = .01$  level:  $r = .419$  and  $r = .463$ ; the other place dependent item revealed no significant relationship,  $n = 78$ ). An examination of the place affect sub-scale’s item-to-total scores (the internal homogeneity test) and whether an item’s elimination improved corresponding alpha values reinforced the correctness of this decision to reassign the satisfaction-related item (Favourite park values improved from  $\alpha = .806$ ,  $n = 76$  to  $\alpha = .836$ ,  $n = 76$ ; and, Park most recently visited values improved from  $\alpha = .835$ ,  $n = 78$  to  $\alpha = .856$ ,  $n = 78$ ). Similar benefits were achieved for the place dependent scale with the addition of this satisfaction-related item.

The low reliability scores of the place dependence sub-scale were somewhat troubling. Nunally (1978) suggests that a value of  $\alpha = .70$  as the lowest acceptable score for Cronbach’s alpha. DeVellis (2003) suggests that alphas that fall below  $\alpha = .60$  are unacceptable. Cortina (1993) confirms this suggesting that for scales with less than six

items a threshold of  $\alpha = .60$  for evaluating reliability is reasonable. For those answers related to respondents' favourite park, low place dependence may also be explained by the possibility that several of the students surveyed for the preliminary test never visited their favourite park, and therefore a functional relationship with these parks has probably not formed, thereby weakening their agreement with place dependence items. This was not an issue for the final survey sample as all the participants have been to the park. A decision was made to proceed with the use of these four items as measures of place dependence because of these explanations, but also because they had been successfully used in many past place attachment studies.

Further examination of the place attachment scale and related sub-scale's item-to-total values and whether an item's elimination improved corresponding alpha values revealed little benefit in removing specific items. Exceptions include item Q.3m "Most of my friends are in some way connected with my use of Park "X"; its removal improved coefficient alpha scores on the place attachment scale as well as the place identity scale for both favourite park and park most recently visited.

The pro-environment behavioural intentions scale also proved to be a reliable measure for the preliminary test; a Cronbach's alpha of  $\alpha = .944$  was achieved for the combined 26-item scale, as well as high scores for a 14-item park-specific set of pro-environment behavioural indicators ( $\alpha = .916$ ) and a 12-item general environment set of pro-environment behavioural indicators ( $\alpha = .873$ ). A review of item-to-total values and examination of whether an item's elimination improved corresponding alpha values revealed little benefit in removing specific items in any other pro-environment behavioural scales.

Exploratory factor analysis which utilized varimax rotation revealed the presence of four factors measure by the place attachment items. Most of the place affect items loaded with the place identity items in Factor 1. The remaining place dependence items loaded on the second factor. Despite this finding, and based largely on a desire to retain the theoretically based attitudinal conceptualization of place attachment, a three sub-dimension conceptualization of place attachment was retained for the final application of the survey instrument and its subsequent analysis. Exploratory factor analysis was also conducted on

the behavioural intentions scale. Four factors were identified and sorted using varimax rotations (see Appendix B-2). While patterns demonstrated by these factor loadings were examined for their substantive content no further analysis was undertaken with these items.

These findings were combined with comments generated by a peer-review of the final survey instrument to make the scales more concise, comprehensible and yet valid tools for measuring the central concepts of the study. For example, based on one recommendation place-specific and general pro-environmental items were separated into two distinct subscales in the final survey to increase the ease of completing the pro-environment behavioural intentions section (see Appendix A-3, Question 8). The peer-review process involved review of the final survey instrument by eight academic peers and eight Parks Canada staff.

Based on findings during the preliminary test and feedback from the peer-review process several items were removed from the main concept scales. The 23 place attachment items which appeared in the preliminary test were reduced to 16; six of the remaining items measured place identity, four measured place dependence and six measured place affect. The pro-environment behavioural intentions scale was reduced from 26 items to 24 items; 12 items measured park-related pro-environment behavioural intentions and 12 items measured general pro-environment behavioural intentions.

Aside from attempting to increase comprehensibility and external validity, and decrease repetitiveness, several items were removed due to political reasons. Any item which attempted to measure voting patterns or opinions regarding taxation were removed at the request of Parks Canada. It was theorized that the removal of these items would not affect the final result of this study as their purpose, to measure how politically active a park visitor would be in support of the environment and how financially supportive park visitors would be through monetary means, were measured by other items that were retained in the survey. Items related to financial decisions were also reassessed after the preliminary test as the student-based sample used to test the scales demonstrated high levels of disagreement with any tax, donation or fee related scale items. This sensitivity to financial items on the scale was equated with low incomes that characterize student populations. Theorizing that this

would not be a dominant characteristic of the visitors to Point Pelee National Park, most financially-related items were retained.

### ***Response Rate***

The quota sample, which was developed in partnership between the researcher and park staff, yielded a list of individuals who had traveled to the park within the last four years. Of the original 1191 questionnaires that were mailed, 80 were returned to the park due to out-of-date or incomplete addresses. A total of 357 questionnaires were returned to the researcher; 355 were accepted for use in the study resulting in a return rate of 32.5%.

Goyder (1985) suggests: “A ‘typical’ survey response rate exists only insofar as there is a typical salience level of topic, sponsor, target population, and set of field procedures” (p. 237). A response rate in the 30% range is not uncommon for social science based research studies; this is especially true for studies like this which are characterized by an unsolicited mailing with only one reminder postcard sent to Canadian residents. Two surveys conducted by the park in the last five years resulted in response rates of 37% (Parks Canada 2000a; 2000b) and 22% (Parks Canada, c.2003). The study completed in 2000 was a self-administered questionnaire distributed to every fourth visitor entering the park as an insert in the park information guide. The 2003 study featured a self-completed questionnaire which was mailed to individuals living near the park. Similar return rates have also been reported by social scientists conducting research in other Ontario parks (e.g., Bowman, 2001; Mulroney, in press). In contrast, Dillman and Carley-Baxter (2000) report significantly higher rates of return for surveys conducted in United States national parks. Over a 12 year period the mean rate of return for self-completed visitor experience questionnaires which were handed out by park staff at US national parks was 79%. This response rate was likely elevated by in-person distribution of the questionnaire and more intense follow up including a reminder postcard sent two weeks after the initial distribution and a reminder letter and replacement survey sent two weeks after the post card.

In this current study response rates for the different quota sample groups did match some of the expectations proposed during the sample selection process. Table 4.5 describes the rates

of return for each individual quota group. Advisory Group Members ( $n = 14$ ), Friends of Point Pelee ( $n = 48$ ), Program Participants ( $n = 38$ ), and Fundraiser Participants ( $n = 25$ ) returned surveys in numbers that were within 3% of the anticipated return rates.

Surprisingly “Let’s Keep in Touch” Repeat Visitors ( $n = 85$ ), and “Let’s Keep in Touch” First Time Visitors ( $n = 64$ ) produced higher rates of questionnaire return than expected. Annual Pass Holders ( $n = 78$ ) and Campers ( $n = 3$ ) returned far fewer surveys than anticipated. The greatest gaps between anticipated returns and actualized returns were associated with the “Let’s Keep in Touch” Repeat Visitors (an increase of 7.1 %) and Campers (a shortfall of 18.5 %).

Rates of return for each quota sample group in comparison with the overall number of respondents included in the study’s sample are described in the fifth column in Table 4.1 and Figure 4.1.

Table 4.1

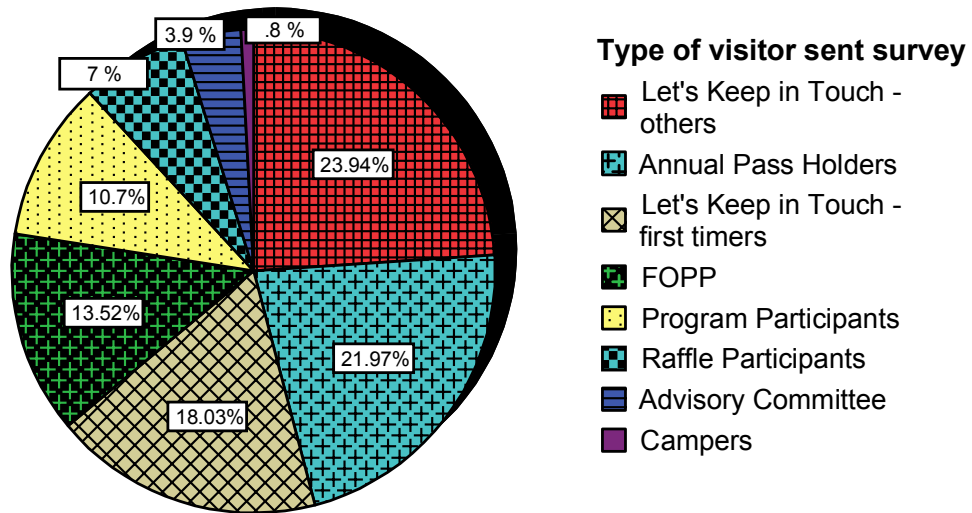
*Quota Sample Groups’ Anticipated vs. Actual Rate of Return ( $n = 355$ )*

	# Distributed	Anticipated Rate of Return	# Returned	% of Final Sample ( $N = 355$ )	% of Surveys Distributed to Quota Group	% of Surveys Distributed to Sample Population ( $N = 1111$ )
<b>Let’s Keep in Touch – Repeat Visitors</b>	177	20 %	85	23.9 %	48 %	7.7 %
<b>Annual Pass Holders</b>	314	30 %	78	22 %	24.8%	7 %
<b>Let’s Keep in Touch – First Time Visitors</b>	236	20 %	64	18 %	27.1 %	5.8 %
<b>Friends of Point Pelee</b>	103	50 %	48	13.5 %	46.6 %	4.3 %
<b>Program Participants</b>	136	25 %	38	10.7 %	27.9 %	3.4 %
<b>Fundraiser Participants</b>	91	25 %	25	7 %	27.5 %	2.2 %
<b>Advisory Committee</b>	28	50 %	14	3.9 %	50 %	1.3 %
<b>Campers</b>	26	30 %	3	.8 %	11.5 %	.3 %
<b>Total</b>	1111	na	355	99.8 %	na	32 %

Note 1: 1191 surveys were distributed; 80 were returned due to incomplete or out of date postal addresses.

Figure 4.1

*Percentage of Visitors who Returned Surveys from each Quota Sample Group*



The higher than anticipated response rates for the two “Let’s Keep in Touch” groups may be explained by these individuals’ heightened interest in the park, as indicated by their willingness to complete a comment card about their experience at Point Pelee National Park. Completion of the form signified their interest in the park and perhaps a greater willingness to participate in a survey related to the park. This interest or salience-related boost in response rate has been observed in other social science studies (Dillman & Carley-Baxter, 2000; Heberlein & Baumgartner, 1978). The slightly lower response rate amongst the first time visitors in this group may be linked to lower levels of place attachment.

The low rates of return amongst Annual Pass Holders is somewhat puzzling as this group was expected to hold high levels of place attachment, and therefore should have felt an investment of time in completing the survey to be worthwhile. Perhaps distance from park may have had an impact on this response rate; in particular those who live closest to the park may only see it as a convenient setting for recreational opportunities and therefore their attachment may not be bound up with cognitive or emotional commitments but rather just functional convenience. The low response rate amongst Campers is also somewhat

puzzling. Surveys were sent to the designated representative of each group of visitors who used Point Pelee National Park's campsite. The campsite is available only for group use, and is often reserved by natural history and environmental groups. As many as 30 individuals can use the campsite at one time. It was initially speculated that these individuals, through their prolonged exposure with the park made possible by the opportunity to camp *inside* the boundaries of the park would demonstrate a higher attachment to the park, and therefore would be more likely to complete and return the questionnaires. Their affiliation with environmental groups also created the expectation that they would find completing a survey on environmental attitudes and behaviours to be very salient to their interests. No immediate explanation for the low response rate demonstrated by campers is apparent. One could speculate that perhaps the "official delegates" charged with representing the group and liaising with park to coordinate reservations were not attached to or interested in the park; rather their visit to the park was obligatory, part of their official duties as special programs coordinators for the environmental organization that they represented.

### **Non-response considerations**

External validity of the sample is a concern given the response rate of 32.5%. Some researchers suggest any response rate under 50% should be investigated for non-response error (Babbie, 1990). Goyder (1985) reports varying opinions amongst academics regarding acceptable and "realistic" response rates for mail surveys ranging from 30 to 70%. Others recommend a check of non-response error for all studies (Linder, Murphy, & Briers, 2001). Very few of the 150 place attachment and environmental behaviour studies drawn on for this study performed a check for non-response error. Regardless of this lack of consensus on when a non-response bias check is needed, a check for non-response error was performed. Comparable data are not available concerning the population from which the sample was drawn, however two other approaches for checking non-response error were utilized: a) a comparison of late to early respondents, and b) a comparison of the current sample's visitor characteristics with the respondents to the *2000 Point Pelee National Park Visitor Survey*. Both methods are recommended by recent meta-analysis studies examining non-response bias from a number of fields as a means to estimate non-response bias (Armstrong &



Overton, 1977; Dooley & Lindner, 2003; Lindner & Wingenbach, 2002; Lindner et al., 2001; Miller & Smith, 1983).

### **Comparison of late to early respondents**

Studies have found that late respondents share more similarities with non-respondents than early respondents (Linder, et al., 2001; Miller & Smith, 1983). Differences between late respondents ( $n = 50$ ) and early respondents ( $n = 305$ ) were tested for, as an initial, convenient measure of non-response bias in this study. Late responses were those survey instruments that were returned to the researcher at least two weeks after the initial mailing and just after the follow up post cards were mailed.

Independent samples t-tests were used to identify significant differences between late and early respondents. Characteristics that were analyzed for differences included: Level of respondent's satisfaction (a composite measure that included means from social, environmental and activity satisfaction); place attachment; place-specific and general pro-environmental intentions; the number of days spent at Point Pelee in the last 12 months; age; and income. No significant differences were revealed by the t-tests, and eta squared scores revealed the magnitude of the difference in the means between each variable was very small (see Table 4.2).

Chi-square tests were used to investigate differences in five non-continuous variables. An examination of the categorical variable frequency of visitation to Point Pelee National Park revealed no significant difference between late and early respondents ( $\chi^2(4, N = 351) = .172, p = .883$ ). No significant differences were also found for education levels ( $\chi^2(4, N = 351) = 4.851, p = .303$ )<sup>6</sup>, income levels ( $\chi^2(6, N = 345) = 5.531, p = .478$ )<sup>1</sup>, or knowledge about the park ( $\chi^2(2, N = 348) = .958, p = .620$ ). In this analysis of differences between the groups sex ratio were also examined; however, because a 2x2 table was produced Yates' Correction

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<sup>6</sup> Chi square tests for education and income were both characterized by either one or two categories that had an expected count of 5 values, thereby causing some concern that the minimum expected value assumption associated with Chi square calculations may have been violated. However many authors suggest that if at least 80% of table cells have 5 or more expected values in them, then this is adequate to achieve confidence in the Chi square statistics produced (Pallant, 2005). This minimum was achieved for the two variables of concern and therefore significant confidence was reached for these Chi square results.

for Continuity statistic was used (Pallant, 2005). Again no significant difference was detected between the two groups ( $\chi^2(1, N = 349) = .005, p = .946$ ).

Table 4.2

*Differences between Late and Early Respondents*

Variable	Mean (M)		Standard Dev. (SD)		t-values (t)	Signif. (p)	Eta squared
	Early	Late	Early	Late			
<b>Satisfaction<sup>a</sup> composite</b>	4.42	4.55	.598	.537	1.493	.136	.003
<b>Place attachment</b>	3.50	3.44	.631	.670	-.552	.581	.000
<b>General Env. Behav.</b>	3.68	3.75	.690	.616	.646	.519	.001
<b>Park Specific Behav.</b>	3.80	3.79	.700	.681	-.109	.913	.000
<b>Days/last 12 months</b>	11.35	8.43	27.486	12.656	-.717	.474	.015
<b>Age</b>	52.31	56.06	13.991	12.417	1.752	.081	.000

<sup>a</sup> This measure of satisfaction represents an average mean of all three satisfaction variables (activity, environment and social).

### **Comparison with previous park visitor sample**

A second method of assessing non-response bias is comparison of data from previous research with the sample population. The study which comparisons were drawn from was conducted by Parks Canada staff through a random distribution of questionnaires during the summer of 2000 (Parks Canada, 2000a; 2000b). This method is not entirely valid for analyzing non-response bias as the quota-based sample which characterizes this current study will inevitably be somewhat different from a random sample of visitors to Point Pelee National Park. However, it should serve as an interesting point of comparison for park staff and perhaps contribute to comparisons with other protected areas; hence its inclusion in this analysis.

A response rate of 37% ( $n = 817$ ) characterized the Point Pelee National Park Visitor Survey conducted in the summer of 2000. Surveys were distributed in a passive manner as an insert in the park information guide and given to every fourth visitor who passed through the

park's main gate from July to September. The survey is reported to be a representative sample of visitors to the park with the exception of season pass holders (Parks Canada, 2000a; 2000b). However it could be suggested that another weakness with the sampling procedure resulted from the summer-only distribution; visitors during the peak visitation season of spring migration were missed. This may have resulted in a sample characterized by fewer birders and older adults and a larger number of beach recreationists and family-oriented visitors.

Regardless of these caveats, the following variables were compared: country of residence; visitor's age; travel party composition; first time versus repeat visitors; knowledge about park; and, frequency of visit. Unfortunately no comparison of variables such as education, sex or income could be made because Parks Canada did not collect these data in the *2000 Point Pelee National Park Visitor Survey*.

Several differences are apparent. In terms of place of origin a higher representation of Canadian residents (84.5 %,  $n = 300$  vs. 70 %,  $n = 572$ ) than US residents (15.5 %,  $n = 55$  vs. 24 %,  $n = 196$ ) characterized this study versus the 2000 study (see Table 4.3). The remaining 5% of visitors in the 2000 study were from other countries (Parks Canada, 2000a; 2000b), a portion of the park visitor population that was eliminated in this current study due to financial constraints. A decrease in the number of US-based visitors to Canada post 9-11 and the SARS outbreak of 2003 may explain some of this difference, as could the summer distribution of the 2000 Parks Canada questionnaire. As explained in the Methods Chapter, this current study's sample is not a representative sample of visitors to Point Pelee National Park, but efforts were made to approximate the US-Canada visitor mix. The lack of a follow-up post card or paid postage for the return of US-resident surveys may account for the 3.4% higher rate of return demonstrated by Canadian residents versus US residents.

Table 4.3

*U.S. versus Canadian Residents' Response Rates*

	Current study					Parks Canada 2000 survey	
	# Distrib.	Anticipated Rate of Return	# Returned	% of Final Sample (N = 355)	% of returned surveys distributed to quota group	# Returned in 2000 Parks Canada Visitor Survey	% of Final Sample for 2000 Parks Canada Visitor Survey
U.S.	189	20 %	55	15.5 %	29.1 %	196	24 %
Canada	922	30 %	300	84.5 %	32.5 %	572	70 %

Note. The 2000 Point Pelee National Park Visitor Survey study provides only rounded data in its summary documents (Parks Canada, 2000a; 2000b).

A second difference was apparent when a comparison of age groups was made (see Table 4.4). A low number of respondents 34 years of age and younger characterized this study's sample. Children and young adults under the age of 25 only represented 1.5% ( $n = 9$ ) of the study's sample compared with the 2000 visitor study which featured 37% ( $n = 291$ ) of its respondents 24 years and under. This is not a large concern as the focus of the study was on the attitudes and behaviours of adults and not youth or children. However respondents between the ages of 25 and 34 are also somewhat lower in this study compared with Parks Canada's 2000 study (8.5 %,  $n = 30$  vs. 14 %,  $n = 110$ ). This gap is reversed in the older age groups with individuals 55 to 65 year old (26.2 %,  $n = 93$  vs. 8 %,  $n = 63$ ) and 65 years of age and older (21.4 %,  $n = 76$  vs. 5 %,  $n = 39.25$ ) much more prevalent in this study's sample than the 2000 study. The only age group that is characterized by similar proportions in the two studies is also the largest group in both samples, individuals aged 35 to 54 (38.9 %,  $n = 138$  vs. 36 %,  $n = 283$ ). It is possible that the difference in age is partially due to the manner in which the two survey instruments were distributed.

Table 4.4

*A Comparison of Sample Age Groups Percentages*

	< 25 years	25-34 years	35-54 years	55-64 years	> 65 years
<b>Current study (n = 346)</b>	1.5 %	8.5 %	38.9 %	26.2 %	21.4 %
<b>2000 Parks Canada Visitor Study<sup>a</sup> (n = 785)</b>	37 %	14 %	36 %	8 %	5 %

<sup>a</sup>Parks Canada, 2000a

A third comparison between the two study samples can be made using a series of questions designed to measure park knowledge (see Appendix A-3, Question 27). The same questions, with slight modifications in this current study, were used to evaluate how knowledgeable park visitors were about the ecological and cultural significance of Point Pelee National Park. Respondents in this study's sample achieved a significantly higher number of correct answers than respondents in the 2000 study (see Table 4.5). For example, a higher percentage of respondents to this current study attained five or six correct questions out of a total of six questions (71 %,  $n = 252$  vs. 50 %,  $n = 373$ ).

Table 4.5

*A Comparison of Number of Correct Answers to the Knowledge Testing Question (in Percentages)*

	≤ 3 correct	4 correct	5 correct	6 correct
<b>Current study (n = 348)</b>	11.4 %	17.7 %	32.1 %	38.9 %
<b>2000 Parks Canada Visitor Study<sup>a</sup> (n = 521)</b>	25 %	25 %	36 %	14 %

<sup>a</sup>Parks Canada, 2000a; 2000b.

Two other variables can be examined; however their utility for comparative purposes is somewhat suspect due to the sampling methods used in this study to identify specific users based on number of previous visits. The first of these is first time visitors and repeat visitors. In comparison with this study, the 2000 visitor survey had a higher proportion of

first time visitors (15.5 %,  $n = 55$  vs. 46 %,  $n = 368$ ) and a corresponding lower number of repeat visitors (84.5 %,  $n = 300$  vs. 54%,  $n = 432$ ) (see Table 4.6). Frequency of visitation is a second category which can be compared; however the phrasing of the questions also hinders useful comparisons; the 2000 study asked for frequency of visitation during the last 2 years and the current study asked a question based on visitation during the last 3 years. They are reported in Tables 4.7 and 4.8.

Table 4.6

*A Comparison of First Time Visitors vs. Return Visitors to Point Pelee National Park*

	First Time Visitors	Return Visitors
<b>Current study</b> ( $n = 355$ )	15.5 %	84.5 %
<b>2000 Parks Canada Visitor Study<sup>a</sup></b> ( $n = 521$ )	46 %	54 %

<sup>a</sup>Parks Canada, 2000a; 2000b.

Table 4.7

*Number of Visits to Point Pelee National Park in Past Three Years: Data from Current Study*

	< once in 3 years	Once in 3 years	Once per year	Several times per year	At least once per month
<b>Current study</b> ( $n = 351$ )	14.6 %	10.7 %	19.7 %	38.6 %	15.2 %

Table 4.8

*Number of Visits to Point Pelee National Park in Past Two Years<sup>a</sup>*

	None in last 2 years	Once in 2 years	2-3 times in 2 years	4-5 times in 2 years	> 5 times in 2 years
<b>2000 Parks Canada Visitor Study</b> ( $n = 521$ )	23 %	21 %	29 %	14 %	13 %

<sup>a</sup>Parks Canada, 2000a; 2000b.

In summary, a comparison of the study's late and early respondents revealed little difference between the two groups of visitors and generalizability with the larger sample population appears warranted. A comparison with existing knowledge of visitor characteristics

documented in the *2000 Point Pelee National Park Visitor Survey* suggests the study's sample may not be representative of the parks' visitor population. However this has no negative impact on the overall utility of the data collected in this study to explore the theoretical relationships between place attachment, pro-environmental behaviour and various external factors being pursued here in this study. It may, however, limit the development of specific practical recommendations tailored to the Point Pelee National Park. Nevertheless the findings will contribute a great deal to our general understanding of environmental attitudes and behaviours, and the role that a specific context such as a national park may play.

The preceding response rate analysis highlights many characteristics of the study's sample of park visitors. Additional characteristics are provided next.

## ***Descriptive Characteristics***

### **Socio-demographic characteristics**

The following socio-demographic characteristics were collected for this study: Age, gender, income, and education. They will facilitate comparison of this study's sample with other studies. Based on previous place attachment and environmental attitude-behaviour research, it is not anticipated that these variables will demonstrate strong relationships with place attachment or pro-environmental behaviour.

These socio-demographic characteristics are summarized in Table 4.9. A higher number of females (52.7 %,  $n = 187$ ) than males (45.6 %,  $n = 162$ ) completed and returned the survey. As is often observed in other park research, visitors to Point Pelee National Park reported higher education levels than the national average; more than three quarters of the sample noted the completion of a university degree or college diploma.<sup>7</sup> A large number of respondents (20 %,  $n = 71$ ) declined to answer the question on household income. Of the remaining respondents, the largest income group was the CND \$100,000 and over group at 19.2% ( $n = 68$ ). Reported rates of annual household income also appear higher than the

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<sup>7</sup> In 2002 43% of Canada's working-age population aged 25-64 had a college diploma or university degree (Statistics Canada, 2005a).

national average; just over 66% ( $n = 164$ ) of respondents reported incomes over \$60,000<sup>8</sup>. The final socio-demographic indicator, age was characterized by a mean of 52.83 years of age ( $SD = 13.8$ ). As reported earlier, using age categories standardized by Parks Canada, the largest age group was 35 to 54 years of age (38.9 %,  $n = 138$ ), however nearly half (47.6 %,  $n = 169$ ) of the sample was 55 years of age or older.

Table 4.9

*Socio-demographic Characteristics*

<b>Sex (<math>n = 349</math>)</b>						
	<b>Female</b>	<b>Male</b>				
	187	162				
	(52.7)	(45.6)				
<b>Education (<math>n = 351</math>)</b>						
	<b>Elementary</b>	<b>High School</b>	<b>College diploma</b>	<b>University bachelor degree</b>	<b>University graduate degree</b>	
	17	72	82	104	89	
	(4.8)	(20.3)	(23.1)	(29.3)	(25.1)	
<b>Income (<math>n = 275</math>)</b>						
	<b>&lt; \$20,000</b>	<b>\$20,000 - \$39,999</b>	<b>\$40,000 - \$59,999</b>	<b>\$60,000 - \$79,999</b>	<b>\$80,000 - \$99,999</b>	<b>&gt;\$100,000</b>
	17	35	58	46	50	68
	(4.8)	(9.9)	(16.3)	(13)	(14.1)	(19.2)
<b>Age (<math>M = 52.83</math>, <math>n = 346</math>, <math>SD = 13.829</math>)</b>						
	<b>≤ 16 yrs</b>	<b>17-24</b>	<b>25-34</b>	<b>35-54</b>	<b>55-64</b>	<b>≥ 65 yrs</b>
	4	5	30	138	93	76
	(1.1)	(1.4)	(8.5)	(38.9)	(26.2)	(21.4)

Note 1: Percentages in parentheses

Note2: Income in Canadian dollars

<sup>8</sup> In 2003 two-person house holds earned an average \$72,000 before taxes. Unattached individuals earned an average of CND \$30,900 before taxes (Statistics Canada, 2005b).



## Place Attachment Characteristics

The intensity of place attachment expressed by the survey respondents was measured with two different questions. Question 2 asked respondents to indicate their level of attachment to Point Pelee National Park by selecting a number from 0 indicating “No attachment” to 10 indicating that they were “Very attached.” Nineteen (5.4 %) respondents did not answer the question (see Table 4.10). Many of these missed responses may have been an artefact of the question format and placement on the survey page. Of the remaining respondents an overwhelming majority (81.7 %,  $n = 290$ ) claimed a moderate to high level of attachment (i.e., a score of 7 or higher) and only 46 (4.8 %) indicated a modest through low attachment (i.e., a score of 6 or less). The mean level of attachment was 8.25 ( $n = 336$ ).

Table 4.10

*Intensity of Place Attachment, Place Affect, Place Identity, and Place Dependence: Responses to Questions 2 and 3*

<b>Question 2</b> Level of Attachment	<b>Place Attachment</b> ( $n = 336$ )	<b>Place Attachment</b> ( $n = 346$ )	<b>Place Affect</b> ( $n = 349$ )	<b>Place Identity</b> ( $n = 347$ )	<b>Place Dependence</b> ( $n = 350$ )	<b>Question 3</b> Level of Attachment
<b>1 thru 6 – Low</b>	46 (13.7)	1 (.3)	0 (0)	2 (.6)	8 (2.3)	<b>1 - Low</b>
<b>7 – Moderate</b>	42 (11.8)	18 (5.1)	12 (3.4)	11 (3.1)	104 (29.7)	<b>2 – Moderately Low</b>
<b>8 – Moderate to High</b>	72 (20.3)	139 (39.2)	106 (29.9)	99 (27.9)	147 (41.4)	<b>3 – Neutral</b>
<b>9 – High</b>	71 (20.0)	167 (47)	183 (51.5)	179 (50.4)	80 (22.5)	<b>4 – Moderately High</b>
<b>10 – Very Attached</b>	105 (29.6)	21 (5.9)	48 (13.5)	56 (15.8)	11 (3.1)	<b>5 – High</b>
	$M = 8.25$ $SD = 1.846$	$M = 3.5$ $SD = .838$	$M = 3.7$ $SD = .825$	$M = 3.7$ $SD = .855$	$M = 2.7$ $SD = 1.232$	

Note 1: Percentages are in parentheses.

Note 2: In calculating means for variables drawn from Question 3 a minimum number of items was required for place attachment ( $\geq 14$ ), place affect ( $\geq 5$ ), place identity ( $\geq 5$ ), and place dependence ( $\geq 3$ ). This was used during initial descriptive statistic analysis. For SEM and correlation analysis all cases were used.

Question 3 featured the use of 16 place affect, place dependence and place identity items to measure an overall level of place attachment. Survey participants were asked to indicate their level of disagreement or agreement with each item. These were coded “1” for “Strongly disagree” through “5” for “Strongly agree.” If respondents answered at least 14 of

the 16 items, their totals were averaged to determine each individual's level of place attachment. Disagreement with items indicated low levels of attachment, and high levels of agreement indicated high levels of attachment.

The largest portion of respondents "agreed" with the place attachment items (47 %,  $n = 167$ ), thereby expressing moderate levels of place attachment to the park; only 5.9% ( $n = 21$ ) "strongly agreed" with the place attachment items, thereby expressing high levels of place attachment. A large portion of respondents (39.2 %,  $n = 139$ ) averaged a neutral opinion towards the place attachment items, and by default a neutral attitude toward the park. Only a small portion of the sample (5.4 %,  $n = 19$ ) "disagreed" or "strongly disagreed" with the place attachment items, thereby expressing a low level of attachment to the park. These observations support the anticipated findings that a high proportion of respondents would indicate moderate to high place attachment. The mean intensity of place attachment specified by the participants was 3.49 ( $SD = .636$ ). These findings are not surprising based on previous place attachment research which has documented positive feelings toward parks (Korpela et al., 2001), and the anticipated positive attitudes that Friends of Point Pelee and repeat visitors would demonstrate.

From Question 3, the intensity of each respondent's place affect, place dependence and place identity could also be calculated (see Table 4.10). Each respondent's average place affect and place identity scores were calculated if they answered at least five of the six items found in each sub-dimension. Similar qualifiers were set for measuring place dependence, however for this sub-dimension respondents had to answer at least three of the four place dependence items. A mean score of 3.7 was achieved for place affect ( $SD = .649$ ,  $n = 349$ ) and place identity ( $SD = .700$ ,  $n = 347$ ). The functional relationship with the park, or place dependence was characterized by a much smaller mean of 2.9 ( $SD = .814$ ,  $n = 350$ ). Table 4.10 summarizes additional information. For example, in each category the largest portion of survey participants expressed a "neutral" level of place dependence (41.4 %,  $n = 147$ ), and moderately high levels of place identity (50.4 %,  $n = 179$ ) and place affect (51.4 %,  $n = 183$ ). However, also of interest is the high number of respondents (29.7 %,  $n = 104$ ) who expressed moderately low levels of place dependence.

In comparing the forms of measurement used in determining survey participants' attachment to Point Pelee National Park, it appears that the format of Question 2 produced a much higher level of expressed place attachment than the format utilized in Question 3. Question 3 is the preferred method of measurement as it is intended to provide a more nuanced understanding of place attachment. However Questions 2 was included in the study for comparative purposes and for reference in future studies where a full place attachment scale may not be feasible due to space constraints.

Table 4.11 describes the central tendency measures for the place attachment scale items. Place dependence items are characterized by the lowest mean scores and higher levels of variance. The lowest scoring item: "The things I do at Point Pelee I would enjoy doing just as much at a similar site" [reverse coded] ( $M = 2.56$ ,  $SD = 1.036$ ) may be characterized by a low score because it was a negatively phrased statement. Barnette (2000) suggests that items that are negatively phrased and require reverse coding, are often characterized by lower means than positively phrased items creating problems with internal consistency and other statistics. This may explain the low mean for this one item, however many of the other place dependence items also illustrate lower levels of attachment, suggesting that a functional relationship with Point Pelee may not be the leading contributor to survey respondents' attachment to Point Pelee National Park.

The place affect items are characterized by a broad range of averages and variance. Respondents indicated high levels of agreement with the more benign and generalizable affect items such as "I am fond of Point Pelee N.P." ( $M = 4.42$ ,  $SD = .641$ ). However they did indicate less support for the more strongly phrased items such as "I feel happiest when I am at Point Pelee N.P." ( $M = 3.08$ ,  $SD = 1.024$ ) and "Point Pelee is my favourite place to be" ( $M = 2.95$ ,  $SD = .984$ ). These latter items may be more effective indicators of those respondents who are highly attached to the park.

Little variance between or within the item means used to measure place identity characterized the data set. This may indicate that the place identity items are measuring a

similar construct. If this is the case, fewer items could be used in subsequent renditions of this sub-scale. Similar and high corrected item-total correlation values for each place identity item, ranging from  $r = .503$  to  $.738$ , appear to support this (see Appendix B-3).

Table 4.11

*Measures of Central Tendency for Place Attachment Scale Items*

Scale items	<i>N</i>	<i>M</i>	<i>SD</i>
<b>Place Identity Items</b>			
a. When I visit Point Pelee N.P., others see me the way I want them to see me	332	3.76	.857
b. I identify strongly with Point Pelee N.P.	351	3.89	.858
c. I feel Point Pelee N.P. is part of me	348	3.35	1.054
d. Visiting Point Pelee N.P. says a lot about who I am	347	3.63	.955
e. Point Pelee N.P. means a great deal to me	350	3.95	.845
f. I feel I can really be myself when I am in Point Pelee N.P.	350	3.83	.904
<b>Place Affect Items</b>			
a. I feel happiest when I am at Point Pelee N.P.	351	3.08	1.024
b. Point Pelee N.P. is my favourite place to be	352	2.95	.984
c. I feel strong, positive feelings for Point Pelee N.P.	352	4.02	.793
d. I feel relaxed when I am at Point Pelee N.P.	351	4.36	.634
e. I am fond of Point Pelee N.P.	348	4.42	.641
f. I really miss Point Pelee N.P. when I am away too long	348	3.17	1.152
<b>Place Dependence Items</b>			
a. The things I do at Point Pelee N.P. I would enjoy doing just as much at a similar site (r)	345	2.56	1.036
b. I wouldn't substitute any other area for doing the types of things I do at Point Pelee N.P.	349	2.77	1.106
c. I get more satisfaction out of visiting Point Pelee N.P. than any other park	350	2.80	1.113
d. Point Pelee is the best place for what I like to do	350	3.24	1.016

(r) Item was reserve coded for analysis purposes.

### **Pro-environmental Behaviour Characteristics**

Pro-environmental behaviour amongst survey participants was identified in Question 8 (Appendix A-3) through the measurement of respondents' expressed intentions to engage in a number of pro-environment behaviours during the next 12 months. These intentions were divided into park-specific and general environmental behaviours.

On a Likert-type scale where "1" indicated it was "Not probable" that the survey participant intended to participate in the selected environmental behaviours and a "5" indicated that it

was “Highly probable” the following results were attained: A mean score of 3.7 ( $SD = .680$ ,  $n = 349$ ) was achieved for pro-environment behavioural intentions related to the general environment, and a mean score of 3.8 ( $SD = .696$ ,  $n = 344$ ) was achieved for pro-environment behavioural intentions related to the park. Only those respondents who completed at least 10 of the 12 items found in each of the pro-environmental sub-scales were included in this analysis. In short, a moderately high level of pro-environment behavioural intentions was observed in the sample population. Table 4.12 describes the frequencies of responses related to Question 8.

Table 4.12

*Frequencies of Park-Specific and General Pro-Environment Behaviour Categories*

	<b>Park-specific categories</b> ( $M = 3.8$ , $n = 344$ , $SD = .883$ )	<b>General environment categories</b> ( $M = 3.7$ , $n = 347$ , $SD = .877$ )
<b>Very low to moderately low</b> <sup>a</sup>	16 (4.5)	17 (4.8)
<b>Neutral</b>	75 (21.1)	102 (28.7)
<b>Moderately high</b>	193 (54.4)	184 (51.8)
<b>Very high</b>	60 (16.9)	46 (13)

Note 1: Percentages in parentheses

Note 2: A minimum number of items were required for each behavioural intention category ( $\geq 10$ ) in the initial descriptive statistics analysis, but not later in SEM or correlation analysis.

Note 3<sup>a</sup>: Categories 1 and 2 were collapsed into one, Very low to moderately low, due to low numbers.

Table 4.13 reports on each pro-environment behavioural intention item’s mean and standard deviation. Participants were instructed to indicate how probable their participation in the listed pro-environmental behaviours would be in the next 12 months on a 1 to 5 scale. A “1” indicated it was “Not probable” that they would perform the behaviour, “5” indicated it was “Very probable.”

These measures highlight a lower level of planned participation in political or activist-based activities (e.g., “Participate in organized, peaceful environmental protests” ( $M = 2.29$ ,  $SD = 1.92$ ) and “Participate in a public meeting about managing Point Pelee N.P. or a similar park” ( $M = 2.84$ ,  $SD = 1.246$ )). Higher levels of planned participation are evident for activities that are easy to perform and perhaps more socially engrained. They are also characterized by lower levels of variance (e.g., “Sort garbage into recyclable materials and non-recyclable materials” ( $M = 4.87$ ,  $SD = .514$ )). Only moderate levels of planned participation characterize activities related to financial contributions or payment (e.g., “Pay extra for transportation if it is environmentally friendly” ( $M = 3.37$ ,  $SD = 1.317$ ) and “Contribute donations to ensure protection of parks like Point Pelee N.P.” ( $M = 3.59$ ,  $SD = 1.178$ )). In summary, the more active and activist type items were consistently characterized by lower than average scores and greater variance. This is not unexpected as these activities are less broadly embraced by the public and are more resource intensive to perform (i.e., money and time).

Table 4.13

*Measures of Central Tendency for Pro-environment Behavioural Intentions Scale Items*

Scale items	<i>N</i>	<i>M</i>	<i>SD</i>
<b>General Environmental Behaviours<sup>a</sup></b>	349	3.7	.680
a. Talk to policy makers about environmental issues	347	2.63	1.426
b. Buy fruits and vegetables grown without pesticides or chemicals (i.e., organic food)	349	3.88	1.180
c. Pay extra for transportation if it is environmentally-friendly (e.g., a fuel efficient car)	345	3.37	1.317
d. Sort garbage into recyclable material and non-recyclables	351	4.87	.514
e. Invest in companies that utilize green technologies	341	3.36	1.228
f. Reduce energy and water consumption	349	4.48	.839
g. Learn more about the state of the environment and how to help solve environmental problems	349	4.13	.892
h. Participate in organized, peaceful environmental protests	348	2.29	1.92
i. Join in community clean up efforts	348	3.55	1.224
j. Contribute money to environmental organizations	347	3.61	1.256
k. Talk to others about environmental issues	348	4.12	1.013
l. Avoid buying products from companies with poor environmental records	350	4.0	1.010

Scale items	<i>N</i>	<i>M</i>	<i>SD</i>
<b>Park-specific Environmental Behaviours<sup>a</sup></b>	344	3.8	.696
m. Pick up litter at Point Pelee National Park left by other people	345	4.2	1.036
n. Tell my friends not to feed the animals in Point Pelee National Park and similar parks	346	4.0	1.086
o. Sign petitions in support of Point Pelee National Park and similar protected areas	344	4.2	1.035
p. Learn more about Point Pelee National Park's natural environment	345	4.07	.917
q. Write letters of support of Point Pelee National Park and similar protected areas	344	3.1	1.267
r. Volunteer my time to projects that help Point Pelee National Park or similar parks and nature areas	344	3.18	1.278
s. Encourage others to reduce their waste and pick up their litter when they are in Point Pelee National Park	345	4.04	1.056
t. Participate in a public meeting about managing Point Pelee National Park and parks like it	344	2.8	1.246
u. Pay increased park fees if they were introduced and used for park programs	346	3.8	1.167
v. Volunteer to reduce my use of a favourite spot in the park if it needs to recover from environmental damage	345	4.33	.906
w. Volunteer to stop visiting a favourite spot in the park if it needs to recover from environmental damage	345	4.39	.870
x. Contribute donations to ensure protection of parks like Point Pelee National Park	343	3.59	1.178

Note1<sup>a</sup>: Minimum number of items required (i.e.,  $\geq 10$ ) to calculate central tendency measures for each behavioural intention category. Calculations for individual items utilized all cases in data base.

Pro-environmental behaviour was also measured with other questions in the survey instrument. In a similar Likert-type scale format survey participants were asked to indicate, if after visiting the park they were more likely to support the environment and the park. On a scale from “1” which represented “strongly disagree” and “5” which represented “strongly agree” a mean of 3.85 ( $SD = .832$ ) was achieved in response to the question: “After visiting Point Pelee N.P. are you encouraged to do more for the environment” and a mean of 3.68 ( $SD = .838$ ) was realized in response to the question “After visiting Point Pelee N.P. are you encouraged to do more for the park.” A large majority “agreed” or “strongly agreed” that they were encouraged to do more for the environment (64.5 %,  $n = 229$ ) and for the park (56.3 %,  $n = 200$ ). These high rates of agreement correspond strongly the findings observed in the larger behavioural intentions scales; however for these single item questions, doing

more for the general environment was characterized by a higher mean than doing more for the park.

Pro-environment behaviour was also documented by Question 4f (Appendix A-3) which asked survey respondents if they had been a member of an environmental group in the past 12 months. Based on previous environmental behaviour studies membership in an environmental organization is a strong predictor of pro-environment behavioural intentions. Surprisingly, nearly half the sample population (44.8 %,  $n = 159$ ) stated that they had been a member of an environmental organization in the last 12 months. A second approach to documenting membership was also accomplished through collaboration with Friends of Point Pelee. The park's membership group provided a list of current members. Friends of Point Pelee members who returned a completed survey numbered 48 or 13.5% of survey respondents. Twenty-eight (7.9%) survey respondents indicated that they were a member of FoPP and an environmental group. This overlap represents 60.9% of FoPP members and 17.6% of environmental group members. Despite this overlap the researcher wanted to retain both variables as it was believed that a difference between the park-specific membership and the general environmental membership may exist.

Information on donations of time and money in the last 12 months to Friends of Point Pelee (FoPP) and environmental groups was also requested (Questions 6 and 7). Only 35.8% ( $n = 125$ ) claimed to have donated money to Friends of Point Pelee, however nearly half the sample population stated that they had donated money to an environmental group in the last 12 months (46.8 %,  $n = 166$ ). These donations included group membership fees. Donation amounts ranged from CND \$2 to CND \$25,000. Those who donated money to FoPP made an average donation of \$75.28 ( $SD = \$183.79$ ). Donations made to other environmental groups averaged \$526.63 ( $SD = \$2,160.33$ ). These monetary donations included membership fees if respondents were members of FoPP or another environmental organization.

Donations of time were lower with 17.1% ( $n = 61$ ) of the survey respondents stating that they had assisted Friends of Point Pelee and 26.5% ( $n = 94$ ) of respondents stating that they



had spent time helping environmental groups. Donation of time to these groups during the last 12 months ranged from one to 365 days. Those who donated time to FoPP contributed 16.8 days per year ( $SD = 52.49$ ), where as those who contributed time to other environmental groups averaged 25 days per year ( $SD = 64.83$ ). A comparison of group members with the overall sample averages of donated time and money is detailed in Table 4.14.

Table 4.14

*Donation of Time and Money to Friends of Point Pelee (FoPP) and Other Environmental Groups<sup>a</sup>*

	Money Donated to FoPP		Time Donated to FoPP		Money Donated to Env. Groups		Time Donated to Env. Groups	
	Yes	No	Yes	No	Yes	No	Yes	No
<b>Sample</b> ( <i>n</i> = 351)	128 (36.1)	223 (62.8)	61 (17.2)	288 (81.1)	166 (46.8)	176 (49.6)	94 (26.5)	254 (71.5)
<b>Members of Friends of Point Pelee</b> ( <i>n</i> = 47)	42 <sup>c</sup> (87.5)	5 (10.4)	18 (37.5)	29 (60.4)	26 (54.2)	20 (41.7)	20 (41.5)	26 (54.2)
<b>Environmental Group Members</b> ( <i>n</i> = 157) <sup>b</sup>	69 (43.4)	88 (55.3)	34 (21.4)	123 (77.4)	114 (71.7)	39 (24.5)	75 (47.2)	81 (50.9)
<b>Total Donations (Sample Ave.)</b>	<i>M</i> = \$20.23, <i>n</i> = 341, <i>SD</i> = \$37.37)		<i>M</i> = 2.94, <i>n</i> = 349, <i>SD</i> = 22.68)		<i>M</i> = \$255.61, <i>n</i> = 342, <i>SD</i> = \$1,525.68)		<i>M</i> = 6.75, <i>n</i> = 348, <i>SD</i> = 35.35)	
<b>Total Donations (Donor Ave.)</b>	<i>M</i> = \$75.28, <i>n</i> = 125, <i>SD</i> = \$183.793)		<i>M</i> = 16.8, <i>n</i> = 61, <i>SD</i> = 52.49)		<i>M</i> = \$526.63, <i>n</i> = 166, <i>SD</i> = \$2,160.33)		<i>M</i> = 25, <i>n</i> = 94, <i>SD</i> = 64.83)	

<sup>a</sup> Percentages are in parentheses. To be classified as a contributor participants had to have donated at least CND \$1 and/or 1 day to Friends of Point Pelee or another environmental group.

<sup>b</sup> 28 of the 47 FoPP members, noted they were members of an environmental group within the last 12 months and are also included in the latter category. Strangely the 19 remaining FoPP members either do not think of FoPP as an environmental group or forgot they were members of FoPP.

<sup>c</sup> All membership of FoPP in the sample (*n* = 48) should have indicated that they donated money to FoPP because the question included membership fees as part of the donation.

## **External factors**

Apart from measuring place attachment and pro-environment behaviours, the survey instrument was also designed to determine several other factors. Based on previous research and theoretical considerations each of these factors should demonstrate a moderate to strong relationship with the two central concepts of this study. These factors are described in three separate stages. First, the variables that can be used to classify visitors are described. This is followed by a report on variables related to visitation patterns. A third group of external factors are described in a final section called “Other variables.”

### **Visitor classification**

The following visitor descriptors are described next: day versus overnight visitors; first time versus repeat visitor; favourite activity to participate in while visiting Point Pelee National Park; plans to return to the Park; and, importance of visiting the park in last trip involving a visit to the park. These are in addition to the basic socio-economic indicators described earlier in this chapter. They are not a main focus of further analysis in this thesis, but do inform some of the discussion here and will be returned to in subsequent analysis.

One approach to categorizing visitors in the survey sample is whether they were *day visitors* or *night visitors* during their most recent trip to Point Pelee National Park (Appendix A-3, Question 13). The majority of visitors were day visitors (71.3 %,  $n = 253$ ), followed by visitors who stayed overnight in the region for at least one night (27.6 %,  $n = 98$ ). The percentages of day versus overnight visitors adjust slightly when this question is asked in a slightly different manner: Question 12 asked respondents to indicate what visitation category best described their most recent visit to Point Pelee National Park. Close to 97% of visitors claimed to be day visitors. This difference in responses to these survey questions can be explained through question format and the fact that few visitors actually stay overnight inside the park. More accommodation facilities lie outside the park.

It was also speculated that visitors who have visited Point Pelee National Park more than once may be characterized by higher levels of place attachment and pro-environmental behaviours than visitors who have only been to the park once. Determining whether a visitor was a *first time visitor* or a *repeat visitor* was conducted in two different ways. The first step entailed using the park's database which details which visitors who had completed the "Let's Keep in Touch" forms were first time visitors. This was used as a basis for gathering as many first time park visitors as possible and resulted 64 (18 %) respondents returning surveys from this group. However this was deemed to be only a rough estimate considering the time elapsed since they had completed the "Let's Keep in Touch" form. The visitors could have returned to the park between that time and the distribution of the survey. As an alternative, two dates collected in the survey, year of most recent visit and year of first visit were used to give a more accurate estimation of the "first-time" versus "repeat visitor" status of each respondent. This method of calculation resulted in 55 respondents or 15.5% of the survey sample being identified as first time visitors to the park. The remainder of the survey sample, 84.5% ( $n = 300$ ) were repeat visitors. While only 43 (67.5 %) members of this latter group were also found in the quota sample group of "Let's Keep in Touch" first time visitors, it was determined that the classification resulting from the use of most recent year of visit and year of first visit data categories was the more valid and reliable measure and is used throughout the remainder of this study when first time visitors are discussed.

A final means of categorizing visitors is the identification of their *favourite activity* while visiting Point Pelee National Park. Question 26 (Appendix A-3) was used to collect this information. Even though respondents were instructed to provide only one activity, they often wrote more than one leisure pursuit in the space provided. When this occurred, only the first listed response was recorded. The leading activities were bird watching (41.1 %,  $n = 146$ ), walking (20.6 %,  $n = 73$ ), hiking (10.4 %,  $n = 37$ ), biking (5.9 %,  $n = 21$ ) and wildlife watching (2.5 %,  $n = 2.5$ ). A total of 22 different activities were identified.

Question 23 measured respondents' *plans to return* to Point Pelee National Park. It was speculated that intentions to return to the park might be strongly related higher levels of attachment than those who were not planning to return. Additionally higher levels of pro-

environment behavioural intentions towards the park were expected as individuals who plan to use the Park again would more readily care for the park. A majority of respondents “Strongly agreed” (75.2 %,  $n = 267$ ) or “Agreed” (15.5,  $n = 55$ ) that they planned to return to the park.

The *importance of the park* in respondents’ decision to take their most recent trip that included a stop at the park was measured by Question 11. It is hypothesized that if the park played an important role in respondents’ most recent trip (which included a visit to the park), those same respondents may demonstrate a high level of place attachment for the park. Over half of respondents (54.9 %,  $n = 195$ ) stated it was the “Entire influence.” An additional 23.1% ( $n = 82$ ) reported the park was very influential (i.e., they indicated an 8 or 9 on a 0-10 point scale where 10 represented the park as the entire influence). This variable can be used as a guide to understanding individual’s motivation for traveling to the park. Respondents who indicated that Point Pelee National Park was the “entire influence” for taking the trip demonstrated intense motivation for visiting the park.

### **Visitation Patterns**

Survey respondents can also be differentiated by travel patterns. These were measured via frequency of visitation, duration of visit, year of first visit to the park and subsequent length of affiliation with the park, and visitation to the park during childhood. Higher levels of each of these visitation characteristics are expected to be linked with higher levels of place attachment amongst survey respondents, and possibly park-specific pro-environmental behaviours. In Question 17 the majority of visitors described their visitation to Point Pelee National Park as “Several times a year” (38.6 %,  $n = 137$ ) (see Table 4.15). Frequency of visitation was also documented by Question 18 which asked how many days in the last 12 months had the survey respondents spent at the park. A mean of 10.95 ( $SD = 25.965$ ) days was documented. Remarkably only 57 (16.1 %) survey respondents reported they had not spent any time in the park during the last 12 months. In Question 21 respondents who has taken an overnight trip in the park in the last 12 months stayed an average of 2.1 ( $SD =$

5.461) overnight trips to the park in the last year. Eighty-one (23.1 %) respondents reported taking an overnight trip to the Point Pelee National Park region in the last year.

Table 4.15

*Frequency of Visitation*

	<b>Number of visits</b> ( <i>n</i> = 351)
<b>&lt; once in 3 years</b>	52 (14.6)
<b>Once in 3 years</b>	38 (10.7)
<b>Once per year</b>	70 (19.7)
<b>Several times per year</b>	137 (38.6)
<b>At least once per month</b>	54 (15.2)

Note: Percentages in parentheses

*Duration of visit* was also measured. Questions 13 and 21 were used to investigate this variable. For respondents that did report visitation to the park in the last 12 months the following observations were made. The mean length of day visits for respondents' most recent trip to Point Pelee National Park was 3.34 hours (*SD* = 2.920). The mean for the length of an *average* overnight visit was 4.27 nights (*SD* = 3.284) and mean for the length of respondents' most *recent* overnight visit was 3.9 nights (*SD* = 3.330). Major changes in the duration of visit data were made to address outlier issues; the following values resulted and were utilized in subsequent SEM and correlation analysis: The mean for the length of an *average* overnight visit was 1.3 nights (*SD* = 2.438) and mean for the length of respondents' most *recent* overnight visit was 1.06 nights (*SD* = 2.266).

*Length of affiliation* with Point Pelee National Park is expected to be strongly linked to place attachment with the park. Length of affiliation was calculated by subtracting the year respondents reported first visiting the park from the year 2005. A very lengthy term of affiliation was observed in the sample population (*M* = 25.35, *SD* = 18.97). Figure 4.2 depicts categories of respondents' length of affiliation. The weakness with this measure of affiliation is that the years between the first visit and most recent are likely characterized by differing degrees of interaction with and perhaps commitment to the park. Nevertheless this

was the deemed to be the most concise method of attempting to measure these characteristics amongst study participants.

Figure 4.2

*Length of Affiliation (n = 339)*

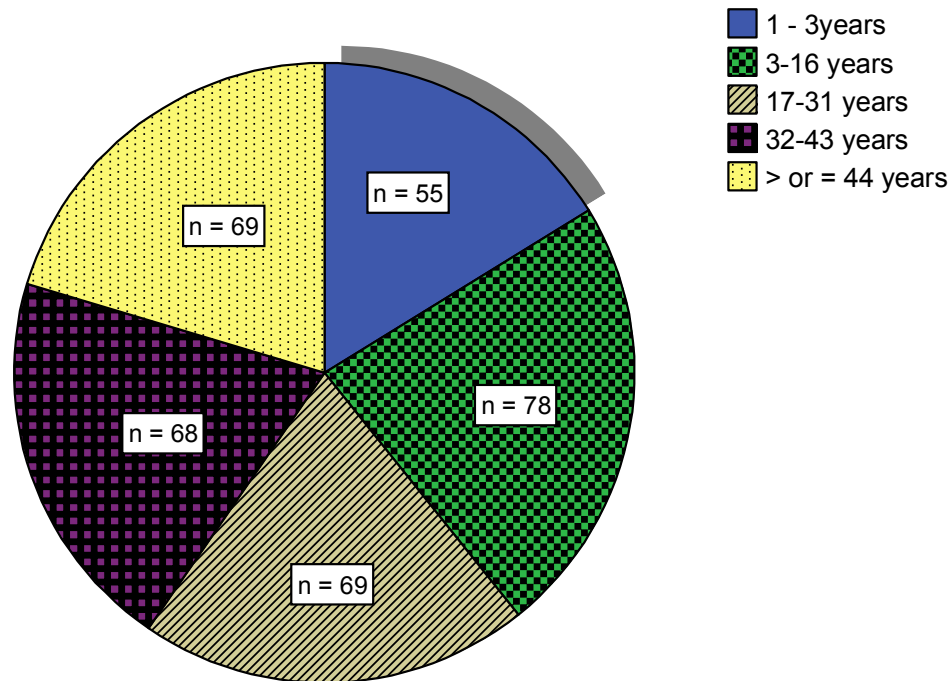


Table 4.16 depicts the number of respondents who *visited Point Pelee National Park and other parks as a child* (16 years or younger). Visitation to a place during childhood may foster greater levels of attachment (Chipeniuk, 1998; Milton, 2002) and visitation to parks in general as a child may be linked to pro-environmental behaviours and/or place-specific pro-environmental behaviours (Chawla, 1992; Palmer, 1998). Reporting on data collected by Question 19 more than half of respondents never visited Point Pelee National Park as children (54.1 %,  $n = 192$ ), while 31.9% ( $n = 113$ ) visited the park “Sometimes” or “Often” during their childhood. In contrast, a much larger majority of respondents reported frequent visits to other parks as children; 64.2% ( $n = 228$ ) stated they had often or sometimes traveled to parks. Only 13.8% reported never visiting parks as a child. The levels of place

attachment and pro-environment behavioural intentions will be investigated more closely for respondents who have visited Point Pelee National Park during their childhood and are reported in the next section of the Results Chapter.

Table 4.16

*Visitation to Point Pelee National Park and other Protected Areas during Childhood*

	Never	Rarely	Sometimes	Frequently
<b>Visitation to PPNP (n = 341)</b>	192 (56.3)	36 (10.6)	60 (17.6)	53 (15.5)
<b>Visitation to other Parks (n = 340)</b>	49 (14.4)	63 (18.5)	123 (36.2)	105 (30.9)

Note. Percentages appear in parentheses.

### Other variables

Several final external variables are described below. These factors include: place satisfaction; distance travelled to the park from each participant’s place of residence; substitution of Point Pelee National Park; and, motivation for visiting the park.

*Place satisfaction* was measured with Question 1 which featured the use of a Likert-type scale ranging from “1 - Very dissatisfied” to “5 - Very satisfied.” The single item used to measure overall satisfaction with the visitor experience produced a higher level of reported satisfaction ( $M = 4.70$ ,  $SD = .603$ ) amongst respondents than the aggregate measure of satisfaction based on three separate mode of experience indicators: natural, social and activity-oriented environments ( $M = 4.45$ ,  $SD = .591$ ) (see Table 4.17). The high means achieved from both measures reflect park visitors’ high level of satisfaction with the park visitation experience. The lowest results were achieved in satisfaction levels with the park’s “social environment” ( $M = 4.24$ ,  $SD = .878$ ). A few respondents expressed discomfort with this category of experience and failed to answer the question. Others may have also been somewhat confused by the item; this may have resulted in a higher incidence of selecting the middle or “neutral” indicator on the Likert-type scale (i.e., A high frequency of selecting “3” or “neutral” characterized responses to this question). Additionally there were considerable

comments made by long-term, presumably local respondents regarding the changes in park regulations over the years and how this has curtailed opportunities for families to recreate at the park's beaches. This may have contributed to some dissatisfaction with the park's social environment. Upon additional reflection of the usefulness of these two approaches to measuring place satisfaction, the latter variable based on the aggregated score of visitor's opinion regarding the three modes of experience may be the best measure to move forward with. Substantively speaking it addresses directly visitor's assessment of the park's environment, rather than the visitor's experience.

Table 4.17

*Place Satisfaction Categories*

<b>Level of Satisfaction</b>	<b>...with overall visitor experience</b> ( <i>n</i> = 354, <i>M</i> = 4.7, <i>SD</i> = .603)	<b>...with natural environment</b> ( <i>n</i> = 352, <i>M</i> = 4.59, <i>SD</i> = .653)	<b>...with social environment</b> ( <i>n</i> = 344, <i>M</i> = 4.24, <i>SD</i> = .878)	<b>...with opportunities to participated in favourite activities</b> ( <i>n</i> = 352, <i>M</i> = 4.49, <i>SD</i> = .773)	<b>Average of natural, social and activity satisfaction categories</b> ( <i>n</i> = 354, <i>M</i> = 4.44, <i>SD</i> = .591)
<b>Very Dissatisfied</b>	2 (.6)	2 (.6)	3 (.9)	3 (.9)	2 (.6)
<b>Somewhat Dissatisfied</b>	2 (.6)	3 (.9)	8 (2.3)	5 (1.4)	5 (1.5)
<b>Neutral</b>	9 (2.5)	11 (3.1)	59 (17.2)	28 (8)	32 (9)
<b>Somewhat Satisfied</b>	74 (20.9)	107 (30.4)	108 (31.4)	98 (27.8)	104 (29.4)
<b>Very Satisfied</b>	267 (75.4)	229 (65.1)	166 (48.3)	218 (61.9)	204 (57.6)

Note. Percentages are in parentheses.

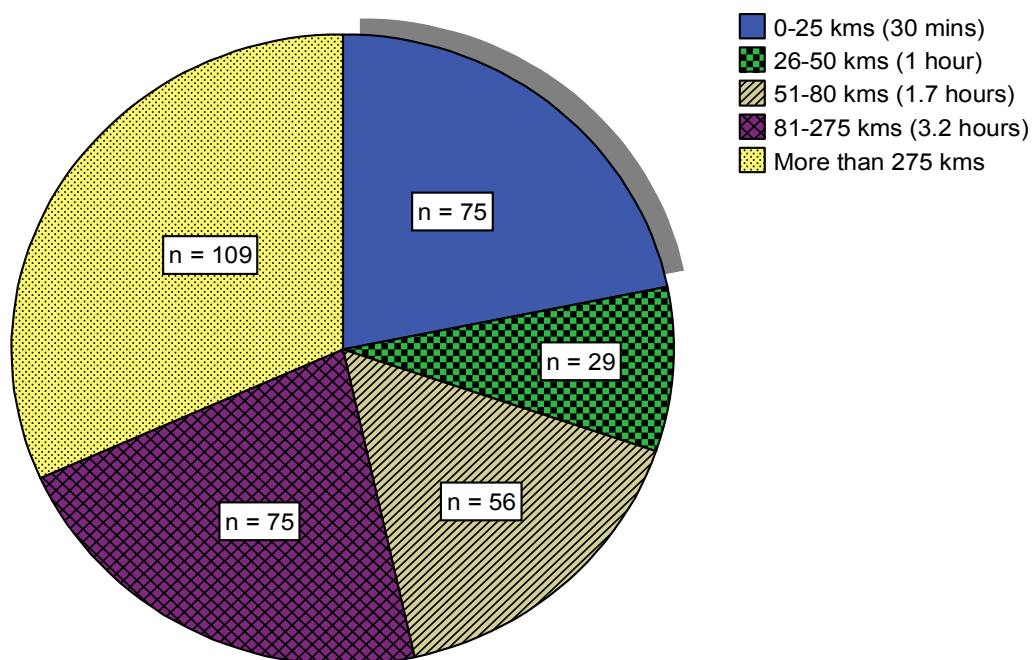
*Distance between respondents' place of residence and the park* was determined using postal codes for Canadian residents and zip codes for US residents. Some place research suggests that individuals who live close to a park or nature area may be more pre-disposed to demonstrate high levels of place attachment and place-specific pro-environmental



intentions, a product of neighbourhood stewardship (Kaltenborn & Williams, 2002; Syme et al., 2002). Distance was identified by using the on-line map service Map Quest (www.mapquest.com) to determine the driving distance between the points. The increments used in Figure 4.3 to report results were developed using driving times (i.e., 30 min, 1 hr, 3 hr, and more than 3 hr) and the Canadian Tourism Commission’s standardized definition of a tourist (i.e., an individual who travels more than 80 km from his/her place of residence). Nearly a quarter of study participants live less than 30 minutes from the park (21.1 %,  $n = 75$ ), where as 30.7% ( $n = 109$ ) live at least three hours from the park, significantly decreasing their ability to make day trips to the park. A mean of 270.6 km ( $SD = 540.576$  km) characterized the distance between respondents’ place of residence and the park.

Figure 4.3

*Distance between place of residence and Point Pelee National Park (n = 351)*



Study participants were also asked to report on their *awareness of substitutes for Point Pelee National Park* (i.e., the park was not unique, they could find the attributes they believe exist at Point Pelee at other nature-destinations), and their *ability to substitute the Park for another nature-based destination* (i.e., their freedom from constraints such as enough time and money to travel to an alternative site). It was anticipated that those who were aware of parks similar to Point Pelee National Park and did not believe the park to be unique, especially in relation to their needs, would be less attached to the park, and possibly express a low level of pro-environment behavioural intentions toward the park. The same was true for those who felt they were not constrained from choosing to visit another park.

Responses to these questions were measured with a Likert-type 1 to 5 scale in which “1” represented strong disagreement and “5” represented strong agreement with the questions. These items were reverse coded to ease interpretation. Not unexpectedly, a very similar pattern of response was achieved for both items (see Table 4.18). A majority of respondents stated they “Strongly disagreed” or “Disagreed” with the statements indicating that they would easily substitute (51.2 %,  $n = 182$ ) or were aware of alternative sites (53.5 %,  $n = 190$ ) to Point Pelee National Park. However a substantial portion of the sample population also stated that they “Strongly agreed” or “Agreed” that they could easily substitute (31.3 %,  $n = 111$ ) or were aware of (25.9,  $n = 92$ ) alternatives to the park.

Table 4.18

*Awareness of Substitute Destinations, and Ability to Substitute PPNP with other Destinations*

	M	SD	Sub very acceptable	Sub somewhat acceptable	Neutral	Sub somewhat not acceptable	Sub not acceptable
<b>Aware of substitutes (n = 342)</b>	3.40	1.177	21 (6.1)	71 (20.8)	60 (17.5)	129 (37.7)	61 (17.8)
<b>Able to substitute (n = 343)</b>	3.32	1.285	32 (9.3)	79 (22.3)	50 (14.6)	112 (32.7)	70 (20.4)
<b>Combined / Anti-substitution (n = 343)</b>	3.35	1.066	12 (3.5)	46 (13)	101 (28.5)	115 (32.4)	69 (19.4)

Note. Percentages appear in parentheses.

*Motivation for visiting the park* was measured with a rank formatted question (Appendix A-3, Question 20). Four different motives were listed and respondents were asked to rank from one to four the most important to least important reason. As expected, a small number of study participants did not complete the question as instructed and gave equally important rankings to each motivation they deemed important (e.g., they gave 1<sup>st</sup> ranks to visiting the natural environment, friends and family and participating in outdoor activities, and a 2<sup>nd</sup> rank to learning about the park's natural environment). These respondents' ( $n = 32$ ) answers were excluded from the any additional analysis noted in this report related to motivations.

It was anticipated that different motivations may be more strongly linked with place attachment. Two approaches were used to examine the motivation data. First, the frequency with which each of the four motives was ranked most important was determined. The initial step involved the removal of problems cases where "first-rank" was assigned to more than one motive ( $n = 32$ ). The remaining cases were examined; motivations to enjoy nature was the leading motive for visiting the park ( $n = 157, 48.6\%$ ) followed by activity-based motives ( $n = 103, 31.9\%$ ), social-motives ( $n = 27, 8.4\%$ ), and learning-motives ( $n = 18, 5.6\%$ ).

In a second step, responses, based on the original scale where "1" represented "Most important" and "4" represented "Least important" were reverse coded and treated as continuous variables. Respondents were also allowed to indicate if a motivation was not applicable. These were given a value of 1 in the reverse coded set of motivation data. In short, a range of values where "5" indicated a motivation was very central to their decision to visit and a value of "1" represented no applicability was created. Once again visiting the natural environment received the highest importance ranking amongst respondents ( $M = 4.1, SD = 1.060$ ) followed by participation in outdoor activities ( $M = 3.7, SD = 1.249$ ), visitation with family and friends ( $M = 2.67, SD = 1.213$ ) and learning about the park's natural environment ( $M = 2.6, SD = 1.018$ ). The social motive category, visiting friends and family, received the greatest number of "Not applicable" responses amongst all the

motivation categories (20.1 %,  $n = 65$ ) outdistancing the next closest category by three-fold. Table 4.19 reports the frequencies of each ranking for the four motivation categories.

Table 4.19

*Rankings of Motivations for Visiting Point Pelee National Park (n = 323)*

<b>Motivation</b>	<b>M</b>	<b>SD</b>	<b>1<sup>st</sup> Rank</b>	<b>2<sup>nd</sup> Rank</b>	<b>3<sup>rd</sup> Rank</b>	<b>4<sup>th</sup> Rank</b>	<b>Not Applicable</b>
Nature	4.1	1.060	163 (52.8)	98 (31.5)	37 (12)	7 (2.3)	16 (5)
Activity	3.7	1.249	108 (35.3)	94 (30.7)	56 (18.3)	40 (13.1)	23 (7.1)
Social	2.67	1.213	23 (7.7)	68 (22.7)	79 (26.3)	86 (28.7)	65 (20.1)
Learning	2.6	1.018	17 (5.7)	40 (13.3)	98 (32.7)	129 (43)	37 (11.5)

Note. Percentages appear in parentheses.

This summary of respondents' motivations for visiting Point Pelee National Park completes the reporting of basic descriptive statistics for variables examined in this study. Next, a review of the reliability of the major scales used in this study is presented. This is followed by a report of the psychometric properties of place attachment and pro-environment behavioural intentions scale. The chapter ends with a description of findings arising from the application of inferential statistics used to study relationships between the major variables of this study.

### ***Characteristics of the Place Attachment and Pro-environment Behavioural Intentions Scales***

This section examines the two dominant scales used in the final survey instrument. Correlation coefficients between scale items and scale dimensions are reported. Next the reliability of each scale and its sub-scales is highlighted. This is accompanied by an analysis of individual items in each scale including mean-if-item-was-deleted, item-total correlation,

and alpha-if-item-was-deleted. Finally, a brief review of the psychometric qualities of each scale is provided through a report of principle components analyses.

### **Place attachment scale characteristics**

As described in the Methods Chapter, most items in the place attachment scale were used previously in place attachment research. However the combination and number of items is unique to this study, as are the use of some of the place affect items. As a result, the reliability of the scale and its sub-scales, along with corrected item-total correlation, mean-if-item-was-deleted, and alpha-if-item-were-deleted are reported in Table 4.20.

The reliability of the place attachment scale was determined to be very good, with a coefficient alpha of  $\alpha = .92$ . The three place attachment sub-scales also produced reasonable reliability scores. The four item place dependence sub-scale produced a coefficient alpha of  $\alpha = .75$ . Higher scores were produced by the larger six item sub-scales that measured place identity ( $\alpha = .86$ ) and place affect ( $\alpha = .82$ ). Although not reported in Table 4.20, the reliability of a combined measure of place affect and place identity was assessed; the 12 item place affect/identity scale produced a Cronbach's alpha of  $\alpha = .91$ .

To evaluate the internal consistency reliability estimates (internal homogeneity), item-to-item correlations of each item were calculated. This statistic provides an indication of the degree to which each item correlates with the scale's total score. It is the correlation of the item being evaluated with all the scale items, excluding itself (DeVellis, 2003; Pallant, 2005). The corrected item-total correlations for the 16 item scale ranged from  $r = .239$  to  $.734$  (see Table 4.20). Item-to-item correlations and related measures of internal consistency of the three original sub-dimensions of place attachment are reported in Appendix B-3; all but one of these correlations fell within an acceptable standard (i.e.,  $r \geq .3$ ). The item, "The things I do at Point Pelee N.P. I would enjoy doing just as much at a similar site" was identified as a candidate for removal ( $r = .239$ ).

In summary, each place attachment-related scale surpassed Nunally's (1978) suggested minimum coefficient alpha value for a reliable scale (i.e.,  $\alpha = .70$ ) and approximates DeVellis' (2003) respectable to very good rating ( $\alpha = .70$  thru  $\alpha = .90$ ), thereby suggesting

that the 16 item place attachment scale and related sub-scales had adequate reliability for addressing the research objectives of this study. In large part, the internal consistency estimates also support this.

Table 4.20

*Place Attachment Scale: Internal Consistency and Coefficient Alpha Values ( $\alpha = .918$ ;  $M = 55.87$ ;  $SD = 10.165$ ; 16 items;  $n = 309$ )*

Scale items	Sub-scales	Mean if item deleted	Item-total correlation	Alpha if item deleted (16 items)
<b>Place Identity Items</b>				
a. When I visit Point Pelee N.P., others see me the way I want them to see me	Place Identity ( $\alpha = .861$ , 6 items) <sup>a</sup>	52.05	.442	.913
b. I identify strongly with Point Pelee N.P.		51.90	.713	.910
c. I feel Point Pelee N.P. is part of me		52.43	.734	.909
d. Visiting Point Pelee N.P. says a lot about who I am		52.16	.645	.912
e. Point Pelee N.P. means a great deal to me		51.83	.714	.910
f. I feel I can really be myself when I am in Point Pelee N.P.		51.93	.636	.912
<b>Place Affect Items</b>				
a. I feel happiest when I am at Point Pelee N.P.	Place Affect ( $\alpha = .821$ , 6 items) <sup>a</sup>	52.69	.710	.910
b. Point Pelee N.P. is my favourite place to be		52.84	.686	.911
c. I feel strong, positive feelings for Point Pelee N.P.		51.75	.657	.912
d. I feel relaxed when I am at Point Pelee N.P.		51.43	.548	.915
e. I am fond of Point Pelee N.P.		51.37	.546	.915
f. I really miss Point Pelee N.P. when I am away too long		52.61	.693	.911
<b>Place Dependence Items</b>				
a. The things I do at Point Pelee N.P. I would enjoy doing just as much at a similar site (r)	Place Dependence ( $\alpha = .754$ , 4 items) <sup>a</sup>	53.21	.239	.925
b. I wouldn't substitute any other area for doing the types of things I do at Point Pelee N.P.		53.03	.571	.915
c. I get more satisfaction out of visiting Point Pelee N.P. than any other park		52.98	.691	.911
d. Point Pelee is the best place for what I like to do		52.54	.713	.910

Note 1 (r) Item was reserve coded when entered into data base.

Note 2 <sup>a</sup> For details on item contributions to scale reliability for each place attachment sub-scale see Appendix B-3.

Correlations coefficients were also generated to assess the relationship between place attachment scale items. With the exception of results associated with the item Q.3i the correlations were statistically significant ranging from a low, moderate correlation of  $r = .249$ ) to a high of  $r = .676$ . These observations suggest that the items used to measure place attachment are moderately to strongly positively correlated. These results were taken into account when considering item deletion.

### **Pro-environment behavioural intentions scale characteristics**

As with the place attachment scale, the pro-environment behavioural intentions scale featured items that were used in previous studies, but with slight modifications. To demonstrate its effectiveness as a measurement tool in this study, the reliability of the scale and its sub-scales are described in Tables 4.21 and 4.22. For the 12 item park-specific sub-scale a coefficient alpha of  $\alpha = .87$  was achieved. A similarly high alpha of  $\alpha = .85$  was produced by the 12 item general environment behavioural intentions sub-scale. When all 24 items were combined in an overall measure of pro-environment behavioural intentions a reliability coefficient of  $\alpha = .91$  was achieved. As the bulk of analysis focused on how respondents differ in their park-specific and general behavioural intentions, this 24-item combined scale is not elaborated on further here, but is reported on in Appendix B-4.

Corrected item-total correlations ranged from  $r = .229$  thru  $.624$  for the 12 item general environmental behaviour scale, and  $r = .441$  thru  $.635$  for the 12 item park-specific pro-environmental behaviours scale. Only one corrected item-total correlation fell below the  $r = >.3$  statistical threshold traditionally employed to evaluate the relationships between scale items. This item, “Sort garbage into recyclable materials and non-recyclable materials,” was retained in the scale, in part, because its removal would only have increased each scale’s Cronbach’s alpha by  $.001$  for the combined scale, and  $.002$  for the general environmental behaviours scale. It was also retained because of its face validity, (i.e., substantively speaking it still appeared to make sense as a measure of environmental behaviour).

Table 4.21

*Internal Consistency and Coefficient Alpha Values for General Environment Behavioural Intentions Scales*

Scale items	Mean if item deleted	Item-total correlation	Alpha if item deleted
<b>General Environmental Behaviours</b>			
( $\alpha = .848$ , 12 items, $n = 328$ )			
a. Talk to policy makers about environmental issues	41.74	.577	.832
b. Buy fruits and vegetables grown without pesticides or chemicals (i.e., organic food)	40.51	.501	.837
c. Pay extra for transportation if it is environmentally-friendly (e.g., a fuel efficient car)	41.01	.457	.842
d. Sort garbage into recyclable material and non-recyclables	39.52	.229	.851
e. Invest in companies that utilize green technologies	41.01	.581	.831
f. Reduce energy and water consumption	39.92	.436	.842
g. Learn more about the state of the environment and how to help solve environmental problems	40.23	.615	.831
h. Participate in organized, peaceful environmental protests	42.09	.568	.832
i. Join in community clean up efforts	40.82	.496	.838
j. Contribute money to environmental organizations	40.78	.552	.833
k. Talk to others about environmental issues	40.27	.580	.832
l. Avoid buying products from companies with poor environmental records	40.38	.624	.829

Table 4.22

*Internal Consistency and Coefficient Alpha Values for Park-Specific Environment Behavioural Intentions Scales*

Scale items	Mean if item deleted	Item-total correlation	Alpha if item deleted
<b>Park-specific Environmental Behaviours</b>			
( $\alpha = .869$ , 12 items, $n = 339$ )			
m. Pick up litter at "X" park left by other people	41.53	.502	.862
n. Tell my friends not to feed the animals in Park "X" and similar parks	41.72	.572	.857
o. Sign petitions in support of Park "X" and similar protected areas	41.51	.613	.855
p. Learn more about "X" Park's natural environment	41.66	.635	.855
q. Write letters of support of Park "X" and similar protected areas	42.62	.616	.854
r. Volunteer my time to projects that help Park "X" <sup>a</sup> or similar parks and nature areas	42.55	.514	.862
s. Encourage others to reduce their waste and pick up their litter when they are in "X" Park	41.68	.570	.857
t. Participate in a public meeting about managing Park "X" and parks like it	42.91	.521	.861



u. Pay increased park fees if they were introduced and used for park programs	41.93	.441	.866
v. Volunteer to reduce my use of a favourite spot in the park if it needs to recover from environmental damage	41.39	.581	.858
w. Volunteer to stop visiting a favourite spot in the park if it needs to recover from environmental damage	41.33	.565	.859
x. Contribute donations to ensure protection of parks like Park “X”	42.12	.586	.856

Overall, the high coefficient alpha scores and the internal consistency estimates for all three pro-environmental behavioural scales indicate a high level of reliability amongst these three scales that is adequate for the research purposes of this study.

### ***Psychometric analysis of place attachment and pro-environmental behaviour scales***

This study, using conceptually-based grouping of scale items (i.e., place affect, place dependence and place identity), explored the dimensionality of place attachment. This, as explained previously, is rooted in a desire to explore the construct of place attachment through an attitude-based lens. Calls for ongoing exploration of place attachment’s dimensionality have been made by many researchers (i.e., Jorgensen & Stedman, 2001; Williams & Vaske, 2003; Stedman, 2003b). To address this, an exploratory analysis of data produced by the study’s main scales was conducted using principle components analysis.

The 16 items of place attachment scale were subjected to principal components analysis. Prior to performing this exploratory factor analysis the suitability of the data was assessed. This consisted of an inspection of the correlation matrix which revealed the presence of many coefficients of .3 and above. The Kaiser-Meyer-Okin value was .93, exceeding the recommended value of .6 (Kaiser, 1970; 1974) and the Barlett’s Test of Sphericity (Barlett, 1954) reached statistical significance, supporting the factorability of the correlation matrix.

Principle components analysis revealed the presence of three components with eigenvalues exceeding 1, explaining 46.9%, 9% and 6.7% of the variance respectively (see Appendix B-5). The third factor lacked depth; only one item loaded strongly on this factor for an

eigenvalue of 1.072. An inspection of the screeplot confirmed the results highlighted by the eigenvalues; a clear break between the second and third components was evident. A break after the second factor on a scatterplot supported the decision that two factors were more appropriate and an oblique rotation was re-run. The two factor structure was confirmed as acceptable.

Unfortunately the pattern of item correspondence was somewhat puzzling; place affect and identity items loaded on both factors. This does not correspond with previous studies that have found strong support for a two dimensional structure of place attachment which features place affect and identity loading on one factor and place dependence items loading on a second. The factor loadings for these two indicators are described in Appendices B-5. The lowest loading item on the place dependence factor (i.e.,  $<.4$ ) was removed from further analysis. The appropriateness of using oblique rotation (Pedhazur & Pedhazur Schmelkin, 1991) was confirmed with a strong correlation between the two factors ( $r = .586$ ).

The pro-environment behavioural intentions scales were also subjected to principal components analysis. Prior to performing this exploratory factor analysis an inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The Kaiser-Meyer-Olkin values ranging from .84 and .88, rising above the recommended value of .6 (Kaiser, 1970; 1974) and the Barlett's Test of Sphericity (Barlett, 1954) reached statistical significance, supporting the factorability of the correlation matrix.

Principle components analysis revealed the presence of several components in each of the pro-environmental behaviour scales that has eigenvalues exceeding 1. The park-specific pro-environment behavioural intentions scale was characterized by three components which explained 41.7%, 12%, and 9.7% of the scale's total variance. Two factors were identified for the general intentions scale; they explained 37.9% and 10.7% of the construct's total variance. Oblique rotation with Kaiser Normalization was utilized to confirm factor loading (Appendix B-6 & B-7). Correlations between the factors confirmed very modest correlations; Factor 1 and Factor 2 of the general environmental intentions scale shared a

correlation of  $r = .348$ , and for the park-specific intentions the following correlations were observed: Factors 1 and 2:  $r = .329$ ; Factors 2 and 3:  $r = .282$ ; and, Factors 1 and 3:  $r = .382$ .

### ***Relationships between Place Attachment, Pro-environment Behavioural Intentions and External Factors***

One of the main objectives of this study is to explore the relationships between place attachment, pro-environmental behavioural intentions and several other external variables. This is described next. First correlation analyses were conducted to confirm that a majority of variables did demonstrate relationships with each other. This is an important first step in preparation for SEM. Relationships between place attachment and pro-environment behavioural intentions are described first. This is followed by an examination of these factors' relationships with the external variables included in this study: a) visitation characteristics; b) place satisfaction; c) membership in an environmental organization and related indicators; d) distance of park from residence; e) substitution of Point Pelee National Park; f) motivation; and g) socio-demographic characteristics.

To explore relationships between place attachment and pro-environment behavioural intentions variables were created by averaging items from the place attachment and pro-environment behavioural scales. This process, described earlier in this chapter, resulted in combined measures of place attachment, place identity, place affect, place dependence, general pro-environment behavioural intentions, place-specific environment behavioural intentions and a combination of the general and place-specific intentions. Due to the prevalence in the literature of place affect and identity items often loading in a single factor, the variable Place Identity-Affect (Id\_Aff), was created and also included in the correlation analysis. This was a composite measure based on the aggregate means of all 12 items associated with these two sub-dimensions.

Relationships between these variables were investigated using Pearson product-moment correlation coefficient. This tool measures the strength of linear relationships between two variables, but not the nature. Interpretation of the strength of correlations was guided by

Cohen's (1998) suggestions:  $r = .10$  to  $.29$  (small);  $r = .30$  to  $.49$  (medium);  $r = .50$  to  $1.0$  (large). The direction of these relationships is reflected by the presence or absence of a negative sign accompanying each correlation value. Preliminary analyses were performed to ensure there was no violation of the assumptions of normality, linearity and homoscedasticity. As was anticipated, significant, positive and moderately strong relationships were found between all place attachment variables and behavioural intention variables (see Table 4.23). Park-specific behavioural intentions and the place attachment variables displayed the strongest correlations ranging from  $r = .536$  ( $n = 337, p \leq .001$ ) with place attachment to  $r = .421$  ( $n = 341, p \leq .001$ ) with place dependence. The combined variable for pro-environment behavioural intentions was characterized by the next strongest relationships with the place attachment variables. The combined measure of place attachment ( $r = .481, n = 340, p \leq .001$ ) demonstrated the strongest relationship with the combined measure of behavioural intentions while place dependence had the weakest ( $r = .385, n = 344, p \leq .001$ ). As predicted, pro-environment behavioural intentions relating the environment in general were characterized by the weakest relationships with the place attachment variables. These relationships were characterized by the same patterns described previously; the strongest relationship was evident with the combined measure for place attachment ( $r = .351, n = 340, p \leq .001$ ) and the weakest relationship was apparent with place dependence ( $r = .287, n = 344, p \leq .001$ ).

To understand the relationships between place attachment and pro-environment behavioural intentions further correlation analysis was undertaken between these two main constructs and the individual items in each constructs' scales. As expected positive, moderately strong correlations were found between all park-specific pro-environment behavioural intentions items and place attachment. "Learn more about Point Pelee N.P.'s natural environment" ( $r = .537, n = 337, p \leq .001$ ) shared the highest correlation with place attachment and "Pay increased park fees if they were introduced and used to park programs" ( $r = .258, n = 339, p \leq .001$ ) shared the lowest correlation.

Table 4.23

*Place Attachment and Pro-environment Behavioural Intentions: Observed Correlations and Centrality Measures*

	Place Attach	Place Ident	Place Affect	Place Depend	Id_Aff	Gen Behav	Park Behav	All Behav
Place Attach	1							
Place Ident	.912**	1						
Place Affect	.939**	.849**	1					
Place Depend <sup>a</sup>	.825**	.587**	.686**	1				
Id_Aff	.970**	.958**	.951**	.666**	1			
Gen Behav	.351**	.338**	.320**	.287**	.346**	1		
Park Behav	.536**	.515**	.495**	.421**	.530**	.711**	1	
All Behav	.481**	.462**	.441**	.385**	.474**	.924**	.927**	1
<i>M</i>	3.49	3.73	3.67	2.85	3.70	3.69	3.81	3.75
<i>SD</i>	.636	.700	.649	.814	.647	.680	.696	.638
<i>N</i>	346	347	349	350	350	349	344	349

Note 1: Variables were analyzed using Pearson' correlation coefficient;

Note 2: \*\*  $p < .001$ .

<sup>a</sup> Throughout the correlation analysis section place dependence is calculated using all four items; later for SEM the least reliable item was removed.

General pro-environment behavioural intentions items also showed positive significant correlations with place attachment, but ranged in strength from small to medium. The exception to this was the item “Sort garbage into recyclable material and non-recyclable.” Several other general pro-environment behaviours such as “Talk to policy makers about environmental issues” ( $r = .167, n = 338, p \leq .01$ ) and “Buy fruits and vegetables grown without pesticides or chemicals” ( $r = .156, n = 340, p \leq .01$ ) shared the lowest, significant correlations with place attachment. The modest strength of these relationships and the relationships between other general pro-environment behavioural intentions are unsurprising given the lack of congruence between place attachment and general environmental behaviours. The one non-significant item related to recycling had a high mean ( $M = 4.87$ ,

$SD = .514$ ), perhaps indicating that this activity is generally accepted by all respondents (and perhaps the public at large) and therefore is not especially useful in attempting to discern differences in specific populations.

Finally, place attachment items were compared with the mean values for general and place-specific pro-environment behavioural intentions. As expected place attachment items correlated more strongly with place-specific than general behavioural intentions. All place-specific items demonstrated medium strength, positive correlations with place attachment, with the exception of “Point Pelee N.P. is my favourite place to be” ( $r = .284, n = 342, p \leq .001$ ) and “The things I do at Point Pelee N.P. I would enjoy doing just as much at a similar site” (reverse coded for analysis) ( $r = .156, n = 355, p \leq .01$ ). The small correlation for the latter item may be linked to its negative phrasing, which may have confused respondents. As was stated previously it was the only item in the place attachment scale that was negatively phrased. This same item produced the only non-significant correlation when place attachment items were compared with the general pro-environment behavioural intentions variable. The remaining place attachment items only shared modest, significant, positive relationships with the general pro-environment behavioural intentions variable. This parallels the findings described above, place-specific behaviours appear to share a stronger relationship with place attachment than general behavioural intentions, a finding that was expected.

### **Visitation characteristics**

Next, the relationship between the three main variables in this study, place attachment, and place-specific and general pro-environment behavioural intentions and survey respondents’ visitation characteristics were examined. Based on previous studies and theoretical speculation visitation characteristics were expected to be strongly related to place attachment and to a lesser degree pro-environmental intentions. Visitation characteristics, measured a number of different ways by the survey instrument, are presented next.

*Frequency of visitation* was examined using three measures. The first, the number of day trips taken to Point Pelee National Park. in the 12 months previous to completing the

questionnaire (Days) produced positive relationships with all place attachment factors; the highest correlation was with place identity ( $r = .259, n = 337, p \leq .001$ ) and the lowest with place dependence ( $r = .167, n = 339, p \leq .001$ ). Although not strong relationships, these findings do reinforce expectations that frequent use of a park creates a bond between the individual and the park. Interestingly this was not as strongly supported with corresponding findings when frequency of overnight visitation was compared with place attachment variables. Positive but very small relationships with the place attachment variables were identified ranging from a high of ( $r = .189, n = 345, p \leq .01$ ) for place attachment to a low with place identity ( $r = .151, n = 354, p \leq .01$ ).

A third frequency variable, *trip frequency*, is characterized by ranked categories (i.e., “1” = visited park once in the last 3 years through “5” = visited park at least 1 time in the last month) was compared with place attachment. Positive, significant relationships of a moderate strength characterized relations between trip frequency and all five place attachment variables. Relations with place attachment ( $r = .419, n = 343, p \leq .001$ ), place identity ( $r = .425, n = 350, p \leq .001$ ), and place affect-identity ( $r = .426, n = 351, p \leq .001$ ) demonstrated the highest coefficient scores, followed by place affect ( $r = .390, n = 351, p \leq .001$ ) and place dependence ( $r = .341, n = 349, p \leq .001$ ). This reinforces the anticipated relationship between frequent use of the park and intense attachment to the park.

All three visitation frequency variables were also compared with pro-environmental intentions. Only one relationship was found to be significant at the  $p \leq .001$  level; a small positive correlation was found between trip frequency and place-specific behavioural intentions ( $r = .220, n = 342, p \leq .001$ ). This gives modest support to the theory that individuals who utilize the park on a frequent basis may also be willing to take action to protect it.

Table 4.24

*Correlations and Measures of Central Tendency: Visitation Patterns, Place Attachment and Pro-environment Behavioural Intentions*

	Place Attach	Place Ident	Place Affect	Place Depend	Place Id-Aff	Env Behav	Park Behav	All Behav	Hours	Nights (rec)	Nights (ave)	Days /trips	Ovnight trips	Trip freq	Affil	Child
Place Attach	1															
Place Ident	.911*	1														
Place Affect	.939**	.819	1													
Place Depend	.825**	.588*	.686**	1												
Place Id-Aff	.970**	.956*	.952*	.665*	1											
Env Behav	.351**	.344**	.325**	.284**	.351**	1										
Park Behav	.536**	.513**	.491**	.420**	.526**	.711**	1									
All Behav	.481**	.466**	.445**	.382**	.477**	.924**	.927**	1								
Hours	-.034	-.017	-.051	-.011	-.038	-.015	.043	.012	1							
Night (rec)	.121*	.105*	.145**	.131*	.144**	.065	.072	.115**	-.527**	1						
Night (ave)	.182**	.161**	.175**	.160**	.177**	.110*	.055	.089	-.325**	.676**	1					
Days trips	.226**	.259**	.204**	.167**	.242**	-.052	.131*	.052	.071	-.102	-.025	1				
Over-night trips	.189**	.151**	.178**	.182**	.172	.079	.054	.072	-.238**	.381**	.541**	.063	1			
Trip frequency	.419**	.425**	.390**	.341**	.426**	-.010	.220**	.121*	.083	-.198**	-.103	.459**	.009	1		
Affiliation w. PPNP	.201**	.258**	.183**	.125*	.231**	.021	.136*	.092	-.028	-.015	-.040	.191**	-.070	.507**	1	
Childhood @ PPNP <sup>a</sup>	.246**	.251**	.222**	.182**	.247**	.060	.128	.107*	.167**	-.236**	-.246	.166	-.188	.373**	.511**	1
<i>M</i>	3.49	3.73	3.67	2.84	3.70	3.70	3.81	3.75	3.34	1.06	1.03	9.87	.36	3.29	25.35	1.92
<i>SD</i>	.635	.700	.660	.816	.650	.680	.696	.638	2.920	2.266	2.438	18.410	.867	1.275	18.972	1.166

Note 1: Variables were analyzed using Pearson's correlation coefficient; \*\*  $p < .001$ ; \*  $p < .05$

Note 2: Statistics for days, nights, overnight trips donated reflect adjustments made to these variables to reduce the affect of outliers in preparation for structural equation modeling. These adjustments are detailed in the final section of the Results Chapter.



*Duration of visit* was measured by documenting the number of hours day visitors spent in the park during their last visit ( $M = 3.34$ ,  $SD = 2.920$ ,  $n = 355$ ) or the number of nights they spent in the park during their most recent overnight trip ( $M = 1.06$ ,  $SD = 1.056$ ,  $n = 355$ ) and their average trip in the last 12 months ( $M = 1.03$ ,  $SD = 2.438$ ,  $n = 355$ ).

Duration of a day visit to the park was characterized by no statistically significant relationships with the place attachment variables. The average length of an overnight trip spent at or near the Park (Nights(ave)) shared the most notable correlations amongst the trip length variables with place attachment, however they were very small ranging from a high of ( $r = .182$ ,  $n = 355$ ,  $p \leq .001$ ) with place attachment and a low of ( $r = .160$ ,  $n = 355$ ,  $p \leq .05$ ) with place dependence. The length of the most recent overnight trip (Nights(rec)) was also shared significant relationship with the place attachment items, but lower than Nights(ave).

Only two correlations between the behavioural intentions variables and the trip length variables were observed; these two correlations are so small that their significance may be due to other factors such as sample size (see Table 4.24).

*Length of affiliation* with Point Pelee National Park was a third variable used to examine the relationship of visitation patterns with place attachment and pro-environment behavioural intentions. Based on previous research and theories it was proposed that the number of years individuals had known the park would be strongly related to high levels of place attachment and park-specific pro-environment behavioural intentions. These expectations were supported. Significant, positive small correlations were found between length of affiliation and place attachment ( $r = .201$ ,  $n = 331$ ,  $p \leq .001$ ), place identity ( $r = .258$ ,  $n = 332$ ,  $p \leq .001$ ), place affect ( $r = .183$ ,  $n = 333$ ,  $p \leq .01$ ), place dependence ( $r = .125$ ,  $n = 334$ ,  $p \leq .05$ ) and place affect-identity ( $r = .231$ ,  $n = 334$ ,  $p \leq .001$ ). Of note are the stronger relationships that are apparent with emotion and cognitive variables in comparison with the functional measure, place dependence. This lends support to the notion that over time an individual's attitude and relationship with a place can covert from a use-oriented or functional association to one that is more related to self identity (Moore & Graefe, 1994).

The only behavioural intention variable that demonstrated a significant correlation with length of affiliation was park-specific pro-environment behavioural intentions ( $r = .136, n = 329, p \leq .05$ ). Although it is a small linear relationship, it does imply a relationship may be present between these two factors. This corresponds to initial study expectations which suggested place-specific pro-environment behavioural intentions may be positively associated with individuals' length of affiliation with the park.

The final variable used to examine the relationship between visitation patterns, place attachment and pro-environment behavioural intentions was *childhood visitation* to Point Pelee National Park (see Table 4.24). Significant positive, yet small correlations were found between frequency of childhood visitation to Point Pelee National Park and place attachment ( $r = .246, n = 335, p \leq .001$ ), place identity ( $r = .251, n = 336, p \leq .001$ ), place affect ( $r = .222, n = 337, p \leq .001$ ), place dependence ( $r = .182, n = 338, p \leq .001$ ) and place affect-identity ( $r = .247, n = 338, p \leq .001$ ). Park visitors who had visited Point Pelee more frequently in their childhood demonstrated higher levels of attachment to the park in comparison with individuals who had not visited or visited infrequently during childhood. These findings support the theory that place-interaction during childhood may foster the development of place attachment.

Results from a comparison of childhood visitation and behavioural intentions are much more mixed. As anticipated, visitation to Point Pelee as a child and park-specific pro-environment behavioural intentions shared a significant, positive, small linear relationship ( $r = .107, n = 333, p \leq .05$ ). No other significant correlations were present between childhood visitation to Point Pelee and general behavioural intentions. The singular significant correlation may suggest that childhood interaction with a place may foster place-specific protective behaviours, or some similar relationship.

### **Place satisfaction**

Based on a limited number of previous studies, satisfaction with Point Pelee National Park was expected to be correlated with place attachment. Data analysis supported this. All

place attachment variables shared small to medium, significant positive correlations with all measures of satisfaction (see Table 4.25). The composite measure of satisfaction (Combine Sat) which combined the average means of three modes of visitor experience, natural environment, social environment and activity-focused, produced the highest correlations with the place attachment variables ranging from a high score with place attachment ( $r = .285, n = 345, p \leq .001$ ) to a low score with place dependence ( $r = .173, n = 349, p \leq .001$ ).

Of the three individual satisfaction scores (nature, social and activity), nature shared the least in common with the place attachment variables. Only one very weak, significant relationship was observed ( $r = .146, n = 343, p \leq .05$ ). Satisfaction with social and activity-based environments shared modest correlations with all place attachment indicators. Very similar patterns were observed between the satisfaction measures and behavioural intentions indicators. However correlations were much weaker overall. The strongest correlation was observed between satisfaction with opportunities to engage in favourite activities and park-specific pro-environment behavioural intentions ( $r = .243, n = 341, p \leq .001$ ).

The significant correlations between most satisfaction measures and place attachment measures, support the proposition that place satisfaction is related to place attachment. Results from the comparison of behavioural intentions variables and place satisfaction variables produced less clear results. One point of interest includes the lack of significant correlations between satisfaction with the park's natural environment and any of the pro-environment behavioural intentions.

Table 4.25

*Correlations and Measures of Central Tendency: Place Satisfaction, Place Attachment and Pro-environment Behavioural Intentions*

	Place Attach	Place Ident	Place Affect	Place Depend	Id-Aff	Env Behav	Park Behav	All Behav	Visit Exp Sat	Nature Sat	Social Sat	Activity Sat	Combine Sat
Place Attach	1												
Place Ident	.912**	1											
Place Affect	.939**	.849**	1										
Place Depend	.825**	.587**	.686**	1									
Id-Aff	.970**	.958**	.951**	.666**	1								
Env Behav	.351**	.338**	.320**	.287**	.346**	1							
Park Behav	.536**	.515**	.495**	.421**	.530**	.711**	1						
All Behav	.481**	.462**	.441**	.385**	.474**	.924**	.927**	1					
Visit Exp Sat	.260**	.208**	.216**	.165	.219**	.096	.232**	.151**	1				
Nature Sat	.146**	.111*	.101	.110*	.110*	-.004	.071	.017	.542**	1			
Social Sat	.241**	.229**	.225**	.133*	.237**	.084	.167**	.119**	.497**	.390**	1		
Activity Sat	.253**	.228**	.205**	.154**	.225**	.124*	.243**	.182**	.548**	.355**	.393**	1	
Combine Sat	.285**	.253**	.232**	.173**	.253**	.081	.208**	.132**	.683**	.720**	.807**	.767**	1
<i>M</i>	3.49	3.73	3.67	2.85	3.70	3.69	3.81	3.75	4.70	4.59	4.24	4.49	4.44
<i>SD</i>	.636	.700	.649	.814	.647	.680	.696	.638	.603	.653	.878	.773	.591

Note: Variables were analyzed using Pearson's correlation coefficient; \*\*  $p < .001$ ; \*  $p < .05$

## **Membership and donations to environmental causes**

To develop a better understanding of the relationship between place attachment and pro-environment behavioural intentions a second category of external variables were measured and examined. These variables were selected to represent individuals' past environmental behaviours. The first of these, membership has been a good indicator of individuals' inclination to partake in environmentally responsible behaviours in the future (McFarlane & Boxall, 2003; Olli et al., 2001). Membership in an environmental organization in the last 12 months and membership in Friends of Point Pelee (FoPP) were compared with the study's main constructs (see Table 4.26).

A comparison of place attachment variables with FoPP membership produced significant, small, positive correlations (see Table 4.26). The strongest correlation existed with place identity-affect ( $r = .267, n = 355, p \leq .001$ ), followed by place affect ( $r = .261, n = 355, p \leq .001$ ), place attachment ( $r = .264, n = 346, p \leq .001$ ), place identity ( $r = .251, n = 354, p \leq .001$ ), and place dependence ( $r = .188, n = 353, p \leq .001$ ). Correlations between environmental group membership and place attachment variables revealed weaker linear relationships. Place identity ( $r = .210, n = 346, p \leq .001$ ) shared the highest correlation with environmental group membership followed by place identity-affect ( $r = .176, n = 347, p \leq .001$ ), place attachment ( $r = .141, n = 340, p \leq .001$ ), and place affect ( $r = .123, n = 347, p \leq .05$ ). No significant correlation was found between place dependence and environmental group membership.

It was assumed that higher levels of donations to FoPP would correlate with attachment to the park; this was supported by modest correlations between money donated to FoPP and the place attachment variables with statistically significant correlations ranging from a high of ( $r = .241, n = 341, p \leq .001$ ) for place affect and a low of ( $r = .146, n = 339, p \leq .001$ ) for place dependence. A strong connection between time donated to FoPP and place attachment variables was not observed; four significant ( $p \leq .05$ ) correlations were present; however the strength of these correlations made them somewhat irrelevant.

No expectations were held for the relationship between the place attachment variables and donations of time and money to environmental groups with the exception of the speculation that attachment to a park might be related to pro-environmental actions elsewhere or conversely, an expressed commitment to the environment might correspond with or transmit into commitment to all parks in general and Point Pelee in particular. However this was not strongly supported. Four very low, significant correlations were observed between place attachment variables and donations of time and money to environmental groups.

Correlations between the membership variables and the behavioural intentions factors were also very inconclusive. A small, positive correlation was observed between FoPP membership and park-specific intentions ( $r = .143, n = 344, p \leq .001$ ) but not with general behavioural intentions. Much stronger correlations between behavioural intentions and membership in an environmental group, especially for general pro-environment behavioural intentions ( $r = .426, n = 343, p \leq .001$ ) were observed. This corresponds strongly with a priori expectations that environmental group membership would be a good predictor of pro-environment behavioural intentions.

Correlations between behavioural intentions indicators, donations to FoPP and other environmental groups demonstrated similar patterns. Donations of time and money to FoPP revealed two significant but very weak correlations with the intentions indicators, where as time and money donations to other environmental groups produced significant, modest correlations with all environmental behavioural indicators. The correlation between money donated to an environmental group and general pro-environment behavioural intentions was the strongest ( $r = .271, n = 336, p \leq .001$ ).

Table 4.26

*Correlations and Measures of Central Tendency: Membership and Donations to Environmental Causes, Place Attachment and Pro-environment Behavioural Intentions*

	Place Attach	Place Ident	Place Affect	Place Depend	Id-Aff	Env Behav	Park Behav	All Behav	FoPP Mem	Env Mem	Time FoPP	Money FoPP	Time Other	Money Other
Place Attach	1													
Place Ident	.912**	1												
Place Affect	.939**	.849**	1											
Place Depend	.825**	.587**	.686**	1										
Id-Aff	.970**	.958**	.951**	.666**	1									
Env Behav	.351**	.338**	.320**	.287**	.346**	1								
Park Behav	.536**	.515**	.495**	.421**	.530**	.711**	1							
All Behav	.481**	.462**	.441**	.385**	.474**	.924**	.927**	1						
FoPP Mem	.264**	.251**	.261**	.188**	.267**	.079	.143**	.115*	1					
Env Mem	.141**	.210**	.123*	.058	.176**	.426**	.294*	.387**	.118*	1				
Time FoPP	.118*	.097	.119*	.107*	.112*	.016	.089	.057	.157**	.135*	1			
Money FoPP	.219**	.202**	.241**	.146**	.230**	.088	.159**	.134*	.350**	.101	.352**	1		
Time Other	.119*	.139**	.074	.045	.112*	.221**	.126**	.186**	.086*	.285**	.206**	.101	1	
Money Other	.076	.107*	.075	.022	.095	.271**	.199**	.247**	.137*	.285**	.001	.167*	.425**	1
<i>M</i>	3.49	3.73	3.67	2.85	3.70	3.69	3.81	3.75	na	na	1.30	20.23	3.64	134.40
<i>SD</i>	.636	.700	.659	.816	.649	.680	.696	.638	na	na	3.950	37.37	10.293	318.394

Note 1: Variables were analyzed using Pearson's correlation coefficient; \*\*  $p < .001$ ; \*  $p < .05$

Note 2: Statistics for days and money donated reflect adjustments made to these variables to reduce the affect of outliers in preparation for structural equation modeling. These adjustments are detailed in the final section of the Results Chapter.

## Distance

A brief comparison of place attachment and behavioural intentions variables with distance between the survey respondent's place of residence and Point Pelee National Park revealed only three significant correlations (see Table 4.27). These correlations were very small and may not indicate there is any real relationship between these variables. It appears that distance is not related to pro-environment behavioural intentions or place attachment.

Table 4.27

*Correlations and Measures of Central Tendency: Distance, Place Attachment and Pro-environment Behavioural Intentions*

	Place Attach	Place Ident	Place Affect	Place Depend	Id-Aff	Env Behav	Park Behav	All Behav	Distance
Place Attach	1								
Place Identity	.912**	1							
Place Affect	.939**	.849**	1						
Place Depend	.825**	.587**	.686**	1					
Id-Aff	.970**	.958**	.951**	.666**	1				
Env Behav	.351**	.338**	.320**	.287**	.346**	1			
Park Behav	.536**	.515**	.495**	.421**	.530**	.711**	1		
All Behav	.481**	.462**	.441**	.385**	.474**	.924**	.927**	1	
Distance	-.099	-.109*	-.101	-.082	-.111*	.073	-.027	.023	1
<i>M</i>	3.49	3.73	3.67	2.85	3.70	3.69	3.81	3.75	270.6
<i>SD</i>	.636	.700	.659	.816	.648	.680	.696	.638	540.576

Note: Variables were analyzed using Pearson's correlation coefficient; \*\*  $p < .001$ ; \*  $p < .05$

## Substitution of Point Pelee National Park

Survey respondents were asked if they could "easily substitute Point Pelee N.P. with another park" ( $M = 3.3$ ,  $SD = 1.285$ ) and were "aware of other parks and natural areas that meet [their] needs as well as Point Pelee N.P." ( $M = 3.4$ ,  $SD = 1.177$ ). These negatively phrased questions featured the use of a Likert-type scale where "1" represented strongly disagree and "5" represented strongly agree. Designed to measure respondents' ability and



willingness to substitute Point Pelee National Park for another park or nature area, the means of both questions were quite low indicating reluctance for many respondents to substitute Point Pelee for another park. These two variables were reverse coded to facilitate interpretation and then combined to create a composite measure (Sat\_All); a reliability coefficient of  $\alpha = .665$  ( $n = 342$ ) was produced for this construct. Although low, with only two items making up this measure, this coefficient alpha value is still above Cortina's (1993) recommended reliability score for factors with less than six items.

This combined measure, Sub\_All ( $M = 3.4$ ,  $SD = 1.066$ ), produced moderately strong, positive, significant correlations with all place attachment variables (see Table 4.28). This indicates that individuals with high place attachment expressed reluctance to substitute Point Pelee National Park with other parks and nature areas. Of particular interest is the highest correlation, between place dependence and the combined measure of substitution ( $r = .460$ ,  $n = 341$ ,  $p \leq .001$ ). This result is paralleled by responses to the awareness of substitutes measure; a comparison of place dependence with this variable produced the strongest correlation amongst the place attachment variables ( $r = .412$ ,  $n = 340$ ,  $p \leq .001$ ). The lowest correlation between the substitution and place attachment variables resulted from a comparison of place identity and awareness of substitutes ( $r = .264$ ,  $n = 341$ ,  $p \leq .001$ ). The strength of this linear relationship is smaller than was observed between place dependence and awareness of substitutes. This suggests that awareness of other sites, and especially the "attributes" found there, may be more tied to function than identity. These results imply that Point Pelee National Park offers a context for unique activities/uses, as respondents who were attached to the park suggested that the park is somewhat distinctive and that they are unaware of other comparable sites.

A comparison of ability to substitute (Sub\_Ability) and place attachment variables, the overall measure place attachment shared the highest significant correlation with the constraints measure ( $r = .400$ ,  $n = 335$ ,  $p \leq .001$ ). This also informed the combined measure of substitution (Sub\_All) moderately strong, positive correlation with place attachment ( $r = .441$ ,  $n = 335$ ,  $p \leq .001$ ). Both sets of values indicate that survey respondents who expressed

Table 4.28

*Correlations and Measures of Central Tendency: Substitution, Place Attachment and Pro-environment Behavioural Intentions*

	Place Attach	Place Identity	Place Affect	Place Depend	Id-Aff	Env Behav	Park Behav	All Behav	Sub_aware	Sub_ability	Sub_All
Place Attach	1										
Place Identity	.912**	1									
Place Affect	.939**	.849**	1								
Place Depend	.825**	.587**	.686**	1							
Id-Aff	.970**	.958**	.951**	.666**	1						
Env Behav	.351**	.338**	.320**	.287**	.346**	1					
Park Behav	.536**	.515**	.495**	.421**	.530**	.711**	1				
All Behav	.481**	.462**	.441**	.385**	.474**	.924**	.927**	1			
Sub_Ability(r)	.400**	.331**	.385**	.363**	.375**	.047	.136*	.099	1		
Sub_Aware (r)	.361**	.264**	.313**	.412**	.304**	.161**	.221**	.212**	.498**	1	
Sub_All (r)	.441**	.347**	.406**	.460**	.396**	.117*	.204**	.177**	.878**	.852**	1
<i>M</i>	3.49	3.73	3.67	2.85	3.70	3.69	3.81	3.75	3.32	3.40	3.59
<i>SD</i>	.636	.700	.659	.816	.648	.680	.696	.638	1.285	1.177	1.066

Note 1: Variables were analyzed using Pearson's correlation coefficient; \*\*  $p < .001$ ; \*  $p < .05$

Note 2: (r) Substitution variables reverse coded

increasing levels of place attachment, also displayed disagreement with the notion that they could easily substitute Point Pelee National Park with another park, and in particular they were not constrained in doing so (i.e., they could easily travel to and have enough time and money to visit another park or natural area).

Results observed from a comparison of the substitution variables with behavioural intentions were less cohesive. Constraints to substitution produced only one small positive correlation with park-specific pro-environment behavioural intentions ( $r = -.136, n = 336, p \leq .001$ ).

It is not surprising that general behavioural intentions and the combined measure of behavioural intentions did not share significant correlations with the constraints variables as a lack of congruence between subject matter may be one of the reasons for this. However it is surprising that a stronger significant relationship between place-specific intentions and constraints was not detected. It was suggested that as individuals felt more constrained to visit other parks, they would be more willing to focus efforts on Point Pelee National Park as it is a place that they would be “forced” to continue to recreate/visit due to these constraints; and therefore would be willing to take pro-environmental actions to protect it.

A comparison of the perception that Point Pelee National Park is somewhat unique and that respondents were unaware of comparable substitutions produced significant correlations with all three pro-environment behavioural intentions (ranging from ( $r = .221, n = 335, p \leq .001$  to  $r = .161, n = 339, p \leq .001$ ). Although very small, these correlations could suggest that individuals are increasingly willing to perform environmentally responsible behaviours, both for the park and to a lesser extent in day to day activities, if they believed that Point Pelee offered unique attributes that were not substitutable via other parks and natural areas. The correlation between awareness of substitutes and park-specific intentions supports the expectation that place-specific behaviours may be related to attitudes towards and knowledge about Point Pelee National Park. No significant relationships were observed between behavioural intentions and ability to substitute with the exception of a very small correlation between park-specific behaviours and Sub\_Ability. The strength of this correlation is too weak to suggest any true support that there is a significant relationship between these variables.

## **Motivations for visiting Point Pelee National Park**

Survey respondents were also asked to indicate their most important motivation for visiting Point Pelee National Park. As reported earlier, an interest in the natural environment was selected the most important by the greatest number of survey participants followed by participation in outdoor activities, spending time with friends and family and learning about the park's natural environment. It was theorized that certain motivations could be linked with various place attachment and pro-environment behavioural intentions. For example, individuals who ranked "participate in the outdoor activities I enjoy" might express higher levels of place dependence, or individuals who ranked "enjoy the natural environment" may express higher levels of place-specific behavioural intentions in comparison with those who ranked "spend time with friends and family" most important.

Using Pearson's Product Correlation Coefficient to examine the relationship between place attachment variables, pro-environment behavioural intentions and whether an individual ranked nature, activity, social or learning first, only three, small, significant correlations were found (See Table 4.29). The motivation variables were based on values where "5" represented a very important motivation and "1" represented the motivation is not important at all.

Only nature and social motives shared statistically significant relationships with the place attachment variables. The strongest of these correlations was between nature motives and place identity and place identity-affect ( $r = .190, n = 323, p \leq .001$ ). However, even this correlation is rather weak. Additionally, all but one combination of possible correlations between the motives and pro-environment behavioural intentions failed to produce a significant relationship; the exception to this, nature motivations and park-specific intentions was extremely weak ( $r = .115, n = 313, p \leq .005$ ). In short, motivations do not appear to have strong associations with the study's main constructs.

Table 4.29

*Correlations and Measures of Central Tendency: Motivations for Visit, Place Attachment and Pro-environment Behavioural Intentions*

	Place Attach	Place Ident	Place Affect	Place Depend	Id-Aff	Env Behav	Park Behav	All Behav	Nature	Activity	Social	Learn
Place Attach	1											
Place Ident	.912**	1										
Place Affect	.941**	.819**	1									
Place Depend	.832**	.599**	.694**	1								
Id-Aff	.972**	.956**	.951**	.677**	1							
Env Behav	.352**	.347**	.330**	.282**	.346**	1						
Park Behav	.543**	.530**	.502**	.423**	.530**	.924**	1					
Park All	.486**	.477**	.453**	.383**	.488**	.924**	.924**	1				
Nature (r)	.172**	.190**	.171**	.112*	.190**	.104	.115*	.116	1			
Activity (r)	.005	.077	-.009	-.018	.036	.010	-.014	-.002	.000	1		
Social (r)	.129*	.146**	.173**	.046	.167**	-.030	.069	.024	.021	-.009	1	
Learn (r)	-.056	-.060	-.060	-.026	-.063	.062	.020	.040	.227**	-.226**	-.155**	1
<i>M</i>	3.47	3.72	3.65	2.83	3.68	3.68	3.80	3.74	4.19	3.69	2.68	2.60
<i>SD</i>	.643	.704	.657	.823	.649	.686	.687	.636	1.060	1.250	1.213	1.077

Note 1: Variables were analyzed using Pearson's correlation coefficient; \*\*  $p < .001$ ; \*  $p < .05$

Note 2(r): Motivation variables were reverse coded; respondents who assigned first rank to more than one motivation were removed

### **Socio-economic characteristics of park visitors**

Few expectations were held for socio-economic variables' relationships with behavioural intentions and place attachment. This is due to the mixed findings that have been reported in both the place attachment and environmental behaviour literature regarding the impact of socio-economic factors on individuals' attachment to specific places or environmental behaviours.

To explore these relationships place attachment and behavioural intentions variables were compared with the gender and age of survey respondents (see Table 4.30). Age shared no significant correlations with either the place attachment or pro-environment behavioural intentions variables. However the variable gender shared significant, positive, yet very small correlations with place attachment ( $r = .129, n = 340, p \leq .05$ ), place identity-affect ( $r = .109, n = 349, p \leq .05$ ), and place dependence ( $r = .117, n = 030, p \leq .05$ ). Significant, small positive correlations were also observed between individuals' gender and general pro-environment behavioural intentions ( $r = .110, n = 343, p \leq .05$ ) and the combined measure of behavioural intentions ( $r = .118, n = 343, p \leq .05$ ), but not for park-specific intentions. These findings indicated that higher levels of attachment and behavioural intentions were expressed more frequently by female participants in the study than male. However, this was not true of the relationship between gender and arguably the most important dependant variable in the study, place-specific pro-environment behavioural intentions. Again the caveat must be expressed in tandem with these results; the correlations are very small and may be the result of other factors such as sample size.

Income featured categories ranging from "1" which represented "Less than \$20,000" to "6" which represented a household income of "\$100,000 or more" and education which ranged from "1" which represented the completion of "Elementary school" to "5" which represented the completion of a "University graduate degree." Again only few significant and small correlations were detected. A negative correlation between education and place dependence ( $r = -.116, n = 349, p \leq .05$ ) was observed indicating that those respondents with lower levels of education also expressed higher levels of place dependences. Negative

correlations between income and place affect ( $r = -.115, n = 345, p \leq .05$ ), and place dependence ( $r = -.115, n = 345, p \leq .05$ ) were found suggesting that individuals' with lower incomes expressed high levels of emotional and functional attachment to the park.

However, once again these correlations were extremely slight and may be a manifestation of other factors such a change statistical outcomes. No statistically significant correlations were observed between education and income and the study's main constructs. In summary, and as expected, in this study socio-economic variables do not appear to be strongly related to place attachment or pro-environment behavioural intentions.

This description of the relations between place attachment, pro-environment behavioural intentions, and socio-economic variables is the final correlation analysis that was performed. These findings, in conjunction with the descriptive statistics detailed earlier were combined to form the foundation for the next stage of analysis, structural equation modeling. This is described next.

Table 4.30

*Correlations and Measures of Central Tendency: Socio-economic characteristics, Place Attachment and Pro-environment Behavioural Intentions*

	Place Attach	Place Ident	Place Affect	Place Depend	Id-Aff	Env Behav	Park Behav	All Behav	Gender	Education	Income	Age
Place Attach	1											
Place Ident	.912**	1										
Place Affect	.941**	.819**	1									
Place Depend	.832**	.599**	.694**	1								
Place Id-Aff	.972**	.956**	.951**	.677**	1							
Env Behav	.352**	.347**	.330**	.282**	.346**	1						
Park Behav	.543**	.530**	.502**	.423**	.530**	.924**	1					
Park All	.486**	.477**	.453**	.383**	.488**	.924**	.924**	1				
Gender	-.129*	-.103	-.103	-.110*	-.109*	-.110*	-.103	-.118*	1			
Education	-.090	-.064	-.077	-.116*	-.075	.049	-.034	.003	.080	1		
Income	-.099	-.034	-.115*	-.115*	-.081	-.033	-.101	-.066	-.011	.266**	1	
Age	-.031	-.044	-.056	.033	-.050	-.055	-.061	-.060	.164**	.083	-.059	1
<i>M</i>	3.47	3.72	3.65	2.83	3.68	3.68	3.80	3.74	na	3.58	4.64	52.83
<i>SD</i>	.643	.704	.657	.823	.649	.686	.687	.636	na	1.111	1.846	13.828

Note: Variables were analyzed using Pearson's correlation coefficient; \*\*  $p < .001$ ; \*  $p < .05$



## ***Exploring relationships with structural equation modeling***

The preceding description of the data normality and freedom from biases, measures of central tendency and correlation coefficients provide the foundation for the final stage of analysis, further refinement of an understanding of relationships between place attachment, pro-environment behavioural intentions and several other external variables. Structural equation modeling (SEM) was the main tool used in this task, however hierarchical regression analysis was also employed. SEM involved fitting measurement models of latent factors within a path model creating a hybrid or structural model. This structural model was used to test the predictive ability of several factors. The ultimate end goal was to determine the direct and indirect affects of place attachment and various external variables on pro-environment behavioural intentions.

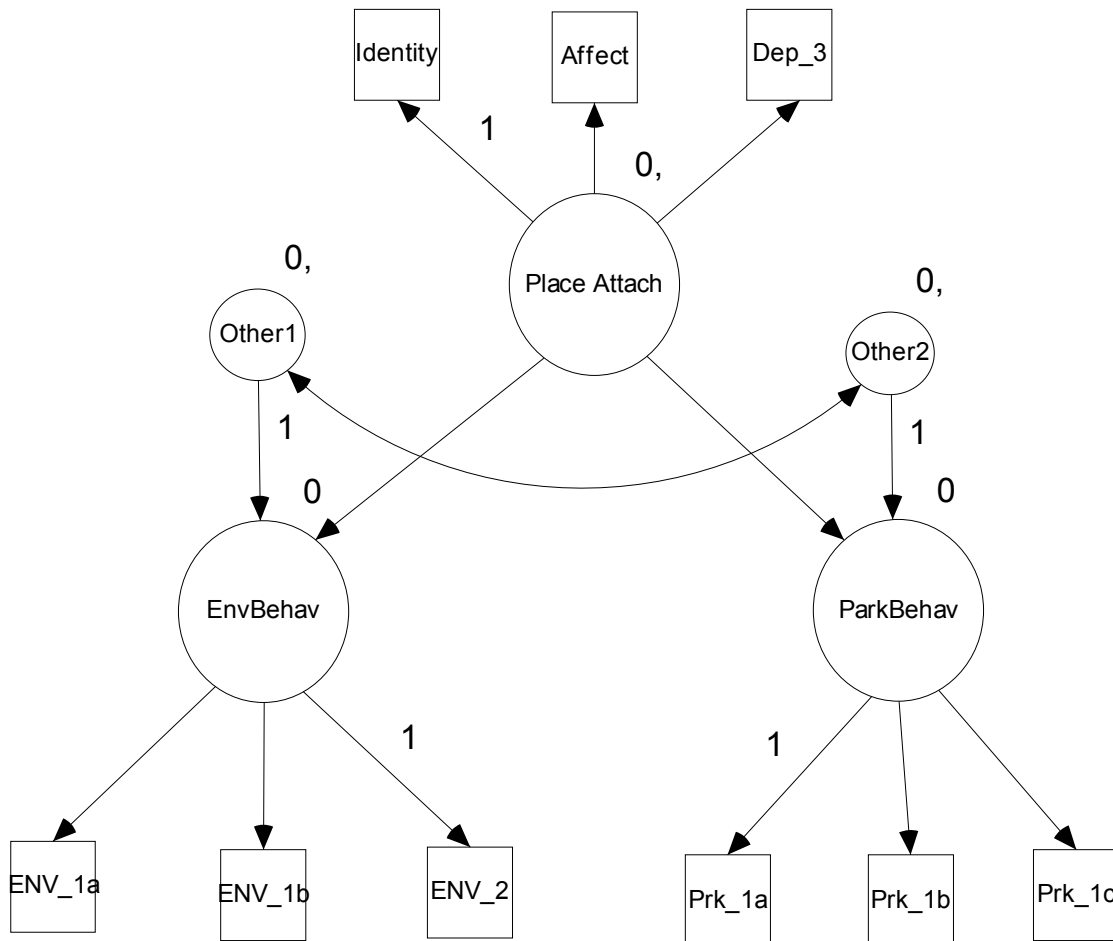
### **Model estimation**

In developing the structural model the first option was to test a fully latent model that included each of the factors' many indicators (i.e., 16 place attachment items; 12 park-specific and 12 general behavioural intentions items; see Appendix C-1). The second option was to utilize the combined variables in a path model (see Appendix C-2). As described earlier these "combined" variables were developed by merging the averages of each scale's items creating an aggregate mean score. This model is considerably more parsimonious than the fully-latent factors model, but there are still drawbacks. The first of these issues is that each observed variable in the model is assumed to have been measured without error by the model fitting program (Pedhazur, 1997); in reality this is not possible and the effect of this assumption upon the results depicted in the path model is unclear. So, while the overall model may indicate good fit with the data and significant path coefficients were obtained, it was not known whether these parameters were over or underestimated due to unaccounted for error. Second, a reduced model offers little flexibility in the case of model misfit, and the combined variables used in the model can obscure significant effects of underlying elements that make up each construct.

A third model option was to aggregate factors into sub-categories (see Figure 4.4). This reduced the number of indicators, creating a more parsimonious model, but also allowed some flexibility in the model as well. In short, it was simpler than the fully-latent model and therefore allowed clearer and more straight-forward analysis. The resulting reduced-indicator model was also sensitive to the effect of underlying factors providing the potential for a more nuanced understanding of each construct and their interactions with other factors.

Figure 4.4

*Hypothesized Structural Model of Place Attachment and Pro-environment Behavioural Intentions Relationship*



Due to its many advantages this reduced-indicator model was chosen. Developing indicators was the first step in creating this model. Behavioural intentions factors were

considered first. As no consensus exists in the literature on the dimensionality of environmental behaviours, exploratory factor analysis was initiated to assign items from the two 12-item scales to a reduced number of indicators. Based on the principle components analysis that was documented earlier the items were divided into indicators for the latent model. This was also guided by a priori considerations that are addressed in environmental behaviour empirical research (i.e., general vs. specific behaviours, and easy/passive vs. resource intensive/active behaviours). This entailed two factors that were identified from the general behaviour intentions scale and three factors that were produced from the park-specific scale.

As it is desirable to have at least three indicators for latent factor models (Bollen, 1989; Kenny, 1979; Kline, 2005) items from the general environmental intentions Factor 1 (the factor that explained the greatest amount of variance) was divided to create two indicators (Env\_1a and Env\_1b). This split was based partly on the substantive content of the indicators; Env\_1a was characterized by items that require more effort or expertise to perform. Appendix C-5 provides a list of items assigned to each indicator. As there was some uncertainty of the impact of splitting Factor 1 into two indicators, Env\_1 was also created to be used as an alternative indicator for model testing. Env\_1 contains all six of the items originally assigned to Factor 1 in the principle components analysis. The remaining environmental intentions factor, Factor 2 was retained intact (i.e., 6 items) and titled Env\_2. Substantively speaking these items can be described as more engrained in societal practices and generally more easily performed.

The three factors that were identified for park-related behavioural intentions were also retained unchanged. Substantive meanings were again used to assess these factors, in part, to verify the validity of the principle components analysis. It is evident that items in the second factor are behaviours that are challenging to implement, being resource intensive (i.e., Prk\_1b), otherwise, no clear pattern was evident. Factor loading may instead have been affected by other phenomena such as the order in which the items appeared on the original scale. These three factors were retained and assigned the following labels: Prk\_1a,

Prk\_1b, Prk\_1c (Appendix C- 6). All indicators were calculated in SPSS, created by averaging items' means.

These newly created indicators were incorporated into structural models to test the relationship between place attachment and pro-environment behavioural intentions. Two other approaches used in this study to select indicators of place attachment are described next. Overall it is believed that a reduced number of observed variables simplified the analysis process enabling greater clarity in studying relationships between constructs. At the same time, a sufficient number of indicators were maintained to achieve flexibility in exploring the domains of the study's main factors.

A reduction in the number of indicators for the place attachment construct was also undertaken. Three measurement models for place attachment were created, each featuring different indicator configurations. The creation of the first model, the Hypothesized Model, was guided by the original theoretical framework of this study. The 16 place attachment items were divided into the sub components: place affect, place identity and place dependence. This is depicted in Figure 4.4. Previous research supports the use of theoretically-based groupings or "parcels" as they can produce solutions that fit the data better and are less prone to biased estimates than item-level solutions as would be present in a fully-latent model (Bandalos, 2002; Kishton & Widaman, 1994).

These place attachment indicators are aggregate mean scores of the items from each sub-scale. The reliability of these three sub-dimensions had previously been tested and only one item, the reverse coded place dependence item "3i." was deemed to be a liability. For the SEM analysis the item was removed from the place dependence indicator boosting its coefficient alpha from .754 to .823. A new indicator Dep\_3 was created.

At least two other measurement models of place attachment were also developed and tested. In the first alternative model of place attachment (Alt Model A) place affect and place identity were combined in one indicator (Id-Aff), and place dependence with just three items (Dep\_3) acted as the second indicator (see Appendix C-5). This division of the 16 place

attachment items into place affect-identity and place dependence is based on results from previous empirical studies which observed this two-dimensional characteristic of place attachment.

The second alternative model of place attachment (Alt Model E) featured the creation of two indicators for place attachment using the results from the exploratory factor analysis conducted earlier in the study (see Appendix B-5). The two components identified in this analysis were utilized to create Id\_Aff\_efa (9 items) and Dep\_efa (6 items). Like its predecessors, the reverse coded item Q.8i was removed from Dep\_efa due to poor factor loadings and its detrimental effects on the scale's overall alpha coefficient. Appendix C-5 describes the items that were utilized in each of the place attachment indicators.

Next the reliability of all new indicators was assessed, reliability coefficients are reported below for the behavioural intentions indicators, as well as the place attachment indicators, including the place attachment sub-dimensions that received attention earlier in this chapter (see Table 4.31). All show reasonable scores. The lowest, Env\_2a ( $\alpha = .612$ ,  $n = 341$ , 3 items) is still acceptable given the small number of items that it was based upon (Cortina, 1993).

Reliability is an important consideration when fixing the scale of a factor or measurement model. In SEM the scale of a factor may be fixed by setting the factor's variance to 1; if the factor is a dependent variable such as park-specific behavioural intentions researchers usually fix the regression coefficient, the path leading from the construct to one of its indicators, to 1 (Tabachnick & Fidell, 2001). In the main Hypothesized Model (Figure 4.4) indicators with good reliability, but also with the best substantive representative content were identified as the most appropriate indicators for each latent construct (Kline, 2005; E. Woody, personal communication, March 2006). A regression weight of 1 was assigned to the coefficient paths between these indicators in the Hypothesized Model and the Alternative Models (i.e., Prk\_1a; Env\_2; Identity, and Id\_aff; and Id\_aff\_efa) and their respective factor. Fixing the regression coefficient to 1 gives the factor the same variance as the measured variable.

Table 4.31

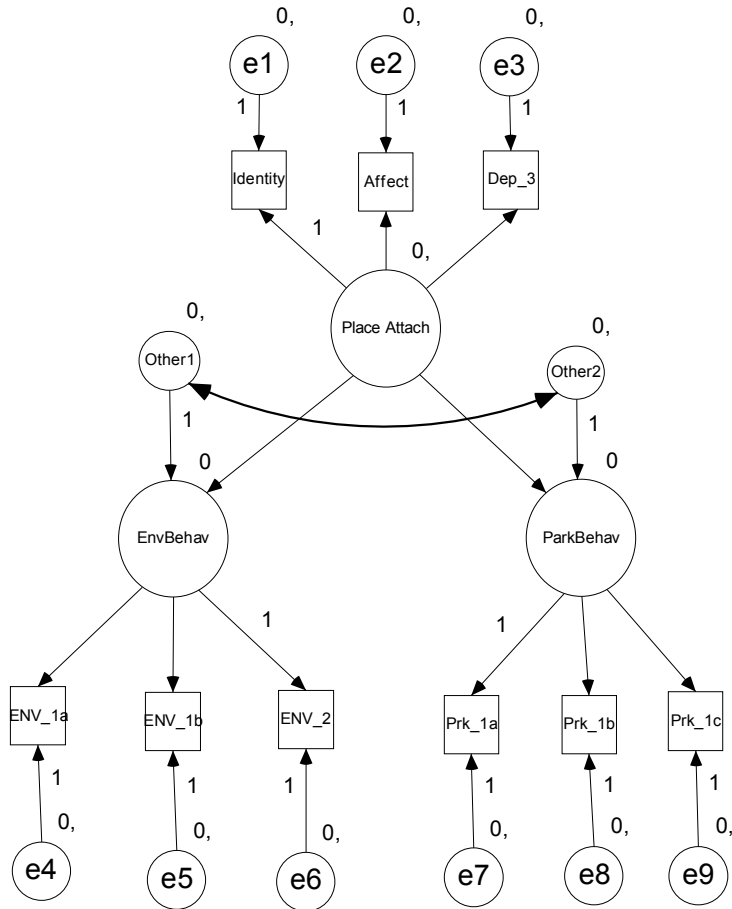
*Summary of indicator reliability coefficients and number of items used in each indicator*

<b>Indicator</b>	<b>Alpha</b>	<b>N</b>	<b>Items</b>
Prk_1a	.801	343	5
Prk_1b	.757	343	3
Prk_1c	.785	342	4
Env_1a	.730	343	3
Env_1b	.612	341	3
Env_1	.780	337	6
Env_2	.752	337	6
Identity	.861	319	6
Affect	.821	341	6
Dep_3	.823	341	3
Id_Aff	.913	315	12
Id_Aff_efa	.892	319	9
Dep_efa	.889	320	6

Five different combinations of measurement models were incorporated into structural or hybrid models through the connections made by paths denoting relationships between the latent factors. These relational paths between place attachment and behavioural intentions are the same in all five models. Figure 4.5 illustrates the Hypothesized Structural Model. Following conventions for drawing structural models indicators or observed variables are illustrated by rectangles; factors are depicted with circles or ellipses; disturbances, the variance in the factors that is unexplained by the variables specified as its direct causes, are represented by a circle with a path arrow leading to the factor (labelled Other1 thru Other 2); and, measurement errors, unique variance unexplained by its latent factor, are represented by a circle and an path arrow leading from each observed variable and to a circle (labelled e1 through e9).

Figure 4.5

*Hypothesized Model*



In the development of this model it was necessary to depict a hypothesized relationship between park-specific behaviours and general behaviours. The two behavioural intentions factors were anticipated to be strongly correlated due to their very similar substantive content. Figure 4.5 depicts the two-headed arrow (highlighted) connecting Other 1 and Other 2. This demonstrates how this relationship was input into the SEM model. Appendix C-6 provides an overview of the four alternative models.

Following the development of structural models, the data was re-examined for violations of assumptions made by SEM. The first evaluation was whether sample size was adequate to test the proposed models. In the proposed main hypothesized model ten indicators or measured variables are proposed. A sample size of 355 was deemed adequate in addressing

the suggested ratio of cases to observed variables. The ratio of cases to observed variables was 355:9 (39:1) and ratio of cases to estimated parameters was 355:31 (12:1).

Next an analysis of missing data was conducting using SPSS 14.0. The overall impact of missing data on analysis processes was considered to be of minimal risk as less than 5% of cases and less than 5% of each variable's data used in this analysis were characterized by missing data (Kline, 2005). Missing data was addressed in two ways. To conduct model building where modification and residual indices assisted in developing model fit a second data base was created using SPSS's EM estimation. EM estimation or the EM algorithm is a powerful tool that produces a linear regression imputation to fill in missing data; its output is useful for exploration of models (Allison, 2003). Once the models' fit was maximized the original data set was used to explore relationships. Amos was instructed to fill in the missing data, inputting estimated means using maximum likelihood means estimation. This is viewed as one of the best approaches to dealing with missing values in SEM (Alison, 2003, Kline, 2005).

In addition to regular inspection of the data that was performed during the early stages of data analysis, a second re-examination of multicollinearity, outliers and missing values was conducted as part of the recommended preparations for structural equation modeling (Kline, 2006). Multicollinearity is observed when inter-correlations among variables are so high that certain mathematical operations are impossible; in short this means that the variables are measuring the same thing. Kline suggests correlation exceeding  $r = .85$  should be considered redundant and Hair et al. (1998) suggests a threshold of  $r = .90$ . After reviewing the correlation matrices of all potential models multicollinearity was determined to not be a problem. A high correlation between place affect and place identity ( $r = .849$ ) presented some concern for the Hypothesized Model, but this was reconsidered after reviewing Hair, et al.'s statement that multicollinearity is not an issue unless there are at least two or more coefficients above  $r = .90$ .

Outliers were identified previously during the first wave of data screening. Extremes due to data entry errors were corrected at that time, but a decision was made to allow other



extremes to remain. In preparation for SEM it was decided that some extremes should be addressed. A rule of thumb suggests that values that are plus or minus three standard deviations from the mean are considered extreme, and may affect structural equation modeling (Kline, 2005). Several univariate outliers, extreme values associated with one variable, were again confirmed. There is no consensus in the literature on how to address outlier values. Some statisticians suggest removal of extreme values, other recommend their transformation to less extreme values. Following recommendations by Tabachnick and Fidel (2001) the most extreme outliers were reassigned a value that was one unit larger than the next most extreme score in the distribution. For example, in the most extreme case for number of overnight trips to Point Pelee National Park, a respondent stated that s/he had made 50 visits in the last 12 months. This value was transformed to the new value of 6, one unit higher than the next most extreme value which was 5 overnight trips. Extreme outliers were transformed for six external variables: day length, overnight trip length, number of days spend in PPNP in the last 12 months, number of overnight visits in the last 12 months.

Variables were then examined for normality and linearity. Most variables in the study showed normal distributions. However some did display high levels of skewness and kurtosis. These variables included: length of overnight visit (Nights(ave) and Nights(rec)); number of days spent in PPNP in the last 12 months (Days); number of overnight trips to PPNP in the last 12 months (Ovr\_night); distance between Park and residence (KmsPPNP). It was decided that these variables' distributions were not unusual for park visitation patterns and should not be modified further.

### **Model Estimation: Model Fit**

The correlations matrices are the first stage in developing and comparing different models and examining relationships in SEM. For each model a correlation matrix was developed to examine the relationships between model variables. These matrices are presented in tandem with each structural model in Appendices C-10a thru C-18b. The raw data is presented in a correlation matrix, rather than covariate matrix as the standardized estimates facilitate comparison of variables more easily (Kline, 2005). Publishing standards related to SEM

reporting also suggest that means and standard deviations of all observed variables in the matrix be reported (Boomsma, 2000; McDonald & Ringo Ho, 2000).

Maximum likelihood estimation (MLE) was employed due to its robustness against violations of various statistical assumptions underlying modeling efforts (Kline, 2005). In fact, it is suggested in current SEM literature “that use of an estimation method other than MLE requires explicit justification” (Hoyle, 2000 cited in Kline, 2005 p. 112). The parameters generated by MLE are relatively robust against non-normality and results of statistical test may be positively biased, leading to the rejection of the null hypothesis (Kline, 2005) and resulting in fairly conservative estimates.

The Hypothesized Model (Figure 4.4) was tested using the sample data. The model chi-square ( $x_M^2$ ), relative model chi square (CMIN/df), comparative fit index (CFI) and the root mean square error of approximation (RMSEA) were used to examine the model fit. These measures are described next. Also described is the Akaike information criterion (AIC), a measure which was used in the next stage of analysis which compared the Hypothesized Model with Alternative Models. Although model fit is a main focus of SEM, many caveats are associated with this process and its outcome; Tomarken and Waller (2003) provided additional guidance in this analysis.

- a)  $x_M^2$  –the generalized likelihood ratio, is also known as the likelihood ratio chi-square or the model chi-square. A small  $x_M^2$  value is desired since as the value of  $x_M^2$  increases, the fit of an overidentified model becomes increasingly worse. If its statistical significance is more than  $p = .05$  the model should be rejected. Unfortunately studies with large sample sizes invariably produced non-significant  $x_M^2$ 's. Studies with large correlations can also lead to high  $x_M^2$  values (Kline, 2005). Therefore this statistic, while useful, should be considered with the results of other indices; as Joreskog suggests (1993) it should be used as a measure of fit rather than a test statistic because of the many restrictive assumptions that a model chi-square is based upon (Pedhazur, 1997).

- b) CMIN/df – the relative model chi square or normal chi square is considered to be a better indicator than just CMIN because it attempts to make the model fit less dependent on sample size (which is a fault of model chi-square). This statistic should be less than 2 or 3 to be considered a good fit (Kline, 2005), although some researchers have allowed values as large as 5.
- c) CFI – the comparative fit index is used to compare the proposed model with a baseline or “independent” model in which all variables are assumed to be uncorrelated with the dependent variable, and therefore the poorest possible fit. This statistic should be .90 or higher (Hu & Bentler, 1999).
- d) RMSEA – the root mean square error of approximation examines difference between observed and predicted covariances. These covariance residuals should be close to zero. A RMSEA of less than .08 is deemed to be adequate, and less than .05 is considered very good (Kline, 2005). A strength of this fit statistics is that it tends to be free of sampling bias (McDonald & Ringlo Ho, 2002).
- e) AIC – the Akaike information criterion is a parsimony adjusted predictive fit index (i.e., it favours simpler models) which is most often used to identify the best model amongst competing non-hierarchal models (Kline, 2005). The model with the best fit (and fewest parameters) has the smallest AIC value.

Table 4.32 lists the results of these goodness-of-fit indices. The bolded results, Hypothesized Model – 2<sup>nd</sup> draft, are from the model that was eventually adopted for the next phase of analysis. Reasons for this are described next.

Table 4.32:

*Fit indices for original and respecified hypothesized model*

<b>Model</b>	$\chi_M^2$	<i>df</i>	<i>p</i>	<b>CMIN/df</b>	<b>CFI</b>	<b>RMSEA</b>	<b>AIC</b>
Hypothesized Model	139.341	24	.000	5.806	.929	.117	199.341
<b>After Respecification</b>							
<b>Hypothesized Model – 2<sup>nd</sup> draft<sup>a</sup></b>	<b>55.229</b>	<b>23</b>	<b>.000</b>	<b>2.401</b>	<b>.980</b>	<b>.063</b>	<b>117.229</b>

Note 1 <sup>a</sup> Final model selected for use in remaining SEM analysis.

Note 2: Fit statistics are based on EM estimation data base created in SPSS, not ML means estimation in AMOS.

The  $\chi^2_M = 142.083$ ,  $df = 24$ , with  $p = .000$  was not really low enough to be considered a good fit. It was also significant, which was unsurprising because of the large sample size and therefore ignored. However the  $CMIN/df = 5.920$  was also high. The  $CFI = .930$  showed reasonable fit, but the  $RMSEA = .118$  was not close to the adequate threshold of .08 or less.

Additionally, all paths were found to be significant ( $p < .05$ ). This included the correlation between park-specific pro-environmental behaviours and general pro-environmental behaviours thereby justifying this proposed covariance.

As most of the fit indices suggested that the model was a close, but far from good fit with the data, respecification of the model was undertaken. This generally involves two steps, an examination of the residuals and modification indices produced by the test results. The modification indices recommended several changes, each designed to improve the fit of the model with the data. The first recommendation was to correlate Env\_1a to Prk\_1b. This recommendation was unsurprising as it was suspected that part of the lack of good fit for the model could be due to measurement covariance between several of the behaviour intentions measures. Upon closer examination it made good substantive sense to correlate Env\_1a and Prk\_1b because these two indicators contained the most challenging and resource intensive behaviours, and would therefore be reacted to in a similar fashion by survey respondents (see Appendix C-6 for a list of items used in these indicators). These indicators were correlated and the model was run again. This time the fit was very good across all pertinent fit indices: a lowered  $\chi^2_M = 39.563$ ,  $df = 23$ , with  $p = .017$  was an improvement, as was a  $CMIN/df = 1.720$ . More importantly the  $RMSEA = .045$  and the  $CFI = .990$  both demonstrated very good fit. Table 4.32 documents these changes. Due to the goodness of fit achieved by this one modification no further respecifications were undertaken. Many researchers caution that if model modifications are undertaken to develop a good-fitting model, the fewer modifications the better (Kline, 2005; Ullman, 2001).

Once the proposed model was finalized with slight modifications, it was compared with the four other Alternative Models detailed earlier (Appendix C-4). The same initial fit

examination was conducted with the Alternative Models using the EM imputation data set created with SPSS. As expected the same respecification of connecting the error covariance of Prk\_1b and Env\_1a was undertaken. These models were run a second time with the original data base using ML means estimated tool provided by Amos. Fit indices were used to compare the models with one another. The following indices were used in this comparison. Bolded values identified the best values for each type of fit indices.

Table 4.33

*Comparison of Hypothesized Model with Alternative Models*

Model	$\chi_M^2$	df	p	CMIN/df	CFI	RMSEA	AIC
Hypothesized (3x3)	55.229	23	.000	2.401	.980	.063	117.229
Alt A (2x3)	39.708	16	.001	2.482	.980	.065	95.708
Alt B (2x2)	<b>20.342</b>	10	.026	2.034	<b>.990</b>	.054	<b>70.342</b>
Alt C (3x2) <sup>a</sup>	30.310	16	.016	<b>1.894</b>	<b>.990</b>	<b>.050</b>	86.310
Alt D (efa 2x2)	56.14	16	.000	3.509	.968	.084	112.144

Note 1<sup>a</sup> Final model selected for use in remaining SEM analysis.

Note 2: The original/main data base was the source of this data; ML means estimation was utilized to address missing data. The EM imputation data base demonstrated a better fit with the model overall, this explains the superior goodness of fit indices results in Table 4.27. Model A was the best fit with the EM imputation data. The original data base, utilizing ML means estimation, was returned to for the final examination of fit as it would be the main data set for the remainder of the modeling. The only exception to this was when good fit between a new model and the data set was not achieved; the EM imputation data set was then utilized to calculate modification indices.

Note 3: Alt. A (2x3) was characterized by two empirically-inspired indicators for place attachment (Id-Aff and Dep\_3), three indicators for general environmental behaviours, and three park intentions indicators.

Note 4: Alt B (2 x 2) was characterized by two place attachment indicators (Id-Aff and Dep\_3); two indicators for general environmental intentions based solely on principle component analysis factor loadings, and three indicators for park intentions

Note 5: Alt C (3x2) was characterized by three place attachment indicators; two general environment intentions indicators drawn specifically from principle component analysis factor loadings; and, three park intentions.

Note 6: Alt D (2x2) was characterized by two place attachment indicators created from principle component analysis factor loadings (Id\_Aff\_efa and Dep\_efa); two general environment intentions indicators, and three park intentions indicators.

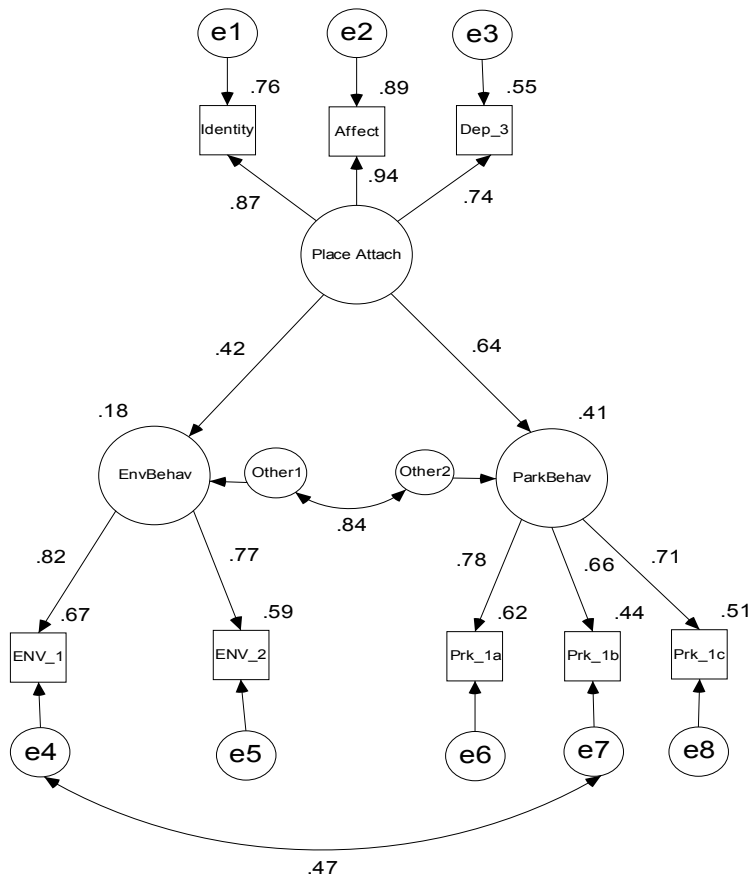
Alternative Models C and B performed the best; the utilization of two indicators for general environmental intentions appeared to contribute to model fit. The three indicator measure of place attachment also appears to have contributed to the model fit. The only measure of fit that Alternative Model B surpassed Alternative Model C in was the parsimony adjusted AIC (70.342 vs. 86.310). This measure acknowledges parsimony as well as goodness of fit, and therefore ranked Alternative Model B highest due to its small number of parameters. This improvement was not notable enough to elicit the adoption of Alternative Model B as

three-indicators (observed measures) of latent constructs are preferred in SEM (Kline, 2005) in part because fewer constraints need to be placed on the model to explore relationships between variables and run fit indices. In other words, three indicators of a latent construct such as place attachment will always be preferred because of its superior statistical latitude. Granted, it must also be recognized that it may be preferable to see three indicators for general environmental intentions as well. However the fit statistics did not encourage this.

Taking these observations under consideration, the final baseline model to be used in analysis is Alternative Model C. This model, including significant coefficients, is illustrated in standardized form in Figure 4.6. Correlation tables for this figure and subsequent structural models are included in Appendices C-9 thru C-18b.

Figure 4.6

*Final Structural Model: Relationship between Place Attachment, General and Park-specific Pro-environment Behavioural Intentions*



Once the best model fit was determined, relations between the factors in the model could be examined. The first of these relationships was the interaction between the study's main constructs, place attachment, park-specific pro-environment behavioural intentions and general pro-environment behavioural intentions.

Additional relationships between these three constructs and relevant variables were also explored. These variables were incorporated into the main structural model in two ways: a) as single-indicator, observed variables, and b) as components of multi-indicator latent factors. The former group includes the four motivation categories, three satisfaction categories, FoPP and environmental group membership and distance. The latent factors include: a) frequency (days spent at PPNP in the last 12 months and frequency of visitation); b) length of visit (nights(ave) and nights(rec),  $\alpha = .81$ ); c) park relationship (visitation during childhood and length of affiliation); d) satisfaction (nature\_sat, activity\_sat, and social\_sat,  $\alpha = .65$ ); e) park commitment (FoPP membership, money and time donated to FoPP), f) general environmental commitment (environmental group membership, time and money donated to an environmental group); and, g) anti-substitution (sub\_aware and sub\_ability,  $\alpha = .66$ ). These latent factors are described more thoroughly in the following section. First, a description of the observations regarding the relationship between the study's main constructs follows.

Both direct effects and indirect effects of each factor are described. This involves a description of regression coefficients which represent the strength and nature of the relationship between two factors. While Amos does not report significance levels for indirect effects, these relationships can be assumed to be significant if all relevant unstandardized path coefficients are significant (E. Woody, personal communications, March 2005; Kline, 2005; MacKinnon, Lockwood, Hoffman, West, & Virgil, 2002)<sup>9</sup>. When

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<sup>9</sup> Cohen & Cohen (1983) and MacKinnon et al.'s (2002) rule of thumb regarding the significance of indirect effects was verified with the employment of a z test utilizing Sobel's test (1982; 1986) ( $z\text{-value} = a*b/\text{SQRT}(b^2*s_a^2 + a^2*s_b^2)$ ). In brief this equation enables verification that the effects of an independent variable are carried by a mediating variable to a dependent variable (Preacher & Leonardelli, 2006).

appropriate, the portion of variance in a dependent factor explained by a specific set of independent variables is also highlighted.

This exploration of relationships is initiated with an examination of the main place attachment and behavioural intentions model. This is followed by a description of relation between these constructs and several visitation pattern variables. Observations associated with the investigation of place satisfaction, membership, commitment, distance, substitution, and motives for visiting the park round out the findings chapter.

### **Place attachment & environmental intentions model**

Figure 4.6 illustrates the study's main structural model; relationships depicted by both the measurement and structural paths were all found to be significant ( $p \leq .001$ ). As expected, place attachment strongly predicted park-specific pro-environment behavioural intentions ( $\beta = .64$ ) and had a smaller effect on general pro-environment behavioural intentions ( $\beta = .42$ ). Place attachment also strongly predicted its indicators place affect ( $\beta = .94$ ), place identity ( $\beta = .87$ ), and place dependence ( $\beta = .74$ ). General pro-environment behavioural intentions strongly predicted its measures as portrayed by factor loadings ranging from  $\beta = .82$  to  $.77$ . The same pattern was observed for park-specific behavioural intentions and its predictive ability of its three measures ( $\beta = .66$  to  $.79$ ). As factor loadings from all three measurement models were statistically significant, and above a standard threshold values of  $.4$ , the measurement models were deemed to be acceptable.

The performance of specific measures was also examined. Place affect was the purest measure of place attachment with a variance estimate of  $.049$ . Prk\_1b was the least precise measure in the model; its estimated variance in measuring general behavioural intentions was  $.607$ . As expected, a strong correlation between place specific and general pro-environment behavioural intentions was observed ( $r = .84, p \leq .001$ ). Indicators Env\_1 and Prk\_1b shared a moderate correlation of ( $r = .47, p \leq .001$ ). Place attachment predicted 19% of general pro-environment behavioural intentions' variance. As anticipated, place attachment explained more of place-specific behavioural intentions' variance ( $R^2 = .41$ ).



Overall the results depicted by the model lend support to the relationships proposed a priori, and enable a rejection of the null hypothesis.

## ***External Variables***

### **Frequency of visitation**

Frequency of travel to Point Pelee National Park was the first external variable to be input into the revised Hypothesized Model. The affect of frequency on place attachment, behavioural intentions and their relationship was examined. Appendix C-10a depicts the results of this modeling. Based on the findings of previous research frequency was hypothesized to be a predictor of place attachment and park-specific behaviours. It was also speculated that frequent visitation to a park may also have some predictive power regarding individual's general environment behavioural intentions in that individuals who visited parks may be interested in environmental issues or may be inspired to be more environmentally responsible in their every-day routines (i.e., carry-over effects).

The predictor variable frequency was developed from two observed variables present in the original data set, the number of days each respondent visited Point Pelee National Park in the last 12 months (Days) and the frequency of visitation measured with a Likert-type formatted question ranging from "1 - once in the last three years" to "5 - at least once per month" (Freq). After the structural model was analyzed for goodness of fit ( $\chi^2_M = 62.952$ ,  $df = 28$ ,  $p \leq .000$ ; CMIN/ $df = 2.248$ ; CFI = .979; RMSEA = .059; AIC = 136.952) the examination of relationships between these factors proceeded.

Analysis revealed that frequency of visitation was a strong, positive predictor of place attachment explaining 27% of place attachment's variance ( $\beta = .52$ ,  $p \leq .001$ ). Individuals who frequently visited Point Pelee National Park were more likely to demonstrate high levels of place attachment. The non-significant path between frequency of visits and park-specific behaviours and the positive paths travelling through place attachment to park-specific intentions suggest that place attachment fully mediates the impact of frequent visitation on park-specific intentions. In other words, assuming correct directionality

specification, the non-significant direct path between frequency and park-specific behavioural intentions, and statistically significance paths to place attachment and then on to park-specific intentions is a strong demonstration of mediator effects (Baron & Kenny, 1986; Kline, 2005). The combined affect of place attachment and frequency explained 42% of visitors' park-specific behavioural intentions; frequency's indirect effect on park-specific behaviour was  $\beta = .34$ .

Interestingly a significant negative direct effect was observed between frequency and general pro-environment behavioural intentions. Earlier univariate correlation analysis identified a negative non-significant relationship between these two variables. The results from the model suggest that individuals who visit the park most frequently will also demonstrate lower levels of general pro-environment intentions ( $\beta = -.35, p \leq .001, R_2 = .27$ ). This finding refutes prior speculation that frequent park visitation may be an indicator of strong environmental behaviours.

The directionality of relations between variables depicted in Appendix C-10a was based on previously published research. However it could also be argued that place attachment is a predictor of frequency of visitation. As a result an alternative model was developed, Appendix C-10b, to examine this relationship. Goodness of model fit and the main parameter estimates remained unchanged in this new model as the same data, variables, and number of estimated parameters remained the same as the model in Appendix C-10a. The only difference was directionality. The model reveals that place attachment is a significant predictor of frequency ( $\beta = .52, p \leq .001, R_2 = .27$ ), and now has an indirect effect through frequency on general behavioural intentions ( $\beta = -.18$ ). The indirect effects of frequency on the two behavioural intentions have disappeared with the change in directionality. All other parameters remain the same.

### **Duration of visit**

Duration of visit was included in the study due to findings noted by Williams et al. (1992) that *perceived* length of visit as opposed to *actual* length of visit appeared to be related to

place attachment. They found that respondents who believed they had stayed on the trail at least two days or longer demonstrated higher levels of place attachment. A theoretical leap was made when this finding was combined with observations from the recreation and natural resources management literature. The literature suggests that as individuals interact longer with nature, they gain a greater appreciation for nature and are more likely to engage in pro-environmental behaviours (e.g., Borrie & Roggenbuck, 2001; McGehee & Norman, 2002; Patterson et al., 1998). As a result it was speculated that length of trip might be positively associated with place-specific pro-environment behavioural intentions. Initial analysis of relationships between these variables using correlation analysis found very weak positive relationships between place attachment and length of trip, and very few correlations between length of trip and behavioural intentions. Structural equation modeling confirmed a lack of relationship between length of trip and behavioural intentions. Both structural paths between these factors were statistically non-significant.

In Model C-11a place attachment was depicted as a predictor of trip length. It was theorized that stronger attachments would result in individuals' desire for and achievement of a longer stay at the park. Initial correlation analysis revealed length of stay for *day* visitors did not have a significant relationship with place attachment, but two measures of length of overnight visits did share positive correlations with attachment. These were used as the indicators for trip length. One, Nights(recent) documented the number of nights an individual had stayed at or near Point Pelee National Park during their most recent trip, and Nights(ave) represented the average length of overnight trips in the last year. The latter measure, parallel's Williams et al.'s (1992) measure of perceived length of stay. As with Williams et al.'s study Nights(ave) demonstrated the stronger, albeit a weak, positive association with place attachment in this study. When installed in the measurement model for trip length both indicators featured strong factor loadings. Overall the structural model demonstrated good fit ( $\chi^2 = 42.345$ ,  $df = 28$ ,  $p = .008$ ; CMIN/ $df = 1.762$ ; CFI = .987; RMSEA = .046; AIC = 123.345).

While the model revealed that place attachment predicted trip length, the amount of variance within trip length that place attachment explained was very modest ( $\beta = .21$ ,  $p \leq .05$ ,  $R^2 =$

.04). Trip length did not share a statistically significant relationship with either behavioural intentions category; however as with the other models place attachment did positively predict them.

Again, one could argue that the directionality of relationships between trip length and place attachment could be reversed. A long stay at a park could foster place attachment and not simply be an outcome of place attachment. To examine this, an alternative model was developed (see Appendix C-11b). The major changes arising from this change in directionality were that trip length now positively predicted place attachment ( $\beta = .21, p \leq .05, R_2 = .04$ ), and produced indirect, but negligible effects on general behavioural intentions ( $\beta = .02$ ) and park-specific intentions ( $\beta = .05$ ). All other parameters remained the same.

### **Park relationship, length of affiliation, and visitation as a child**

Two other visitation pattern variables collected in the study were length of affiliation and visitation during childhood. Writings of early place theorists and more recent empirical studies suggest these two variables foster the development of place attachment and perhaps even behavioural intentions. It was therefore expected these two variables would positively predict place attachment and park-specific pro-environment behavioural intentions.

The two variables were combined to produce a latent factor named Park Relationship. The measurement model was considered acceptable as the factor loadings were moderate to strong and statistically significant. Overall the structural model demonstrated good fit ( $\chi^2 = 64.065, df = 28, p = .000$ ;  $CMIN/df = 2.288$ ;  $CFI = .978$ ;  $RMSEA = .060$ ;  $AIC = 138.065$ ) (see Appendix C-12).

The model revealed that the newly created factor relationship predicted place attachment, explaining 10% of the construct's variance ( $\beta = .32, p \leq .001$ ). As length of affiliation and frequency of visits during childhood increased, so did place attachment. The model also depicts place attachments' direct effect on park-specific behavioural intentions ( $\beta = .63, p \leq .001$ ) and general behavioural intentions ( $\beta = .45, p \leq .05$ ). Park relationship had an indirect effect on park-specific behavioural intentions ( $\beta = .21, p \leq .001$ ) and general intentions ( $\beta =$

.15,  $p \leq .001$ ). Park relationship and place attachment combined to explain 41% of park-specific intentions' and 19% of general intentions' variance. The strong predictive association between park relationship, place attachment, and park-specific behaviours appears to support several of the study's original expectations regarding relationships between these factors. As with frequency of visitation, place attachment appears to fully mediate the effects of construct based on visitation during childhood and affiliation.

The effect of these two variables was also examined separately. First a model examining length of affiliation's prediction of place attachment and pro-environmental intentions was assessed. Model fit was found to be good: ( $\chi^2_M = 54.587$ ,  $df = 21$ ,  $p = .000$ ;  $CMIN/df = 2.742$ ;  $CFI = .976$ ;  $RMSEA = .070$ ;  $AIC = 123.587$ ). The model confirmed that length of affiliation positively predicted place attachment ( $\beta = .22$ ,  $p \leq .001$ ,  $R^2 = .05$ ), and indirectly affected park-specific behaviours ( $\beta = .14$ ) and general intentions ( $\beta = .10$ ). The impact of length of affiliation was fully mediated by place attachment. Place attachment's direct predication of pro-environmental intentions was similar to that observed in the other model: statistically significant and moderately strong.

Childhood interaction with the Park was also placed in a model to examine its affects on place attachment and pro-environmental intentions. The model's fit with the data was evaluated and found to be adequate: ( $\chi^2_M = 40.021$ ,  $df = 21$ ,  $p = .007$ ;  $CMIN/df = 1.906$ ;  $CFI = .987$ ;  $RMSEA = .051$ ;  $AIC = 106.021$ ). The models re-confirmed the findings observed in the park relationship model. Childhood visitation positively predicted place attachment ( $\beta = .22$ ,  $p \leq .001$ ,  $R^2 = .05$ ), and indirectly affected place-specific ( $\beta = .16$ ) and general pro-environmental intentions ( $\beta = .11$ ).

### **Place satisfaction**

Low satisfaction with a place when combined with high place attachment has been positively associated with place-specific behavioural intentions and concerns in past studies (Stedman, 2002; Shumaker & Taylor, 1984). To test this, satisfaction with Point Pelee National Park's natural, social, and activity-conducive environments was measured. These three indicators were combined to create the latent factor Place Satisfaction. Factor loadings

indicated that this measurement model was acceptable (see Appendix C-13a). The overall structural model used to examine place satisfaction's relationship with place attachment and behavioural intentions demonstrated good fit ( $\chi^2_M = 83.755$ ,  $df = 37$ ,  $p = 0.000$ ;  $CMIN/df = 2.264$ ;  $CFI = .972$ ;  $RMSEA = .060$ ;  $AIC = 163.755$ ). Place satisfaction and place attachment were treated as independent, correlated variables in this model. The correlation was statistically significant and modest in size ( $\beta = .32$ ,  $p \leq .001$ ).

As with previous models place attachment's direct effect on park-specific intentions was higher ( $\beta = .62$ ,  $p \leq .001$ ) than its effect on general intentions ( $\beta = .41$ ,  $p \leq .001$ ). Place satisfaction had no direct effects on behavioural intentions.

One could also re-conceptualize the directionality of the relationship between place attachment and place satisfaction. For example some place-related literature has suggested that satisfaction with a place leads to the formation of attachment. Appendix C-13b depicts such a relationship. Significant changes between this model and the previous model include: place satisfaction now positively predicts place attachment ( $\beta = .32$ ,  $p \leq .001$ ,  $R^2 = .10$ ) and has indirect effects on general ( $\beta = .13$ ,  $p \leq .001$ ) and park-specific behavioural intentions ( $\beta = .20$ ,  $p \leq .001$ ).

Alternatively one could also argue that attachment to place might affect the level of satisfaction a respondent could express due to the influence of factors such as the effect of positive emotions and feelings toward a place and how this might cloud one's judgement. On the other hand a long term affiliation with the park, which has honed a respondent's knowledge of the park and his/her thoughts on what the park should be, may also affect satisfaction. This potential impact of place attachment on satisfaction is depicted in Appendix C-13c. In this model place attachment positively predicts place satisfaction ( $\beta = .32$ ,  $p \leq .001$ ,  $R^2 = .10$ ); however its only effects on behavioural intentions are direct as the coefficient paths between place satisfaction and behavioural intentions remain statistically insignificant.

A final means of analyzing the relationship between satisfaction and the study's main constructs is to examine the individual affects of each satisfaction variable on place attachment and behavioural intentions. This entailed the creation of three new models; each utilized a single-indicator, the observed variable representing individuals' satisfaction with opportunities to engage in a favourite activity, satisfaction with the park's natural environment, and satisfaction with the park's social environment.

The first of these models examined the relationship of activity satisfaction with the study's main constructs. This model (see Appendix C-13d) demonstrated good fit ( $\chi^2_M = 53.916$ ,  $df = 21$ ,  $p = .000$ ;  $CMIN/df = 2.567$ ;  $CFI = .978$ ;  $RMSEA = .067$ ;  $AIC = 119.916$ ). The model revealed that activity satisfaction predicts place attachment ( $\beta = .22$ ,  $p \leq .001$ ,  $R^2 = .05$ ), and had very small indirect effects on general ( $\beta = .09$ ,  $p \leq .001$ ) and park-specific behaviours ( $\beta = .14$ ,  $p \leq .001$ ) through place attachment. Minor changes in the direct effects of place attachment on general ( $\beta = .41$ ,  $p \leq .001$ ) and park-specific pro-environment behavioural intentions ( $\beta = .62$ ,  $p \leq .001$ ) were also observed. Place attachment and activity satisfaction combined to explain 42% of park-specific intentions and 18% of general behavioural intentions. No significant relationship between activity satisfaction and the two behavioural intentions constructs were observed.

Appendix C-13e proposes that satisfaction with the park's natural environment predicts place attachment. Goodness of fit was achieved for the model ( $\chi^2_M = 42.411$ ,  $df = 21$ ,  $p = .000$ ;  $CMIN/df = 2.210$ ;  $CFI = .983$ ;  $RMSEA = .058$ ;  $AIC = 112.41$ ). Although a statistically significant relationship was observed between nature satisfaction and place attachment, this was very small and the variable only explained 1% of the place attachment's variance ( $\beta = .11$ ,  $p \leq .05$ ). Similarly infinitesimal indirect effects of nature satisfaction on behavioural intentions through place attachment were found (park-specific:  $\beta = .08$ , general:  $\beta = .05$ ;  $p \leq .05$ ). This result may be the result of statistical chance rather than evidence of a predictive relationship between the two factors. Place attachment again demonstrates strong prediction of park-specific behavioural intentions ( $\beta = .64$ ,  $p \leq .001$ ) and general intentions ( $\beta = .42$ ,  $p \leq .001$ ). Nature satisfaction had no significant direct relationship with these two factors.

Appendix C-13f depicts the model used to explore the relationship between satisfaction with the park's social environment and the study's main constructs. Again, this satisfaction measure was proposed to predict place attachment. This was found to be a modest, but statistically significant prediction ( $\beta = .24, p \leq .001, R_2 = .06$ ). Satisfaction with the Park's social environment had modest indirect effects on park-specific behavioural intentions ( $\beta = .16, p \leq .001$ ) and general behavioural intentions ( $\beta = .10, p \leq .001$ ). A no significant direct relationship was observed between satisfaction with the park's social environment and the two pro-environment behavioural intentions factors; however as with the other models in this study place attachment demonstrated strong direct effects on park-specific ( $\beta = .63, p \leq .001$ ) and general behavioural intentions ( $\beta = .42, p \leq .001$ ).

As with the model depicted in Appendix C-13c, the directionality of the three models that examined the relationship between the single-indicators of satisfaction and the study's main constructs could be reversed. Tests for this were performed. The results for each model with reversed directionality mirrored their predecessors, with the exception that now place attachment significantly predicted each of the observed variables utilized to represent different facets of satisfaction. Place attachment predicted a) activity satisfaction ( $\beta = .22, p \leq .001, R_2 = .05$ ); b) nature satisfaction ( $\beta = .11, p \leq .05, R_2 = .01$ ); and c) social satisfaction ( $\beta = .24, p \leq .001, R_2 = .06$ ), in each of the respective models. No significant relationships between the satisfaction indicators and the behavioural intentions factors were observed.

## **Membership**

As was described in Chapter 2, in previous studies membership in an environmental group has been a good predictor of pro-environmental attitudes, behavioural intentions and past behaviours. In this study it was expected that membership in Friends of Point Pelee and membership in an environmental group within the last 12 months would be positively associated with pro-environment behavioural intentions. It was also anticipated that membership in FoPP would be strongly related to place attachment.



Appendix C-14a outlines one of three structural models used to examine this. This model features a latent factor titled Membership, which is based on two membership indicators, FoPP membership and membership in and environmental organization. The measurement model for membership was rejected in part because factor loadings for the FoPP indicator proved to be too small.

In a second model FoPP was used as a single indicator of membership (see Appendix C-14b). The model's fit was determined to have good fit with the data ( $\chi^2_M = 35.909$ ,  $df = 21$ ,  $p = .022$ ;  $CMIN/df = 1.710$ ;  $CFI = .990$ ;  $RMSEA = .045$ ;  $AIC = 101.909$ ). The model revealed that place attachment was moderately predictive of FoPP membership ( $\beta = .28$ ,  $p \leq .001$ ,  $R^2 = .08$ ). However FoPP did not have a statistically significant direct relationship with the two behavioural intentions. This result is not surprising given the low correlations between FoPP membership and the intentions measures observed during earlier analyses.

These non-significant path coefficients were also negative in value. A puzzling outcome given that correlations between FoPP membership and the study's main constructs were positive in value when correlation analysis was performed. Upon further reflection it was decided that a special data set would be developed to assess FoPP membership's relationship with pro-environment behavioural intentions. This decision was based on the concern that the high number of environmental group members in the data base may be affecting the outcome of attempts to assess FoPP membership's usefulness as an indicator of pro-environmental intentions. To address this, a new database was created that removed all environmental group members with the exception of those who were FoPP members. The new data base ( $n = 222$ ) only contained members of FoPP ( $n = 48$ ) and individuals who were not members of an environmental group in the last 12 months ( $n = 174$ ).

The model, depicted in Appendix C-14b, was re-run using the new data set and is presented in Appendix C-14c. Given the use of a new data set model fit was reassessed and found to be adequate:  $\chi^2_M = 46.182$ ,  $df = 21$ ,  $p = .001$ ;  $CMIN/df = 2.199$ ;  $CFI = .976$ ;  $RMSEA = .074$ ;  $AIC = 112.182$ . The new data appeared to rectify the negative values of the coefficient paths between FoPP membership and the behavioural intentions factors.

The model revealed place attachment as a positive predictor of FoPP membership ( $\beta = .35, p \leq .001, R_2 = 12$ ). It also strongly predicted park-specific pro-environment behavioural intentions ( $\beta = .67, p \leq .001, R_2 = .47$ ) and general behavioural intentions ( $\beta = .44, p \leq .001$ ). Interestingly, while membership in FoPP did not directly predict pro-environmental intentions towards the park, it did positively predict general intentions ( $\beta = .14$ ). However this relationship was just barely significant ( $p = .050$ ) and should be interpreted accordingly. Place attachment and FoPP membership combined to explain 26% of general pro-environment behavioural intentions' variance. In Model C-14c place attachment's indirect effect on behavioural intentions via FoPP membership was an infinitesimal ( $\beta = .05$ ).

One could again argue that FoPP membership may also be a predictor of place attachment. To examine this, the model was run again with a change in the directionality between FoPP membership and place attachment (see Appendix C-14d). No changes were observed except that FoPP membership now positively predicted place attachment ( $\beta = .35, p \leq .001, R_2 = 12$ ), and it had indirect effects via place attachment on general intentions ( $\beta = .15$ ) and park-specific intentions ( $\beta = .23$ ).

A main third structural model was created to explore the relationship between membership in an environmental organization and the two main constructs of the study (see Appendix C-14e). This category of membership is not exclusive of FoPP membership; 28 members of FoPP who responded to this study acknowledged that they were members of an environmental organization in the last 12 months. Model fit was determined to be just barely adequate ( $\chi_M^2 = 62.069, df = 21, p = .000$ ;  $CMIN/df = 2.955$ ;  $CFI = .972$ ;  $RMSEA = .074$ ;  $AIC = 128.049$ ).

All paths in the model were statistically significant ( $p \leq .001$ ). Environmental group membership weakly predicted place attachment ( $\beta = .15, p \leq .05, R_2 = 02$ ) and, as expected, strongly predicted park-specific intentions ( $\beta = .22, p \leq .001$ ) and general behavioural intentions ( $\beta = .42, p \leq .001$ ). Place attachment strongly predicted park-specific intentions ( $\beta = .61, p \leq .001$ ) and general behavioural intentions ( $\beta = .34, p \leq .001$ ). Environmental

group membership and place attachment combined to explain 45% of park-specific and 34% of general pro-environment behavioural intentions. Environmental group membership's indirect effects on these two factors were quite small:  $\beta = .09$  for park-specific intentions, and  $\beta = .05$  for general intentions.

When the directionality of this model was changed so that place attachment became the hypothesized predictor of environmental group membership, similar numbers were achieved. The exceptions were that place attachment was now a weak predictor of environmental group membership ( $\beta = .15, p \leq .05, R_2 = .02$ ), and its indirect effects via environmental group membership were even smaller:  $\beta = .03$  for park-specific behavioural intentions and  $\beta = .06$  for general intentions. In short, membership in an environmental group appears to be an effective predictor of pro-environmental behavioural intentions. Individuals who are members of an environmental organization, approximately half of survey respondents, expressed higher levels of pro-environmental behavioural intentions than those who were not members.

## **Commitment**

Membership was also used to create two latent factors to represent park commitment and general environmental commitment. Two structural models were created, the first utilized indicators that represent general environmental commitment. Titled Gen Commit, the new latent factor in this model featured three indicators, membership in an environmental organization within the last 12 months, number of days donated to an environmental organization other than Friends of Point Pelee, and the amount of money (including membership fee) donated to an environmental organization other than Friends of Point Pelee. Although two of the three factor loadings on the latent factor Gen Commit were a little undersized (.38, .39, and .77) the measurement model was accepted (see Appendix C-15a). The overall structural model used to examine general environmental commitment's relationship with place attachment and behavioural intentions was assessed for goodness of fit and was found lacking. An additional modification was recommended by Amos. A correlation of time and money donated to environmental groups ( $r = .33$ ) helped increase goodness of fit. The final fit statistics were:  $\chi^2 = 88.912, df = 37, p = .000$ ; CMIN/df =

2.403; CFI = .969; RMSEA = .063; AIC = 168.912. In this model, displayed in Appendix C-15a, place attachment was proposed to predict general commitment. This is based on the idea that attachment to natural places may encourage individuals to engage in environmentally responsible actions in other, day-to-day settings.

As with the structural model that focused on environmental group membership, all paths in the general environmental commitment structural model were statistically significant. Almost all values were the same too. The exceptions to this were associated with prediction of general pro-environment behavioural intentions; its explained variance increased to .48. General commitment's prediction of general pro-environmental intentions increased slightly ( $\beta = .57, p \leq .001$ ) while place attachment's prediction of the construct decreased slightly ( $\beta = .28, p \leq .001$ ). Place attachment's prediction of general commitment was small but statistically significant ( $r = .20, p \leq .05, R^2 = .04$ ); its indirect effects on general intentions ( $\beta = .06$ ) and park-specific intentions ( $\beta = .12$ ) were small. Essentially this is the same result as was achieved with the single indicator environmental group membership.

As with many of the other relationships investigated here, the directionality of this model could also be reversed. It makes sense to suggest that general commitment indicators such as days and time donated to environmental causes might be good predictors of place attachment; support of the environment is likely related to parks in general and could be linked to Point Pelee National Park in particular. This was tested with the model depicted in Appendix C-15b. Most model parameters remained the same. The exception to this was general commitment's positive prediction of place attachment ( $r = .20, p \leq .05, R^2 = .04$ ) and its indirect effects on general behavioural intentions ( $\beta = .12$ ) and park-specific intentions ( $\beta = .06$ ).

Membership in Friends of Point Pelee was also included in a measurement model designed to represent commitment to Point Pelee National Park (titled Park Commit). As with the above commitment model, time and money donated to Friends of Point Pelee were also used as indicators (see Appendix C-15c). The data base ( $n = 222$ ) that excluded environmental group members who were not members of FoPP was utilized to perform SEM. Good,

statistically significant factor loadings indicated the factor model was adequate. Overall good fit for the structural model was also achieved ( $\chi^2_M = 69.542$ ,  $df = 38$ ,  $p = .001$ ; CMIN/ $df = 1.830$ ; CFI = .972; RMSEA = .061; AIC = 147.542).

Like the general environmental commitment model above, results between the single-indicator FoPP membership model and the park commitment model are very similar. Exceptions include increased prediction of place attachment ( $\beta = .45$ ,  $p \leq .001$ ,  $R^2 = .20$ ) and the lack of a statistically significant direct relationship between general behavioural intentions and park commitment. The park commitment factor indirectly affected park-specific intentions ( $\beta = .29$ ,  $p \leq .001$ ), and general intentions ( $\beta = .19$ ,  $p \leq .001$ ) via statistically significant paths through place attachment. Place attachment positively predicted general ( $\beta = .43$ ,  $p \leq .001$ ), and park-specific pro-environment behavioural intentions ( $\beta = .64$ ,  $p \leq .001$ ). Place attachment and park commitment combined to explain 48% of park-specific behavioural intentions variance, and 26% of general intentions.

Revising the directionality of this model could also make sense. Place attachment should positively predict park commitment. Appendix C-15d depicts such a model. All parameters mirrored the previous model with the exception that place attachment strongly predicted park commitment ( $\beta = .45$ ,  $p \leq .001$ ,  $R^2 = .20$ ). A direct effect between park commitment and behavioural intentions remained non-significant. This is contrary to the expectation that variables such as membership in the Park's Friends group as well donations of time and money would be strongly related to park-specific behaviours, and perhaps even general behavioural intentions.

### **Distance of residence from Park**

An exploration of the relationship between distance travelled and the study's main constructs was accomplished by incorporating a single-indicator into the main structural model which represented the number of kilometres between study participants' mailing addresses, assumed to be their main place of residence, and the park (Appendix C-16a). The

structural model's fit was assessed and was determined to be adequate ( $\chi^2_M = 40.273$ ,  $df = 21$ ,  $p = .007$ ;  $CMIN/df = 1.918$ ;  $CFI = .987$ ;  $RMSEA = .051$ ;  $AIC = 106.273$ ).

The model in Appendix C-16a depicts distance as a predictor of place attachment. One could propose this based on scattered evidence that individuals living closer to the park may demonstrate higher levels of functional attachment, an element of the overall place attachment construct. Interestingly a statistically significant, albeit small prediction of place attachment was made by the distance variable ( $\beta = -.12$ ,  $p \leq .05$ ). The path coefficient suggests that individuals living close to the park demonstrate higher levels of place attachment; however the amount of place attachment's variance explained by this interaction is negligible ( $R^2 = .01$ ).

A non-significant relationship between place-specific pro-environment behavioural intentions was also observed. This suggests that distance of residence from has no direct effect on park-related environmentally responsible behaviours. It was speculated that individuals who live close to the park might demonstrate higher levels of stewardship; however this does not seem to be strongly supported. Distance did have an indirect effect on park-specific behavioural intentions ( $\beta = -.08$ ) and general behavioural intentions ( $\beta = -.05$ ). These negative values suggest that individuals living closer to the park more frequently expressed intentions to engage in pro-environment behavioural intentions, however these values are quite small, and should be interpreted with caution.

A finding that was even more unexpected was a statistically significant relationship between distance and general pro-environment behavioural intentions ( $\beta = .13$ ,  $p \leq .05$ ). Although very modest in effect, this finding suggests that as distance of residence increases so do expressed intentions to perform general environmentally responsible behaviours. As with the other models in this study place attachment positively predicted both categories of pro-environmental behavioural intentions.

A second means of theorizing the relationship between distance of residence from the park and the study's main constructs was to make place attachment a predictor of distance. One

could argue that place attachment may predict individuals' decisions to relocate to (Bricker & Kerstetter, 2000) or continue living near the park. Strong place attachment might also be a strong pull factor in bringing visitors back to the park each year despite the distance that needs to be travelled. The affect of place attachment on distance was estimated using the model illustrated in Appendix C-16b. All parameters remained as the model depicted in Appendix C-16a with one exception: place attachment now weakly predicted distance ( $\beta = -.12, p \leq .05, R_2 = .01$ ), and had an indirect, albeit negligible effect on general pro-environment behavioural intentions via distance ( $\beta = -.02$ ). This finding suggests that individuals with high levels of place attachment may be less likely to travel great distances to get to the park. This would seem to refute the propositions outlined above regarding place attachment's affect on distance.

### **Substitution**

Substitution, defined by a) the ability to substitute and b) awareness of similar destinations, was initially hypothesized to be predicted by place attachment, and also to be a strong predictor of park-specific pro-environmental behaviours. The structural model in Appendix C-17a reflects these hypotheses. The latent factor substitution was based on two indicators, Sub\_aware and Sub\_ability; these variables were characterized by data arising from the questions "I can easily substitute Point Pelee N.P. with another park or natural area as a place to visit (i.e., I can travel there; I have enough time and money, etc.)" and "I am aware of other parks and natural areas that meet my needs as well as Point Pelee N.P. does (i.e., Point Pelee is not unique; I can find the attributes that I find there, at another site)." The data were reverse coded to facilitate analysis, hence the name "anti"-substitution.

The measurement model, based on significant moderately strong factor loadings, was deemed to be acceptable. The structural model also demonstrated good fit with the data ( $\chi^2_M = 57.751, df = 28, p = .001$ ;  $CMIN/df = 2.063$ ;  $CFI = .982$ ;  $RMSEA = .055$ ;  $AIC = 131.751$ ). The model revealed that place attachment was indeed a fair predictor of anti-substitution, explaining 28% of the factor's variance ( $\beta = .53, p \leq .001$ ). Place attachment demonstrated strong prediction of park-specific behavioural intentions ( $\beta = .70, p \leq .001$ ) and general behavioural intentions ( $\beta = .49, p \leq .001$ ). Strangely anti-substitution did not have a

significant relationship with park-specific pro-environment behavioural intentions. This suggests that individuals, who are not aware or able to substitute Point Pelee National Park for another site, are no more likely to engage in park-specific environmentally responsible behaviours than individuals who expressed higher levels of ability to substitute and awareness of substitutes. In short substitution does not appear to be a good predictor of pro-environmental behaviour. One note of caution associated with the results from this model. A suppression effect appears to be affecting the path coefficient values between substitution and the two behavioural intentions factors. The values should be positive as the original correlations between these factors were positive (see Appendix C-17). Further analysis which controls for the presence of place attachment and explores the effect of other variables may facilitate greater understanding of this phenomenon. This is discussed further at the end of the Findings Chapter.

An alternative model featuring the same variables was developed that suggested substitution could be a predictor of place attachment. This model, included in Appendix C-17b, revealed the same parameter estimates as the previous model, however substitution now positively predicts place attachment ( $\beta = .53, p \leq .001, R_2 = .28$ ). Additionally, because of the statistically significant coefficient paths leading from substitution via place attachment to both behavioural intentions factors, substitution also demonstrated fairly substantial indirect effects on these factors:  $\beta = .37$  for park-specific intentions and  $\beta = .26$ , for general pro-environment behavioural intentions.

Initial correlation analysis suggested the two substitution variables may demonstrate different relationships with the study's main constructs. Slightly stronger correlations between place attachment and ability to substitute Point Pelee National Park (Sub\_ability) and moderately stronger correlations between park-specific behavioural intentions and awareness of substitutes for the Park (Sub\_aware) suggested that separate analyses of the effect of each of these substitution variables may be productive. To this end two additional structural models were developed to generate estimates.



The first model, depicted in C-17c, examines the predictive effect of awareness of substitutes (Sub\_aware). Model fit was tested and found to be adequate ( $\chi_M^2 = 49.431$ ,  $df = 21$ ,  $p = .001$ ;  $CMIN/df = 2.354$ ;  $CFI = .981$ ;  $RMSEA = .062$ ;  $AIC = 115.431$ ). Awareness of substitutes was found to be a positive predictor of place attachment ( $\beta = .35$ ,  $p \leq .001$ ,  $R_2 = .12$ ). Sub\_aware did not have a statistically significant direct relationship with the behavioural intentions factors, but it did have indirect effect via paths through place attachment; these included  $\beta = .22$  with park-specific intentions and  $\beta = .15$  with general behavioural intentions. Interestingly the negative coefficient path values of the previous model have disappeared. Place attachment's prediction of the two behavioural intentions factors also "normalized" to a range of coefficient values witnessed in previous structural models in this study;  $\beta = .63$ ,  $p \leq .001$  for park-specific behaviours and  $\beta = .41$ ,  $p \leq .001$  for general intentions.

The model in Appendix C-17d depicts the same model, but with a change in the directionality between place attachment and awareness of substitutes. This model implies that place attachment could predict respondent's awareness of substitutes to Point Pelee National Park. For example, an individual with high levels of emotional and identity-based attachments may find it impossible to duplicate their unique relationship with the park in another setting. This model reveals parameter estimates similar to the previous model. The exception is that place attachment is now the positive predictor of awareness of substitutes ( $\beta = .35$ ,  $p \leq .001$ ,  $R_2 = .12$ ). This prediction suggests an individual with high place attachment would also express higher levels of disagreement with the statement that other parks and natural areas could meet his or her needs as well as Point Pelee National Park (i.e., the park was not unique; s/he could find the attributes of the park, at another site).

A similar exploration was undertaken to examine the relationship between ability to substitute (Sub\_ability) and the study's main constructs. A model, illustrated in Appendix C-17e, was developed to accomplish this. The model fit was assessed and found to be very good ( $\chi_M^2 = 36.600$ ,  $df = 21$ ,  $p = .019$ ;  $CMIN/df = 1.743$ ;  $CFI = .990$ ;  $RMSEA = .046$ ;  $AIC = 102.600$ ). Strangely negative beta coefficient values appeared again on the paths between ability to substitute and the two behavioural intentions factors; initial correlation analysis

suggested this should be a positive relationship. Suppression effect or some other phenomenon may be influencing the results associated with this model, therefore cautious interpretation is warranted.

In this model ability to substitute (Sub\_ability) was a positive predictor of place attachment ( $\beta = .41, p \leq .001, R_2 = .17$ ). This finding suggests that individuals who did not feel they were able to substitute Point Pelee National Park for another natural area expressed higher levels of place attachment than individuals who felt they were able to. Ability to substitute was a negative predictor of general behavioural intentions ( $\beta = -.14, p \leq .05$ ) and park-specific intentions ( $\beta = -.12, p \leq .05$ ). This suggests that low ability to substitute Point Pelee National Park with another natural area was tied to lower expressed plans to engage in place-specific and general pro-environmental behaviours. The latter finding supports initial thoughts on the impact on substitution. No obvious explanation currently exists for the finding associated with general pro-environmental behaviours. Place attachment was positive predictor of general behavioural intentions ( $\beta = .48, p \leq .001$ ) and park-specific behavioural intentions ( $\beta = .69, p \leq .001$ ). Ability to substitute also had indirect effects on the two behavioural intentions factors:  $\beta = .20$  for general intentions, and  $\beta = .28$  for park-specific intentions.

Changing the directionality of this model so that place attachment is a predictor of ability to substitute does not make a great deal of theoretical sense. Ability to substitute is largely based on resources such as time to travel and the financial status of each respondent. Other factors related to place attachment may possibly play role in affecting ability to substitute, however these are not readily apparent. An alternative model was developed that examines this relationship in case a revisitation of the literature produced some support for place attachment's prediction of substitution ability. Appendix C-17f contains this model. All parameters are the same as the previous model except for place attachment's prediction of ability to substitute ( $\beta = .41, p \leq .001, R_2 = .17$ ), and its indirect, negligible effects on general intentions  $\beta = -.06$ , and park-specific intentions  $\beta = -.05$ .

## Motivation for visit

The final factor reported on here is motivation for visit to the park and its relationship with the study's two main factors. Four motives were documented; these were "to enjoy the natural environment;" "to participate in the outdoor activities I enjoy;" "to spend time with my friends and/or family;" and, "to learn about the park's natural environment."

Respondents were asked to rank the importance of each motive from 1 (the most important) to 4 (the least important). If respondents gave the same ranking to two motives they were removed from the data set, excluding them from further analysis related to motivations for visiting the park. The new data set contained 323 cases. Individuals were also allowed to indicate if the motive was not applicable. These were assigned a value of 5. All responses were then reverse coded to facilitate interpretation. A motive with a newly assigned value of 5 indicated the motive was the most important for the respondent in this new ordering of the variable.

Motives were treated in this study as predictors of place attachment and pro-environmental intentions. For example if an individual was very interested in nature s/he would be attached to a nature-based place such as Point Pelee and perhaps engage in pro-environmental behaviours designed to protect the natural elements of that place. A single-indicator latent factor was created for each motive. Appendix C-18a provides an example of one of the four motivation structural models. This model, which examines the relationship between the study's main constructs and how important nature was in visiting Point Pelee National Park, was characterized by the following fit measures:  $\chi^2 = 37.794$ ,  $df = 21$ ,  $p = .014$ ; CMIN/ $df = 1.800$ ; CFI = .989; RMSEA = .048; AIC = 103.794. A second model (see Appendix C-18b), which examines the relationship between the importance of visiting the park to spend time with friends and family and the study's main constructs, also demonstrated good fit:  $\chi^2 = 55.426$ ,  $df = 21$ ,  $p = .000$ ; CMIN/ $df = 2.639$ ; CFI = .977; RMSEA = .068; AIC = 121.426. Only these two factors (Motive\_soc and Motive\_nat) exhibited a statistically significant relationship with place attachment. Both predicted place attachment equally ( $\beta = .19$ ,  $p \leq .001$ ,  $R^2 = .04$ ). Place attachment, in all four models significantly predicted pro-environmental intentions in a similar manner; all coefficient paths were similar to these estimates found in the nature motives model: general behavioural intentions ( $\beta = .43$ ,  $p \leq$

.001,  $R_2 = .18$ ) and park-specific behavioural intentions ( $\beta = .64, p \leq .001, R_2 = .41$ ). This pattern of estimation was very similar to what has been observed in other models used in this study. Motive\_soc had indirect effects via a path through place attachment on general intentions  $\beta = .08$  and park-specific intentions  $\beta = .12$ . Motive\_nat's indirect effects on pro-environment behavioural intentions were a duplicate of this.

Learning and participation in a favourite activity failed to demonstrate any statistically significant relationships with both place attachment, or the two behavioural intentions factors, and are therefore not reported on further. Based on the correlation analysis which identified few statistically significant direct relationships were found between the four motives and either set of behavioural intentions, this lack of significant relationships in these structural equation models is unsurprising. A discussion of these results and the results revealed in the preceding analysis are discussed next.

## Chapter 5: Discussion

Findings, reported in Chapter 4, are discussed further here. Place attachment, its relationship with pro-environmental intentions, and the relationship of several additional variables with the study's main constructs are described next. This is followed by a brief review of findings related to the psychometric properties of place attachment upon the completion of this thesis.

### ***Place attachment and behavioural intentions***

Overall, survey participants demonstrated moderately high levels of place attachment and pro-environmental behaviours. An examination of means associated with the theoretically-based categories of place attachment reveal that place dependence may play a lesser role in the strength of individuals' attachment in comparison with place affect and identity. Place attachment was treated as a uni-dimensional factor for the SEM portion of this study; however, further analysis which utilizes place attachment sub-dimensions which are theoretically-based or derived from principle components analysis will be undertaken.

The central focus of this study was an investigation of the relationship between place attachment and pro-environment behavioural intentions. Support was found for the proposition that place attachment would a) predict both general and place-specific intentions, and b) place attachment would predict place-specific behaviours more strongly.

Place attachment's prediction of general pro-environmental intentions corroborates Vaske and Korbin's (2001) findings from a study of adolescents participating in a nature conservation program; they documented a relationship between place attachment and general environment behavioural intentions. Their study differed in that their analysis was conducted using sub-dimensions of place attachment (i.e. place identity and place dependence). Further exploration of the relation between place identity and place dependence and behavioural intentions should be undertaken and compared with Vaske and Korbin's findings.

The finding that place attachment predicts park-specific pro-environmental behaviours parallels findings observed in the community sociology (Shumaker & Taylor, 1984, Guest & Lee, 1983) as well as recreation and resource management literature (Kaltenborn, 1998; Stedman, 2002; Walker & Chapman, 2003). The emotional, conative and cognitive bonds that individuals form with a place do appear to foster a sense of stewardship or desire to protect and care for that place. This pattern was observed for visitors to Point Pelee National Park. However, the degree to which this expression of protection and stewardship was fostered through visitation and not through other sources such as interactions with other natural areas, formal education, socialization by family and friends, society and cultural valuation of national parks as a whole, and so on, is unknown but may be revealed through further research. An examination of the effect of variables such as length of affiliation and frequency of visit may help illuminate this. This is discussed next.

## ***External Variables***

### **Frequency**

*I've only been to Point Pelee National Park twice so I haven't developed an affinity to it yet, not like Pinery Provincial Park or Algonquin. I think the more you visit a place, the more it becomes a part of you; the more likely you are to pay and fight for its preservation.*

Survey respondent, May 2005.

As this statement from a survey participant suggests, frequency of visits to a place may be related to the development of attachments and protective behaviours related to that place. A strong positive association between frequency of visitation and place attachment has been documented in previous recreation studies (Moore & Graefe, 1994; Williams et al., 1992). One depiction of this relationship, documented in Model C-10a, suggests that frequency is a strong predictor of place attachment. Study results appear to support this representation.

This relationship is based on the theory that frequent visitation may foster the development of place attachment, first through the provision of a setting to interact with nature or partake in social and recreational activities. This can result in the development of place dependence. Later, place identity may develop through the accumulation of place meanings and memories and the development of self identity as influenced by place (Moore & Graefe, 1994).

Place attachment is also depicted as a strong predictor of frequency of visits (Model C-10b). This suggests further exploration of the effect of different facets of place attachment on frequency of visitation may be warranted. For example, an individual who is place dependent, perhaps having few recreation spaces to choose from or who is engaged in a highly site specific activity such as observing migratory birds, will undoubtedly demonstrate higher levels of visitation. Based on correlation analysis, place dependence may be a less significant indicator of frequent visitation than place affect and place identity. Place identity and place affect associated with Point Pelee National Park may produce more frequent visitors of the park. This should be examined through further analysis. A first step in this would be to examine the relationship between place attachment's sub-dimensions and trip frequency.

The negative prediction of general environmental intentions by frequency of visits was puzzling. It was anticipated that frequent users of a park like Point Pelee would be characterized by an interest in nature and the environment and as such would demonstrate moderate levels of pro-environmental intentions. This was not the case. The negative relationship may be result of other factors; for example, the park may serve as an important natural setting for some visitors, but for others it may be just a conveniently located setting in which one can walk the dog or get exercise. Attachments and visitation may not be due to a strong environmental ethic or interest in nature, but rather convenience.

A question that examines individuals' preferred behaviour when in the park, or main reason for visiting the park might help identify functional drivers of frequent visits. Measures of distance may also help us understand if convenient location is a factor in this; however,

distance on its own may not be useful in explaining this phenomenon as there is likely to be a blend of individuals who live close to the park ranging from those with no interest in the park other than to get exercise or walk a dog to those who are intimately bound to the natural elements of that park. Based on analysis of comments made in the open question provided at the end of the survey instrument both extremes of individuals appear to have been captured in the survey. This is reflected in the following quotations from survey respondents; the first comment represents an intense devotion to the park itself and its natural elements, the second represents an opposite perspective largely focused on the importance of amusements and service provision, and the third represents the middle ground, an individual who appreciates the park's more naturalistic attributes, but also the opportunities it provides such as a setting for exercise.

*I absolutely love the park and cannot imagine what life in this region of Ontario would be like without it! It holds plenty of quality memories in my life; it is an educational and ecological site for children and adults. It is a place of serenity and beauty. It has been a major deciding factor for moving out to Kingsville for my husband and myself.*

Survey respondent, May 2005

*The park needs more activities/services – face painting (kids), paddle boats, jet skies, boat rides, petting zoo, horseback riding, souvenir shops and stores, restaurants.*

Survey respondent, May 2005

*I love Pt Pelee. I could spend a whole day everyday at your park. I love nature and love the beach area surrounding the Park. I love to ride my bike along the bike trails. My boyfriend and I spend every opportunity we can in your park either walking the trails, biking, etc. Your park has won my interest and I call it my play ground.*

Survey respondent, May 2005



Fortunately data was collected by the survey instrument that may help explore the reasons for frequent visits. Distance, favourite activity and top ranked motive for visiting the park were documented. Future analysis will be employed to examine if one of these factors can help explain this negative relationship between frequent visits and general environmental behaviours.

### **Length of visitation**

The statistically significant, but somewhat weak prediction of trip length by place attachment in Model C-11a and place attachment by trip length in Model C-11b was somewhat surprising. Only one other study (Williams et al., 1992) has documented the relationship between these two variables; they found significant positive associations but only within very constrained conditions (i.e., the focus was on wilderness attachment and a significant relationship was identified only for those who were highly place attached). As with Williams et al.'s (1992) measure of perceived length of stay, respondent's average length of stay for overnight trips demonstrated a stronger, albeit smaller, positive association with place attachment than the length of respondent's most recent stay. A true difference between survey respondent's most recent and average length of stay is uncertain. The differences between these results could be an artefact of measurement; the results were collected in two differently formatted questions. Nevertheless, it is interesting that a vague parallel can be drawn between Williams et al.'s (1992) perceived length of stay, and this study's average length of stay.

No significant relationships were observed between length of visit and pro-environment behavioural intentions; this was not surprising given the speculative nature of initial theorizing associated with these relationships. Earlier in the study it was proposed that an ethic of care may develop for a place and in particular for its natural surroundings over the duration of a trip. Individuals on longer trips would express higher levels of place-specific pro-environmental intentions as a result. This was proposed to explain why length of trip may be positively associated with pro-environmental intentions.

Further research which examines if a long stay at the park encourages place attachment and pro-environmental intentions and is not simply an outcome of established attachments could be undertaken through a comparison of first time visitors and repeat visitors. A more accurate measure would be a multi-phasic approach to data collection in which place attachment and pro-environmental attitudes, behaviours and behavioural intentions measurement would take place before the trip begins, during, and after the trip is complete. This analysis of place attachment and pro-environmental tendencies development has yet to be undertaken in place attachment research. Environmental education literature documents some longitudinal research on the impact of park interpretation programming and classroom-based education programs on childrens' and adolescents' pro-environmental behaviours and attitudes (Gotch & Troy, 2004; Newhouse, 1990; Talbot & Kaplan, 1995). Some discussion within the tourism literature on the creation of more "mindful" tourists has also touched on this theme (Higham & Carr, 2002; Madin & Fenton, 2004; Moscardo, 1996; 1999; Russel, 2002; Stewart, Hayward, & Devilin, 1998; Tubb, 2003). This could be done for park visitors who book their campsites months ahead of traveling. It could also be used to assess the affect of multi-day trips or thru-hiking on long trails or participation in volunteer tourism projects which feature a major nature focus (Halpenny & Cassie, 2003; McGehee & Norman, 2002).

### **Relationship: Length of affiliation and visitation during childhood**

A strong theoretical and empirical base was drawn on to hypothesize that length of affiliation with Point Pelee National Park and visitation to the park as a child would predict attachment to the park, and possibly park-specific pro-environment behavioural intentions. This was supported by results observed in correlation analyses, and later in a structural equation model that combined the effects of visitation during childhood and length of affiliation into one latent factor (Model C12a). Direct effects of childhood visitation and length of affiliation positively predicted place attachment, and through indirect effects predicted park-specific and general pro-environmental intentions. These indirect effects were more modest for general environmental intentions than park-specific intentions. This supports the proposition that length of affiliation and visitation during childhood may foster

place-protective behaviour. The affect was mediated by place attachment. The following statement from a survey respondent reinforces the importance of childhood visitation and length of affiliation in the formation of attachments and place-protective behaviours:

*I have spent many happy hours as a child, young adult and as a parent there.  
The park is a special spot to me and cannot be replaced, compared, or  
“exchanged” by any other spot.*

Survey respondent, May 2005.

Results of two models (Models C-12b & C-12c) which examine the affects of these variables separately revealed similar findings, although visitation as a child did appear to have a slightly stronger predictive ability.

These findings corroborate observations made by other place researchers (e.g., Kaltenborn, 1997; Kyle et al., 2004d; Lee and Allen, 1998; Mesch and Manor, 1998; Moore & Graefe, 1994) regarding the possible importance of length of affiliation in fostering place attachment. This study differed from most place attachment studies in that measurement of affiliation was not based on a question which asked respondents for the number of years they have visited a setting, rather respondents in this study were asked to report the year they first visited the park. This change in data collection was made to make it easier for respondents to answer. However, the weakness in this is that the years between the first visit and the most recent were likely characterized by differing degrees of interaction with the park. There may have been many years in between the first and last visit to the park where the respondent had no affiliation with the park other than the memories and social connection she or he made in earlier visits to the park. The end result may be inflated length of affiliation values.

Several studies have reported different relationships between place attachment sub-dimensions and length of affiliation. For example, Moore and Graefe (1994) report place identity was positively associated with length of affiliation but not place dependence. Examination of this phenomenon should be undertaken in the next stage of this study.

A variable related to length of affiliation is length of residency near the park. For example, how long the individuals had lived in the region, had they moved to the region because of the park's presence, and so on. This factor can have an impact on place attachment and park-specific pro-environmental intentions. Kaltenborn & Williams (2002) observed little difference between residential history, past experience of tourists with an area and levels of place attachment and opinions on the attributes of the local environment. Other research has found slightly different evidence to this (Guest & Lee, 1983; Shumaker and Taylor, 1984). Further examination of length of residency is needed to complement findings related to length of affiliation.

Findings from this study corresponded with previous research which documented the importance of childhood interaction with nature and nature-based places in fostering a pro-environmental ethic, place attachments and place-protective behaviours (Chawla, 1992; Chipeniuk, 1998; Harvey, 1989; Kahn & Kellert, 2002; Palmer, 1998). This finding highlights the importance of children's interaction with natural environments, through informal opportunities such as family outings or back yard exploration, and formalized environmental education programming.

### **Place Satisfaction**

Place satisfaction was shown to be an antecedent of place attachment in Model C-13b and positively predicted by place attachment in Model C-13c. Traditionally, place satisfaction has been characterized as a factor that contributes to place attachment (Eisenhauer et al., 2000; Mesch & Manor, 1998; Uzzell et al., 2002). High levels of satisfaction with a setting, based in part on the setting's attributes which facilitate social interactions or participation in a favourite recreation activity, may lead to the formation of attachments (Brunson & Shelby, 1993; Kyle et al., 2004d; Kyle et al., 2005; Shelby & Vaske, 1991). For many visitors who travel to Point Pelee National Park, satisfactory visitor experience may lead to place dependence, which in turn affects the development of place affect and place identity as layers of memories and place-specific meanings develop. For some visitors, a sense of satisfaction and perhaps even place attachment may have formed prior to their first visit to

the Point Pelee region. This could be based on stories about the setting from friends and family, or mass media and educational institutions which continually reinforce the importance and attributes of Canada's national parks.

Model C-13c depicts an alternative relationship between place attachment and place satisfaction. It suggests that place attachment can predict individuals' level of place satisfaction; this direct effect of place attachment was supported by the data. Two scenarios, outlined in Chapter 2, attempt to explain the feasibility of this relationship. In short, the first scenario suggested that positive emotional and cognitive bonds with a place could affect individual's critical assessment of a setting. His or her evaluation of a setting could be affected by a view through sentimentally-tinted "rose-coloured glasses." An alternative scenario suggested that experienced and knowledgeable individuals, whose long affiliation with a setting has resulted in place attachment, may be highly critical of changes in a setting. The critical assessment of conditions would be based on visitors' extensive knowledge of what has been the standard, a baseline of sorts, and what ought to be. This latter lens, used for evaluating satisfaction in a setting, would be rooted in socially and personally constructed place meanings and valuations.

Using social judgement theory, Kyle et al. (2004d) examined the affect of place attachment on Appalachian Trail users' perceptions of social and environmental conditions of the trail. They found place identity associated with increased concern for perceived environmental conditions (e.g., depreciative behaviour, development encroachment, use impact, perceived crowding, trail development, and use conflict). Respondents' place dependence scores predicted lower concerns related to environmental conditions encountered on the trail. The authors suggested that these two dimensions of place attachment tapped different sources of meaning for Appalachian Trail hikers, thereby producing differing levels of satisfaction with the trail's natural environment. The place identified respondents had a stronger opinion about social and environmental conditions. These respondents may be very similar to the visitors described in the second scenario. Their critical lens of assessment was driven, in part, by self identity and highly personalized views of what is good versus what is poor. An examination of this relationship between place attachment's sub-dimensions, length of

affiliation, satisfaction, and pro-environmental intentions expressed by park visitors may facilitate greater clarity of this issue.

A more nuanced understanding of satisfaction's relationship with place attachment may have been achieved with more sophisticated measures. Individual models (i.e., C-13d thru C-13f) examined the predictive ability of nature, activity and social satisfaction levels on place attachment. Satisfaction levels associated with the social environment of the park demonstrated the strongest relationship with place attachment, followed closely by activity-related satisfaction levels and nature-related satisfaction. All three satisfaction measures positively predicted place attachment. However, as described previously, the directionality of this relationship could have been reversed depicting place attachment's effect on the three satisfaction indicators. More sophisticated measures of satisfaction may provide greater clarity regarding these relationships. For example, the incorporation of an importance-performance index (Bruyere, Rodriquez, & Vaske, 2002; Hendricks, Schneider, & Budruk, 2004) would generate a clearer understanding of visitors' sources of satisfaction. Questions that measure concern about particular park environments and management practices (Daigle, Hannon, & Stacey, 2003; Davenport, Borri, Freimund, & Manning, 2002; Kyle et al., 2003; Schroeder, 1996; Warzecha & Lime 2000) would also increase our depth of understanding.

In Model C-13b place satisfaction did have moderate indirect effect on both behavioural intentions categories through place attachment. As depicted in Model C-13a, when correlated with place attachment place satisfaction did not have a statistically significant effect on pro-environmental behavioural intentions. This finding appears to be in contrast with Stedman's (2002) study; however he treated these two variables as independent constructs that each have an affect on behavioural intentions. A non-significant result may be related to the high levels of satisfaction expressed by survey respondents. Between 80 and 90% of respondents were somewhat satisfied or very satisfied with three categories of place satisfaction. The lack of a significant relationship could be the result of the population surveyed for in this study, many of whom are transient visitors and although they may visit repeatedly throughout the year or on a yearly basis their interaction with the park over the years has been sporadic and their observations of the park's environmental qualities may not

be as intimately known as those observations made by full- and part-time residents in the Wisconsin lake-district that Stedman studied. A second reason for these high levels of satisfaction may be related to respondents being asked to assess the qualities of a national park, a setting, while it is acknowledged is not perfect, may be characterized by a perception of higher quality than other natural areas, even if this may not be the reality. Finally, the measurement tool itself may have affected responses. The phrasing and approach used to measure place satisfaction in this study, as described above, differed significantly from the approach used by Stedman (2002).

## **Membership**

Membership in an environmental group and Friends of Point Pelee were found to be positive predictors of place attachment (Models C-14b & C-14d). It was also hypothesized and supported by the data that place attachment could be an antecedent of membership (Models C-14c & C-14e). The results related to FoPP membership are based on a separate data base which limited respondents to FoPP members and non-environmental group members. This appeared to rectify earlier confounding results associated with the investigation of FoPP membership's relationship with pro-environmental intentions.

These findings support previous findings reported by Williams et al. (1992) who documented a relationship between wilderness attachment and group membership. Studies from the community attachment literature also have reported the link between place attachment and group membership. In contrast, Vorkinn and Riese (2001) observed no significant relationship between these factors.

Membership in FoPP may both support and be a product of place attachment. Kenworthy Teather (1997) suggests that "voluntary organizations epitomize a specific type of structured social relations, perhaps of particular importance where a population is low" (p.227) like the Point Pelee-Leamington region. FoPP enables local individuals to express their commitment to the park, but also interact socially, benefiting in many personal ways.

Kenworthy Teather (1997) also notes that one way people become attached to a place is through developing bonds to organizations that have a place/community focus. A *social space* is created by the organization's routines such as fundraising and communications campaigns. This fosters the development of a *mental space* of shared and evolving ideology, and an ever increasing pool of memories. Park visitors who live a great distance from the park may attempt to dip into this mental space through membership and connective materials such as the Friends of Point Pelee's newsletter, *Straight to the Point*. However, one could speculate that they are likely more interested in maintaining a connection with the park than the Friends group, as the lack of physical and social interaction with other group members may retard a feeling of group belonging.

Often loyalty to the organization itself may develop, which in turn "emerges as a significant agent in the story of people's attachment to place...as time passes, places, [organizations], and people develop together" (Kenworthy Teather, 1997, p. 226). Loyalty and support of an organization may increase in the face of criticism. For example, an on-going rift is present in the community regarding the Friends' operation of the park's gift shop which is perceived to be in direct competition with local businesses. This was noted in some of the open ended comments collected by the survey instrument. The lack of correlation between FoPP membership and pro-environmental intentions could be partially explained by this organizational loyalty. It is not the park that some FoPP members may be committed to, but rather the Friends group.

The lack of correlation between FoPP members and behavioural intentions initially observed in Model C-14a can be explained by the prevalence of environmental group members present in the data base who are not FoPP members. As was described previously in the Findings Chapter, these non-FoPP environmental group members may hide a link between pro-environmental behaviour and Friends group membership. The creation of a second data base containing only FoPP members and individuals who were neither environmental group members nor FoPP members in the last 12 months was created to address this issue. Correlation analysis using this new data base revealed much stronger relationships between several of the pro-environmental intentions indicators and FoPP membership (Appendix C-



14ii – Modified membership data set). Models C-14c and C-14d also revealed moderate indirect effects of FoPP membership on both behavioural intentions categories. This appears to support the notion that FoPP membership may indicate a greater tendency to engage in pro-environmental behaviours.

A rough comparison of the two membership categories reveals the following observation: Environmental group membership appears to more strongly predict pro-environmental intentions than FoPP membership; however a true direct comparison of these two groups can not be made at present as these results are based on two different data sets.

The speculation that membership in the Friends group may be more strongly motivated by personal benefits such as opportunities for social interactions or “being in the know” as one respondent stated, rather than by a commitment to and interest in the park appears to be somewhat disproved by the moderate correlation between place attachment and Friends membership. In model C-14d it appears that place attachment fully mediated FoPP membership’s modest effect on park-specific intentions. Friends group members’ comments on the survey instrument often reflected a dual commitment to the park and their own pleasure; an example follows:

*As a volunteer I am here as many days as possible and I enjoy all of them.  
My family have spent many days just looking and enjoying this beautiful  
park. It was relaxing for us and always discovered something new each time  
we visited.*

Survey respondent, May 2005.

While this indirect effect is acknowledged one must ask what this attachment is based on; is it the natural environment or socially-related factors enabled by the park setting?

Membership in FoPP may facilitate the maintenances of social opportunities at the park (e.g., lobbying for park entrance fees that are affordable for families, advocating for adequate opportunities for family recreation in the beach areas of the park). These latter speculations may help explain the 28 FoPP members who failed to indicate they were

members of an environmental group in the last 12 months. These individuals may not identify FoPP as an environmentally-focused group.

As was anticipated, membership in an environmental organization proved to be an excellent predictor of general pro-environment behavioural intentions. Membership in an environmental organization and to a lesser degree FoPP proved to be good predictors of general environmental intentions. The importance of membership corresponds with McFarlane and Boxall's (2003) findings that environmental organization membership was a stronger predictor of environmental activities than social-psychological (value orientation, attitudes toward sustainable forest management, knowledge related to forestry) or social structural variables (age, gender, place of residence, education, household income, and dependence on forestry for economic livelihood).

Environmental group membership also moderately predicted park-specific intentions and was a weak predictor of and weakly predicted by place attachment. The relationships with these latter two factors are likely related to a general concern and interest respondents have about the environment, represented by their environmental group membership. Cognitive, functional and/or emotional bonds with all protected areas are likely very reliable characteristics of these individuals, and expressed affection and intentions to support these special places are simply a manifestation of this interest. Correlations with place identity versus place dependence appear to reinforce the suggested link between place identity and choices to engage in pro-environmental behaviours (Vaske & Korbin, 2002).

## **Commitment**

Commitment to the park and to the environment in general was explored through two structural models. Results from the structural model containing the latent factor Gen Commit, based on three indicators, environmental group membership, as well as donated days and money, were very similar to the single indicator membership structural model based on environmental membership. One of the main reasons for combining membership with the two donation variables was to determine if there was a difference between "active" membership characterized by increased donations and time, and passive membership. It

would appear, at least for this data set, the number of days and money donated to environmental causes did not appear to add additional information to our understanding of the factors that affect pro-environmental behaviour or place attachment.

Although no direct significant relationship between commitment to the park (Park Commit) and park-specific behavioural intentions was observed, moderately strong indirect effects were present in Model C-15c. General behavioural intentions were also moderately, and indirectly affected by park commitment. These effects were fully mediated by place attachment. Upon initial examination of the items used to create the park commitment latent factor, one could speculate that they could be better indicators of commitment to the Friends of Point Pelee rather than the park itself. However, the strong links with place attachment and in particular park-specific pro-environmental behaviours reveal the adequacy of these indicators in their intended task.

Place attachment patterns observed using the park commitment and general environmental commitment models reveals similar patterns of prediction as was reported for membership. All relationships were significant, although as expected place attachment more strongly predicted, and was predicted by the latent factor park commitment than general environmental commitment.

Perhaps further between-group analysis may reveal a difference between active and passive members, especially if other variables are introduced into the analysis such as socio-economic factors, attitudes towards environmental behaviours and attitudes towards the environment. These variables were collected in the survey. Future research should include other variables. For example, Martinez and McMullin (2004) in a study of active and passive members of the Appalachian Trail Conference found that active members indicated that the efficacy of their actions was most important in their decision to participate, whereas passive members cited the importance of competing commitments in their decision not to participate. Research which incorporates measures of efficacy, social networks, personal commitments, and personal growth goals should be utilized to examine further the effects of active versus passive membership in the context of place attachment and pro-environmental

behaviour (Manzo & Weinstein, 1987). The end goal of such research is to foster the development of more active involvement in environmental group membership which will lead to expanded support for protected areas like Point Pelee National Park.

### **Distance**

In their study of rails-trails users Moore and Graefe (1994) found that both place identity and place dependence were negatively affected by distance of users' residence from the trail. This study identified similar findings; local users displayed higher levels of place attachment. As with Moore and Graefe's study the correlations and beta coefficient values supporting this finding can be described as modest at best. Some of the model's results also display postential classical suppress effect, this is discussed at the end of this chapter. Regardless the results were statistically significant and do make theoretical sense, therefore some discussion should be devoted to these findings.

In addition to Moore and Graefe (1994), in a second comparative study Kaltenborn and Williams (2002) found that residents expressed higher levels of place attachment than tourists visiting a region. This current study's finding appear to correspond with Kaltenborn and William's observations: individuals who live in the Point Pelee–Leamington region also appeared to demonstrate moderately higher levels of place attachment. The affect of distance on frequency visits is obvious in the following statement from a survey respondent; however the affect on place attachment is perhaps opposite to what the survey's numerical data revealed:

*Point Pelee is part of my life. I love it. I feel like I have come home when I am there. I feel like part of me is always there. If I could I would live near there and be there more often. Because I can't, I do use other parks and areas where I live but I would be devastated if Point Pelee wasn't always available to the public.*

Survey respondent, April 2005.

The relationship between distance and place attachment should be explored further to determine if this hypothesized direction of influence is correct. A comparison of groups based on distance travelled may provide clarification. No direct support of the directionality of relations depicted in Model C-16b is apparent in the literature. This model suggests that place attachment could effect distance traveled. This model was proposed to explain the actions of highly committed or specialized users. For example, “collectors” of national parks could be an example of these users; their identities are wrapped up in the their achievement of visiting all nationally protected areas in their life time. They are highly attached to an abstracted notion of parks and relatively insensitive to distance. The same could be said for many avid bird watchers who make a once in a life time pilgrimage to Point Pelee. Alternatively other birders travelling from a long distance may think of Point Pelee National Park as a must visit annual destination. This sentiment is reflected in the following statement by a survey respondent:

*We have visited the park each May for the last 25 years for birding and connecting with other friends who enjoy the same activity. We love the park!*

Survey Respondent, May 2005

This quotation reflects not only the attraction to nature, but also the importance of social activities. The findings observed in Model C-16b do not appear to support the theory that individuals’ attachment levels will be insensitive to distance. However, an examination of visitor groups based on favourite activities may reveal more support for these latter theories.

Aside from the confusion generated by the directionality debate, the literature also discusses the potential relationship between place of residence, place dependence and place identity (Moore & Graefe, 1994; Kaltenborn & Williams, 2002). An exploration of the relationship between distance and place attachment’s sub-dimensions could supply greater understanding of the relationships observed in the structural models.

The observation that as distance of survey respondents’ residence from the park increased so did expressed intent to perform general environmentally responsible behaviours was an

unexpected finding. It could be explained through an examination of who visit national parks. It could be assumed that if an individual makes an extra effort to travel to a park, and allow his or her name to appear on a mailing list as many of this study's participants did, then they must be very interested in nature and the environment. A respondent who made a greater effort to travel to the park (i.e., travelled the greatest distance) may also have a stronger environmental ethic.

This environmental ethic did not appear to have directly affected the relationship between park-specific intentions and distance traveled. It is understandable how distance may have had a negative effect on park-specific pro-environmental intentions as several of the park-specific behaviours require an individual to live close to the park in order that they can be performed (e.g., participate in public planning process). The following two statements by study participants reflect this constraint:

*I would be happy to participate in activities to help Point Pelee but I live 700 miles away, in Minnesota. I travel to Pelee every year for birding though, and if able, I will remember Point Pelee in my will.*

Survey Respondent, May 2005

*We are very fond of Pt. Pelee as it has nurtured our son's strong interest in birds. He has built his life list there. However being 2 hours away doesn't make it a place we're likely to invest volunteer time.*

Survey Respondent, May 2005

Distance did have an indirect effect on park-specific behaviours through place attachment. These modest effects suggest that increased distance appears to result in decreased expressed intent to perform park-specific behaviours. In other words it appears park visitors who live more closely to the park, plan to engage in park-specific environmentally responsible actions more often than those who live farther away. The effect of distance in this case appears to be fully mediated by place attachment. This result corresponds with

spatial patterns of pro-environmental behaviour observed in the literature. Most environmental behaviour studies have observed that individuals are most interested in taking care of their own neighbourhood or backyard, and less concerned or willing to act in benefit of environments further a field (Norton & Hannon, 1997; Syme, Nancarrow, & Jorgensen, 2002).

In summation, these findings and theories relating to the distance model should be treated with caution. This is based on the low values observed for the beta coefficients and levels of significance. These results may be the result of statistical chance rather than the presence of real effects. Second, the correlation analysis performed prior to the development of the distance structural model indicated there was only one, very weak negative significant relationship between place attachment and distance. No significant relationships were observed between distance and the pro-environmental behaviour categories, lending support to a cautious interpretation of SEM results.

### **Substitution**

Disagreement with questions which probed respondents' awareness of substitutes to Point Pelee National Park, and ability to substitute the park for another destination were characterized by moderate means (i.e.,  $M = 3.4$  for Sub\_aware, and  $M = 3.32$  for Sub\_ability). These questions, unlike the majority of questions in the survey, were negatively phrased and may have contributed to lower scores. These variables also had bi-modal distributions of responses in which approximately 25% of respondents agreed that they could easily substitute the park for another natural area and 50% stated they could not. A comparison of these two groups of respondents would likely reveal a more nuanced understanding of this factor's relationship with place attachment and pro-environmental intentions. Instead, analysis was conducted using the whole survey sample. The bi-modal distribution characterized responses to a Sub\_ability to a greater degree than it did Sub\_aware. Perhaps this offers an explanation for the negative values present in the ability to substitute and combined substitution structural models.

Given the confusing results associated with the appearance of the negative coefficient paths associated with a majority of the substitution models, detailed discussion of the impact of substitution on pro-environment behavioural intentions is limited in this section. Instead greater focus on the relationship between place attachment and substitution follows.

In Model C-17a place attachment positively predicted respondents' inability to substitute Point Pelee National Park, explaining 28% of substitution's variance. Similar observations were made in Models 17d and C-17e; high levels of place attachment predicted disagreement with the statements that respondents could easily substitute the park (i.e., freedom from constraints such as time and money) and respondents were aware of natural areas with similar attributes that would meet their needs. These findings concur with previous studies by Kaltenborn, 1998 and Williams et al., 1992. For example, respondents in Kaltenborn's 1998 study who were characterized by lower levels of place attachment were also more likely to choose alternative recreation areas if environmental problems developed in the current place of recreation.

The two items used to measure the likelihood of substitution could be described as barely adequate in terms of their ability to capture that complexity that characterizes substitution. Shelby and Vaske (1991) suggest it is the quality of experience, more than transient factors such as expense that may be more important to some visitors. It is likely more true for specialized users. Given that quality of experience measures may be more accurate predictors of substitution, the awareness of substitutes question may be the more useful item in this survey. However this is not conclusive as Shelby and Vaske (1991) and others have noted the importance of time as a major constraint in making substitution judgements. This factor was included in the ability to substitute question. An improvement to the substitution questions may have been the inclusion of a direct-question which asked survey respondents to name an alternative setting as a suitable substitute to Point Pelee National Park (Vaske, Donnelly, & Shelby, 1990).

Another factor that may play a role in the assessment of alternative sites is how specialized a visitor is in his or her choice of recreation activity. For example a very experienced birder



may be more knowledgeable of alternative sites in the Point Pelee-Leamington region (Brunson & Shelby, 1993) and therefore more able to substitute a visit to the park for another site. Bricker and Kerstetter (2000) suggest a similar explanation for the lack of place dependence exhibited by highly specialized white-water recreationists on California's South Fork of the American River. They suggest that with increasing specialization a "multitude of choices" are available to the specialized recreationists and the South Fork river, in comparison with other alternatives, fails to engender a bond with these recreationists. Another reason for this lack of place dependence is the South Fork's beginner-level of difficulty. Specialized recreationists can achieve this level of rafting and kayaking experience in a number of locations. These explanations, while appropriate for a popular, but minor, river in the Sierra Nevada Mountains, may not be applicable for a national park. The allure and prestige that most national parks carry in the public's psyche, would likely reduce the occurrence of alternative-site substitution. This combined with Point Pelee National Park's unique attributes would make most alternative sites a poor substitute for most individuals. A respondent's comments regarding the park's uniqueness reinforces this idea:

*Pt. Pelee is a totally unique experience for bird watching in the migratory season. It has no substitute in the surrounding area that is as desirable. I would probably not visit Ontario, if Point Pelee were not available for birdwatching.*

Survey respondent, May 2005

Models C-17b, C-17c, C-17e depict a modification of the directionality of the relationship between place attachment and anti-substitution. In these models increased inability to substitute strongly predicted high levels of place attachment. The positive prediction of place attachment by strong disagreement with the statement that the park is not unique and that the respondent could find an alternative site supports the proposition that awareness of alternatives, or more accurately a lack of awareness may result in place attachment and in particular place dependence. Further examination of the relationship between place

attachment sub-dimensions and the perceived lack of alternative sites may shed some light on this.

The positive prediction of place attachment by strong disagreement with the statement that respondents were able to substitute the Park for another site may be related to the high number of respondents located in the Point Pelee-Leamington region. Traveling to the park as opposed to another Ontario park or public recreation area that is slightly more distant may contribute to this positive association between the two factors. Again, an examination of the role of place dependence versus place identity may help explain this finding.

No significant direct relationship between substitution and park-specific behavioural intentions was observed; this was unexpected as it was proposed that individuals who are dependent on or unwilling change from a specific location may be more committed to maintaining the environmental health of that location as they would be the main beneficiaries of such activities. In Models C-17b, C-17c, C-17e place attachment appears to mediate the affect of substitution on the two pro-environmental intentions factors; the indirect effects of substitution on place-specific intentions were quite strong. However further examination of results from these models should be placed on hold until the negative values associated with the coefficient paths between substitution and the behavioural intentions factors have been resolved. This may be investigated through further manipulation of the present model (e.g., controlling for the presence of place attachment) or through the examination of how substitution may interact with other factors to influence park-specific pro-environment behavioural intentions. For example, place satisfaction, motive for visit, favourite activity, distance from residence to park, and length of affiliation may have some interesting interaction effects with substitution.

### **Motivation for visit**

Literature which explores the relationship between place attachment and motives for visiting a place is limited. However, based on reports by Williams et al. (1992) and Warzech and Lime (2001), it was anticipated that those participants who stated their main motive in

visiting the Park was to enjoy nature, would also demonstrate high levels of place attachment. This was supported by the data to a very modest extent.

Those who stated social motives as very important also demonstrated high levels of place attachment. The importance of social interactions and the Park as a setting for their provision are reflected in the following statements:

*I used to enjoy smelt fishing in Spring. I also used to enjoy the fires and ice skating at the park in Winter. I think these family experiences are very important and should be made available again.*

Survey Respondent, May 2005

*We started going to Pelee soon after we married. Our kids (now in their 20s) went with us from the spring after each was born. All of us have a special affinity with the Park. My husband now leads bird hikes and I volunteer my time when I'm there. The staff of the Park and FoPP, are wonderful. Even though I love the birds, I've always thought the people at Pelee make the difference!*

Survey Respondent, May 2005

The importance of social ties and social interactions in the formation and maintenance of place attachment has long been acknowledged in the community sociology literature (Mesch & Manor, 1998; Shumaker & Taylor, 1984), and very recently has gained greater recognition in the resource management and recreation fields (Brehm et al., 2004; Eisenhauer et al., 2000; Hidalgo & Hernandez, 2001; Kaltenborn, 1997; Kyle & Mowen, 2005; Stedman, 2003a). Unlike the studies by Warzech and Lime (2001) and Williams et al. (1992) nature-related motives were equally predictive of place attachment as socially-related motives. Perhaps this can be explained by the context of the study. Point Pelee National Park, while an important nature preserve, is not a wilderness park. It is small, with a high level of recreation infrastructure, and is heavily utilized by local residents for recreation

especially in the summer months. The contexts of the previously mentioned studies were “wilderness” parks, settings where nature may play a much more dominant role in the perceptions and experiences of park visitors.

Further exploration of the nature- and social-based motives could be conducted with a model that includes the sub-dimensions of place attachment. Correlation analyses suggest there may be a modest difference between the effects of these two factors on place identity and affect. Interestingly no relationship is apparent between any of the motivations and place dependence.

Also of interest was the lack of significant relationship between visitation to the park to participate in a favourite activity and place attachment. Several studies have demonstrated that favourite and especially specialized activities can, but not always, lead to high levels of place attachment (Kyle et al., 2004a; Shelby & Vaske, 1991). Studies have also found that the effect of involvement in a favourite activity on place attachment varies a great deal across groups of recreationists and in different contexts (Bricker & Kerstetter, 2000; Kyle et al., 2004a). An alternative to studying the affect of visitation motivated by a desire to engage in a favourite activity may be to create groups of users based on their favourite activities and re-examine the relationship of activity preference with place attachment sub-dimensions. Visitors engaged in highly specialized activities such as birding could demonstrate higher levels of place attachment than other users.

Finally, while Warzech and Lime (2001) noted that the motive to learn was positively associated with place attachment, no such relationship was observed from this data. Learning as a motive for visiting the park received the lowest motivational importance ranking by survey respondents. It also was characterized by the second highest number of “not applicable” designations after social motivation.

No statistically significant relationships were detected between the four motives and pro-environmental intentions. The lack of statistically significant relationships between the motivation variables and the study’s main constructs may be due to the measures used for

motives. Singular items may not have been adequate in capturing the complexity of individual's motivations for visiting the park. Kyle, Mowen and Tarrant (2004d) utilized multi-dimensional indicators to measure motivations in their study of how urban park user's motivations inspire interaction with place fostering the development of place attachment. Items from the recreation experience preference (REP) scale were utilized to capture a much broader range of motivations. An exploratory factor analysis yielded six categories of motives: Learning, autonomy, activity, social, nature, and health. The study identified the positive effect of these motivation categories on several place attachment sub-dimensions. Additional motivation measures such as items which assess motives related to health and self regulation (Korpela et al., 2001), spirituality (Heitzman & Mannell, 2003), and autonomy may demonstrate significant relationships with place attachment.

Studies within the environmental behavioural field have also attempted to examine the predictive effects of motivations on environmentally responsible behaviour. For example Hartig, Kaiser, and Bowler (2001) examined the link between psychological restoration achieved through interaction with nature and pro-environmental behaviour. Pelletier, Tuson, Green-Demers, Noels, & Beaton (1998) have developed the Motivation toward the Environment Scale (MTES) to assess the impact of motivations related to self-determination on environmental behaviours. These and many others could be drawn on to round out a scale or set of measures more tailored to the exploration of the relationship between visitor motivations, place attachment and pro-environmental behaviours.

### **Socio-economic variables**

In this study structural models designed to explore the relationship between respondents' gender, income, age and education levels and the study's main constructs were not planned for based on the lack of evidence in the literature regarding the ability of these variables to reliably predict place attachment and behavioural intentions. Correlation analyses confirmed the near universal lack of statistically significant relationships between these variables and the study's main constructs. However, some closing comments on these variables are warranted given their importance in comparing this study's results with other environmental behaviour and place attachment studies.

Correlation analysis did reveal small significant relationships between gender and place attachment, and between place dependence and gender, income, and education. In this study women demonstrated slightly higher levels of place attachment, place affect and place dependence than men. Unlike several place attachment studies, age was not a significant factor in this study. As with gender, individuals with lower levels of education and income were also linked with higher levels of place dependence. This finding parallels Williams et al.'s (1992) observation that individuals characterized by lower levels of education and income displayed higher levels of place attachment. Reasons for these results may be more forthcoming with further analysis. One explanation may be that local users, who do not travel as far as some of the park's other visitors, may also be characterized by lower income and education levels and a higher proportion of women to men; the localized nature of these respondents would explain the significant relationship with place dependence.

Interestingly, only gender shared a significant relationship with both general and park-specific behavioural intentions. Again, these results suggest that women expressed slightly higher levels of pro-environmental intentions than men. This finding corresponds with some of the environmental behaviour literature; however, this literature also suggests that women may express greater levels of environmental concern, and perhaps even pro-environmental intentions, but their execution of these behaviours may not always be as predictable (Blake, 2001; Klineberg et al., 1998).

One explanation for the lack of significant relationships between the other socio-economic variables and pro-environmental behavioural intentions is the fact that they are indicators of future behaviours and not simply attitudes about the environment. Some previous environmental attitude-behaviour studies have found strong correlations between these variables and attitudes (e.g., Vorkinn and Riese, 2001), but not behaviours (Kaiser, et al., 1999). Another study by Tindall, Davies, and Mauboules (2003) which compared rates of pro-environmental activism (e.g., time intensive environmental protests) with general environmentally friendly behaviours (e.g., recycling) found differences between men and women. Men more often engaged in activism, and women reported higher rates of

environmentally responsible behaviours. This, the authors suggested might be due to the “double-day” of paid and domestic work that women are often burdened with; environmentally friendly behaviours such as recycling can be undertaken in the context of daily domestic routines. A re-configuration of pro-environmental intentions indicators into passive and active or difficult and easy categories may reveal some additional difference between groups of users. Significant relationships could be evident with gender as well as some other variables such as distance, education, and membership.

### ***Psychometric qualities of place attachment***

A secondary objective of this study was the investigation of the psychometric properties of place attachment. Exploratory factor analysis revealed two dimensions of place attachment which could be generalized as place dependence and place identity-affect.

These labels are somewhat generous in their application as place affect and identity items loaded on both factors. The division of place attachment items in this study was not as straight-forward as has been reported in several other place attachment studies. As a result, place attachment was treated as a uni-dimensional construct for the main portion of this study; however its dimensionality will be re-examined upon the completion of this thesis.

Further examination of the meanings of the items used to measure place attachment may reveal additional reasons for this somewhat fuzzy dispersment of items. Of particular interest in the early stages of this study was the measurement of place affect, and an attempt to verify affect as one of three main domains of place attachment. However, as with many previous studies affect seems to load strongly with place identity items, and also be highly affiliated, as Jorgensen and Stedman (2002) observed, with a combined measure of place attachment. Some further avenues for studying affect and place attachment are described in the Conclusions Chapter.

### ***Measurement and methodology considerations***

Strengths and weaknesses associated with the methodology used in this study are described next. Recommendations for improvements are also made. These strengths, weaknesses and

recommendations are presented in the order that they arose during the development of the study.

Utilizing a quota sample appears to have resulted in moderately good cross section of visitors to Point Pelee National Park. A higher number of repeat park visitors, and lower numbers of adults under the age of 55 years of age and first time visitors to the park in comparison with observations made in the visitor survey conducted in 2000 by park staff may be some cause for concern in attempting to apply these findings to the park's population visitors. However, as stated earlier this was never the intent of this study, instead the focus was to achieve a diverse data set of visitors who were characterized by varying levels of place attachment and other key characteristics. This was achieved.

A potential limitation of the study could be the effect of social desirability bias, a concern that is common within environmental attitude-behaviour studies. Some environmental attitude-behaviour studies employ measures within the survey instrument to address this. For example Hartig, Kaiser and Bowler (2001) utilized the Marlow-Crowne Social Desirability Scale (Crowne & Marlow, 1960) to check for this bias. The authors reported a more substantial effect on reported general ecological behaviours than on other factors measured in the study. Studies that include scales for measuring social desirability bias are the exception within the field. Most studies accept there will be some mild form of social desirability bias present in their data and interpret data accordingly. Due to space constraints on the survey instrument, this survey embraced the more conventional approach of acknowledging the possibility of social desirability bias and did not measure its specific effects on individual factors.

Another concern is highlighted by Breckler (1994) who suggests that correlations among attitude components (e.g., place identity, dependence and affect) may be due to shared variability arising from common measurement methods (e.g., they are all measured with Likert-type scales). However, as other place researchers suggest (Jorgenson & Stedman, 2001), this threat to internal validity is contingent upon the extent that the measurement



effects are correlated with the latent variables of interest (p. 245) and therefore not a major concern for this study.

Acquiescence response bias may also have affected survey results. This may have been produced by the survey instrument's design as most scale items are positively phrased. This could have been addressed by adding more negatively turned items. However, the statistical benefit of performing this is generally considered to be minimal (Kaiser et al., 1999).

Relying on self-reported behaviour may also have produced certain biases and that in interpreting the results it is likely that the relationships between pro-environmental behaviours and attitude measures such as place attachment will be higher than if behaviours were measured via actual observation (Tittle & Hill, 1967). Self reported behaviour reflects the perceptions or beliefs about people's own behaviour rather than their actual behaviour. Inaccurate reporting by individuals may be due to social desirability and other types of conscious or unconscious response bias (Gatersleben, Steg, & Vlek, 2002). Conclusions as to the overall affect of this phenomenon are mixed (Hines et al., 1987; Van Liere & Dunlap, 1981). More recent studies confirm that measuring environmental behaviour through self-reporting produces a stronger environmental attitude-behaviour correspondence than actual observation of behaviours (Kraus, 1996), but this is not conclusive (Fujjii, Hennesy, & Mak, 1985; Warriner, McDougall, & Claxton, 1984). For example, in a study of two ideologically different Swiss transportation associations Kaiser, Wolfing and Fuhrer (1999) found that people are only marginally tempted to give socially-desirable answers.

Many of the external variables examined in this study are measured using single item questions (e.g., "What is your primary motivation for this trip..."). While it is acknowledged that single item measures may be more prone to error than multi-item measures (Babbie, 1999; Converse & Presser, 1986; Newman, 1997), it is believed that the advantages associated with a more concise survey instrument outweigh the need for multi-item indicators for many of the simpler variables. As Converse and Presser (1986) suggest, "Single questions survive, too, for the simple reason that one can never, in a single survey, incorporate multiple measures of everything" ( p. 44).

Survey instrument length was also a concern. The lengthy nature of the survey instrument may have contributed to the modest response rate of 33%. This problem was noted prior to survey distribution; one strategy for dealing with this was placement of key study questions such as the place attachment scale early in the survey in the hope of achieving the most accurate responses to these early questions. Incentives and a reminder post card were utilized in an attempt to boost response rates.

A limitation with the data is that this study is that they were a measure of just one population, and at one time. Comparisons across time and at different locations are greatly needed. The study did attempt to look comparatively at the difference between place-specific and more general behaviours. Other place and pro-environmental behaviour studies have attempted to examine the affect of distance (Brown, Reed, & Harris, 2002), regional scale (Syme, Nancarrow, & Jorgensen, 2002), and neighbourhood scale (Uzzell et al., 2002), however, much more needs to be understood about how scale and location affect the jurisdiction of individual's environmental stewardship obligations, especially in combination with place attachment.

One of the main steps in the analysis process that could have been improved upon was the development of the structural model. Ideally the model's creation should have been a two step process. Each measurement model should have been created and adjusted for best fit. Once goodness of fit was achieved the measurement models could be then joined together in a path model. The final result is a structural model that would again be tested for fit.

In this study this process was shorted by developing and joining the measurement models into a path model. This facilitated evaluation of model fit and respecification as the greater number of observed variables (i.e., degrees of freedom) allowed for the model to be overidentified with no additional constraints. The downfall with such an approach is that measurement error associated with the measurement models can be hidden. An attempt was made to account for this by testing several alternative models that utilized different indicator compositions. Additionally coefficient alpha scores for each scale incorporated into the

model and factor loadings on the measure models were evaluated and found to be sound. In the future further testing of the measurement models, including a comparison of fully and partially latent models to the most simplistic model should be pursued.

Suggestions regarding the improvement of measuring the individual variables included in this study are noted previously in this chapter in the sections devoted to an analysis of their relationships with the study's main constructs. Concerns about each variable and improvements were suggested for measures of satisfaction, length of affiliation, substitution, and motivations. Additional focus could also be turned to the measurement of place affect and its relationship with place identity. This is addressed briefly in the Conclusion Chapter which follows.

## Chapter 6: Conclusion

After a brief review of the study's major findings and some of the implications that arise from them, future directions in research are suggested below.

### ***Summary of findings***

Although an investigation of place attachment dimensionality suggested the potential existence of two underlying factors, confused results, which may be partially attributed to the place affect measure resulted in the choice of treating place attachment as a single factor for study's examination of relationships between key variables. This decision was supported by high reliability of the place attachment scale.

Using correlation analysis and structural equation modeling a number of observations were made regarding relations between place attachment, pro-environmental intentions and several additional variables. The first of these is that place attachment consistently, and positively predicted pro-environmental intentions. Second, place attachment more strongly predicted place-specific intentions than general pro-environmental intentions.

Third, place attachment was predicted by frequency of visitation; length of trip; place satisfaction; activity satisfaction; nature satisfaction; social satisfaction; membership in Friends of Point Pelee; membership in an environmental organization; general environmental commitment; park commitment; distance of respondents' residence from the park; anti-substitution; awareness of substitutes for the park; ability to substitute for the park; nature-motivations; and, social motivations. Motivations related to visiting the park to engage in a favourite activity and motivations related to learning were the only factors examined in this study that did not have a statistically significant relationship with place attachment. By changing the directionality of the relationship depicted in the structural models place attachment also predicted these variables. This change in directional affect was based on theoretical arguments and some empirical evidence. Correlation analysis also suggested a relationship between place attachment and gender. Women expressed higher

levels of attachment than men. The strongest predictive relationships were observed between place attachment and the following factors: anti-substitution (an inability to substitute); frequency of visits; park commitment (based on FoPP membership and donations of time and money to FoPP); ability to substitute; awareness of substitutes; park satisfaction, park relationship (based on length of affiliation and visitation as a child); and FoPP membership.

Fourth, park-specific pro-environmental intentions were directly predicted by place attachment, membership in an environmental organization, general commitment to the environment (based on membership in an environmental group and donations of time and money to environmental causes), and ability to substitute. However, the model which indicated ability to substitute as a direct predictor of park-specific behaviour displayed statistical anomalies that may make this interpretation erroneous (i.e. suppression effect). A number of variables indirectly affected park-specific pro-environmental intentions. Their impacts on park-specific pro-environmental intentions appear to be fully mediated by place attachment. Variables with notable<sup>10</sup> indirect effects on park-specific intentions included: frequency of visits; park relationship; visitation to the park as a child; place satisfaction; social satisfaction; FoPP membership; park commitment; anti-substitution; awareness of substitutes; and, ability to substitute. The strongest predictors of place-specific intentions were place attachment, anti-substitution, frequency of visits and park commitment.

Finally, general pro-environment behavioural intentions were directly predicted by place attachment, general environmental commitment, membership in an environmental organization, and membership in FoPP. Direct relationships observed between general intentions and frequency of visitation to the park, distance of respondents' residence from the park; and ability to substitute the park can be characterized as weak or suspect due to the presence of statistical anomalies (i.e. suppression effect). Indirect effects of a number of variables were observed; these were fully mediated by the presence of place attachment. Factors with notable indirect effects on general pro-environmental intentions were: frequency of visits; park relationship; FoPP membership; park commitment; anti-substitution; and possibly ability to substitute. The strongest predictor of general pro-

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<sup>10</sup> Only indirect effects  $\beta \geq .15$  are noted.

environmental behaviours was general environmental commitment, followed by place attachment, membership in an environmental organization, and frequency of park visitation.

The main implications of these findings is that place attachment appears to be an important factor in the prediction of pro-environmental intentions, and in turn a predictor of pro-environmental behaviour. Not surprisingly this relationship appears strongest between place attachment and park-specific pro-environmental intentions. Individuals who care about a place are more likely to take action to protect it. However what is also of great interest is the moderately strong relationship between place attachment and general pro-environmental intentions. Place attachment has been shown to be a predictor of environmentally responsible behaviours and not just behaviours that are place-specific. These are behaviours that individuals perform on a daily basis, separate from the places that may have helped inspire these actions. Again it cannot be claimed that place attachment causes individuals to engage in pro-environmental behaviours, but a relationship between these factors appears certain.

These findings, combined with the results arising from the examination of the effect of a number of other variables such as frequency of visitation and place satisfaction provide an important contribution to our understanding of an individual's relationship with specific settings, and how this may contribute to pro-environmental behaviour. However much more can be done with this data set and in future approaches to studying these issues. These are explored next.

### ***Future research***

A number of different avenues need to be explored by researchers to address the ambiguities of place attachment, its formation, and its impact on factors such as pro-environmental behavioural intentions. While this study has contributed a small amount of additional understanding of the relationship between these two constructs and additional factors which affect them, much more work is needed. First and foremost, further study of the *process* of

how attachment forms and evolves is necessary. Additionally an increased understanding of how place attachment *promotes* place protective behaviours is called for.

### **Recommended populations and settings for future research**

The link between place attachment and pro-environmental intentions was demonstrated in this study's findings; however verification of this relationship should be explored in other populations and other settings. Adolescents and children are a particularly important population as their impact on the environment will be felt for years to come. Environmental educators have focused on this group for many years and some of the best place-related pro-environmental behaviours research has come from this field; however many more studies need to focus on youth.

A second population that needs further study are active users of protected area systems. This recommendation is based on the pragmatic recognition that a thorough understanding of clients, their needs and the outcomes of their interactions with natural areas are important to the survival of protected area systems. An understanding of the impact of place attachment on future travel plans, intentions to perform environmentally responsible behaviour while in the park as well as future park support is needed. Limited research funds for park agencies make this a necessity as does their dependence on the continued patronage and support of these users.

In contrast non-users of parks are another important group that should be studied in order to gain a better understanding of the degree to which park visitation plays in fostering attachment to parks, and pro-environmental behaviours. Study of this group may reveal lessons about the influence of social and cultural factors on non-park users' attachment or lack of attachment to parks. This gets to the heart of an important management issue for protected area agencies. Do park agencies need to promote visitation to ensure support? Can virtual visits such as nature-based programs on television act as a surrogate for actual visitation? Is existence value, the knowledge that the park exists and is protecting an important resource, strong enough to ensure continued support of conservation programs?

Do people need to physically interact with a national park setting to develop an attachment to it, and ensure support of it? These and many more questions related to the impacts of physically visiting a park can be explored thorough greater attention being paid to non-park visitors.

Mentioned several times in this thesis is the proposition that different types of recreation activity user groups may demonstrate different intensities and forms of place attachment, and as a result also express different levels and forms of pro-environmental intentions. This will be explored utilizing data collected in this study. However, research in other settings where different user groups develop contrasting place meanings and attachments, is needed. This is especially important in the context of natural areas management where finding solutions to points of conflict regarding the management of those places is needed. It is also important in addressing the definition of “environmentally-responsible” behaviours in those areas. One example of this is the on-going debate about motorized off-road vehicle use in wilderness areas. Some studies suggest recreationists engaged in motorized off-road vehicle recreation develop intensive place attachment to settings through their activities (e.g., Bishop, 1996); others suggest a true attachment is impossible because the appreciative elements of genuinely interacting with nature are lost due to the fast-paced, noise-filled encounter these recreationists experience during their visits (T. More, personal communications, April 2006). Additional impacts, such as noise pollution and trail erosion, on non-motorized recreationists may adversely affect the formation of place attachment, shape their opinions of what is sustainable, place-specific pro-environmental behaviour, and perhaps set the foundations for on-going resource use conflict. In short, study of the formation of place attachment and pro-environmental intentions focused on different user groups’ interactions with natural environments could contribute significantly to resolving or at least anticipating resource user conflict.

Another important group are older adults, many of whom are experiencing increased leisure time. Older adults received much of their socialization during the depression era of scarcity or the post-war boom years of plenty. However, most present-day older adults may have had a closer relationship with nature and rural environments than the middle-aged and youthful



portions of Canada's population due to childhoods that were often spent on a family farm or in urban-based contexts that were much more closely connected to rural systems than they are today. Older-adults still play an active role in supporting the environment and natural areas; their ecological foot-prints are often smaller and their ability to volunteer time to community and environmental enhancement efforts can be quite extensive. The perspectives of older adults, given their rich history with different landscapes and their present-day ability to give back to the environment should not be ignored. An exploration of older adults' place meanings and attachments and how this is connected to pro-environmental behaviours should not be ignored.

Transient populations and seasonal residents (Hay, 1998; Kaltenborn, 1997; Stedman, 2002; Williams & Kaltenborn, 2002) are another important group. Seasonal-home owners represent a large portion of the North American population. Their prolonged interaction with natural areas and the social activities that occur there have tremendous impact on their attachment to these places and their willingness to engage in pro-environmental behaviour. More extensive comparisons of tourists and seasonal residents who utilize the same area would provide important insight into the role of length of affiliation and related factors in the formation of place attachment and pro-environmental behaviours.

Another population that is understudied by recreation and place researchers are ethnic and cultural minorities. "New Canadians" make up an increasing proportion of Canada's population; however these are populations, whose residency in Canada is often characterized by a disconnection from rural and natural landscapes and the processes that occur there. The hyper-urbanized existence of many first generation Canadians may lead to a lack of appreciation, awareness and support of rural and natural ecosystems, nature conservation, and arguably a failure to engage in pro-environmental behaviours. Some would argue that urbanites, including many first generation Canadians seek out nature and greenness in a number of places including large urban parks, postage stamp sized parquettes, community gardens, and even forgotten and under-celebrated green spaces such as the fringes of land-fill sites and brownfields. This introduces the second important direction research should

take in the exploration of place attachment formation and its impact on pro-environmental behaviours; an expanded focus of research settings is needed.

Traditionally, community-attachment research has often focused on homes, neighbourhoods and occasionally cities or regions, and recreation research has focused on national forests and parks or iconic hiking trails. This study falls into this latter category. If the goal of such research is to maximize the number of citizens who engage in pro-environmental behaviours, then study of these citizens in the landscapes which they interact with the most may prove more fruitful. The public's interaction with urban and near-urban green-spaces should be a priority in examining place attachment's impact on pro-environmental behaviours. Granted, this interaction may be driven in part by functional convenience or necessity, but this is not likely the entire legacy of interaction with these environments. Place meanings and attitudes are developed for even the most modest of settings, and it is these meanings and attitudes which in turn affect individual's daily decisions to perform general environmental and place-protective behaviours.

In addition to green-urban contexts, a second context which needs increased attention are natural areas with little legislative protection, but which provide important ecological functions and provide opportunities for individuals and groups to interact with nature, and perhaps foster environmental awareness, appreciation and environmentally responsible behaviour. Canada's crown lands and the Bureau of Land Management's holdings in the US are examples of this. These places are in danger of being forgotten, overrun in bids for rapid development. This is not to say that development and resource extraction cannot be permitted anywhere; what is being recommended is an increased understanding and exploration of the role that particular public landscape can play in fostering pro-environmental behaviour and the importance of appreciative values along with many other non-economic values in land use management decisions. Studying individuals' and communities' attachments to anonymous landscapes such as much of Canada's crown lands, could provide additional perspectives on land management decisions and understanding of the role of natural landscapes in individuals' environmental behaviour decision making.

Related to this are landscapes that have experienced extensive primary resource extraction in the past, and that may now be undergoing a transformation into more service oriented forms of economic activity. Several studies (Cheng, Kruger, & Daniels, 2003; Farnum, Hall, & Kruger, 2005; Schroeder, 1996) have examined the different meanings and attachment held by stakeholders in these settings of transition. What make these settings particularly interesting is the rapid formation of place attachment and meanings in newcomers, and the often contrasting views of stakeholders regarding what is sustainable and “appropriate” management of landscapes.

### **Different approaches to research**

A second set of recommendations for further research highlights how researchers might improve the process of examining how attachment forms and may foster pro-environmental behaviours. The first of these is a call for increased longitudinal research in place attachment research. Several examples of this were provided in the body of this thesis including pre, in-situ, and post forms of data collection on nature-based trips, and experiments where the impact of first-time visitation to park, which may or may not include interpretation programming, is examined.

Second, many interpretivistic methodologies may be much more suited to developing an understanding of how interactions with natural settings foster attachments and pro-environmental behaviours. A phenomenological study of individuals’ experiences in natural areas is one such approach. A second approach could be an ethnographic study of visitors to Point Pelee, and in particular a group such as the park’s Friends group. This approach could be very fruitful in producing greater understanding regarding the formation and evolutions of cultures associated with a place like Point Pelee, and cultural production of different meanings associated with recreation, conservation, and so on. A number of interpretivistic studies have begun to tackle these issues however many more are needed.

## **Quantitative approaches**

The final set of recommendations addresses quantitative methods used in place attachment and pro-environment behavioural research. These are intermixed with the identification of a number of avenues of research which need to be explored to gain a better understanding of the relationship between place attachment and pro-environmental intentions, as well as how this relationship is affected by other factors.

In keeping with the importance of theory building, it is essential to continue examining the theory of reasoned action and theory of planned behaviour put forward by Fishbein and Ajzen (1975; Ajzen & Fishbein, 1980). In both theories the authors suggest that attitudes toward specific behaviours are the most direct predictor of those behaviours. Place attachment was used in this study to represent attitude towards a particular object. Place attachment, conceptualized as an attitude, was utilized instead of behaviour specific attitudes and proved to be a good predictor of pro-environment behavioural intentions, especially place-specific intentions. However it would also be useful to examine the relationship between attitudes towards these behaviours and how they predict pro-environment behavioural intentions, both with and without the influence of place attachment. Although not reported on in this thesis attitudes towards general pro-environmental behaviours were documented by this study's survey instrument (see Appendix A-3, Question 9), however space did not permit additional park-specific measures of behavioural attitudes. Nevertheless, an examination of general attitudes towards environmental behaviours may provide richer understanding of why and how individuals plan to engage in environmentally responsible behaviour.

Another form of attitude traditionally measured in environmental behaviour studies and often employed to predict environmentally responsible behaviour are attitudes toward the environment in general. One commonly used measure of environmental attitudes is the New Ecological Paradigm scale (NEP) (Dunlap & Van Liere, 1978; Dunlap, Van Liere, Mertig, & Jones, 2000). This scale has been used in numerous studies to examine the relationship between environmental attitudes and behaviours and the factors that affect this relationship (e.g., Cordano, Welcomer, & Scherer, 2003; Schultz & Zelezny, 1999; Tarrant & Cordell,

1997). A NEP scale was included in the survey instrument to document respondents' general environmental attitudes. Corral-Verdugo (2002) suggests that environmental attitudes measured by NEP could be indirectly, not directly, predicting pro-environmental behaviours through other factors. Place attachment could be one of these factors. This relationship will be examined.

Additional phenomena which also appear to play role in the development of pro-environmental intentions should be measured in tandem with place attachment; these factors include empathy towards nature (Chapman & Walker, 2003); affinity for nature (Kals, Schumacher, & Montada, 1999) and social identity (Pol & Castrechini, 2002). Other factors which were measured in this study and many more, especially situational factors should also be included. With different populations and in different settings these factors may prove to be more significant in the prediction of pro-environmental intentions than place attachment. For example, Chapman and Walker found that empathy fully mediated the affect of place attachment. In contrast Vorkinn and Reise (2001) found place attachment to be a far more significant predictor than a number of social-cultural and social-structural variables.

Further exploration of the dimensionality of the constructs documented in this study should be undertaken. Citing a number of authors (viz. Berger, 1997; Corral-Verdugo, 1996; Lee, de Young, & Marans, 1995) Corral-Verdugo (2002) suggests that pro-environmental behaviour is not a unitary construct but a set of different and independent kinds of conservation constructs. Calls for increased examination of the dimensionality of environmental behaviours have been made by a number of other environmental behaviour researchers (e.g., Berger, 1997; Bratt, 1999; Karp, 1996; Olli, et al., 2001). An increased understanding of the composition of pro-environmental behaviour may facilitate the development of more effective survey instruments. Improved understanding of the underlying characteristics of pro-environmental behaviours will give practitioners a keener understanding of behavioural characteristics which serve to encourage or inhibit environmentally responsible behaviour.

A first step in an exploration of the dimensionality of the behaviours will include a re-examination of principle components analysis results and some additional SEM. An examination of patterns in behavioural intentions based on characteristics such as general versus specific and difficult versus easy is also planned. This exploration may be facilitated through analysis which compares intentions with place attachment sub dimensions, environmental attitudes as measured with the NEP scale, and pro-environmental behaviours performed in the 12-months previous to the completion of the survey.

An examination of relationship between place attachment, its sub-dimensions and place-specific behavioural intentions could be expanded utilizing the behavioural intentions categories developed by Chapman and Walker (2003). This will provide an opportunity to compare the affect of place attachment associated with different settings on segmented forms of pro-environmental intentions ranging from “other-focused non-depreciative intentions” such as telling companions not to feed animals in the park, to “volunteering intentions” such as writing letters in support of the park.

The dimensionality of place attachment should also be explored further, as called for by Williams and Vaske (2003). In this immediate study this will be accomplished by revisiting the results from the exploratory factor analysis. The failure of place affect items to load cleanly on their own factor suggests that affect, at least for this study, is ill-defined and diffuse and parallels the patterns demonstrated by the overarching construct place attachment. Similar findings were reported by Jorgensen and Stedman (2002). The items used in this study of visitors to Point Pelee National Park appear ineffective in identifying a clear place affect sub-dimension. At least two plans of action can be undertaken based on this observation. First greater understanding of emotion and feelings could be undertaken to develop more sophisticated items to measure affect (Milton, 2002). This exploration of emotion, feelings and affinity is particularly important when place attachment’s affect on pro-environmental behaviour is considered and the demonstrated role that emotions and affinity can play in fostering a citizen’s efforts to act in an environmentally responsible manner.

Alternatively this approach can be abandoned with the acceptance that affect is bound up with the overarching construct place attachment, or its closely related cousin place identity. Instead more effort could be devoted to exploring other facets of place attachment, and the much larger construct sense of place. This was anticipated during the development of the survey instrument for this study; several additional measures of individual's relationship with Point Pelee National Park were included in the survey instrument and will be utilized in analyses subsequent to this dissertation to explore place attachment further. As noted earlier in the Discussion Chapter these draw on Hammet et al.'s (2004) research on place bonding, Kaltenborn's (1997) place history, and Bricker & Kerstetter's (2000) observations regarding the connection between lifestyle and place. These and other facets of place-relations such as Kyle et al.'s (2004d; 2005) social bonding or Cloke and Jones' (2001) concept of dwelling could be incorporated into further place research to generate a greater understanding of the different relationships individuals have with settings.

This investigation of place attachment dimensionality and the forms that place attachment takes may run in parallel to further study of the factors that foster the development of place attachment. A stronger focus on both natural attributes (Hidalgo & Hernandez, 2001; Kaltenborn, 1997; Stedman, 2003a) and social attributes (Hay, 1998; Kyle & Mowen, 2005; Kyle et al, 2004d; Stedman, 2003a) that contribute to place attachment has been called for. This exploration of place attachment should occur at different scales (Blake, 2001; Canter, 1997; Cheng, Kruger, & Daniels, 2003; Gustafson, 2001). Comparisons of attachment related to particular components of a setting versus an entire region or neighbourhood need to be conducted. (Brown, Perkins, & Brown, 2003; Moore & Scott, 2003; Syme et al., 2002). And, as mentioned previously, an understanding of factors outside the immediate context of the place of attachment, for example the role of social and cultural agents such as the Internet and environmental group membership should be incorporated into this explorations of place attachment formation. All of these factors not only affect the formation of place attachment, but also affect pro-environmental behaviour.

In closing these recommendations highlight many challenges for future research. The researcher will have to demonstrate significant and persistent attachment to this subject

matter if even a small fraction of this agenda is to be pursued successfully. Perhaps her ongoing affiliation with protected areas and the activities, people and natural attributes she encounters there will foster this sense of attachment and continued commitment to the environmental cause.



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## Appendix A

## **Appendix A-1: Cover Letter**

April 7, 2005

Dear Point Pelee National Park visitor:

Canada's national parks protect and present our natural and cultural heritage for the benefit of all Canadians, now and in the future. Parks Canada is the federal agency entrusted with this responsibility. To help us make sound decisions and build support for our ecological, cultural, social, recreational and economic responsibilities, we need to better understand visitors to national parks as well as Canadians in general. The attached questionnaire investigates how you feel about Point Pelee National Park and how your visits to parks like Point Pelee may be related to your attitudes and behaviour on the environment. The questionnaire should take you approximately 25 minutes to complete. Please take time to fill it out; your thoughts are important to us!

On May 24, 2005, all respondents will be entered into a draw for one of five **family/group annual passes** to Point Pelee National Park of Canada (a value of \$63) and three \$30 **gift certificates** for the Friends of Point Pelee Nature Nook gift shop. Winners will be notified by the Point Pelee National Park survey administrator.

Participation is voluntary and confidentiality of all information is ensured through the use of the unique identifier number printed at the top of your survey. Only the survey administrator, who is an employee of Point Pelee National Park, will know what information matches which identifier. No personal information will be given out with the study's final results. The project has been reviewed by Parks Canada and Point Pelee National Park management, the Friends of Point Pelee Board of Directors, and the Office of Research Ethics at the University of Waterloo. You may decline to answer this survey or any part of it. Information you provide by completing this questionnaire will be handled by research staff only.

**Comments and questions** can be directed to the coordinating researcher for this project, Elizabeth Halpenny, a PhD candidate at the University of Waterloo, or her thesis supervisor Dr. Paul Eagles (see addresses below). **Please return this survey prior to Wednesday, May 9, 2005**. A self addressed stamped envelope is enclosed with the survey.

**Thank you** for participating in this project. A **summary of the project findings** will be published in the autumn Friends of Point Pelee Newsletter, Point Pelee National Park news bulletins and on the Parks Canada website [www.pc.gc.ca](http://www.pc.gc.ca). A copy of the study's **final report** can be viewed in the Point Pelee National Park research library.

Yours sincerely,

Marian Stranak  
Superintendent  
Point Pelee National Park of Canada and  
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*Aussi disponible en français, contactez le (519) 322-2365 poste 211*

## Appendix A-2:

### *Reminder Post Card*



Dear Point Pelee National Park Visitor:

**Please help us to manage Point Pelee National Park.** Two weeks ago we sent you a survey to complete. The survey is designed to help us understand your relationship with the park and your environmental attitudes and behaviours.

We need your input. Please take the time to fill out this survey and return it in the postage-paid, self-addressed envelope by **MAY 16, 2005** (extended deadline).

Complete and return your survey by this date and you will be entered to win one of five **family/group annual passes** to Point Pelee National Park of Canada and one of three **\$30 gift certificates** for the Friends of Point Pelee's gift shop. If you require a new copy of the survey please contact the survey administrator, an employee of Point Pelee National Park at (591) 322-2365 ext. 211.

**Appendix A-3:  
Main Survey Questionnaire**

**Park Visitation and Environmental Behaviour Survey**

Dear Point Pelee National Park visitor: This questionnaire is designed to explore the relationship between park visitation and environmental attitudes and behaviours. The information you provide will be treated confidentially. You may choose to not answer any question that you wish. Thank you for taking the time to participate in this study. The results of this study will help guide park planning efforts at Point Pelee National Park (N.P.) and other protected areas. **Please return this survey by May 9, 2005 in the postage paid, addressed envelope provided to you.** For each question please indicate your answer with a “✓”.

**Section A: Satisfaction with and Attachment to Point Pelee National Park**

<b>1. On your <u>most recent visit</u> to Point Pelee N.P. <u>how satisfied</u> were you with:</b>	<b>Very dissatisfied</b>	<b>Somewhat dissatisfied</b>	<b>Neutral</b>	<b>Somewhat satisfied</b>	<b>Very satisfied</b>
a. Your overall visitor experience at Point Pelee N.P.?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. The quality of the natural environment of Point Pelee N.P.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. The quality of the social environment in Point Pelee N.P.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Opportunities to participate in your favourite activities in Point Pelee N.P.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**2. Overall, how would you describe your feelings of attachment to Point Pelee National Park?**

0-----1-----2-----3-----4-----5-----6-----7-----8-----9-----10  
 No Attachment Very Attached

<b>3. Indicate the degree to which you agree or disagree with the following statements about your relationship with Point Pelee N.P.:</b>	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>
a. I am looking forward to witnessing Point Pelee N.P. evolve as a protected area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. I know Point Pelee N.P. so well that I would recognize the park in a photograph taken at any time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. When I visit Point Pelee N.P., others see me the way I want them to see me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. I identify strongly with Point Pelee N.P.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. I feel connected to Point Pelee N.P.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



3. Indicate the degree to which you agree or disagree with the following statements about your relationship with Point Pelee N.P.:	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
f. Point Pelee N.P. is the only park I desire to visit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. I feel Point Pelee is part of me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. I feel happiest when I am at Point Pelee N.P.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. The things I do at Point Pelee N.P. I would enjoy doing just as much at a similar site	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. There are many things at Point Pelee N.P. that remind me of my childhood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. When I walk through Point Pelee N.P. I feel very strongly that I belong there	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. I am very familiar with Point Pelee N.P.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m. Point Pelee N.P. is my favourite place to be	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n. When I am at Point Pelee N.P., I feel part of it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
o. I rarely visit any park other than Point Pelee N.P.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
p. One of the reasons I live where I do is that Point Pelee N.P. is near by	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
q. I feel strong, positive feelings for Point Pelee N.P.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
r. I wouldn't substitute any other area for doing the types of things I do at Point Pelee N.P.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
s. I have acquired so many experiences at Point Pelee N.P. that I have become intimately bound up with the park	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
t. I feel relaxed when I am at Point Pelee N.P.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
u. I know Point Pelee N.P. like the back of my hand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
v. Visiting Point Pelee N.P. says a lot about who I am	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
w. I am fond of Point Pelee N.P.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
x. I get more satisfaction out of visiting Point Pelee N.P. than any other park	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
y. I only consider Point Pelee N.P. when I plan to visit a park	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
z. I really miss Point Pelee N.P. when I am away too long	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
aa. I am willing to invest my time and/or money to make Point Pelee N.P. a better place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
bb. Point Pelee N.P. is the best place for what I like to do	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
cc. I have a long history with Point Pelee N.P.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
dd. My personal future is closely tied to Point Pelee N.P.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ee. I could draw a rough map of Point Pelee N.P.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ff. Point Pelee N.P. means a great deal to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
gg. I feel I can really be myself at Point Pelee N.P.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Section B: Environmental Attitudes & Behaviour

### 4. State the degree to which you agree or disagree with the following statements.

	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
a. We are approaching the limit of the number of people the earth can support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Despite our special abilities humans are still subject to the laws of nature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Plants and animals have as much right as humans to exist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. The balance of nature is strong enough to cope with the impacts of modern industrial nations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. The so-called “ecological crisis” facing human kind has been greatly exaggerated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. The earth is like a spaceship with very limited room and resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Humans have the right to modify the natural environment to suit their needs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. The balance of nature is very delicate and easily upset	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Humans will eventually learn enough about how nature works to be able to control it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Humans are severely abusing the environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### 5. In the last 12 months did you participate in the following behaviours?

	Yes	No
a. I actively worked to reduce my consumption of energy and/or water	<input type="checkbox"/>	<input type="checkbox"/>
b. I paid more for a product if it was produced in an environmentally responsible manner	<input type="checkbox"/>	<input type="checkbox"/>
c. I supported the environment through letter writing or participating in peaceful protests	<input type="checkbox"/>	<input type="checkbox"/>
d. I tried to learn about nature and environmental issues	<input type="checkbox"/>	<input type="checkbox"/>
e. I boycotted a company’s product if it has a bad environmental record	<input type="checkbox"/>	<input type="checkbox"/>
f. I was a member of an environmental group	<input type="checkbox"/>	<input type="checkbox"/>
g. I tried to convince friends and family to act responsibly toward the environment	<input type="checkbox"/>	<input type="checkbox"/>
h. I participated in a public meeting focused on environmental issues or land use planning	<input type="checkbox"/>	<input type="checkbox"/>
i. I recycled cans, glass and plastics that my household produced	<input type="checkbox"/>	<input type="checkbox"/>

### 6. In the last 12 months how much time and money have you donated to Friends of Point Pelee?

\_\_\_\_\_ days                      \$ \_\_\_\_\_ (including membership fee)

7. In the **last 12 months** how much **time** and **money** have you donated to other environmental organizations (not including Friends of Point Pelee)?

\_\_\_\_\_ days                      \$ \_\_\_\_\_ (including membership fee)

8. In the **next 12 months**, how likely are you to perform the following behaviours?

**The Environment in General**

	Not probable	Somewhat improbable	Neutral	Somewhat probable	Very probable
a. Talk to policy makers about environmental issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Buy fruits and vegetables grown without pesticides or chemicals (i.e., organic food)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Pay extra for transportation if it is environmentally-friendly (e.g., a fuel efficient car)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Sort garbage into recyclable material and non-recyclables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Invest in companies that utilize green technologies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Reduce energy and water consumption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Learn more about the state of the environment and how to help solve environmental problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Participate in organized, peaceful environmental protests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Join in community clean up efforts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Contribute money to environmental organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. Talk to others about environmental issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. Avoid buying products from companies with poor environmental records	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**The Park**

	Not probable	Somewhat improbable	Neutral	Somewhat probable	Very probable
m. Pick up litter at Point Pelee N.P. or other parks left by other visitors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n. Tell my friends not to feed the animals in Point Pelee N.P. or similar parks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
o. Sign petitions in support of Point Pelee N.P. and similar protected areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
p. Learn more about Point Pelee N.P.'s natural environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
q. Write letters in support of Point Pelee N.P. and similar protected areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
r. Volunteer my time to projects that help Point Pelee N.P. or similar parks and nature areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
s. Encourage others to reduce their waste and pick up their litter when they are at Point Pelee N.P. or similar parks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
t. Participate in a public meeting about managing Point Pelee N.P. or similar parks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. In the <u>next 12 months</u> , how likely are you to perform the following behaviours?	Not probable	Somewhat improbable	Neutral	Somewhat probable	Very probable
u. Pay increased park fees if they were introduced and used for park programs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
v. Volunteer to <b>reduce</b> my use of a favourite spot in the park if it needs to recover from environmental damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
w. Volunteer to <b>stop</b> visiting a favourite spot in the park if it needs to recover from environmental damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
x. Contribute donations to ensure protection of parks like Point Pelee N.P.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. How <u>effective</u> do you feel the following behaviours are in protecting the environment?	Never effective	Sometimes effective	Often effective	Always effective
a. <b>Conserving resources</b> (e.g., reducing water consumption; repairing appliances or furniture)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. <b>Practicing sustainable park visitation</b> (e.g., leave-no-trace camping; staying on marked trails when hiking)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. <b>Participating in community-based/non-governmental environmental campaigns</b> (e.g., community clean-ups; signing pro-environmental petitions)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. <b>Participating in government-based pro-environmental programs</b> (e.g., Blue Box Recycling, Household Hazardous Waste Disposal days)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. <b>Influencing and teaching</b> others to act in an environmentally-responsible manner (e.g., telling friends not to feed animals in the park)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. <b>Civic action</b> (e.g., participating in public environmental or park planning meetings; writing letters to policy makers; peaceful protest)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. <b>Contributing financially on an individual basis</b> (e.g., giving money to environmental groups; donating land to conservation groups)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. <b>Green consumerism</b> and making pro-environmental purchasing decisions (e.g., buying a fuel efficient car; investing in green companies)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. <b>Contributing financially through park user fees</b> that will be used to support protected areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. <b>Learning about the environment and developing skills</b> that contribute to pro-environmental efforts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. When was your most recent visit to Point Pelee N.P.?

\_\_\_\_\_/\_\_\_\_\_  
month / year

11. Think about your last visit to Point Pelee N.P.: How important was Point Pelee N.P. in your decision to take the trip? (This may be a day visit or overnight visit).

0-----1-----2-----3-----4-----5-----6-----7-----8-----9-----10  
No influence Entire Influence

12. What visitation category best describes your most recent visit to Point Pelee N.P. (Check only one)

- Day visitor, stay at home
- Day visitor, accommodations in local hotel/motel/campground/friends & family (within 80 km)
- Day visitor passing through to another destination
- Overnight visitor, stay in park campground
- Other (Please describe): \_\_\_\_\_

13. How long was your most recent visit to Point Pelee N.P.?

- For day visits estimate the number of hours you were in the park (multiple entries into the park during the same day are possible, but count as only one visit during the same day)
- For overnight trips to the region or park state the number of days you visited the park during your trip to the region and the total length of trip

If it was a day visit	If it was an overnight trip	
____ hours (total hours at Point Pelee N.P.)	____ days (total number of days spent at Point Pelee N.P.)	____ nights (total length of trip)

14. How many people did you travel with during your most recent trip to Point Pelee?

\_\_\_ Children (less than 17 years old)  
\_\_\_ Adults

15. Indicate with a check mark your agreement with the following questions.

After visiting Point Pelee N.P. I am more willing to donate money to park fundraising programs that would assist with:

	Yes	No
a. Research initiatives	<input type="checkbox"/>	<input type="checkbox"/>
b. Education initiatives	<input type="checkbox"/>	<input type="checkbox"/>
c. Habitat and endangered species restoration initiatives	<input type="checkbox"/>	<input type="checkbox"/>
d. Infrastructure renewal initiatives	<input type="checkbox"/>	<input type="checkbox"/>

16. What year did you first visit Point Pelee N.P.? \_\_\_\_\_

17. On average, how many times per year do you visit Point Pelee N.P.? Indicate the category that best describes your visitation patterns to Point Pelee N.P. (Check only one.)

- Less than once in 3 years
- Once in 3 years
- Once per year
- Several times per year
- At least once per month

**18. Approximately how many days have you spent at Point Pelee N.P. in the last 12 months?**

\_\_\_\_\_ days during last 12 months (including day visits and overnight trips)

**19. How regularly did you visit parks and protected areas as a child (16 years of age or under)?**

This can include day visits and overnight visits. *Check the category that best describes your visitation patterns for each category of park.*

	Never	Rarely	Sometimes	Often
a. Point Pelee National Park	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Other protected areas (Conservation areas, provincial parks, national parks, US state parks, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**20. Rank the following reasons for visiting Point Pelee N.P.? (Place a 1 for your main reason, a 2 for the second most important reason, and so on. Please do not give two reasons the same ranking (e.g., do not assign two 1s to separate reasons)).**

	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	Not applicable
<i>Assign each rank only <u>once</u></i>					
a. I visit Point Pelee N.P. to enjoy the natural environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. I visit Point Pelee N.P. to participate in the outdoor activities I enjoy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. I visit Point Pelee N.P. to spend time with my friends and/or family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. I visit Point Pelee N.P. to learn about the park's natural environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**21. How many times in the last 12 months have you visited the following destinations? Please indicate the approximate number of overnight and/or day trips you have made to these destinations and the length of these visits. If you made more than one overnight trip to the same category of destination, indicate the number of nights you spent on an average trip.**

	Day visits in the last 12 months	Overnight Trips in the last 12 months	Length of average over-night trip
a. Point Pelee National Park	_____ trips	_____ trips	_____ nights
b. Other national parks, provincial parks or conservation areas <u>in Ontario</u>	_____ trips	_____ trips	_____ nights
c. Other national parks, provincial parks, state parks or conservation areas <u>outside of Ontario</u>	_____ trips	_____ trips	_____ nights
d. Natural areas where you didn't have to pay (e.g., Canada Trail, Ontario crown lands)	_____ trips	_____ trips	_____ nights
e. Private reserves & campgrounds	_____ trips	_____ trips	_____ nights

	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
<b>22. State the degree to which you agree with the following statements:</b>					
a. I can easily substitute Point Pelee N.P. with another park or natural area as a place to visit (i.e., I can travel there; I have enough time and money, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. I am aware of other parks and natural areas that meet my needs as well as Point Pelee N.P. does (i.e., Point Pelee is not unique; I can find the attributes that I find there, at another site)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>23. I plan to return to Point Pelee N.P.</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>24. After visiting Point Pelee N.P. I am encouraged to do more for <u>the environment</u></b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>25. After visiting Point Pelee N.P. I am encouraged to do more for <u>the park</u></b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**26. What is your favourite activity to participate in when visiting Point Pelee N.P.?**

\_\_\_\_\_

<b>27. We are interested in finding out how well our education programs are working. To help us evaluate this please indicate whether the following statements are true or false:</b>	True	False
a. Point Pelee N.P. protects a portion of the Boreal Forest	<input type="checkbox"/>	<input type="checkbox"/>
b. Point Pelee N.P. provides an important migration stop-over point for many animals, including birds	<input type="checkbox"/>	<input type="checkbox"/>
c. For more than 100 years human activities have greatly influenced Point Pelee N.P. and the surrounding region	<input type="checkbox"/>	<input type="checkbox"/>
d. Of all the national parks, Point Pelee N.P. protects the lowest diversity of plants and animals	<input type="checkbox"/>	<input type="checkbox"/>
e. Point Pelee N.P. protects part of the Carolinian Life Zone	<input type="checkbox"/>	<input type="checkbox"/>
f. The marsh located in Point Pelee N.P. is one of the largest remaining on the Great Lakes	<input type="checkbox"/>	<input type="checkbox"/>

**Section D: Participant Characteristics**

**28. How do you characterize your place of residence? (Check only one)**       Rural  
 Urban

**29. What outdoor activities have you participated in during the last 12 months?**

	Yes		Yes
a. Picnicking	<input type="checkbox"/>	h. Camping	<input type="checkbox"/>
b. Hiking or backpacking	<input type="checkbox"/>	i. Driving off-road vehicles	<input type="checkbox"/>
c. Wildlife and bird watching around residence	<input type="checkbox"/>	j. Motor boating / jet skiing	<input type="checkbox"/>
d. Wildlife and bird watching away from residence	<input type="checkbox"/>	k. Harvesting & collecting (e.g., mushrooms, seashells)	<input type="checkbox"/>
e. Hunting	<input type="checkbox"/>	l. Fishing	<input type="checkbox"/>
f. Snowmobiling	<input type="checkbox"/>	m. Nature photography	<input type="checkbox"/>
g. Mountain Biking	<input type="checkbox"/>	n. X-country skiing / snowshoeing	<input type="checkbox"/>

**30. What is your age?** \_\_\_\_ years old

**31. What is your sex?**  Male  Female

**32. What is the highest level of education you have completed?** (*Check only one.*)

- |  |   |
|--|---|
| <input type="checkbox"/> Elementary school | <input type="checkbox"/> University bachelor degree |
| <input type="checkbox"/> High School       | <input type="checkbox"/> University graduate degree |
| <input type="checkbox"/> College diploma   |   |

**33. What is your total annual family/household income before taxes?** (*Check only one.*) Please convert your income to Canadian dollars (USD \$1 = CAD \$1.20)

- |  |  |
|--|--|
| <input type="checkbox"/> Less than \$20,000  | <input type="checkbox"/> \$60,000 - \$79,999         |
| <input type="checkbox"/> \$20,000 - \$39,999 | <input type="checkbox"/> \$80,000 - \$99,999         |
| <input type="checkbox"/> \$40,000 - \$59,999 | <input type="checkbox"/> \$100,000 or more           |
|  | <input type="checkbox"/> I prefer not to answer this |

**Section G: Final Statements**

**34. Are there any final thoughts you would like to share about your feelings for Point Pelee N.P., the quality of your visitation experience, or comments about the survey you just completed?**

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**THANK YOU** for sharing your thoughts and opinions with us. Findings from this project will be published in the Friends of Point Pelee National Park newsletter and Point Pelee National Park's news updates. If you would like further information on the project, please contact Elizabeth Halpenny at the address below.

Please return this survey by May 9, 2005 in the postage paid, addressed envelope provided to you. The survey should be returned to: Elizabeth Halpenny, c/o Department of Recreation and Leisure Studies, University of Waterloo, Waterloo, ON, N2L 3G1, Canada; Email: eahalpen@ahsmail.uwaterloo.ca



**Appendix A-4:**  
**Preliminary Survey Instrument**

**Parks, Environmental Attitudes and Behaviours Survey**

**Note:** Highlighted scale items in Question 3 were used in the analysis of the scale during the assessment of the preliminary test of the survey scales.

Please complete the following survey reflecting on your most recent visit to a park or protected area and your experiences in a favourite park or protected area.

1. What is the name of the park or protected area that you most recently visited?

\_\_\_\_\_

2. What is the name of your favourite park or protected area?

\_\_\_\_\_

3. Indicate the degree to which you agree or disagree with the following statements about your relationship with the park you most recently visited, and your favourite park. Just complete one of the columns below if the park your visited most recently is also your favourite park.

	<b>Park/Protected Area Most Recently Visited</b>					<b><u>Favourite</u> Park/Protected Area</b>				
	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>
a. I am looking forward to witnessing Park “X” evolve as a protected area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. I know Park “X” so well that I would recognize the park in a photograph taken at any time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. I have a special connection to Park “X” <u>and</u> the people who visit it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. I identify strongly with Park “X”	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. I feel connected to Park “X”	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Park “X” is the only park I desire to visit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. I feel NO emotional bond with Park “X”	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. I feel UNHAPPY when I am at Park “X”	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. The things I do at Park “X” I would enjoy doing just as much at a similar site	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. There are many things at Park “X” that remind me of my past	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. My personal future is closely tied to Park “X”’s	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	<u>Park/Protected Area Most Recently Visited</u>					<u>Favourite Park/Protected Area</u>				
	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
l. I am very familiar with Park "X"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m. Most of my friends are in some way connected with my use of Park "X"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n. When I am at Park "X", I feel part of it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
o. I rarely visit any park other than Park "X"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
p. I have NO particular feelings for Park "X"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
q. I feel strong, positive feelings for Park "X"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
r. I wouldn't substitute any other area for doing the types of things I do at Park "X"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
s. I have acquired so many experiences at Park "X" that I have become intimately bound up with the park	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
t. I would like to continue to visit Park "X" indefinitely	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
u. I know Park "X" like the back of my hand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
v. Visiting Park "X" says a lot about who I am	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
w. I feel I can really be myself when I am in Park "X"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
x. I feel like I belong in Park "X"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
y. If I could not do my favourite activity at Park "X", I would stop doing my favourite activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
z. I really miss Park "X" when I am away too long	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
aa. I have NEGATIVE feelings for Park "X"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
bb. Park "X" is the best place for what I like to do	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
cc. I have a long history with Park "X"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
dd. Park "X" will play an important role in my future	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ee. I could draw a rough map of Park "X"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ff. You can tell a lot about a person by seeing them at Park "X"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
gg. Park "X" means a great deal to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
hh. Park "X" makes me feel like no other place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Park/Protected Area Most Recently Visited					Favourite Park/Protected Area				
	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
ii. I only consider Park “X” when I plan to visit a park	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
jj. I get more satisfaction out of visiting Park “X” than any other park	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
kk. I feel relaxed when I am at Park “X”	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ll. Park “X” is my LEAST favourite place to be	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
mm. I am willing to invest my time and/or money to make Park “X” a better place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
nn. When I visit Park “X”, others see me the way I want them to see me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
oo. Park “X” is very special to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
pp. When I walk through Park “X” I feel very strongly that I belong there	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
qq. One of the reasons I live where I do is that Park “X” is near by	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
rr. I am fond of Park “X”	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ss. I identify with the people and image associated with Park “X”	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
tt. I am attached to Park “X”	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
uu. I feel Park “X” is part of me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Select the category that best describes your agreement or disagreement with the following statements. Please substitute the name of your favourite park for “Park ‘X.’” (Check only one category for each).

	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
a. I have no influence over how parks such as Park “X” are protected or managed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Environmental degradation is such a big problem that I personally can’t really do anything about it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. I know how to make changes that benefit the environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. I have skills and knowledge that can be used to help support protected areas like Park “X”	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. I enjoy working to protect natural environments such as Park “X”	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Performing tasks that help the environment gives me great pleasure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

g. I am responsible for the ecological health of Park “X”	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. I am responsible for the ecological health of the planet’s environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. It is important to me that other park visitors believe I act in an environmentally responsible manner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. It is important to me that my friends and family believe I act in an environmentally responsible manner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. My friends and family think that supporting protected areas is important	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. I do not believe my environmentally-responsible actions will help if others do not do the same	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m. I do not have to act in an environmentally-responsible manner if other park visitors do not do the same	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n. I am inspired to do more for the environment when I see others working for the environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
o. My visit to Park “X” has no negative effect on the park’s environmental wellbeing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
p. I feel bothered by the potential environmental impacts produced by my trip to Park “X”	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. In the next 12 months, how likely are you to perform the following behaviours? Please substitute the name of your favourite park for “Park ‘X.’”

	Not probable	Somewhat improbable	Neutral	Somewhat probable	Very probable
a. Avoid buying products from companies with poor environmental records	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Talk to policy makers about environmental issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Buy fruits and vegetables grown without pesticides or chemicals (i.e. organic food)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Pay increased park fees if they were introduced and used for park programs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Volunteer to <b>reduce</b> my use of a favourite spot in the park if it needs to recover from environmental damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Volunteer to <b>stop</b> visiting a favourite spot in the park if it needs to recover from environmental damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Reduce energy and water consumption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Learn more about the state of the environment and how to help solve environmental problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Vote for politicians who support Park “X” and parks like it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Participate in a public meeting about managing Park “X” or similar parks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. Invest in companies that utilize green technologies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. Volunteer my time to projects that help Park “X” or	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Not probable	Somewhat improbable	Neutral	Somewhat probable	Very probable
similar parks and nature areas					
m. Sort garbage into recyclable material and non-recyclables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n. Pick up litter at Park “X” or other parks left by other visitors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
o. Join in community clean up efforts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
p. Sign petitions in support of Park “X” and similar protected areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
q. Participate in organized, peaceful environmental protests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
r. Contribute money to environmental organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
s. Tell my friends not to feed the animals in Park “X” or similar parks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
t. Encourage others to reduce their waste and pick up their litter when they are at Park “X” or similar parks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
u. Talk to others about environmental issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
v. Learn more about Park “X”’s natural environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
w. Pay extra taxes to ensure parks like Park “X” are protected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
x. Pay extra for transportation if it is environmentally-friendly (e.g., a fuel efficient car)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
y. Contribute donations to ensure protection of parks like Park “X”	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
z. Write letters in support of Park “X” and similar protected areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. How effective do you feel the following behaviours are in protecting the environment?

	Never effective	Sometimes effective	Often effective	Always effective	I don't know
a. <b>Green consumerism</b> and making pro-environmental purchasing decisions (e.g., buying a fuel efficient car; investing in green companies)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. <b>Conserving resources</b> (e.g., reducing water consumption; repairing appliances or furniture)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. <b>Practicing sustainable park visitation</b> (e.g., leave-no-trace camping; visiting a favourite park site less if it is suffering from over-visitation)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. <b>Participating in community-based/non-governmental environmental campaigns</b> (e.g., community clean-ups; peaceful protest; signing pro-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

environmental petitions)					
e. <b>Participating in government-based pro-environmental programs</b> (e.g., Blue Box Recycling, Household Hazardous Waste Disposal days)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. <b>Influencing and teaching</b> others to act in an environmentally-responsible manner (e.g., telling friends not to feed animals in the park)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. <b>Political action</b> (e.g., voting for pro-environmental politicians; participating in public environmental or park planning meetings)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. <b>Contributing financially on an individual basis</b> (e.g., giving money to environmental groups; donating land to conservation groups)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. <b>Contributing financially through taxes</b> that will be used by government to support pro-environmental programs and protected areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. <b>Contributing financially through park user fees</b> that will be used to support protected areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. <b>Learning about the environment and developing skills</b> that contribute to pro-environmental efforts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. **What is the population of your place of residence?** (*Check only one.*)
- Less than 1000 people
  - 1000 – 9,999 people
  - 10,000 – 99,999 people
  - 100,000 people or more
8. **How do you characterize your place of residence?** (*Check only one*)
- Rural
  - Urban
9. **How regularly did you visit parks and protected areas as a child** (*18 years of age or under*)? This can include day visits and overnight visits. *Check the category that best describes your visitation patterns for each category of park.*

	Never	Rarely	Sometimes	Often
<b>The park you most recently visited</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Your favourite park or protected area</b>				
<b>Other protected areas</b> (Conservation areas, provincial parks, national parks, US state parks, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. **What is your favourite outdoor recreation activity?** \_\_\_\_\_
11. **What is your age?** \_\_\_\_\_ years old

12. **What is your sex?**    Male       Female

13. **What is your faculty?**    AHS       FES    Other: \_\_\_\_\_

14. **Please comment on this survey instrument. What is missing? What didn't read well?**

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## **Appendix B: Descriptive Statistics**



**Appendix B-1:**  
**Factor Analysis for Preliminary Test of Place Attachment Scale (Favourite Park)**

Scale Items	Factor 1	Factor 2	Factor 3	Factor 4	Communalities	M	Alpha if item del
3ll. Park “X” is my LEAST favourite place to be (r)	<b>.769</b>				.605	4.66	.893
3aa. I have NEGATIVE feelings for Park “X” (r)	<b>.768</b>				.614	4.47	.890
3kk. I feel relaxed when I am at Park “X”	<b>.762</b>				.696	4.27	.888
3gg. Park “X” means a great deal to me	<b>.652</b>	.471			.719	3.91	.883
3tt. I am attached to Park “X”	<b>.578</b>	.530			.695	3.62	.882
3rr. I am fond of Park “X”	<b>.482</b>				.362	4.19	.883
3d. I identify strongly with Park “X”		<b>.856</b>			.777	4.04	.888
3c. I have a special connection to Park “X” <u>and</u> the people who visit it		<b>.837</b>			.793	3.52	.888
3oo. Park “X” is very special to me	.484	<b>.577</b>			.661	3.81	.883
3q. I feel strong, positive feelings for Park “X”	.518	<b>.555</b>			.596	4.05	.888
3z. I really miss Park “X” when I am away too long	.415	<b>.529</b>			.645	3.14	.881
3uu. I feel Park “X” is part of me		<b>.527</b>			.512	3.22	.885
3h. I feel UNHAPPY when I am at Park “X” (r)		<b>.468</b>			.433	4.64	.892
3w. I feel I can really be myself when I am in Park “X”		<b>.420</b>			.392	3.91	.891
3v. Visiting Park “X” says a lot about who I am					.567	3.35	.883
3bb. Park “X” is the best place for what I like to do			<b>.711</b>		.584	3.16	.886
3m. Most of my friends are in some way connected with my use of Park “X”			<b>.695</b>		.572	2.72	.900
3nn. When I visit Park “X”, others see me the way I want them to see me			<b>.620</b>		.524	3.35	.883
3ss. I identify with the people and image associated with Park “X”			<b>.514</b>		.655	3.43	.883
3i. The things I do at Park “X” I would enjoy doing just as much at a similar site				<b>.690</b>	.531	2.96	.896
3ff. You can tell a lot about a person by seeing them at Park “X”				<b>.643</b>	.600	3.01	.896
3r. I wouldn’t substitute any other area for doing the types of things I do at Park “X”				<b>.568</b>	.356	2.56	.898

<b>Scale Items</b>	<b>Factor 1</b>	<b>Factor 2</b>	<b>Factor 3</b>	<b>Factor 4</b>	<b>Commun alities</b>	<b><i>M</i></b>	<b>Alpha if item del</b>
3jj. I get more satisfaction out of visiting Park "X" than any other park				<b>.518</b>	.299	2.97	.896
<b>Percentage of variance explained (rounded)</b>	18%	18%	12%	9%			
<b>Cumulative variance explained (%)</b>	18.41	36.04	47.93	57.35			
<b>Eigenvalue</b>	11.143	2.127	1.620	1.379			

Note 1: Total variance explained by four factors: 57%

Note 2: Items are ordered by factor affiliation

Note 3: Original scale item position is indicated by alphabetical label

Note 4: Extraction method: Principle component analysis; Varimax rotation with Kaiser Normalization

Note 5: Correlation between factors range from  $r = -.756$  to  $-.045$

## Appendix B-2:

### *Factor Analysis for Preliminary Test of Pro-environment Behavioural Intentions Scale*

Scale Items	Factor 1	Factor 2	Factor 3	Factor 4	Communalities	M	Alpha if item del
5z. Write letters in support of Park "X" and similar protected areas	.771				.714	2.68	.941
5q. Participate in organized, peaceful environmental protests	.752				.579	2.58	.943
5j. Participate in a public meeting about managing Park "X" or similar parks	.686				.631	2.85	.941
5v. Learn more about Park "X"'s natural environment	.603			.424	.724	4.00	.941
5p. Sign petitions in support of Park "X" and similar protected areas	.602				.553	3.79	.941
5i. Vote for politicians who support Park "X" and parks like it	.581				.590	3.99	.942
5h. Learn more about the state of the environment and how to help solve environmental problems	.563			.541	.731	4.06	.940
5b. Talk to policy makers about environmental issues	.562				.559	2.55	.941
5k. Invest in companies that utilize green technologies	.499				.439	2.81	.944
5l. Volunteer my time to projects that help Park "X" or similar parks and nature areas	.482	.445		.414	.601	3.36	.941
5x. Pay extra for transportation if it is environmentally-friendly (e.g., a fuel efficient car)	.467		.461		.470	3.24	.943
5e. Volunteer to <b>reduce</b> my use of a favourite spot in the park if it needs to recover from environmental damage		.806			.795	3.82	.942
5f. Volunteer to <b>stop</b> visiting a favourite spot in the park if it needs to recover from environmental damage		.750			.705	3.77	.942
5r. Contribute money to environmental organizations		.632			.605	3.01	.941
5y. Contribute donations to ensure protection of parks like Park "X"	.438	.626			.693	3.19	.940
5w. Pay extra taxes to ensure parks like Park "X" are protected		.566			.539	2.99	.941
5o. Join in community clean up efforts	.455	.506	.498		.716	3.5	.941
5m. Sort garbage into recyclable material and non-recyclables			.753		.613	4.46	.944

Scale Items	Factor 1	Factor 2	Factor 3	Factor 4	Communalities	M	Alpha if item del
5n. Pick up litter at Park "X" or other parks left by other visitors			.724		.615	3.87	.944
5d. Pay increased park fees if they were introduced and used for park programs		.423	.598		.651	3.81	.943
5t. Encourage others to reduce their waste and pick up their litter when they are at Park "X" or similar parks			.556		.593	4.12	.943
5s. Tell my friends not to feed the animals in Park "X" or similar parks	.401		.523		.569	3.96	.941
5c. Buy fruits and vegetables grown without pesticides or chemicals (i.e. organic food)				.749	.645	3.49	.944
5a. Avoid buying products from companies with poor environmental records				.740	.681	3.44	.943
5u. Talk to others about environmental issues	.520			.602	.764	3.97	.941
5g. Reduce energy and water consumption				.413	.497	4.15	.942
<b>Percentage of variance explained (rounded)</b>	21%	15%	14%	13%			
<b>Cumulative variance explained (%)</b>	21.10	36.20	50.00	62.57			
<b>Eigenvalue</b>	11.143	2.127	1.620	1.379			

Note 1: Total variance explained by four factors: 63%

Note 2: Items are ordered by factor affiliation

Note 3: Original scale item position is indicated by alphabetical label

Note 4: Extraction method: Principle component analysis; Varimax with Kaiser Normalization

Note 5: Correlation between factors range from  $r = -.790$  to  $.042$ .

### Appendix B-3

#### *Internal Consistency and Coefficient Alpha Values for Place Identity, Place Affect, and Place Identity Sub-scales*

Scale items	Sub-scales	Mean if item deleted	Item-total correlation	Alpha if item deleted (16 items)
<b>Place Identity Items</b>				
a. When I visit Point Pelee N.P., others see me the way I want them to see me	Place Identity ( $\alpha = .861$ , 6 items)	18.77	.503	.863
b. I identify strongly with Point Pelee N.P.		18.63	.738	.823
c. I feel Point Pelee N.P. is part of me		19.15	.662	.838
d. Visiting Point Pelee N.P. says a lot about who I am		18.88	.676	.834
e. Point Pelee N.P. means a great deal to me		15.56	.706	.829
f. I feel I can really be myself when I am in Point Pelee N.P.		18.66	.656	.837
<b>Place Affect Items</b>				
a. I feel happiest when I am at Point Pelee N.P.	Place Affect ( $\alpha = .821$ , 6 items)	18.90	.650	.779
b. Point Pelee N.P. is my favourite place to be		19.03	.633	.783
c. I feel strong, positive feelings for Point Pelee N.P.		17.95	.620	.788
d. I feel relaxed when I am at Point Pelee N.P.		17.95	.515	.810
e. I am fond of Point Pelee N.P.		17.62	.516	.810
f. I really miss Point Pelee N.P. when I am away too long		17.55	.665	.780
<b>Place Dependence Items</b>				
a. The things I do at Point Pelee N.P. I would enjoy doing just as much at a similar site (r)	Place Dependence ( $\alpha = .754$ , 4 items)	8.78	.293	.823
b. I wouldn't substitute any other area for doing the types of things I do at Point Pelee N.P.		8.58	.649	.638
c. I get more satisfaction out of visiting Point Pelee N.P. than any other park		8.55	.646	.640
d. Point Pelee is the best place for what I like to do		8.09	.644	.646

## Appendix B-4

### *Internal Consistency and Coefficient Alpha Values for Pro-environment Behavioural Intentions Scale ( $\alpha = .914$ , $M = 90.30$ , $SD = 15.296$ , 24 items, $n = 322$ )*

Scale items	Sub-scales	Mean if item deleted	Item-total correlation	Alpha if item deleted (16 items)	
<b>General Environmental Behaviours</b>					
a. Talk to policy makers about environmental issues		87.66	.568	.911	
b. Buy fruits and vegetables grown without pesticides or chemicals (i.e., organic food)		86.42	.468	.912	
c. Pay extra for transportation if it is environmentally-friendly (e.g., a fuel efficient car)		86.91	.468	.912	
d. Sort garbage into recyclable material and non-recyclables		85.43	.180	.915	
e. Invest in companies that utilize green technologies	General Environmental Behaviours ( $\alpha = .848$ , 12 items)	86.92	.534	.911	
f. Reduce energy and water consumption		85.81	.448	.912	
g. Learn more about the state of the environment and how to help solve environmental problems		86.13	.632	.909	
h. Participate in organized, peaceful environmental protests		87.99	.572	.910	
i. Join in community clean up efforts		86.73	.542	.911	
j. Contribute money to environmental organizations		86.68	.563	.910	
k. Talk to others about environmental issues		86.17	.610	.909	
l. Avoid buying products from companies with poor environmental records		86.29	.620	.909	
<b>Park-specific Environmental Behaviours</b>					
m. Pick up litter at "X" park left by other people		Park-specific Behaviours ( $\alpha = .869$ , 12 items)	86.12	.467	.912
n. Tell my friends not to feed the animals in Park "X" and similar parks			86.29	.521	.911
o. Sign petitions in support of Park "X" and similar protected areas			86.07	.573	.910
p. Learn more about "X" Park's natural environment	86.21		.572	.910	
q. Write letters of support of Park "X" and similar protected areas	87.19		.683	.907	
r. Volunteer my time to projects that help Park "X" <sup>a</sup> or similar parks and nature areas	87.08		.536	.911	
s. Encourage others to reduce their waste and pick up their litter when they are in "X" Park	86.25		.552	.910	

<b>Scale items</b>	<b>Sub-scales</b>	<b>Mean if item deleted</b>	<b>Item-total correlation</b>	<b>Alpha if item deleted (16 items)</b>
t. Participate in a public meeting about managing Park "X" and parks like it		87.46	.533	.911
u. Pay increased park fees if they were introduced and used for park programs		86.51	.423	.913
v. Volunteer to reduce my use of a favourite spot in the park if it needs to recover from environmental damage		85.95	.539	.911
w. Volunteer to stop visiting a favourite spot in the park if it needs to recover from environmental damage		85.88	.539	.911
x. Contribute donations to ensure protection of parks like Park "X"		86.69	.631	.909

**Appendix B-5:**  
**Factor Loading of Place Attachment Items: Development of *Id\_Aff\_efa* and *Dep\_efa* Indicators**

Place Attachment	Factor 1	Factor 2	Commun- -alities	<i>M</i>	Alpha if item del
ff. Point Pelee N.P. means a great deal to me ( <i>id</i> )	<b>.811</b>	.500	.664	3.97	.865
q. I feel strong, positive feelings for Point Pelee N.P. ( <i>aff</i> )	<b>.779</b>	.438	.607	4.04	.870
d. I identify strongly with Point Pelee N.P. ( <i>id</i> )	<b>.761</b>	.544	.605	3.90	.869
v. Visiting Point Pelee N.P. says a lot about who I am ( <i>id</i> )	<b>.752</b>	.431	.567	3.64	.870
a. I am fond of Point Pelee N.P. ( <i>aff</i> )	<b>.738</b>		.565	4.42	.877
gg. I feel I can really be myself at Point Pelee N.P. ( <i>id</i> )	<b>.732</b>	.450	.541	3.86	.872
z. I really miss Point Pelee N.P. when I am away too long ( <i>aff</i> )	<b>.677</b>	.632	.560	3.18	.879
t. I feel relaxed when I am at Point Pelee N.P. ( <i>aff</i> )	<b>.652</b>	.356	.425	4.36	.881
c. When I visit Point Pelee N.P., others see me the way I want them to see me ( <i>id</i> )	<b>.621</b>		.388	3.75	.887
b. I get more satisfaction out of visiting Point Pelee N.P. than any other park ( <i>dep</i> )	.474	<b>.849</b>	.721	2.78	.861
a. Point Pelee N.P. is my favourite place to be ( <i>aff</i> )	.509	<b>.814</b>	.670	2.93	.861
bb. Point Pelee N.P. is the best place for what I like to do ( <i>dep</i> )	.572	<b>.795</b>	.662	3.25	.863
h. I feel happiest when I am at Point Pelee N.P. ( <i>aff</i> )	.568	<b>.780</b>	.640	3.07	.862
r. I wouldn't substitute any other area for doing the types of things I do at Point Pelee N.P. ( <i>dep</i> )	.380	<b>.760</b>	.579	2.75	.884
g. I feel Point Pelee is part of me ( <i>id</i> )	.675	<b>.678</b>	.596	3.34	.877
i. The things I do at Point Pelee N.P. I would enjoy doing just as much at a similar site ( <i>dep</i> ) ( <i>r</i> )		<b>.381</b>	.150	2.56	.888
<b>Percentage of variance explained (rounded)</b>	47%	9%			
<b>Culumlative variance explained (%)</b>	46.86	55.86			
<b>Eigenvalue</b>	7.497	1.443			
<b>Number of items</b>	9	6(7)			
<b>Cronbach Alpha</b>	.892	.889			

Note: Total Variance explained 56%

Note 2: Items are ordered by factor affiliation

Note 3: Original scale item position is indicated by alphabetical label

Note 4: Extraction method: Principle component analysis; Oblique rotation with Kaiser Normalization



Note 5: Correlation between Identity-Affect and Dependence Indicators:  $r = .536$

Note 6: (*r*) Item was reverse coded. Item was dropped due to low loading on the factor, and failure to contribute to overall reliability of Factor 2. Exploratory factor analysis identified three factors for this scale; item 3i was a singlet in Factor 3 and was forced into one of the two factors in subsequent Oblique rotation that requested the identification of two factors. Alpha score for Factor 2 reflects the removal of item 3i.

Note 7: From original scale: Dependence items = (*dep*); Identity items = (*id*); Affect items = (*aff*)

## Appendix B-6

### *Factor Loading of General Pro-environment Behavioural Intentions Items: Development of Env\_1; Env\_2; Env\_1a\_Env\_1b Indicators*

Scale Items	Factor 1a	Factor 2	Communi- calities	M	Alpha if item del
8h. Participate in organized, peaceful environmental protests	.756		.584	3.36	.722
8a. Talk to policy makers about environmental issues	.747		.561	2.64	.727
8j. Contribute money to environmental organizations	.688	.300	.476	3.60	.738
8k. Talk to others about environmental issues	.686	.376	.489	4.11	.741
8i. Join in community clean up efforts	.676		.460	3.54	.739
8c. Pay extra for transportation if it is environmentally-friendly (e.g., a fuel efficient car)	.483	.463	.327	3.36	.782
8f. Reduce energy and water consumption		.728	.530	4.48	.714
8l. Avoid buying products from companies with poor environmental records	.548	.653	.536	4.01	.681
8b. Buy fruits and vegetables grown without pesticides or chemicals (i.e., organic food)	.429	.634	.447	3.89	.704
8g. Learn more about the state of the environment and how to help solve environmental problems	.581	.625	.533	4.15	.693
8d. Sort garbage into recyclable material and non-recyclables		.613	.428	4.87	.754
8e. Invest in companies that utilize green technologies	.551	.559	.451	3.38	.716
<b>Percentage of variance explained (rounded)</b>	38%	11%			
<b>Cumulative variance explained</b>	37.87	48.52			
<b>Eigenvalue</b>	4.544	1.278			
<b>Number of items</b>	6	6			
<b>Cronbach's Alpha</b>	.780	.752			

Note 1: Total variance explained by three General Environmental Intention Indicators 49%

Note 2: Items are ordered by factor affiliation

Note 3: Original scale item position is indicated by alphabetical label

Note 4: Extraction method: Principle component analysis; Oblique rotation with Kaiser Normalization

Note 5: Correlation between two General Behavioural Intentions Indicators:  $r = .368$

Note 6: The General Environmental Intentions Factor 1 was split into two indicators: Env\_1a contained the first three items ( $\alpha = .730$ ) and Env\_1b contained the last three items four in Factor 1 ( $\alpha = .612$ ).

## Appendix B-7

### *Factor Loading of Park-specific Pro-environment Behavioural Intentions Items: Development of Prk\_1a; Prk\_1b; Prk\_1c Indicators*

Scale Items	Factor 1	Factor 2	Factor 3	Commu nalities	<i>M</i>	Alpha if item del
8n. Tell my friends not to feed the animals in Point Pelee N.P. or similar parks	<b>.816</b>			.666	4.01	.737
8s. Encourage others to reduce their waste and pick up their litter when they are at Point Pelee N.P. or similar parks	<b>.742</b>	.393		.579	4.04	.765
8m. Pick up litter at Point Pelee N.P. or other parks left by other visitors	<b>.729</b>		.328	.543	4.20	.769
8p. Learn more about Point Pelee N.P.'s natural environment	<b>.720</b>	.395	.440	.570	4.07	.757
8o. Sign petitions in support of Point Pelee N.P. and similar protected areas	<b>.641</b>	.368	.515	.510	4.21	.779
8t. Participate in a public meeting about managing Point Pelee N.P. or similar parks	.335	<b>.829</b>		.700	2.80	.576
8r. Volunteer my time to projects that help Point Pelee N.P. or similar parks and nature areas		<b>.797</b>		.641	3.17	.679
8q. Write letters in support of Point Pelee N.P. and similar protected areas	.562	<b>.716</b>		.635	3.09	.758
8v. Volunteer to <b>reduce</b> my use of a favourite spot in the park if it needs to recover from environmental damage	.497		<b>.886</b>	.842	4.33	.671
8w. Volunteer to <b>stop</b> visiting a favourite spot in the park if it needs to recover from environmental damage	.475		<b>.859</b>	.784	4.39	.691
8u. Pay increased park fees if they were introduced and used for park programs		.360	<b>.657</b>	.474	3.79	.756
8x. Contribute donations to ensure protection of parks like Point Pelee N.P.		.645	<b>.674</b>	.661	3.60	.785
<b>Percentage of variance explained (rounded)</b>	42%	12%	10%			
<b>Cumulative variance explained (%)</b>	41.69	53.68	63.37			
<b>Eigenvalue</b>	5.003	1.438	1.163			
<b>Number of items</b>	5	3	4			
<b>Cronbach's Alpha</b>	.801	.757	.785			

Note 1: Total variance explained by three Park-specific Intension Indicators: 63%

Note 2: Items are ordered by factor affiliation

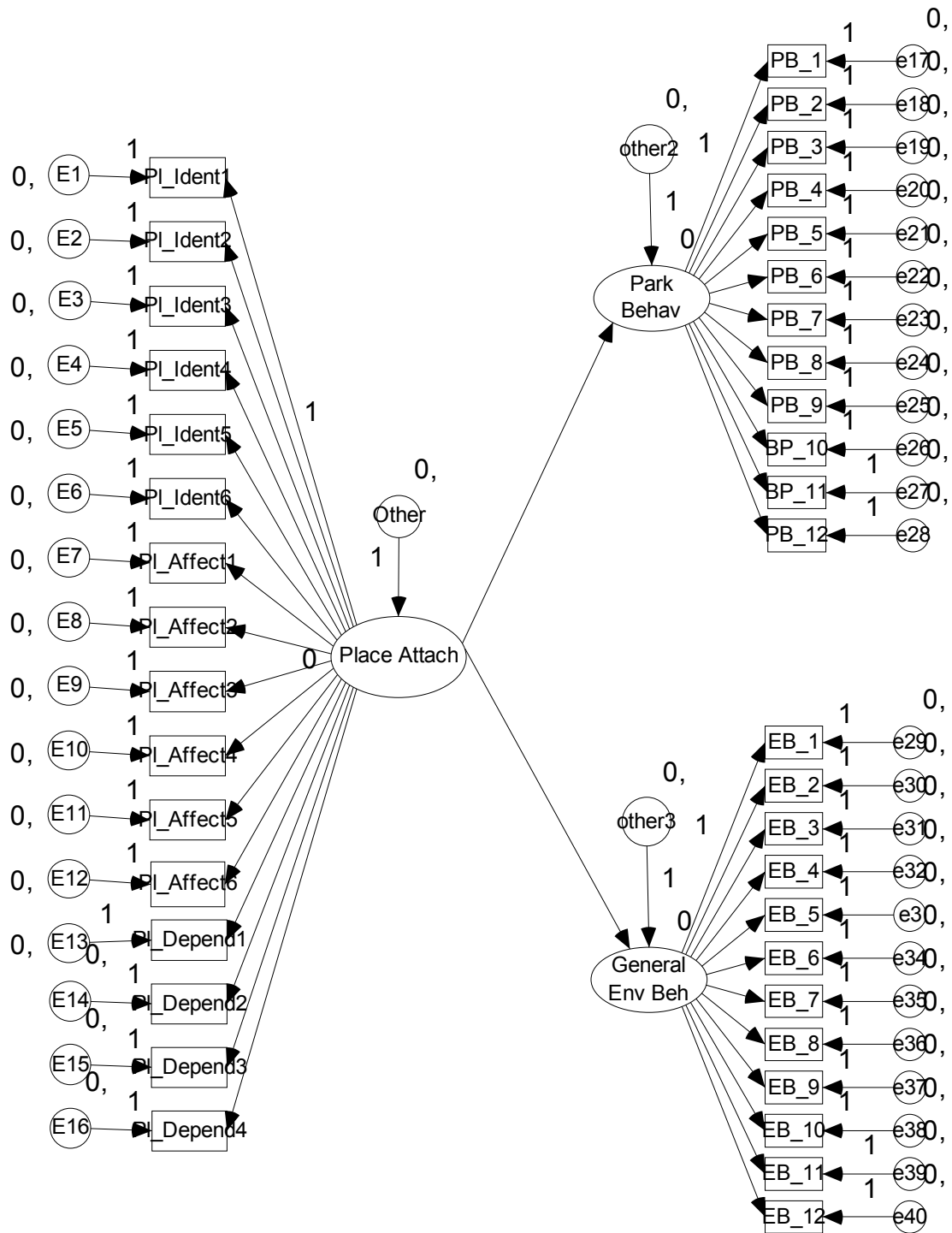
Note 3: Original scale item position is indicated by alphabetical label

Note 4: Extraction method: Principle component analysis; Oblique rotation with Kaiser Normalization

Note 5b: Correlation between Park-specific Intentions Indicators - Factor 1 and 2:  $r = .329$ , and Factors 2 and 3:  $r = .282$

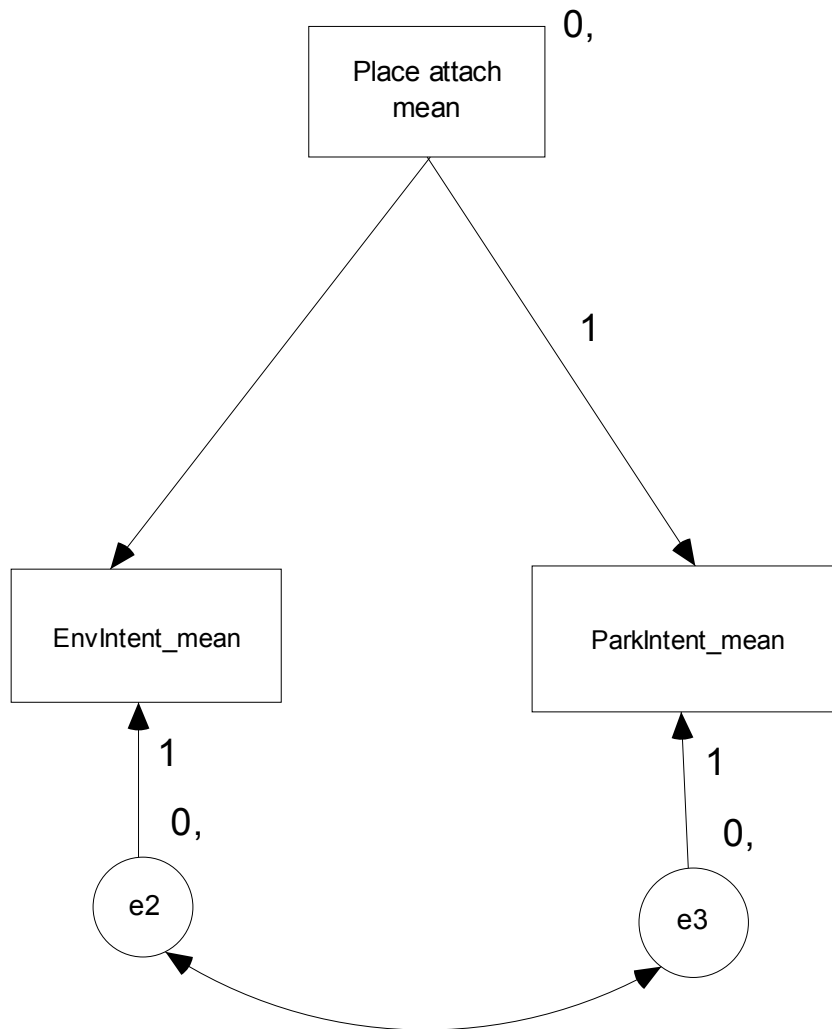
## **Appendix C: SEM Models and Related Correlation Matrices**

**Appendix C-1:**  
*Fully latent structural model depicting the relationship between place attachment and pro-environmental intentions*



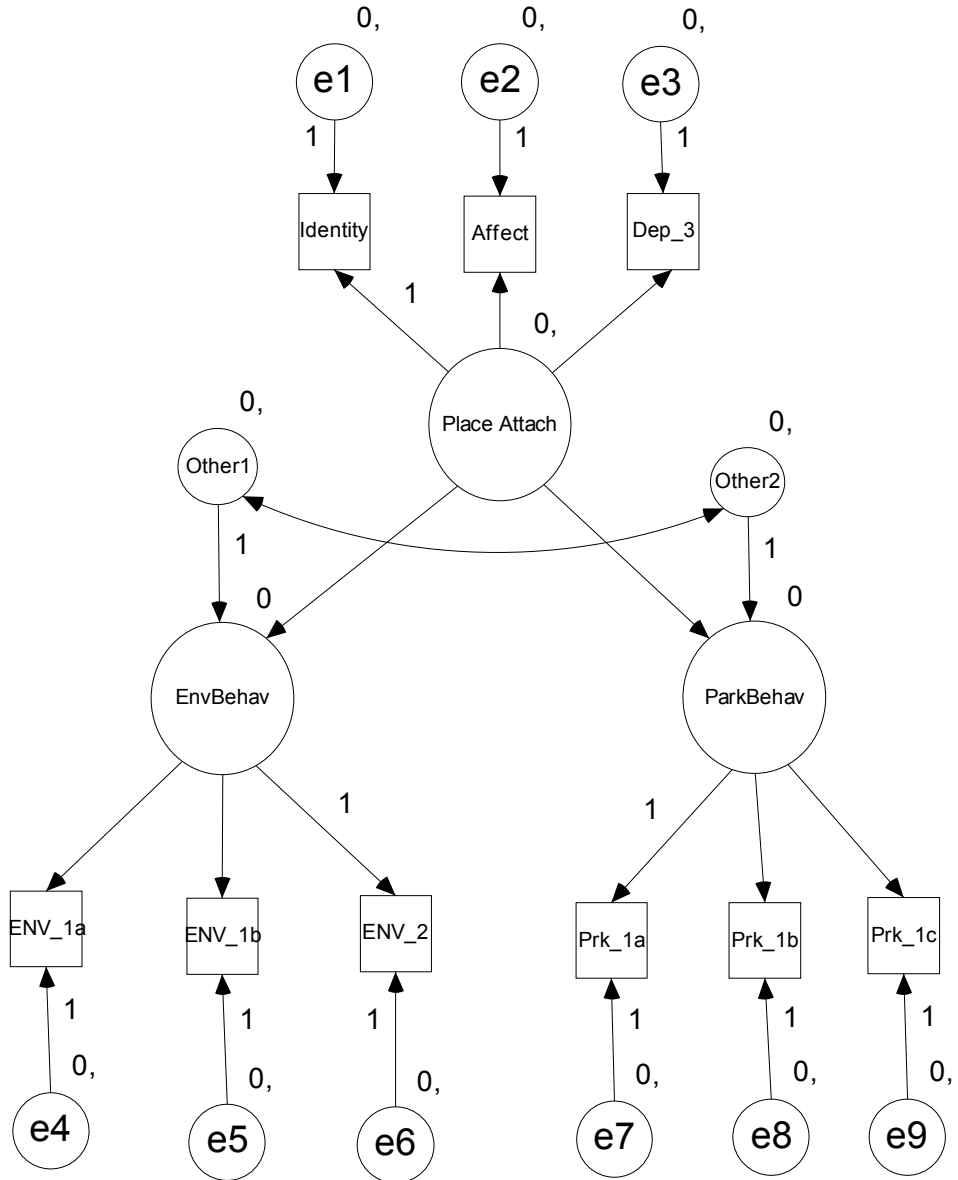
**Appendix C2:**

*Path model depicting the relationship between place attachment and pro-environmental intentions*



**Appendix C3:**

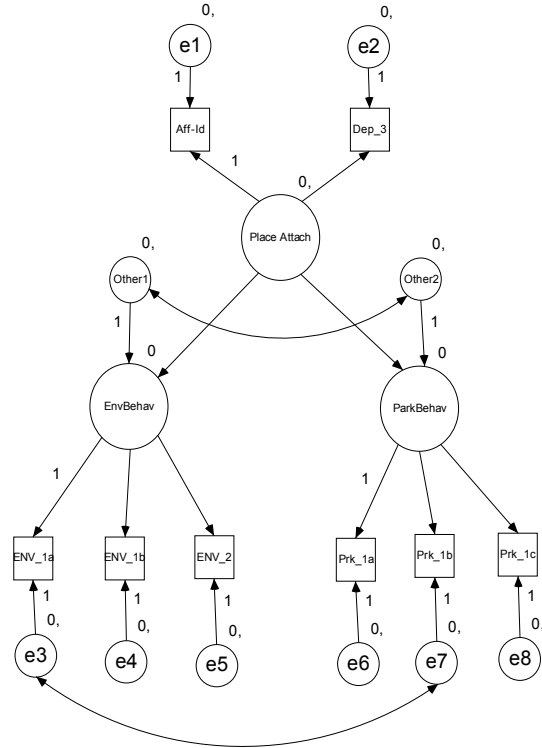
*Partial latent structural model the relationship between place attachment and pro-environmental intentions*



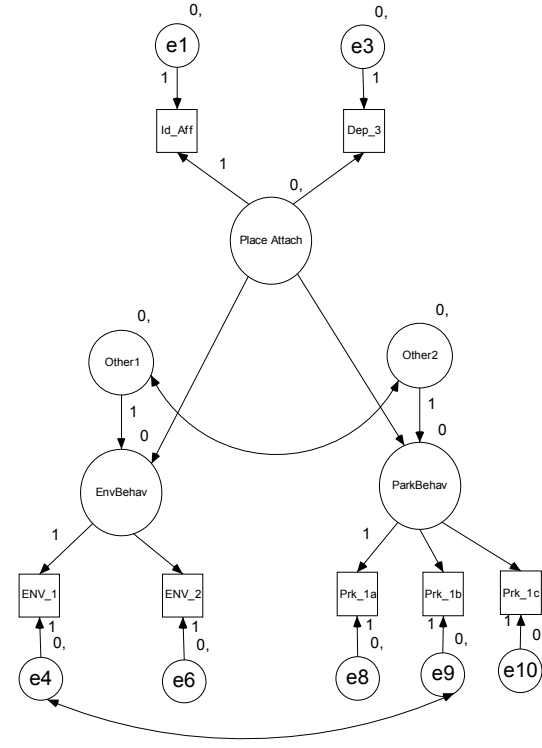
# Appendix C4:

## Alternative Models A, B, C, and D

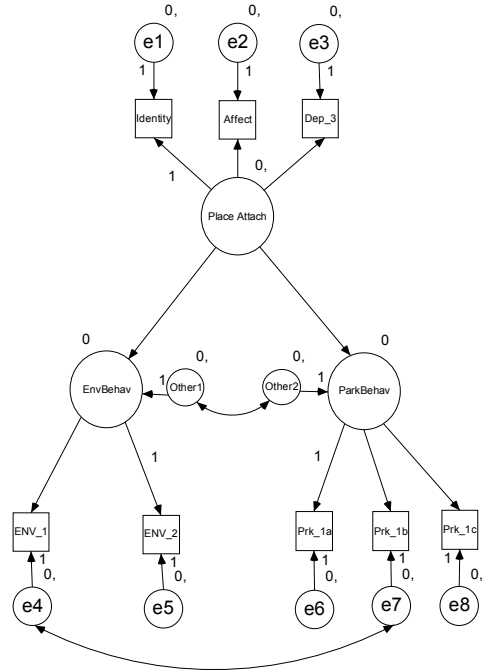
### Alt Model A



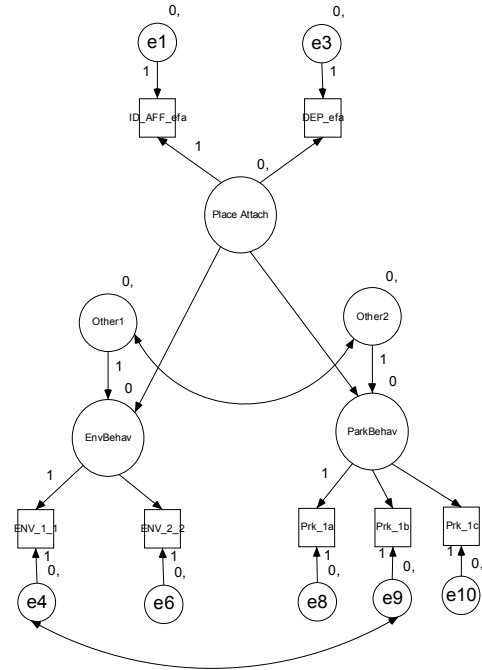
### Alt Model B



### Alt Model C



### Alt Model D





## **Appendix C5:**

### ***Place Attachment Indicators: Assignment of Items***

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#### **Identity**

- a. I feel Point Pelee is part of me.
- b. When I visit Point Pelee N.P., others see me the way I want them to see me
- c. I feel I can really be myself at Point Pelee N.P.
- d. I identify strongly with Point Pelee N.P.
- e. Visiting Point Pelee N.P. says a lot about who I am
- f. Point Pelee N.P. means a great deal to me

#### **Affect**

- a. Point Pelee N.P. is my favourite place to be
- b. I feel happiest when I am at Point Pelee N.P.
- c. I feel relaxed when I am at Point Pelee N.P.
- d. I really miss Point Pelee N.P. when I am away too long
- e. I am fond of Point Pelee N.P.
- f. I feel strong, positive feelings for Point Pelee N.P.

#### **Dep\_3**

- a. I get more satisfaction out of visiting Point Pelee N.P. than any other park
- b. Point Pelee N.P. is the best place for what I like to do
- c. I wouldn't substitute any other area for doing the types of things I do at Point Pelee N.P.

#### **Id\_Aff**

- a. Point Pelee N.P. is my favourite place to be
- b. I feel happiest when I am at Point Pelee N.P.
- c. I feel relaxed when I am at Point Pelee N.P.
- d. I really miss Point Pelee N.P. when I am away too long
- e. I am fond of Point Pelee N.P.
- f. I feel strong, positive feelings for Point Pelee N.P.
- g. I feel Point Pelee is part of me.
- h. When I visit Point Pelee N.P., others see me the way I want them to see me
- i. I feel I can really be myself at Point Pelee N.P.
- j. I identify strongly with Point Pelee N.P.
- k. Visiting Point Pelee N.P. says a lot about who I am
- l. Point Pelee N.P. means a great deal to me

**Id\_Aff\_efa**

- a. Point Pelee N.P. means a great deal to me
- b. I feel strong, positive feelings for Point Pelee N.P.
- c. I identify strongly with Point Pelee N.P.
- d. Visiting Point Pelee N.P. says a lot about who I am
- e. I am fond of Point Pelee N.P.
- f. I feel I can really be myself at Point Pelee N.P.
- g. I really miss Point Pelee N.P. when I am away too long
- h. I feel relaxed when I am at Point Pelee N.P.
- i. When I visit Point Pelee N.P., others see me the way I want them to see me

**Dep\_efa**

- a. I get more satisfaction out of visiting Point Pelee N.P. than any other park
  - b. Point Pelee N.P. is my favourite place to be
  - c. Point Pelee N.P. is the best place for what I like to do
  - d. I feel happiest when I am at Point Pelee N.P.
  - e. I wouldn't substitute any other area for doing the types of things I do at Point Pelee N.P.
  - f. I feel Point Pelee is part of me
-

## **Appendix C6:**

### ***Pro-environment Behavioural Intentions Indicators: Assignment of Items***

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#### **Park-Specific Pro-environment Behavioural Intentions Indicators**

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##### **Prk\_1a**

- a. Tell my friends not to feed the animals in Point Pelee N.P. or similar parks
- b. Encourage others to reduce their waste and pick up their litter when they are at Point Pelee N.P. or similar parks
- c. Pick up litter at Point Pelee N.P. or other parks left by other visitors
- d. Learn more about Point Pelee N.P.'s natural environment
- e. Sign petitions in support of Point Pelee N.P. and similar protected areas

##### **Prk\_1b**

- a. Participate in a public meeting about managing Point Pelee N.P. or similar parks
- b. Volunteer my time to projects that help Point Pelee N.P. or similar parks and nature areas
- c. Write letters in support of Point Pelee N.P. and similar protected areas

##### **Prk\_1c**

- a. Volunteer to **reduce** my use of a favourite spot in the park if it needs to recover from environmental damage
- b. Volunteer to **stop** visiting a favourite spot in the park if it needs to recover from environmental damage
- c. Pay increased park fees if they were introduced and used for park programs
- d. Contribute donations to ensure protection of parks like Point Pelee N.P.

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#### **General Pro-environment Behavioural Intentions Indicators**

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##### **Env\_1a\_1a**

- a. Participate in organized, peaceful environmental protests
- b. Talk to policy makers about environmental issues
- c. Join in community clean up efforts

##### **Env\_1b\_1b**

- a. Contribute money to environmental organizations
- b. Talk to others about environmental issues

##### **Env\_1\_1**

- a. Participate in organized, peaceful environmental protests
- b. Talk to policy makers about environmental issues
- c. Join in community clean up efforts
- d. Contribute money to environmental organizations
- e. Talk to others about environmental issues
- f. Pay extra for transportation if it is environmentally-friendly (e.g., a fuel efficient car)

##### **Env\_2\_2**

- a. Reduce energy and water consumption
- b. Learn more about the state of the environment and how to help solve environmental problems
- c. Sort garbage into recyclable material and non-recyclables
- d. Avoid buying products from companies with poor environmental records
- e. Buy fruits and vegetables grown without pesticides or chemicals (i.e., organic food)
- f. e. Invest in companies that utilize green technologies

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Note: All items were included from the scales; in the EFA test items ENV\_1b "c" and Depend "i" were removed. ENV\_1\_1 "c" was retained.

**Appendix C8a:**

*External Factors' Prediction of Place Attachment*

	<b><math>\beta</math> (direct)</b>	<b><i>p</i></b>
Frequency	.52	$\leq .001$
Length of trip	.21	$\leq .001$
Park relationship	.32	$\leq .001$
Length of affiliation	.22	$\leq .001$
Visitation as a child	.25	$\leq .001$
Place satisfaction	.32	$\leq .001$
Activity satisfaction	.22	$\leq .001$
Nature satisfaction	.11	$\leq .001$
Social satisfaction	.24	$\leq .001$
FoPP membership	.29	$\leq .001$
Environmental group membership	.15	$\leq .001$
Park commitment	.45	$\leq .001$
General environmental commitment	.20	$\leq .001$
Distance	-.12	$\leq .05$
Anti-substitution	.53	$\leq .001$
Awareness of substitutes	.35	$\leq .001$
Ability to substitute	.41	$\leq .001$
Nature motives	.19	$\leq .001$
Learning motives		n.s.
Activities motives		n.s.
Social motives	.19	$\leq .001$

**Appendix C-8b:**

***Prediction of Place-specific Pro-environment Behavioural Intentions***

	<b>β (direct)</b>	<b>p</b>	<b>β (indirect)</b>	<b>p</b>
<b>Place attachment</b>	.58 to .70*	≤ .05	-.05 to .06**	≤ .05
<b>Frequency</b>		n.s.	.34	≤ .001
<b>Length of trip</b>		n.s.	.05	≤ .05
<b>Park relationship</b>		n.s.	.21	≤ .001
<b>Length of affiliation</b>		n.s.	.14	≤ .001
<b>Visitation as a child</b>		n.s.	.16	≤ .001
<b>Place satisfaction</b>		n.s.	.20	≤ .001
<b>Activity satisfaction</b>		n.s.	.14	≤ .001
<b>Nature satisfaction</b>		n.s.	.07	≤ .05
<b>Social satisfaction</b>		n.s.	.15	≤ .001
<b>FoPP membership</b>		n.s.	.23	≤ .001
<b>Environmental group membership</b>	.22	≤ .001	.09	≤ .05
<b>Park commitment</b>		n.s.	.29	≤ .001
<b>General environmental commitment</b>	.29	≤ .001	.12	≤ .05
<b>Distance</b>		n.s.	-.08	≤ .05
<b>Anti-substitution</b>		n.s.	.37	≤ .001
<b>Awareness of substitutes</b>		n.s.	.22	≤ .001
<b>Ability to substitute</b>	-.12	≤ .05	.28	≤ .001
<b>Learning motives</b>		n.s.		n.s.
<b>Activities motives</b>		n.s.		n.s.
<b>Nature motives</b>		n.s.	.12	≤ .001
<b>Social motives</b>		n.s.	.12	≤ .001

\* The lowest direct effect of place attachment (.58) was observed in the Gen Commitment model and the highest (.70) was observed in the Anti-substitution model

\*\* The lowest indirect effect of place attachment ( -.05) was observed in the Distance model and highest indirect effect (.06) was observed in the Gen Commitment and Sub\_Ability models

**Appendix C-8c:**

***Prediction of General Pro-environment Behavioural Intentions***

	<b>β (direct)</b>	<b>p</b>	<b>β (indirect)</b>	<b>p</b>
<b>Place attachment</b>	.61 to .29*	≤ .05	-.18 to -.02**	≤ .05
<b>Frequency</b>	-.35	n.s.	.32	≤ .001
<b>Length of trip</b>		n.s.	.02	≤ .05
<b>Park relationship</b>		n.s.	.15	≤ .001
<b>Length of affiliation</b>		n.s.	.10	≤ .001
<b>Visitation as a child</b>		n.s.	.11	≤ .001
<b>Place satisfaction</b>		n.s.	.13	≤ .001
<b>Activity satisfaction</b>		n.s.	.09	≤ .001
<b>Nature satisfaction</b>		n.s.	.05	≤ .05
<b>Social satisfaction</b>		n.s.	.10	≤ .001
<b>FoPP membership</b>	.14	≤ .05	.15	≤ .001
<b>Environmental group membership</b>	.42	≤ .001	.05	≤ .05
<b>Park commitment</b>		n.s.	.19	≤ .001
<b>General environmental commitment</b>	.57	≤ .001	.06	≤ .05
<b>Distance</b>	.13	n.s.	-.05	≤ .05
<b>Anti-substitution</b>		≤ .05	.26	≤ .001
<b>Awareness of substitutes</b>		n.s.	.14	≤ .001
<b>Ability to substitute</b>	-.14	≤ .05	.20	≤ .001
<b>Learning motives</b>		n.s.		n.s.
<b>Activities motives</b>		n.s.		n.s.
<b>Nature motives</b>		n.s.	.08	≤ .001
<b>Social motives</b>		n.s.	.08	≤ .001

\* the highest direct effect of place attachment (.61) was observed in the Frequency model, and the lowest direct effect (.29) was observed in the Gen Commitment model

\*\* the lowest indirect effect of place attachment (-.02) was observed in the Distance model and the highest indirect effect ( -.18) was observed in the Frequency model

**Appendix C8d:**

**Mediation Effect of Place Attachment in the Prediction of Pro environmental Behavioural Intentions: Partial, Direct and Full Mediation Models**

Variable/ model	Model $x_M^2$	Park-specific Behavioural Intentions				General Behavioural Intentions			
		Park <i>r</i>	Park $\beta$	Park $R^2$	Park <i>Z</i>	Env <i>r</i>	Env $\beta$	Env $R^2$	Env <i>Z</i>
<b>1. Affiliation</b> Partial	<b>57.587</b>	<b>.157**</b> <b>.208**</b> <b>-.011</b>	<b>.14**</b>	<b>.41</b>	<b>3.315**</b>	<b>.061</b> <b>-.023</b>	<b>.10**</b>	<b>.19</b>	<b>3.115*</b>
Direct	168.996		.17*				.01		
Full med	64.180		.143**				.113**		
<b>2. Childhood</b> Partial	<b>40.021</b>	<b>.174**</b> <b>.229**</b> <b>-.002</b>	<b>.164**</b>	<b>.41</b>	<b>4.187**</b>	<b>.073</b> <b>-.018</b>	<b>.111**</b>	<b>.18</b>	<b>3.781**</b>
Direct	150.855		.16*				.06		
Full med.	41.2		.163**				.107**		
<b>3. Commitment to Park</b> Partial	<b>69.542</b>	See Appx. C-15ii	<b>.286**</b>	<b>.48</b>	<b>3.569**</b>	See Appx. C-15ii	<b>.193**</b>	<b>.26</b>	<b>3.082*</b>
Direct	118.435		.73**				.57**		
Full med.	71.613		.310**				.226**		
<b>4. Commitment to Env.</b> Partial	<b>88.912</b>	See Appx. C-15i	<b>.117*</b> (indirect) <b>.29**</b> (direct)	<b>.48</b>	<b>2.569*</b>	See Appx. C-15i	<b>.059*</b> (indirect) <b>.57**</b> (direct)	<b>.49</b>	<b>2.355*</b>
Direct	187.176		.52**				.69**		
Full med.	158.964		.145*				.096*		
<b>5. Distance</b> Partial	<b>40.273</b>	<b>-.096</b> <b>-.019</b> <b>.055</b>	<b>-.002*</b>	<b>.41</b>	<b>-2.057*</b>	<b>.095</b> <b>.019</b>	<b>-.015*</b> (indirect) <b>.0*</b> (direct)	<b>.19</b>	<b>-2.006*</b>
Direct	156.677		-.05				.08		
Full med.	47.941		-.073*				-.048*		
<b>6. Duration of trip</b> Partial	<b>49.345</b>	See Appx. C-11	<b>.135**</b>	<b>.41</b>	<b>3.124*</b>	See Appx. C-11	<b>.083**</b>	<b>.18</b>	<b>2.893*</b>
Direct	166.019		.10				.20*		
Full med.	59.293		.125**				.082**		

<b>7. Frequency</b>	<b>62.952</b>	<b>.256**</b>	<b>.336**</b>	<b>.42</b>	<b>4.649**</b>	<b>.003</b>	<b>.316**</b>	<b>.27</b>	<b>4.967**</b>
Partial		<b>.243**</b>				<b>-.017</b>	<b>(indirect)</b>		
		<b>.053</b>					<b>-.35**</b>		
Direct	141.632		<b>.64**</b>				<b>(direct)</b>		
Full med	96.108		<b>.315**</b>				<b>.25**</b>		
							<b>.203**</b>		
<b>8. Membership Env</b>	<b>62.049</b>	<b>.154**</b>	<b>.091*</b>	<b>.47</b>	<b>2.615*</b>	<b>.116*</b>	<b>.052*</b>	<b>.26</b>	<b>2.471*</b>
Partial		<b>.120*</b>	<b>(indirect)</b>			<b>.027</b>	<b>(indirect)</b>		
		<b>.076</b>	<b>.22**</b>				<b>.42**</b>		
Direct	172.532		<b>(direct)</b>				<b>(direct)</b>		
Full	123.50		<b>.32**</b>				<b>.48**</b>		
			<b>.109**</b>				<b>.073**</b>		
<b>9. Membership FoPP</b>	<b>46.182</b>	<b>.219**</b>	<b>.232**</b>	<b>.47</b>	<b>4.518**</b>	<b>.305**</b>	<b>.15**</b>	<b>.26</b>	<b>3.762**</b>
Partial		<b>.248**</b>				<b>.112</b>	<b>(indirect)</b>		
		<b>.162*</b>					<b>.44*</b>		
Direct	126.090		<b>.27**</b>				<b>(direct)</b>		
Full	50.330		<b>.239**</b>				<b>.29**</b>		
							<b>.175**</b>		
<b>10. Motive Nature</b>	<b>37.794</b>	<b>.096</b>	<b>.112**</b>	<b>.41</b>	<b>1.808</b>	<b>.063</b>	<b>.078**</b>	<b>.18</b>	<b>1.766</b>
Partial		<b>.036</b>			<b>n.s.</b>	<b>.131**</b>			<b>n.s.</b>
		<b>.158**</b>							
Direct	150.482		<b>.14*</b>				<b>.14*</b>		
Full	39.082		<b>.123**</b>				<b>.081**</b>		
<b>11. Motive Social</b>	<b>55.426</b>	<b>.181**</b>	<b>.121**</b>	<b>.41</b>	<b>3.216**</b>	<b>-.034</b>	<b>.081**</b>	<b>.18</b>	<b>3.026*</b>
Partial		<b>-.006</b>				<b>-.007</b>			
		<b>-.028</b>							
Direct	169.412		<b>.09</b>				<b>.01</b>		
Full	57.262		<b>.120**</b>				<b>.078**</b>		
<b>12. Park Relationship</b>	<b>64.065</b>	See	<b>.205**</b>	<b>.41</b>	<b>4.216**</b>	See	<b>.147**</b>	<b>.19</b>	<b>3.812**</b>
Partial		Affil				Affil			
		&				&			
		Child				Child			
Direct	163.125		<b>.016**</b>				<b>.005</b>		
Full	68.026		<b>.21**</b>				<b>.138**</b>		
<b>13. Satisfaction All</b>	<b>83.755</b>	See	<b>.201**</b>	<b>.41</b>	<b>3.949**</b>	See	<b>.113**</b>	<b>.18</b>	<b>3.534**</b>
Partial		other				other			
		Sat.				Sat.			
Direct	176.58		<b>.42**</b>				<b>.26**</b>		
Full	84.387		<b>.209**</b>				<b>.137**</b>		



<b>14.</b>	<b>46.411</b>	<b>.033</b>	<b>.073*</b>	<b>.41</b>	<b>2.006*</b>	<b>-.029</b>	<b>.048*</b>	<b>.18</b>	<b>1.949*</b>
<b>Satisfaction</b>		<b>-.077</b>				<b>.026</b>			
<b>(Nature)</b>		<b>.136*</b>							
Partial									
Direct	162.651		.05				.02		
Full med	46.649		.072*				.047*		
<b>15.</b>	<b>37.852</b>	<b>.149**</b>	<b>.151**</b>	<b>.41</b>	<b>3.991**</b>	<b>.050</b>	<b>.099**</b>	<b>.18</b>	<b>3.595**</b>
<b>Satisfaction</b>		<b>.035</b>				<b>.106</b>			
<b>(social)</b>		<b>.165*</b>							
Partial									
Direct	147.567		.17*				.11		
Full med.	38.016		.153**				.101**		
<b>16.</b>	<b>53.916</b>	<b>.123*</b>	<b>.138**</b>	<b>.42</b>	<b>3.784**</b>	<b>.161**</b>	<b>.091**</b>	<b>.18</b>	<b>3.267**</b>
<b>Satisfaction</b>		<b>.143**</b>				<b>.046</b>			
<b>(Activity)</b>		<b>.270**</b>							
Partial									
Direct	159.868		.24**				.15**		
Full	57.352		.147**				.097**		
<b>17.</b>	<b>36.600</b>	<b>.148**</b>	<b>-.049**</b>	<b>.42</b>	<b>6.201**</b>	<b>.039</b>	<b>-.057**</b>	<b>.19</b>	<b>5.140**</b>
<b>Sub_Ability</b>		<b>.118*</b>				<b>.051</b>			
Partial		<b>.069</b>							
Direct	146.206		.17*				.07		
Full	41.887		.259**				.170**		
<b>18.</b>	<b>49.431</b>	<b>.189**</b>	<b>.218**</b>	<b>.41</b>	<b>5.344**</b>	<b>.174**</b>	<b>.141**</b>	<b>.18</b>	<b>4.431**</b>
<b>Sub_Aware</b>		<b>.200**</b>				<b>.106</b>			
Partial		<b>.161**</b>							
Direct	149.748		.26**				.19*		
Full med.	49.879		.223**				.147**		
<b>19.</b>	<b>57.751</b>	<b>.486**</b>	<b>.370**</b>	<b>.42</b>	<b>5.494**</b>	<b>.278**</b>	<b>.258**</b>	<b>.19</b>	<b>4.537**</b>
<b>Substitution</b>		<b>.358**</b>				<b>.312**</b>			
<b>(anti)</b>		<b>.367**</b>							
Partial									
Direct	119.535		.67**				.44**		
Full med.	59.808		.341**				.223**		

Note 1: Chi square ( $\chi_M^2$ ) values significant to  $p \leq .05$

Note 2: Correlation values ( $r$ ) derived from correlations between construct indicators (Env\_1, Env\_2, Prk\_1, Prk\_2, Prk\_3) and external variable.

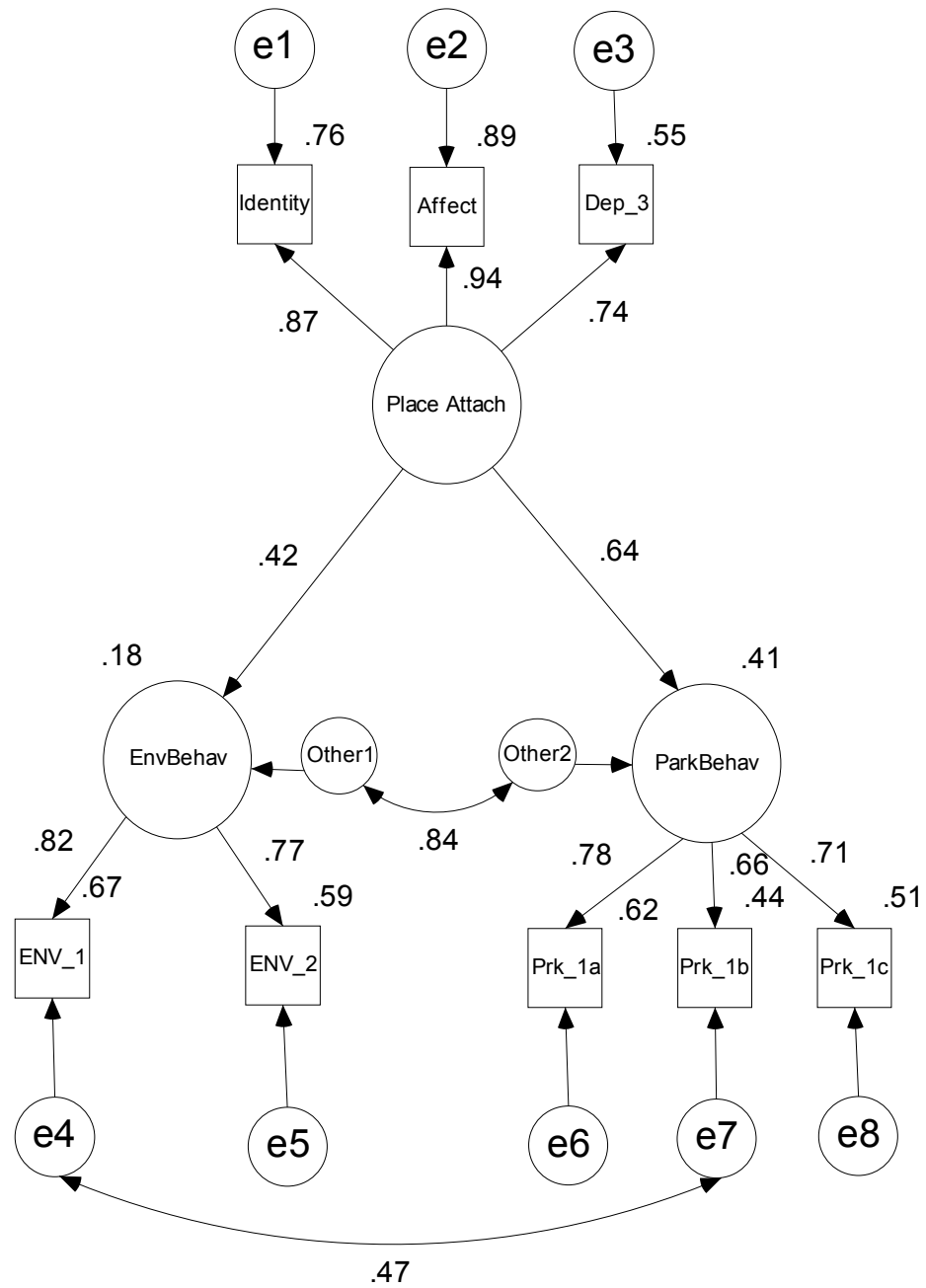
Note 3: Sobel test ( $Z$ ) calculated using an on-line interactive calculator (Preachner & Leonardelli, 2006).

Note 4: Unless otherwise noted, beta coefficient ( $\beta$ ) values listed for the partial mediation models are indirect effects.

Note 5: Commitment to Park and FoPP Membership values based on special database ( $n=222$ ) which contained only cases who were members of FoPP or were non members of an environmental organization in the last 12 months.

***Appendix C-9: Main Structural Model***

*C-9a Relationship between Place Attachment, General and Park-specific Pro-environment Behavioural Intentions*

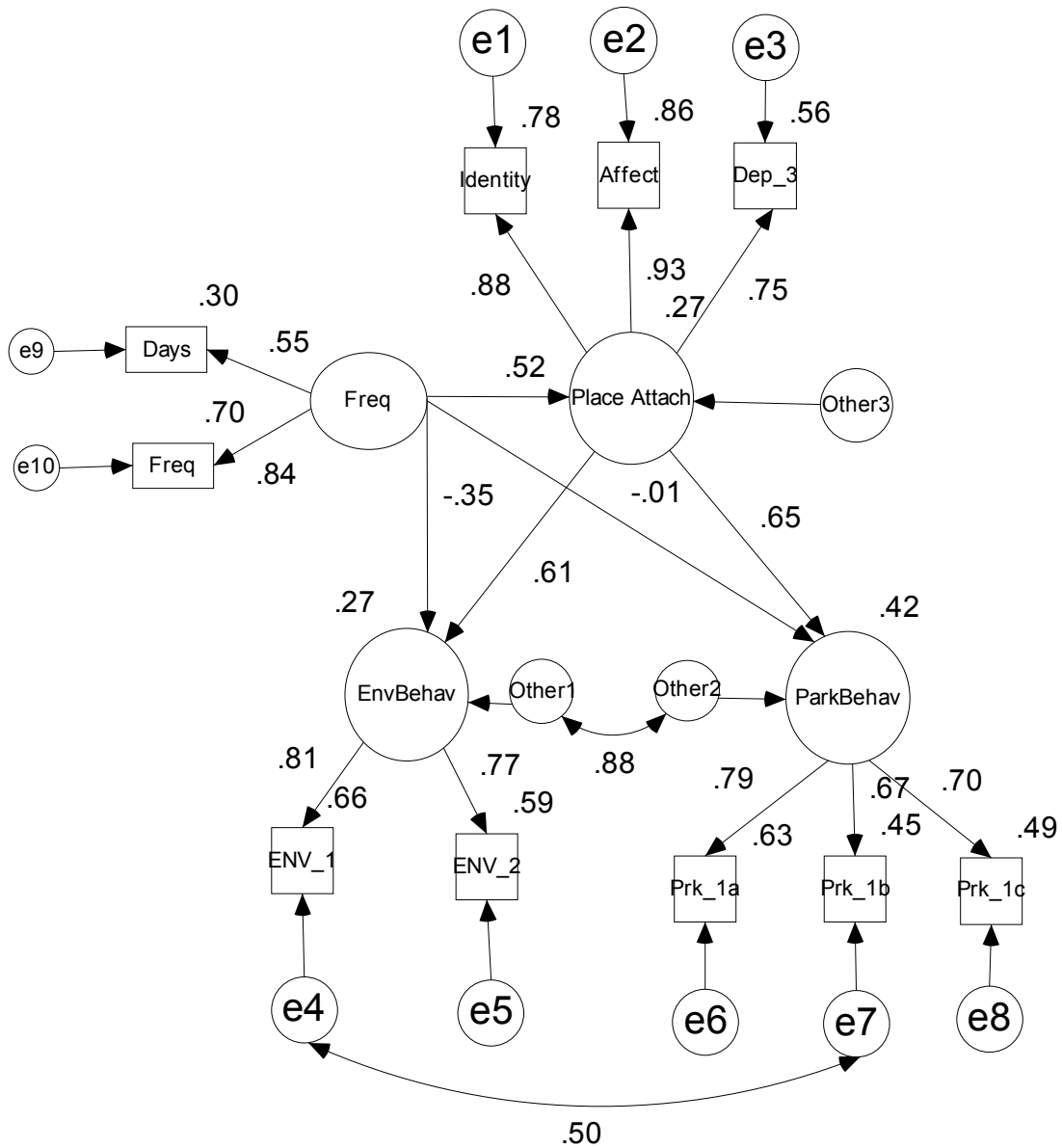


*C-9 Place Attachment and Pro-environment Behavioural Intentions Indicators:  
Correlations and Measures of Central Tendency*

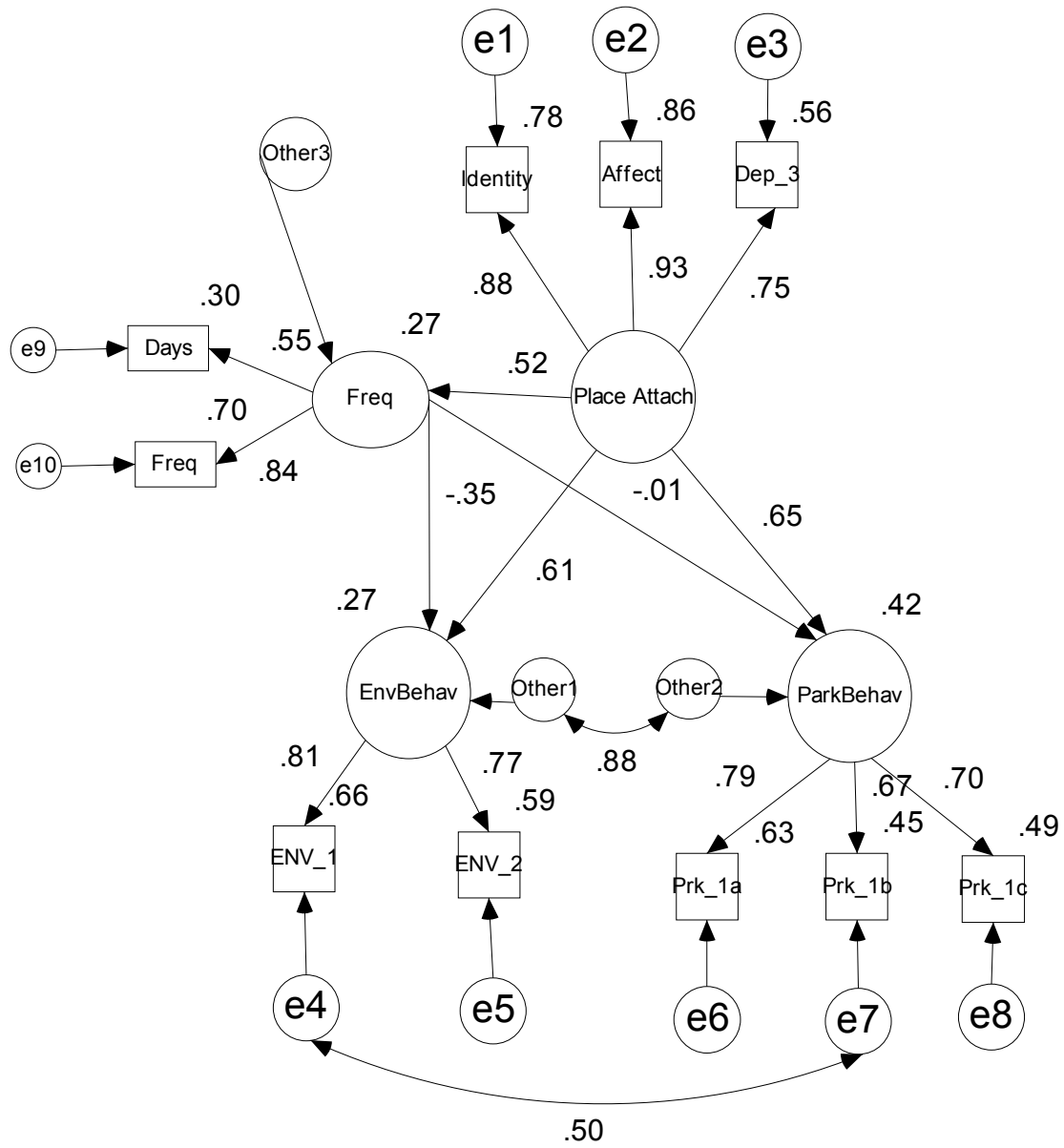
	Ident	Affect	Dep_3	Env_1	Env_2	Prk_1a	Prk_1b	Prk_1c
Ident	1							
Affect	.819**	1						
Dep_3	.621**	.706**	1					
Env_1	.321**	.278**	.271**	1				
Env_2	.304**	.312**	.281**	.630**	1			
Prk_1a	.497**	.486**	.428**	.536**	.474**	1		
Prk_1b	.361**	.358**	.341**	.668**	.444**	.548**	1	
Prk_1c	.409**	.367**	.288**	.526**	.526**	.552**	.445**	1
<i>M</i>	3.73	3.67	2.91	3.26	4.10	4.09	3.02	4.04
<i>SD</i>	.700	.660	.926	.865	.659	.776	1.032	.784

***Appendix C-10: Frequency of Visitation***

C-10a Frequency of Visits predicts Place Attachment and Pro-environment Behavioural Intentions (n.s. paths: Freq → Park-Spec. Intentions)



C-10b Place Attachment predicts Frequency and Pro-environment Behavioural Intentions  
 (n.s. paths: Freq → Park-Spec. Intentions)



*C-10 Frequency of Visits, Place Attachment and Pro-environment Behavioural Intensions Indicators: Correlations and Measures of Central Tendency*

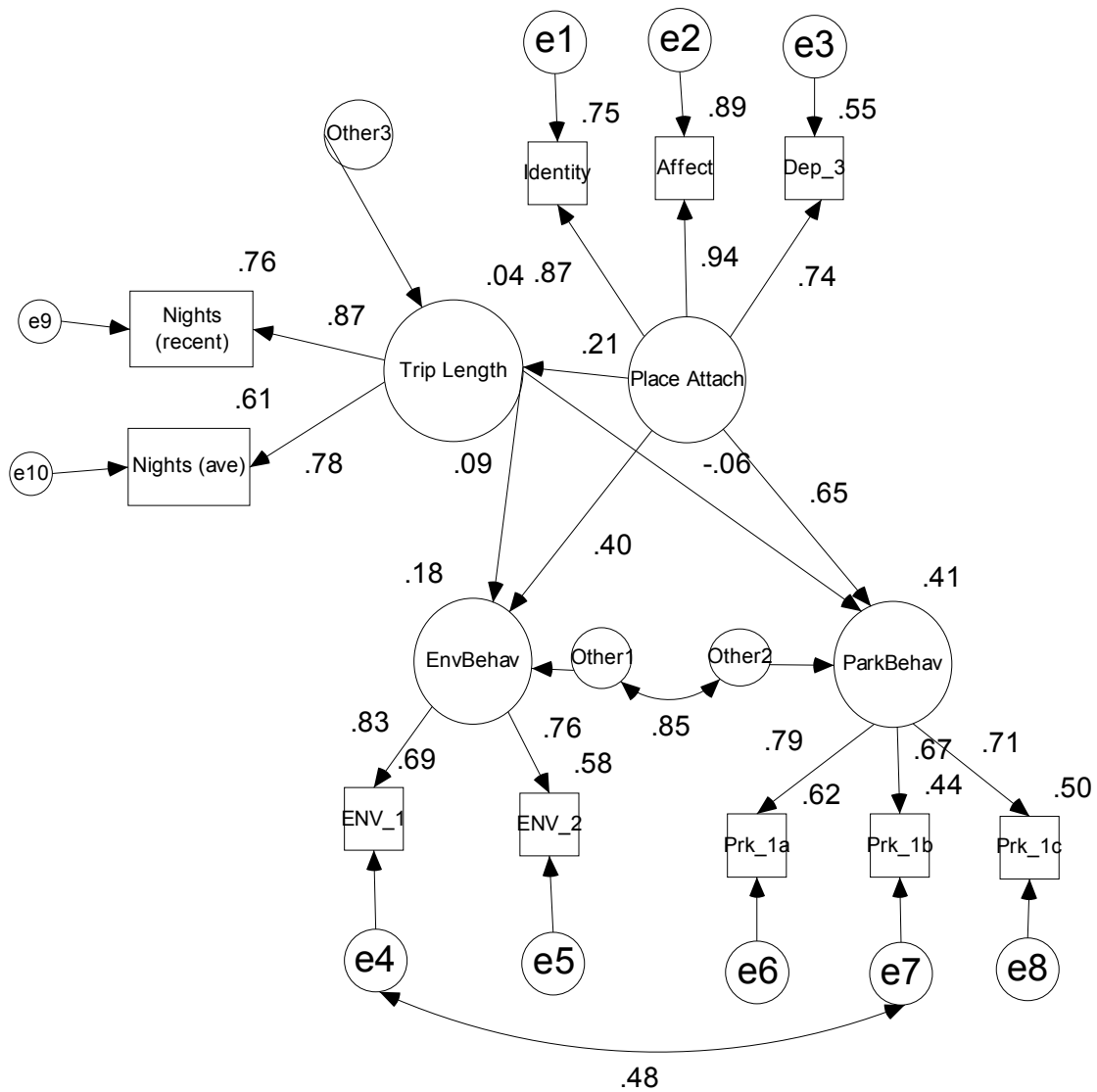
	Ident	Affect	Dep_3	Day_trips	Night_trip	Freq	Env_1	Env_2	Prk_1a	Prk_1b	Prk_1c
Ident	1										
Affect	.819**	1									
Dep_3	.621**	.706**	1								
Days_trips	.259**	.204**	.160**	1							
Night_trips	.151**	.178**	.183**	.063	1						
Freq	.425**	.390**	.344**	.459**	.009	1					
Env_1	.321**	.278**	.271**	-.021	.086	.008	1				
Env_2	.304**	.312**	.281**	-.077	.048	-.017	.630**	1			
Prk_1a	.497**	.486**	.428**	.134*	.017	.256**	.536**	.474**	1		
Prk_1b	.361**	.358**	.341**	.199**	.051	.243**	.668**	.444**	.548**	1	
Prk_1c	.409**	.367**	.288**	.019	.063	.053	.526**	.526**	.552**	.445**	1
M	3.73	3.67	2.91	9.87	.36	3.29	3.26	4.10	4.09	3.02	4.04
SD	.700	.660	.926	18.410	.867	1.275	.865	.659	.776	1.032	.784

\*\*  $p < .001$ ; \*  $p < .05$

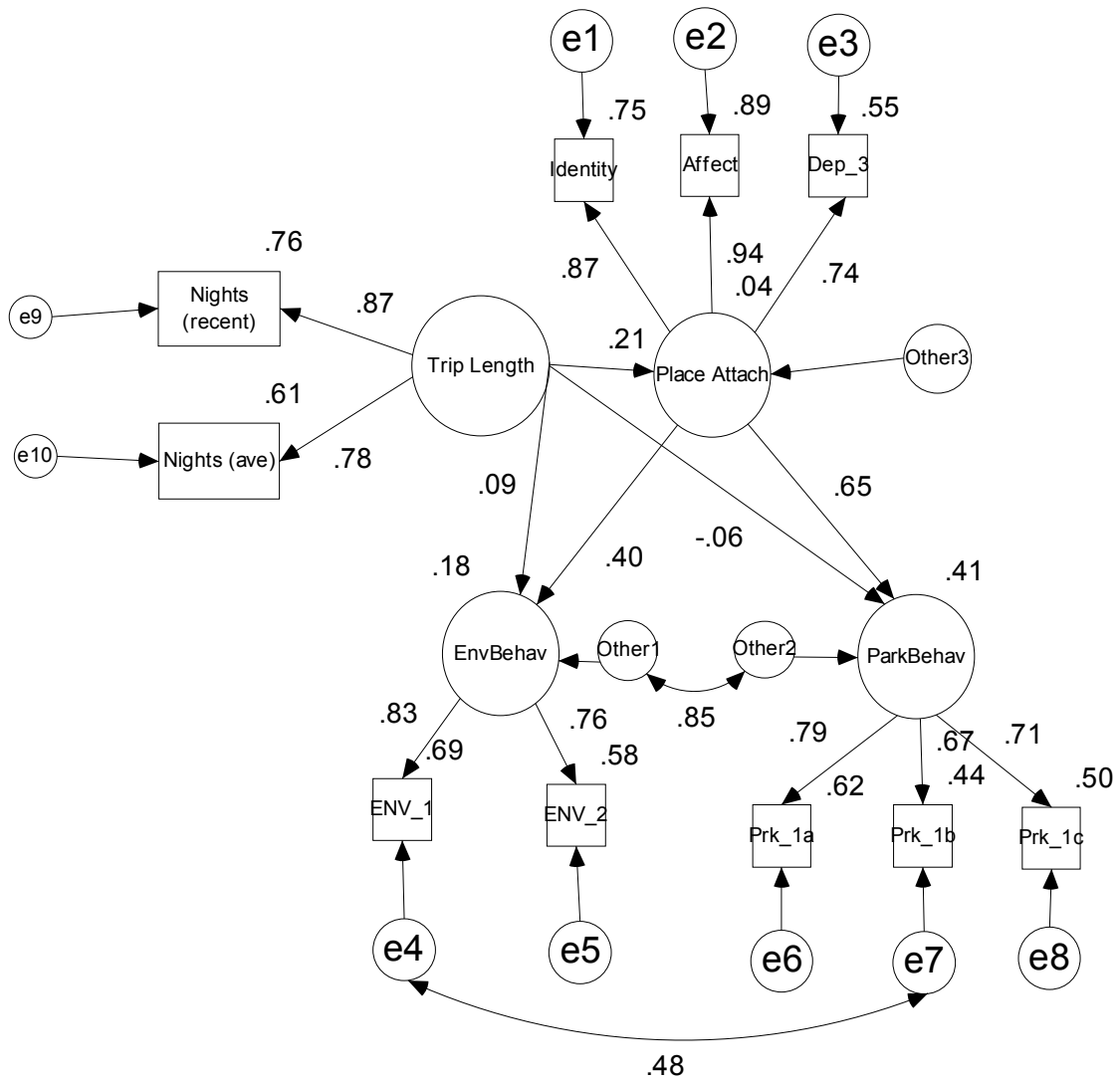


***Appendix C-11: Duration of Visit***

*C-11a Place Attachment predicts Duration of Trip and Pro-environment Behavioural Intentions (n.s. paths: Trip length → Park-Spec. Intentions; Trip length → General Intentions)*



*C-11b Duration of Trip predicts Place Attachment and Pro-environment Behavioural Intentions (n.s. paths: Trip length → Park-Spec. Intentions; Trip length → General Intentions)*



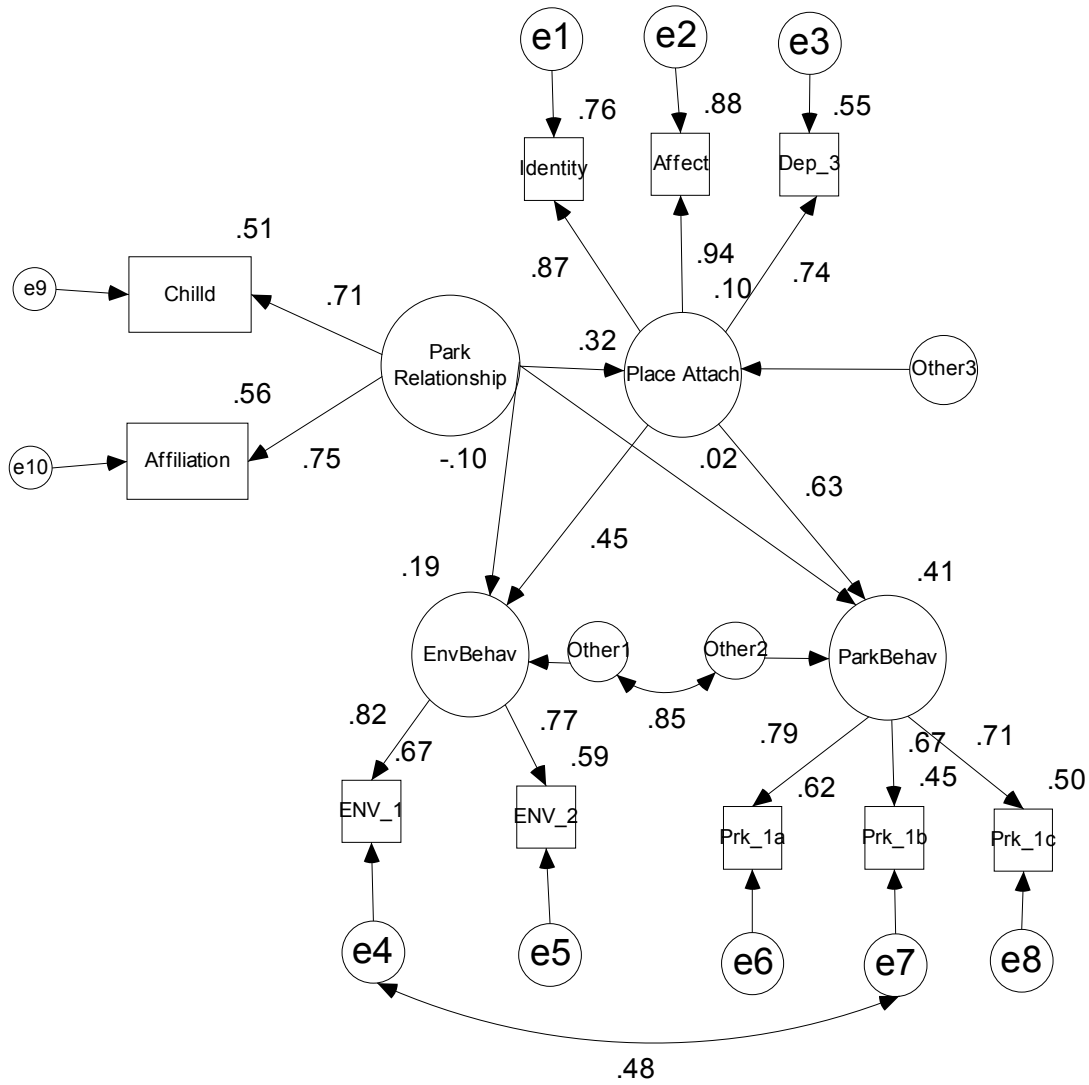
*C-11 Duration of Trip, Place Attachment and Pro-environment Behavioural Intensions Indicators: Correlations and Measures of Central Tendency*

	Ident	Affect	Dep_3	Hours	Nights (recent trip)	Nights (ave trip)	Env_1	Env_2	Prk_1a	Prk_1b	Prk_1c
Ident	1										
Affect	.819**	1									
Dep_3	.621**	.706**	1								
Hours	-.017	-.051	-.030	1							
Nights (recent trip)	.105*	.145**	.078	-.527**	1						
Nights (ave. trip)	.161**	.175**	.181**	-.325**	.676**	1					
Env_1	.321**	.278**	.271**	-.041	.165*	.116*	1				
Env_2	.304**	.312**	.281**	.026	.076	.072	.630**	1			
Prk_1a	.497**	.486**	.428**	.074	.024	.043	.536**	.474**	1		
Prk_1b	.361**	.358**	.341**	.032	.047	.020	.668**	.444**	.548**	1	
Prk_1c	.409**	.367**	.288**	-.009	.103	.065	.526**	.526**	.552**	.445**	1
M	3.73	3.67	2.91	3.34	1.06	1.03	3.26	4.10	4.09	3.02	4.04
SD	.700	.660	.926	2.920	2.266	2.438	.865	.659	.776	1.032	.784

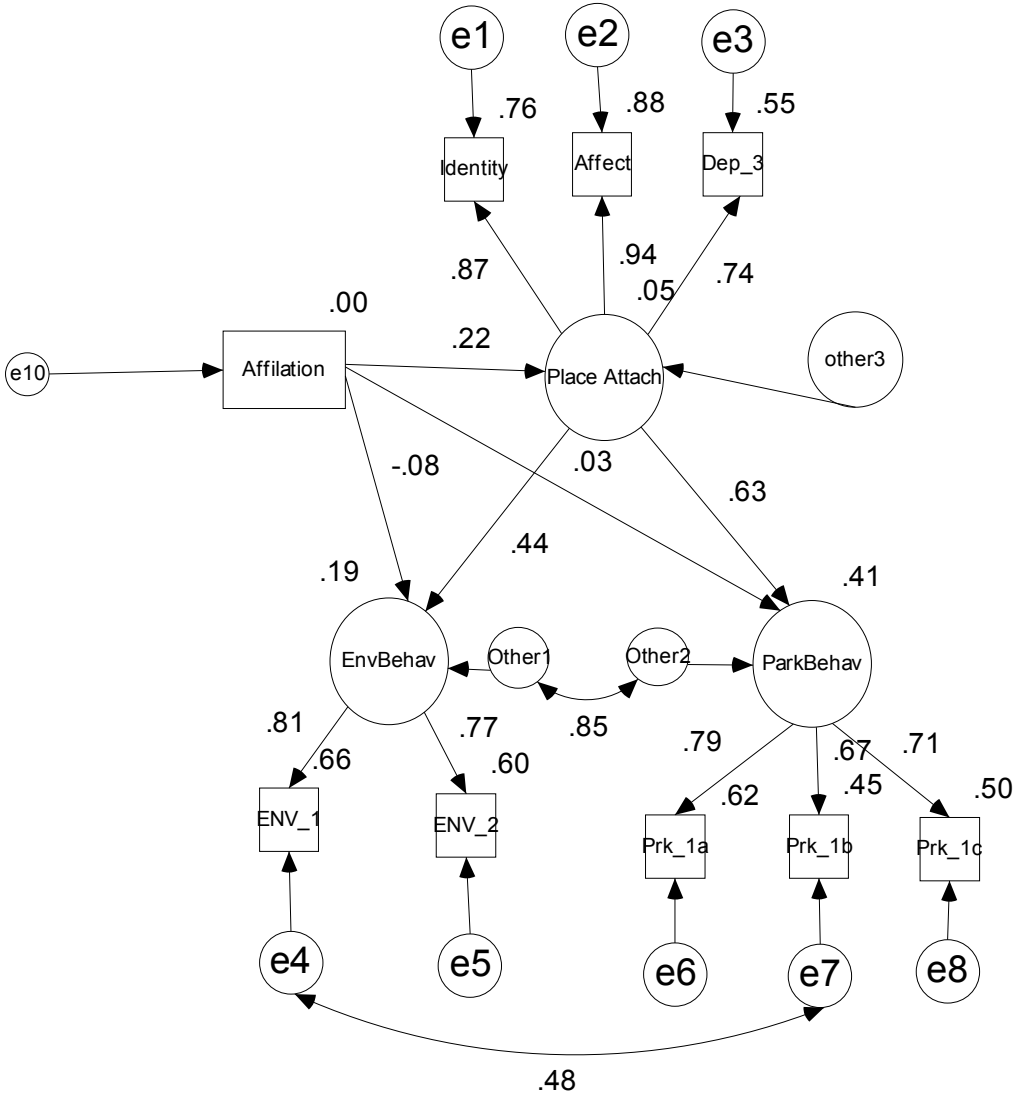
\*\*  $p < .001$ ; \*  $p < .05$

***Appendix C-12: Park Relationship, Affiliation, Childhood Visitation***

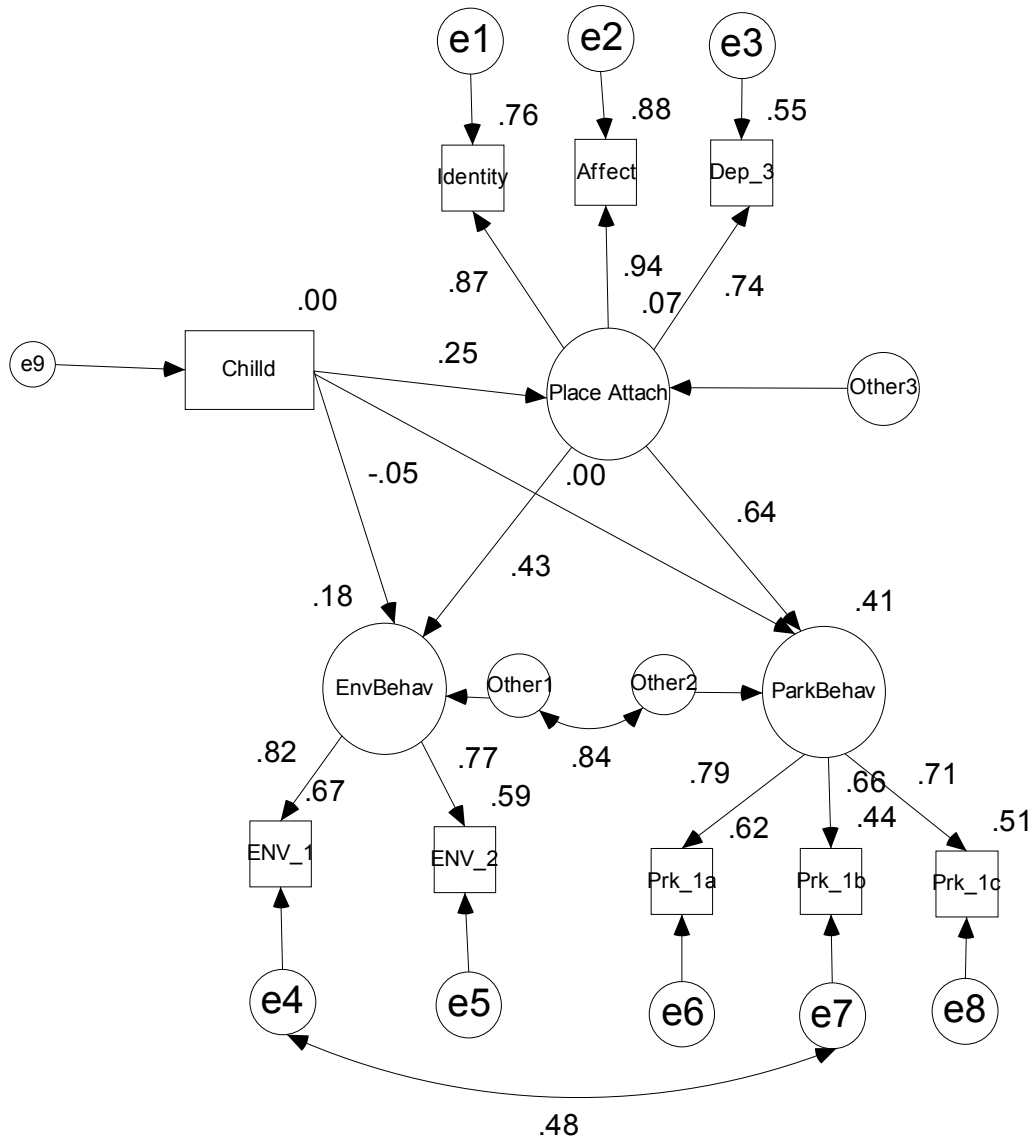
*C-12a Park Relationship (Length of Affiliation & Visitation Duration Childhood) predicts Place Attachment and Pro-environment Behavioural Intentions (n.s. paths: Park Relationship → Park-Spec. Intentions; Park Relationship → General Intentions)*



*C-12b Length of Affiliation predicts Place Attachment and Pro-environment Behavioural Intentions (n.s. paths: Affiliation → Park-Spec. Intentions; Affiliation → General Intentions)*



*C-12c Visitation Duration Childhood predicts Place Attachment and Pro-environment Behavioural Intentions (n.s. paths: Childhood visitation → Park-Spec. Intentions; Childhood visitation → General Intentions)*





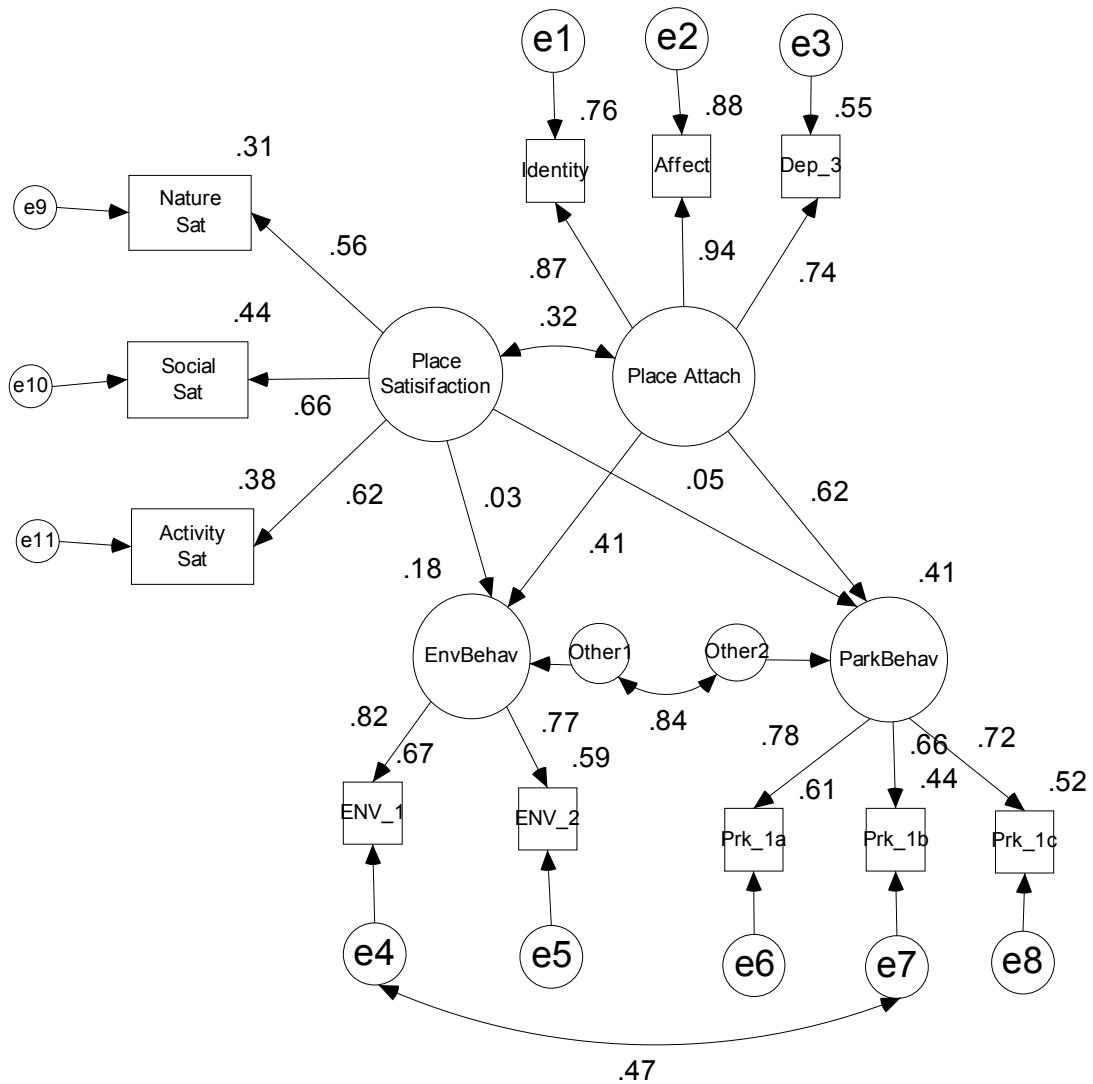
**C-12 Park relationship (Length of Affiliation & Visitation During Childhood) Place Attachment and Pro-environment Behavioural Intentions Indicators: Correlations and Measures of Central Tendency**

	Ident	Affect	Dep_3	Affil	Affil_Cat	Child	Env_1	Env_2	Prk_1a	Prk_1b	Prk_1c
Ident	1										
Affect	.819**	1									
Dep_3	.621**	.706**	1								
Affil	.258**	.183**	.120*	1							
Affil_Cat	.290**	.218**	.161**	.966	1						
Child	.251**	.222**	.199**	.533	.511**	1					
Env_1	.321**	.278**	.271**	.061	.073	.066	1				
Env_2	.304**	.312**	.281**	-.023	-.018	.039	.630**	1			
Prk_1a	.497**	.486**	.428**	.157**	.174**	.159**	.536**	.474**	1		
Prk_1b	.361**	.358**	.341**	.208**	.229**	.150**	.668**	.444**	.548**	1	
Prk_1c	.409**	.367**	.288**	-.011	-.002	.010	.526**	.526**	.552**	.445**	1
M	3.73	3.67	2.91	25.35	3.05	1.92	3.26	4.10	4.09	3.02	4.04
SD	.700	.660	.926	18.972	1.377	1.166	.865	.659	.776	1.032	.784

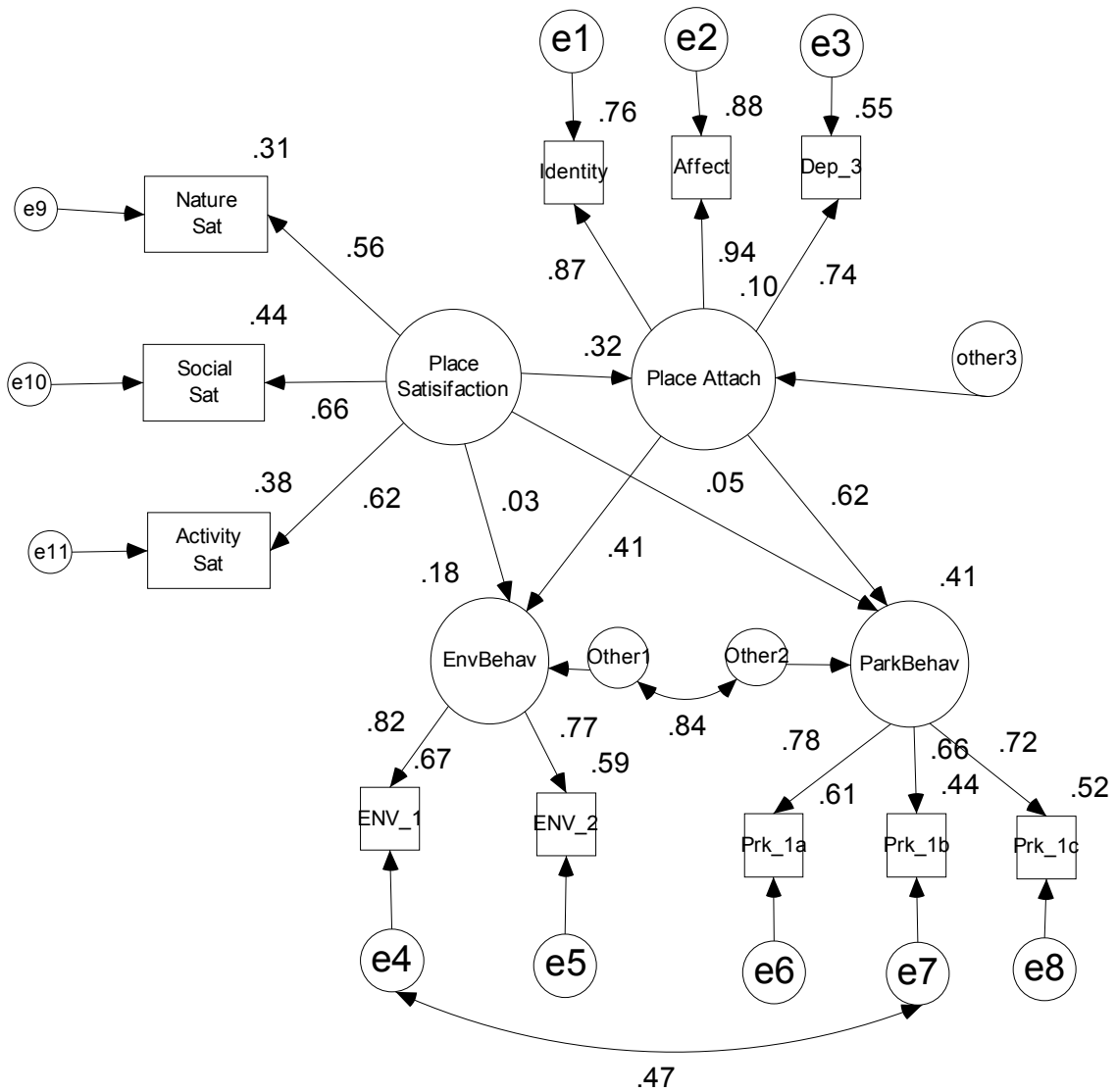
\*\*  $p < .001$ ; \*  $p < .05$

***Appendix C-13: Place Satisfaction***

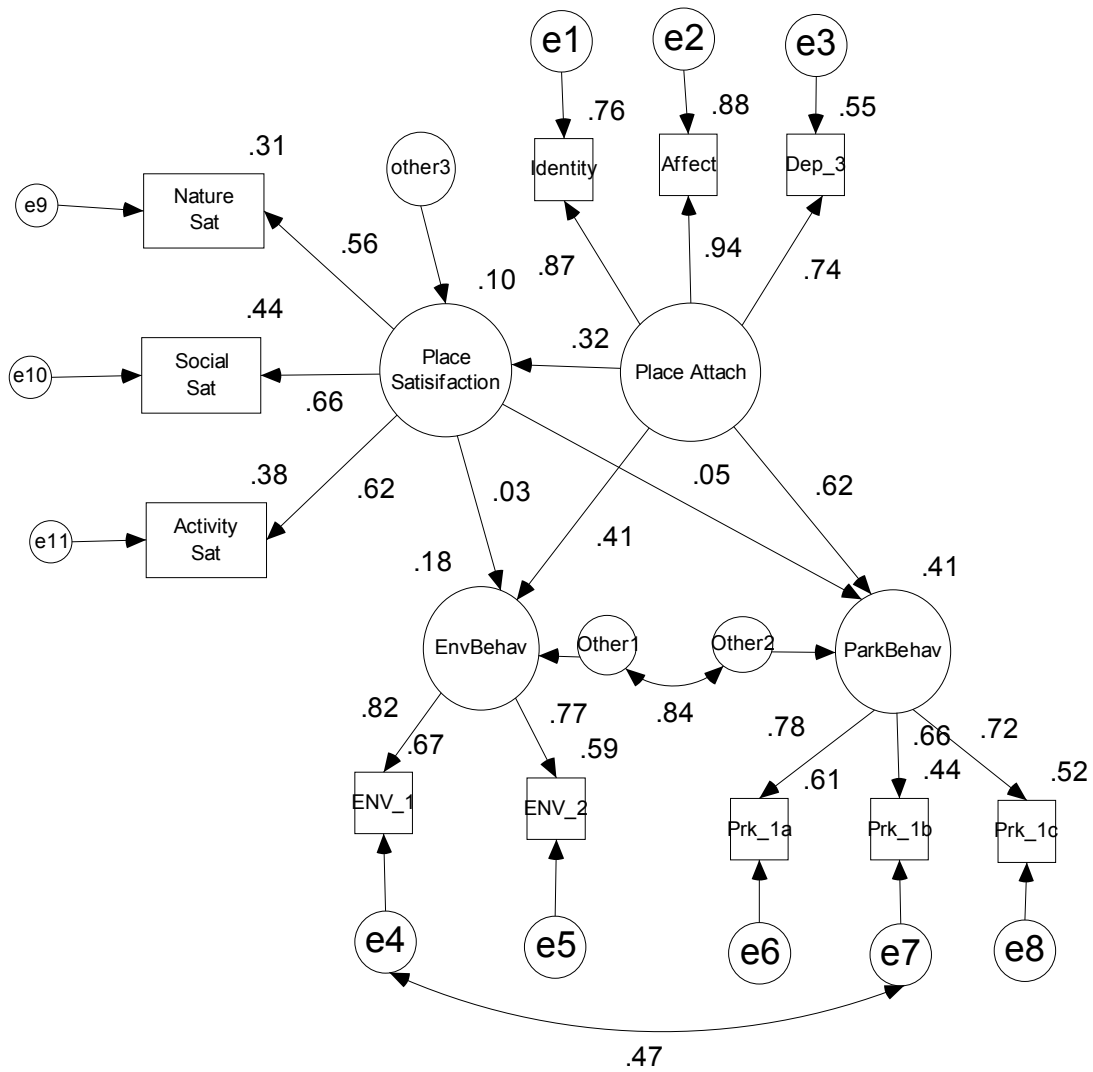
*C-13a Place Satisfaction, Place Attachment and Pro-environment Behavioural Intentions*  
 (n.s. paths: Park Satisfaction → Park-Spec. Intentions; Park Satisfaction → General Intentions)



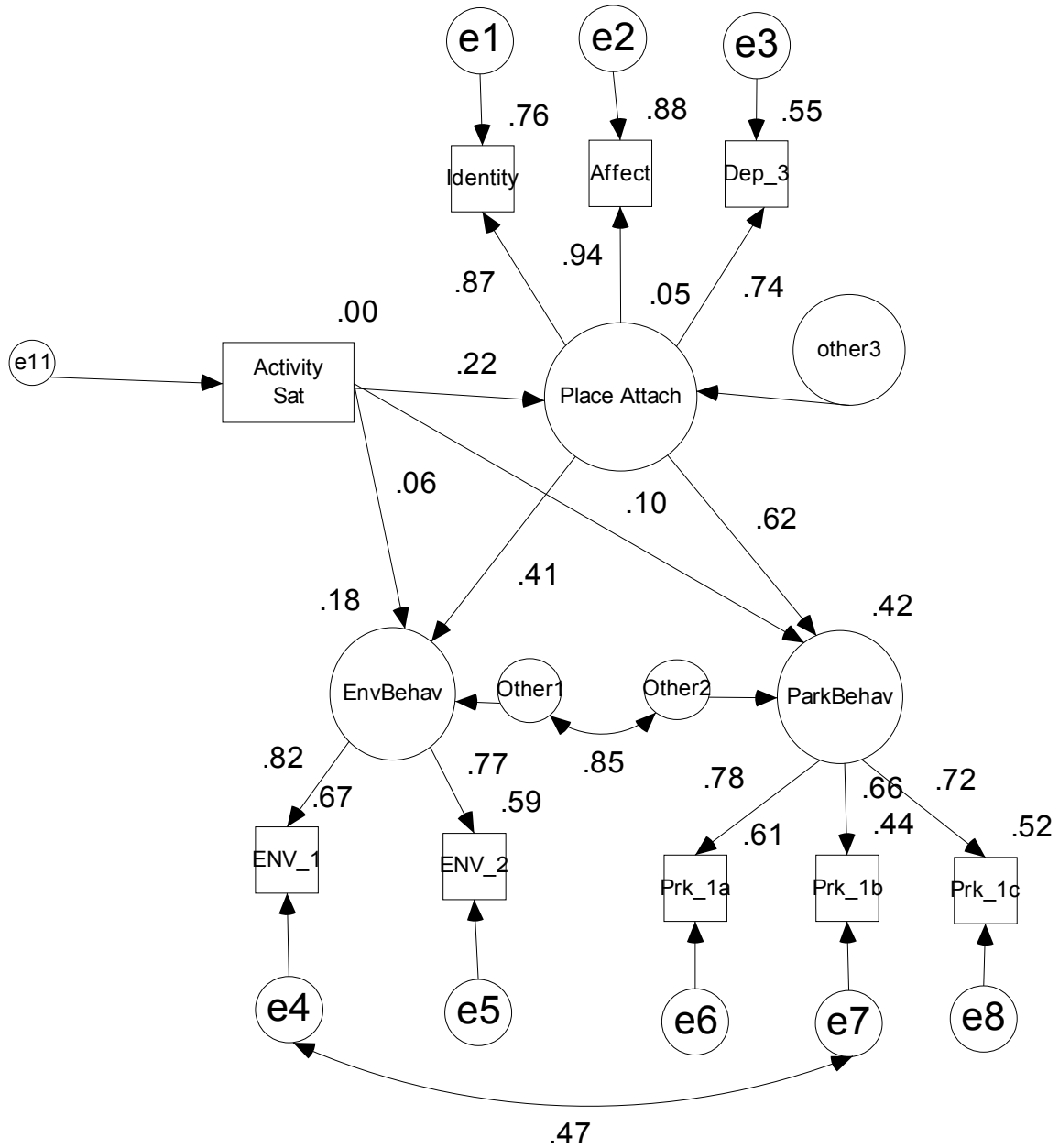
*C-13b Place Satisfaction predicts Place Attachment and Pro-environment Behavioural Intentions* (n.s. paths: Park Satisfaction → Park-Spec. Intentions; Park Satisfaction → General Intentions)



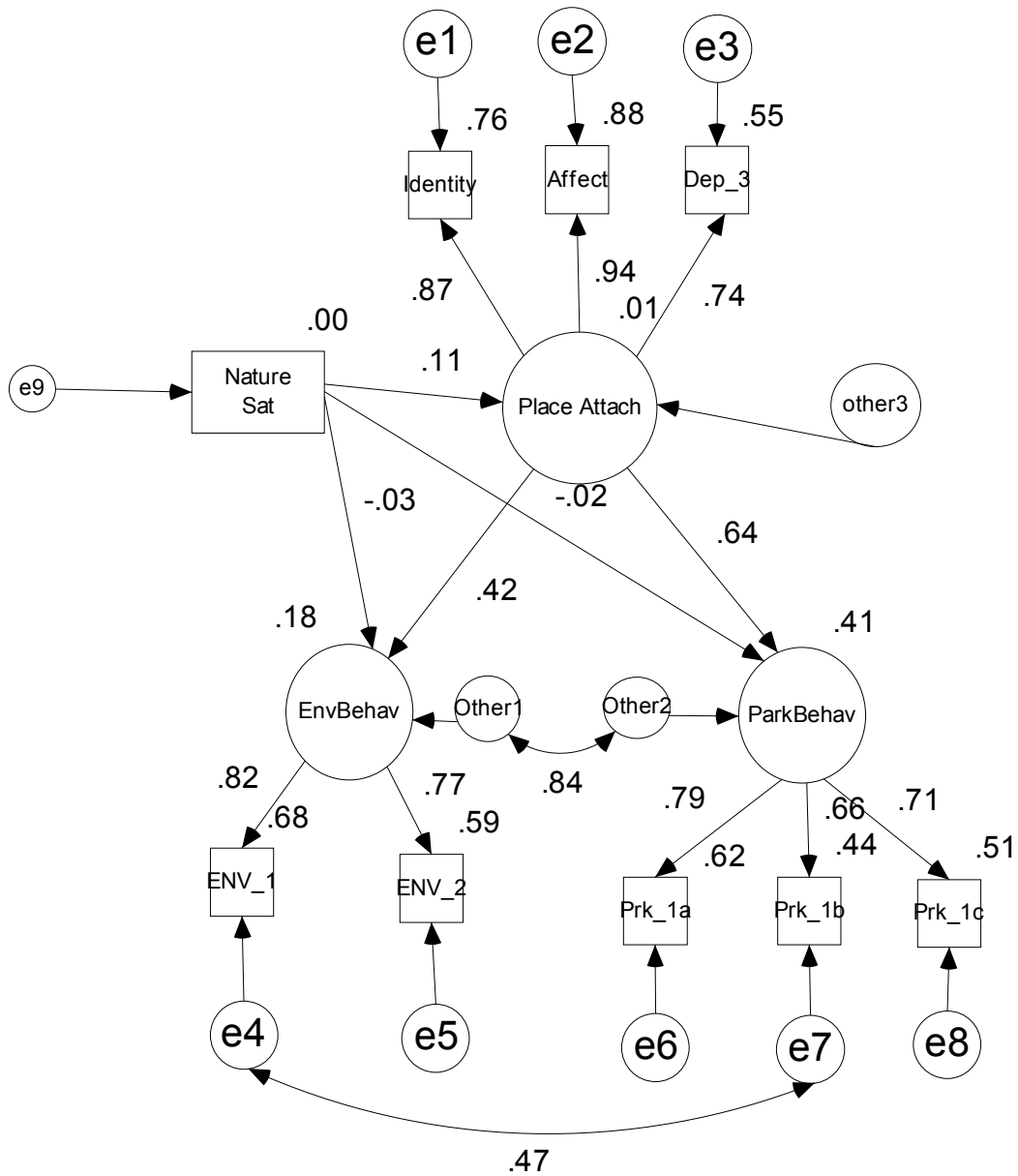
C-13c Place Attachment predicts Place Satisfaction and Pro-environment Behavioural Intentions (n.s. paths: Park Satisfaction → Park-Spec. Intentions; Park Satisfaction → General Intentions)



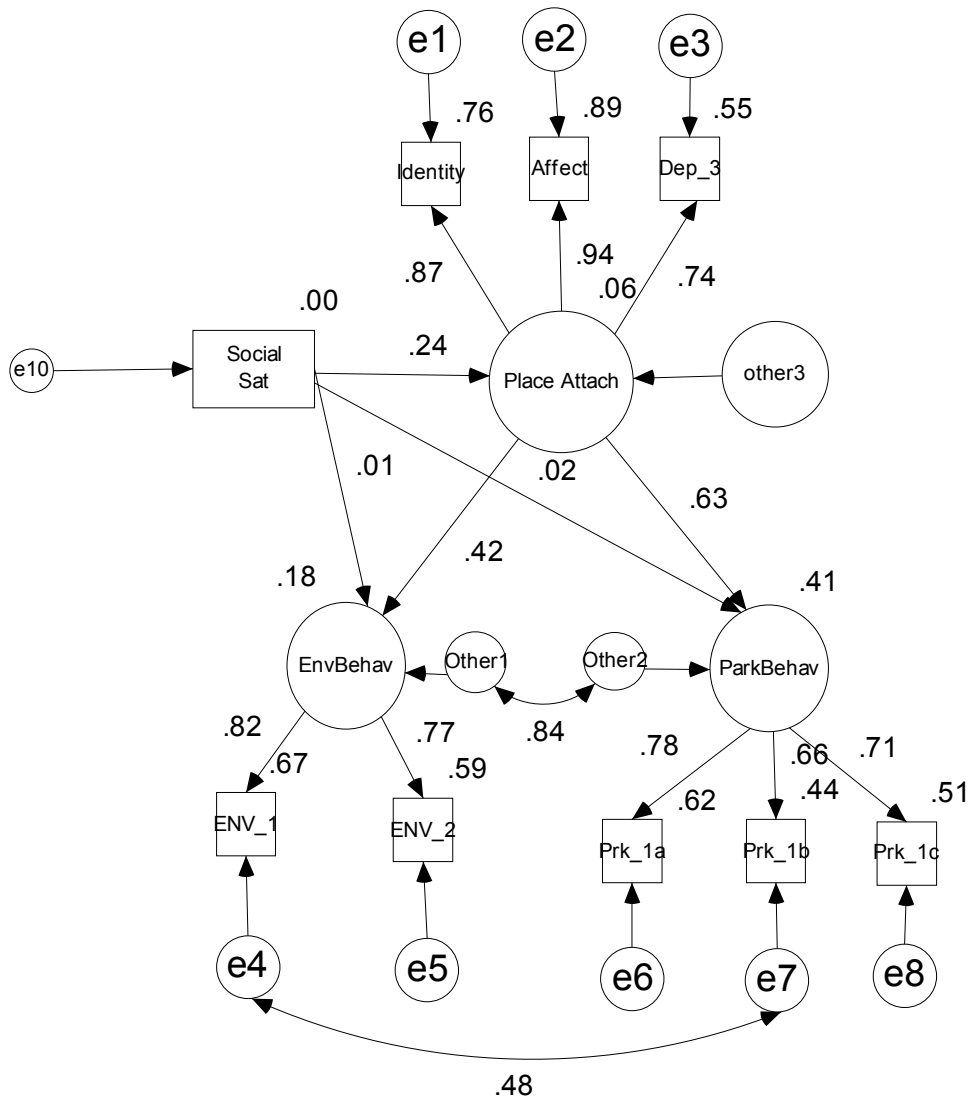
*C-13d Place Satisfaction (activity), Place Attachment and Pro-environment Behavioural Intentions* (n.s. paths: Activity Satisfaction → Park-Spec. Intentions; Activity Satisfaction → General Intentions)



*C-13e Place Satisfaction (nature), Place Attachment and Pro-environment Behavioural Intentions* (n.s. paths: Nature Satisfaction → Park-Spec. Intentions; Nature Satisfaction → General Intentions)



*C-13f Place Satisfaction (social), Place Attachment and Pro-environment Behavioural Intentions* (n.s. paths: Social Satisfaction → Park-Spec. Intentions; Social Satisfaction → General Intentions)





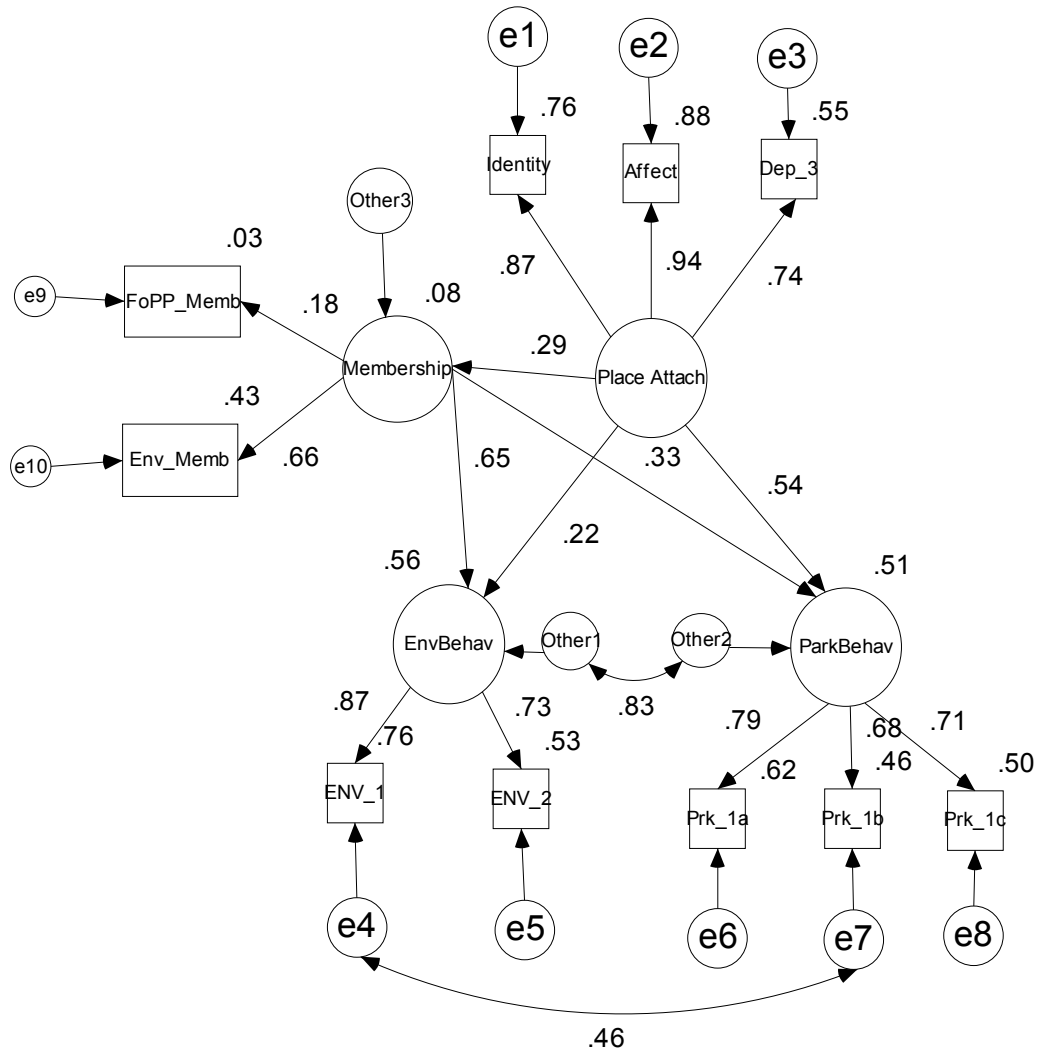
*C-13 Place Satisfaction (Nature\_Sat, Activity\_Sat, Social\_Sat), Place Attachment and Pro-environment Behavioural Intentions Indicators: Correlations and Measures of Central Tendency*

	Ident	Affect	Dep_3	Nature Sat	Social Sat	Activity Sat	Env_1	Env_2	Prk_1a	Prk_1b	Prk_1c
Ident	1										
Affect	.819**	1									
Dep_3	.621**	.706**	1								
Nature Sat	.111*	.101	.129*	1							
Social Sat	.229**	.225**	.151**	.390**	1						
Activity Sat	.228**	.205**	.161**	.355**	.393**	1					
Env_1	.321**	.278**	.151*	-.029	.050	.161**	1				
Env_2	.304**	.312**	.281**	.026	.106	.046	.630**	1			
Prk_1a	.497**	.486**	.428**	.033	.149**	.123*	.536**	.474**	1		
Prk_1b	.361**	.358**	.341**	-.077	.035	.143**	.668**	.444**	.548**	1	
Prk_1c	.409**	.367**	.288**	.136*	.165*	.270**	.526**	.526**	.552**	.445**	1
M	3.73	3.67	2.91	4.59	4.24	4.49	3.26	4.10	4.09	3.02	4.04
SD	.700	.660	.926	.653	.878	.773	.865	.659	.776	1.032	.784

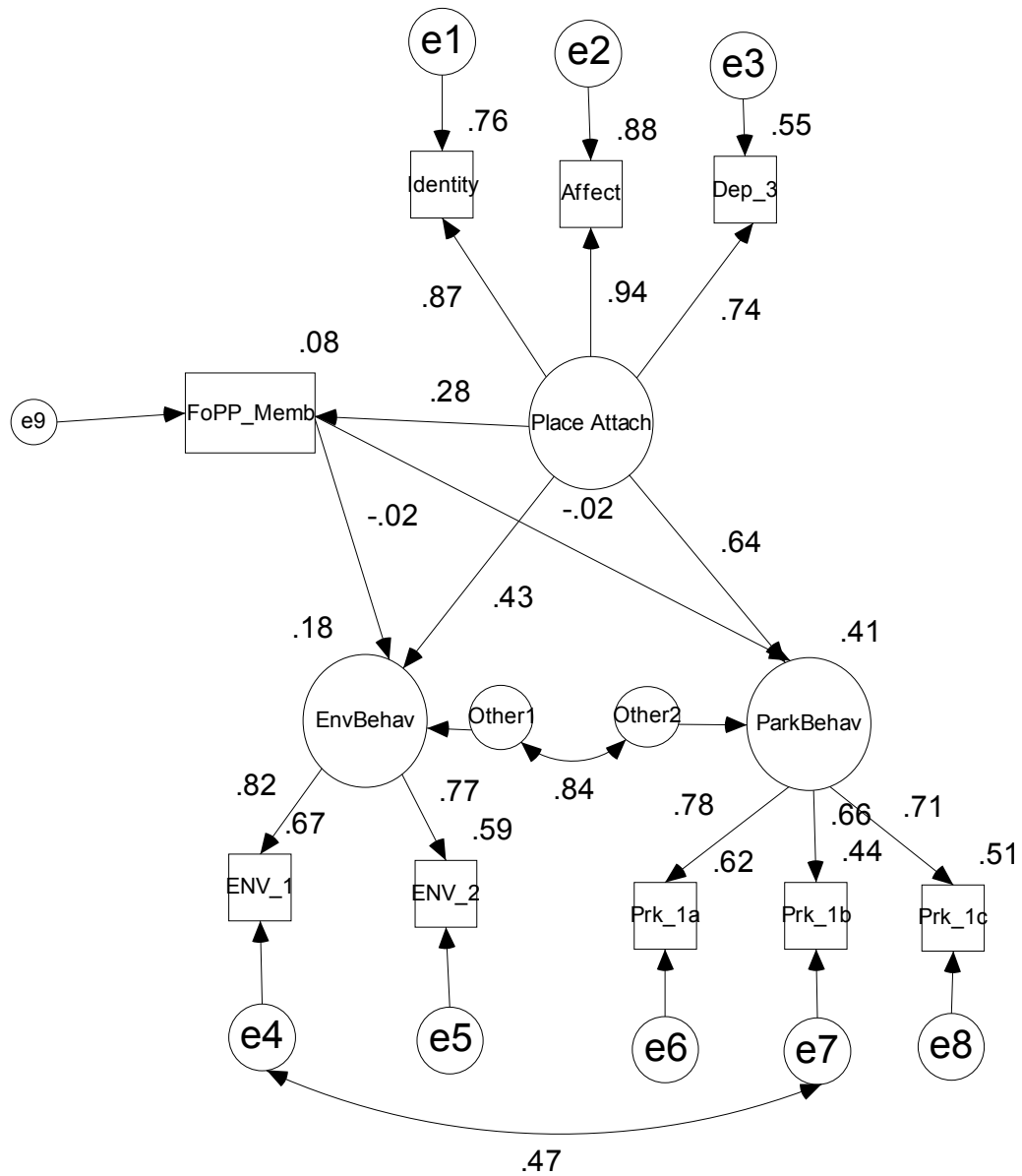
\*\*  $p < .001$ ; \*  $p < .05$

***Appendix C-14: Membership***

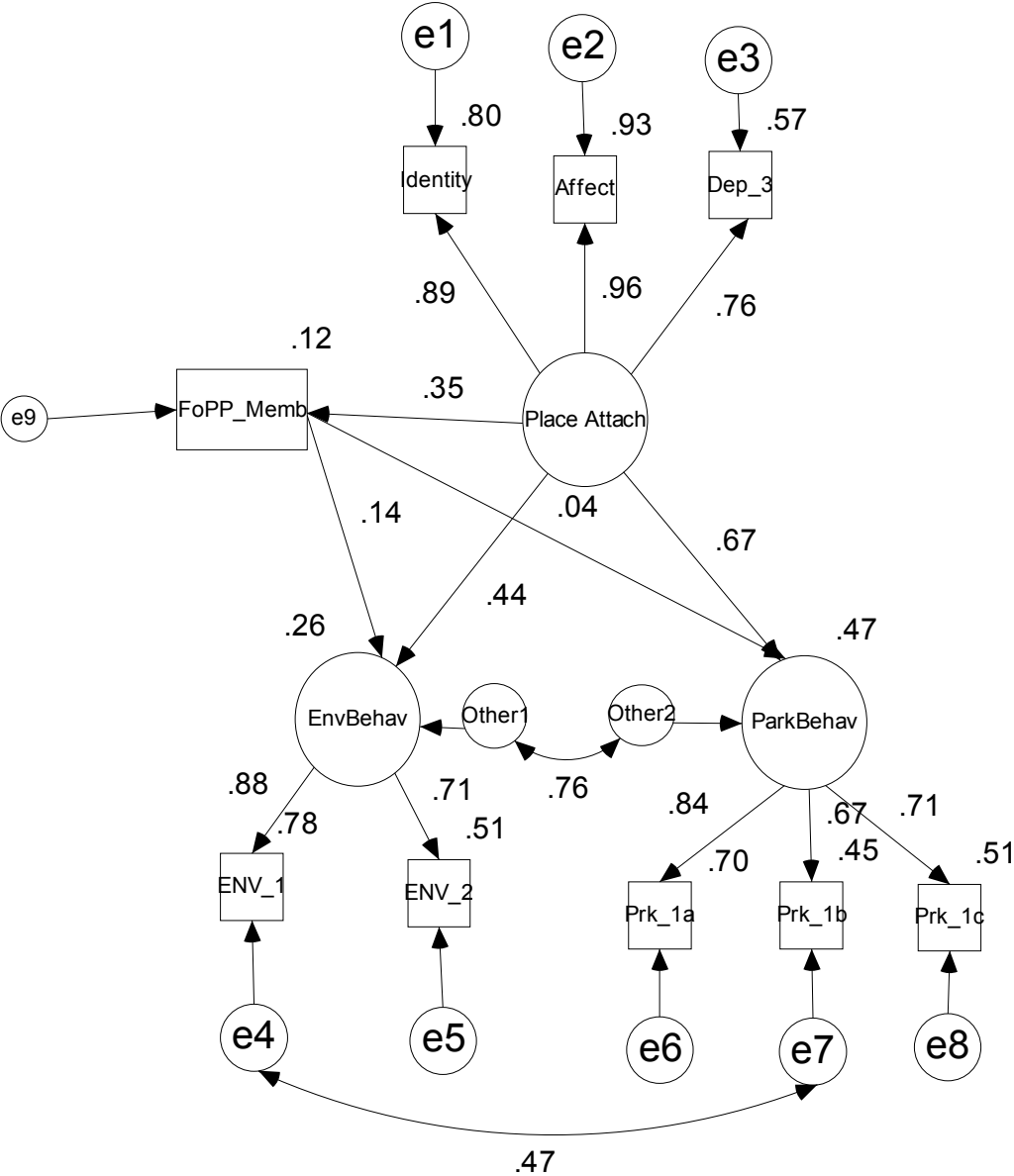
*C-14a Membership (FoPP Membership and Membership in an Environmental Group) Place Attachment and Pro-environment Behavioural*



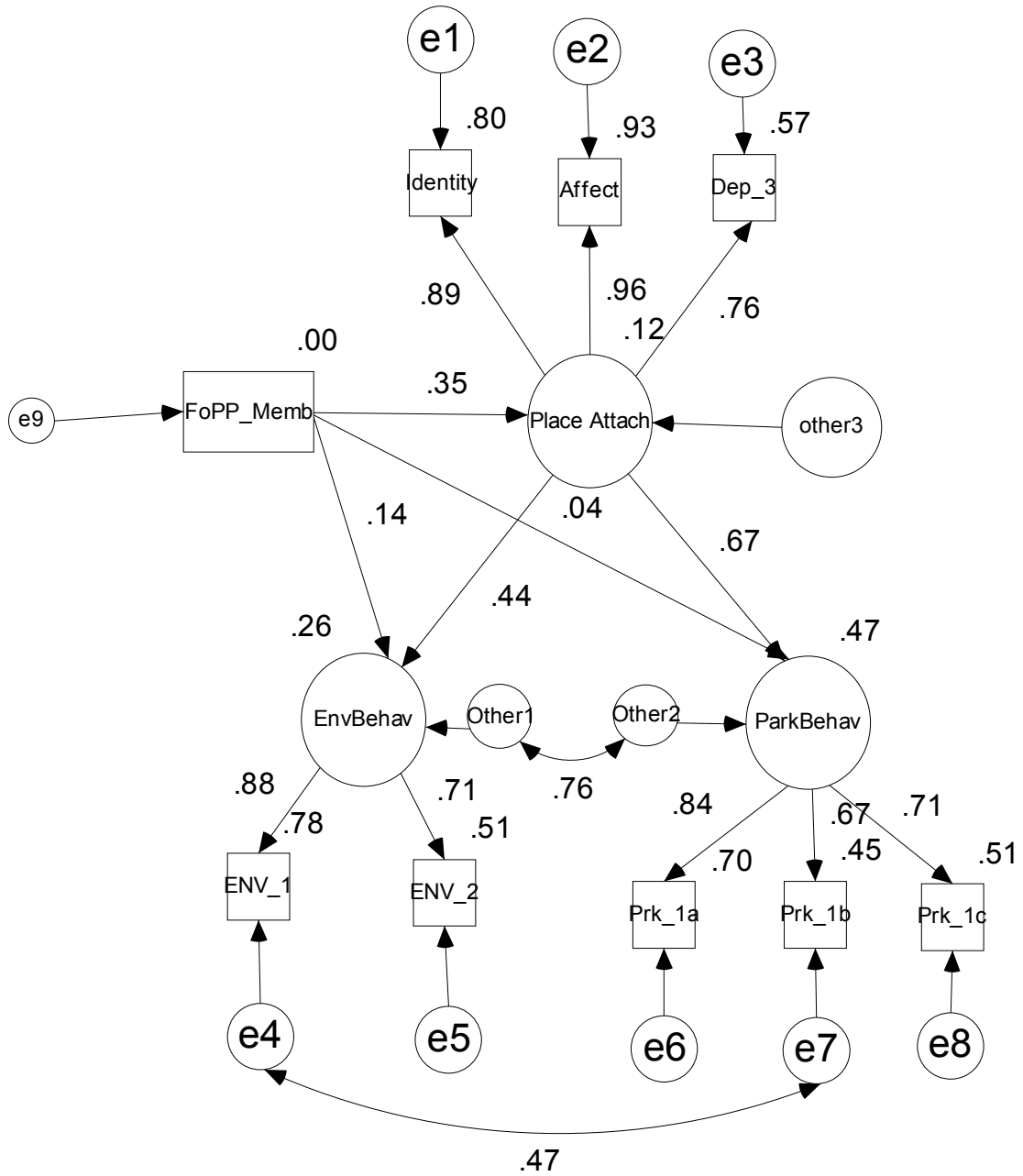
C-14b Membership, Place Attachment and Pro-environment Behavioural (n.s. paths: FoPP Membership → Park-Spec. Intentions; FoPP Membership → General Intentions)



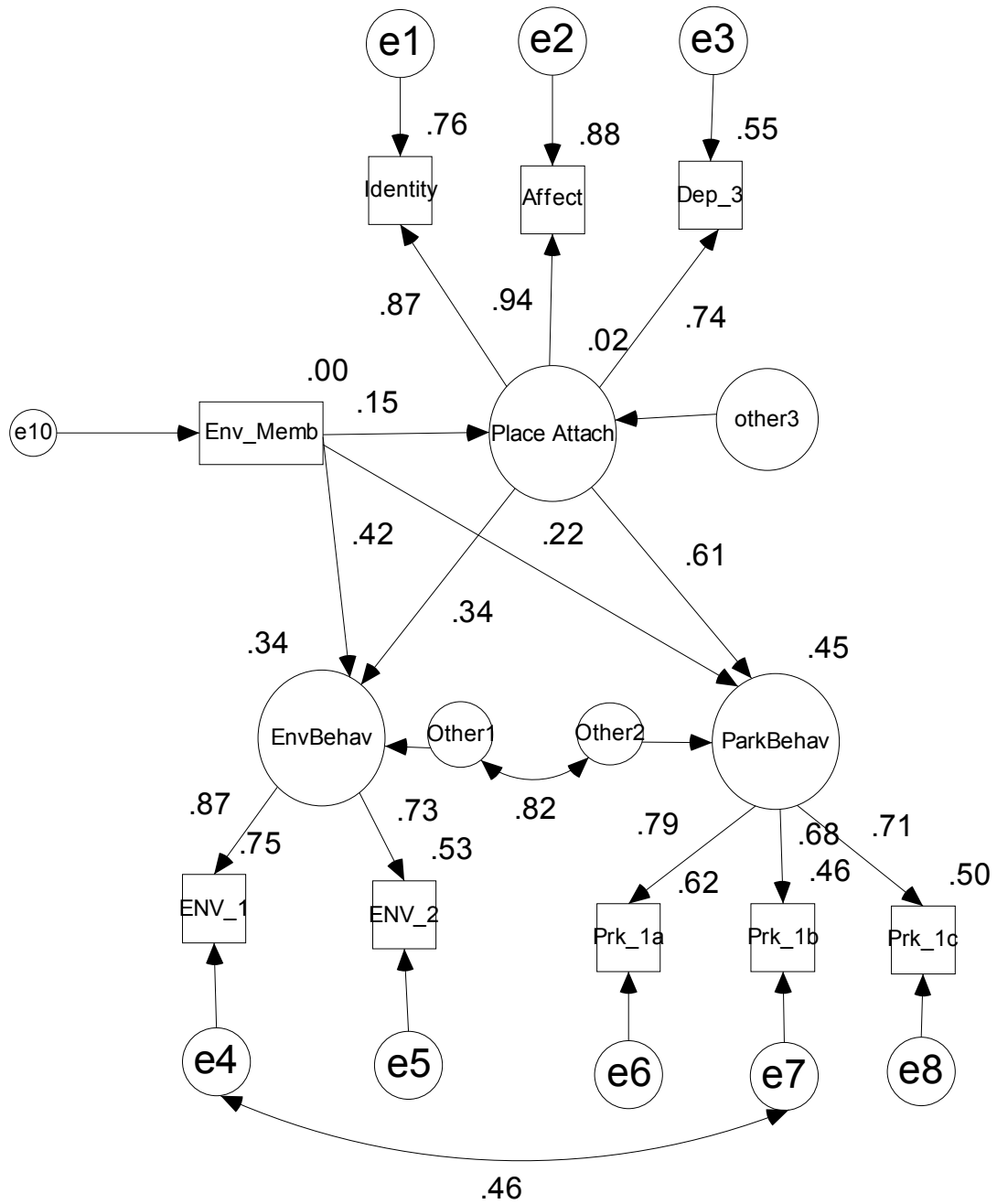
C-14c Place Attachment predicts FoPP Membership and Pro-environment Behavioural  
 (Special FoPP data base n = 222; correlations matrix is supplied in Appendix C-15ii).  
 (n.s. paths: FoPP Membership → Park-Spec. Intentions)



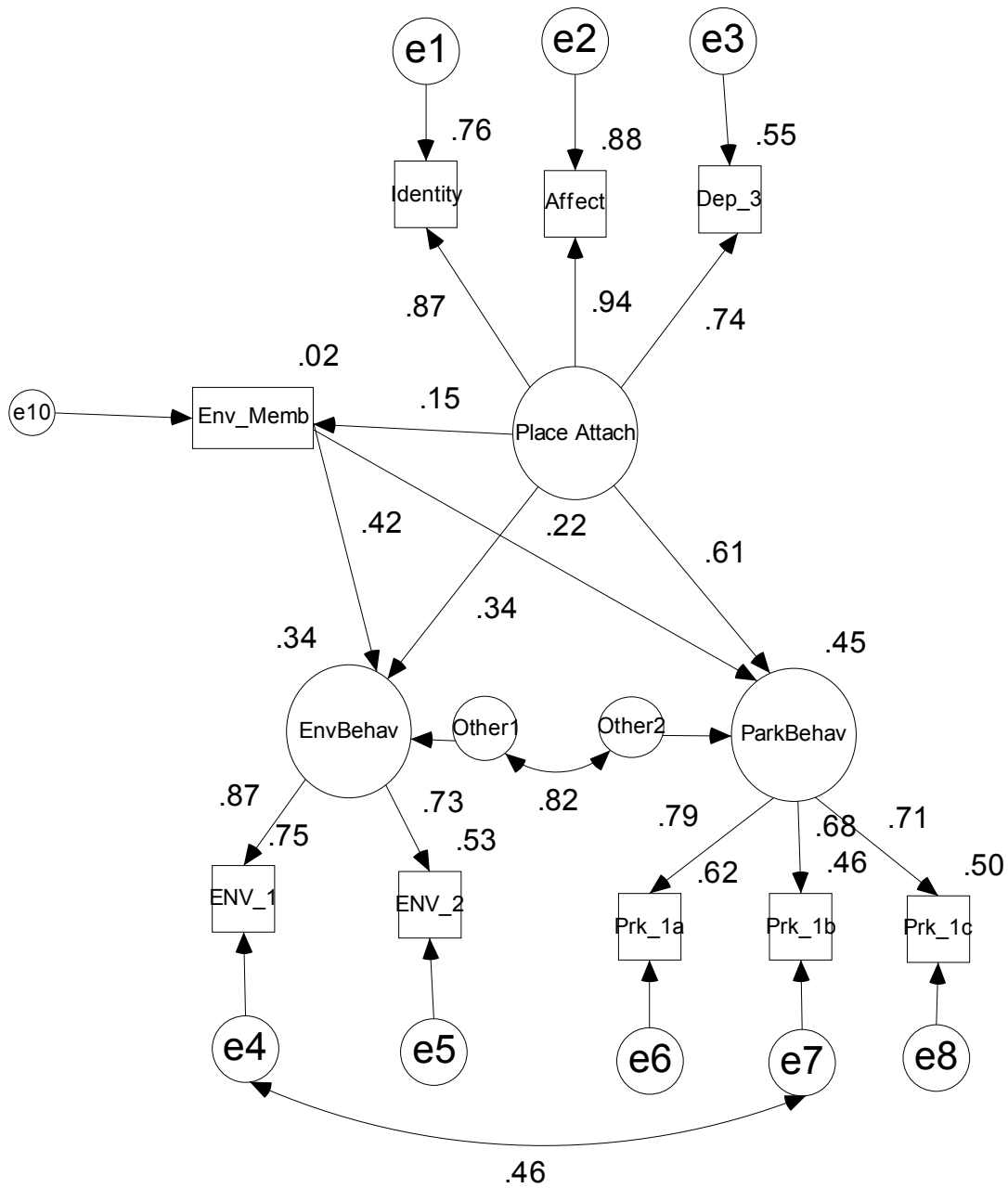
C-14 d FoPP Membership Predicts Place Attachment and Pro-environment Behavioural  
 (Special FoPP data base n = 222; correlations matrix is supplied in Appendix C-15ii).  
 (n.s. paths: FoPP Membership → Park-Spec. Intentions)



*C-14e Environmental Group Membership predicts Place Attachment and Pro-environment Behavioural Intentions (n.s. paths: 0)*



C-14f Place Attachment predicts Environmental Group Membership and Pro-environment Behavioural Intensions (n.s. paths: 0)





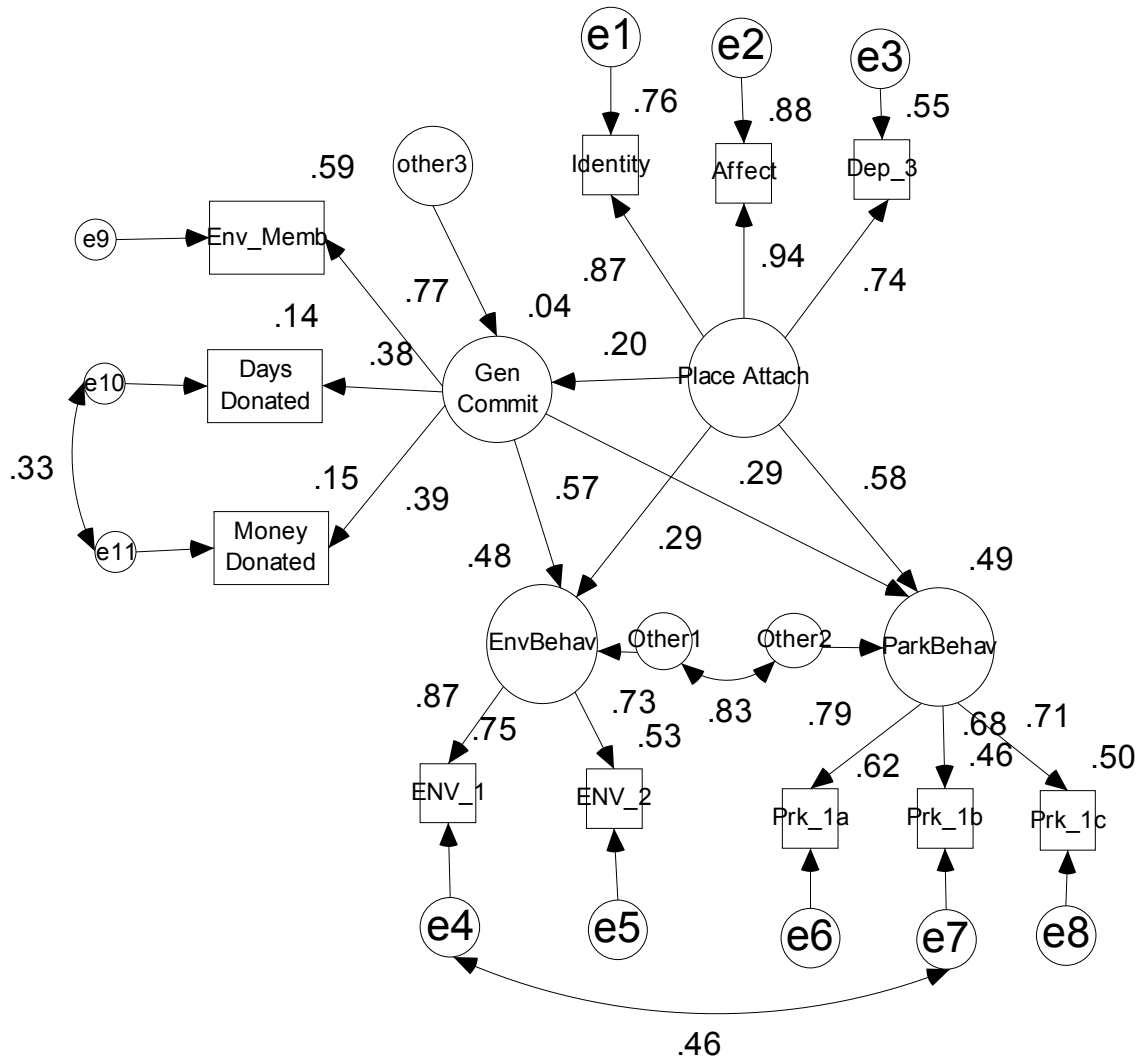
**C-14 Membership (FoPP Membership model C-14a; and Environmental Group Membership), Place Attachment and Pro-environment Behavioural Intentions Indicators: Correlations and Measures of Central Tendency**

	Ident	Affect	Dep_3	FoPP Mem	Env Mem	Env_1	Env_2	Prk_1a	Prk_1b	Prk_1c
Ident	1									
Affect	.819**	1								
Dep_3	.621**	.706**	1							
FoPP Mem	.251**	.261**	.202**	1						
Env Mem	.210**	.123*	.061	.118*	1					
Env_1	.321**	.278**	.271**	.116*	.463**	1				
Env_2	.304**	.312**	.281**	.027	.275**	.630**	1			
Prk_1a	.497**	.486**	.428**	.154**	.166**	.536**	.474**	1		
Prk_1b	.361**	.358**	.341**	.120*	.292**	.668**	.444**	.548**	1	
Prk_1c	.409**	.367**	.288**	.076	.278**	.526**	.526**	.552**	.445**	1
M	3.73	3.67	2.91	na	na	3.26	4.10	4.09	3.02	4.04
SD	.700	.660	.926	na	na	.865	.659	.776	1.032	.784

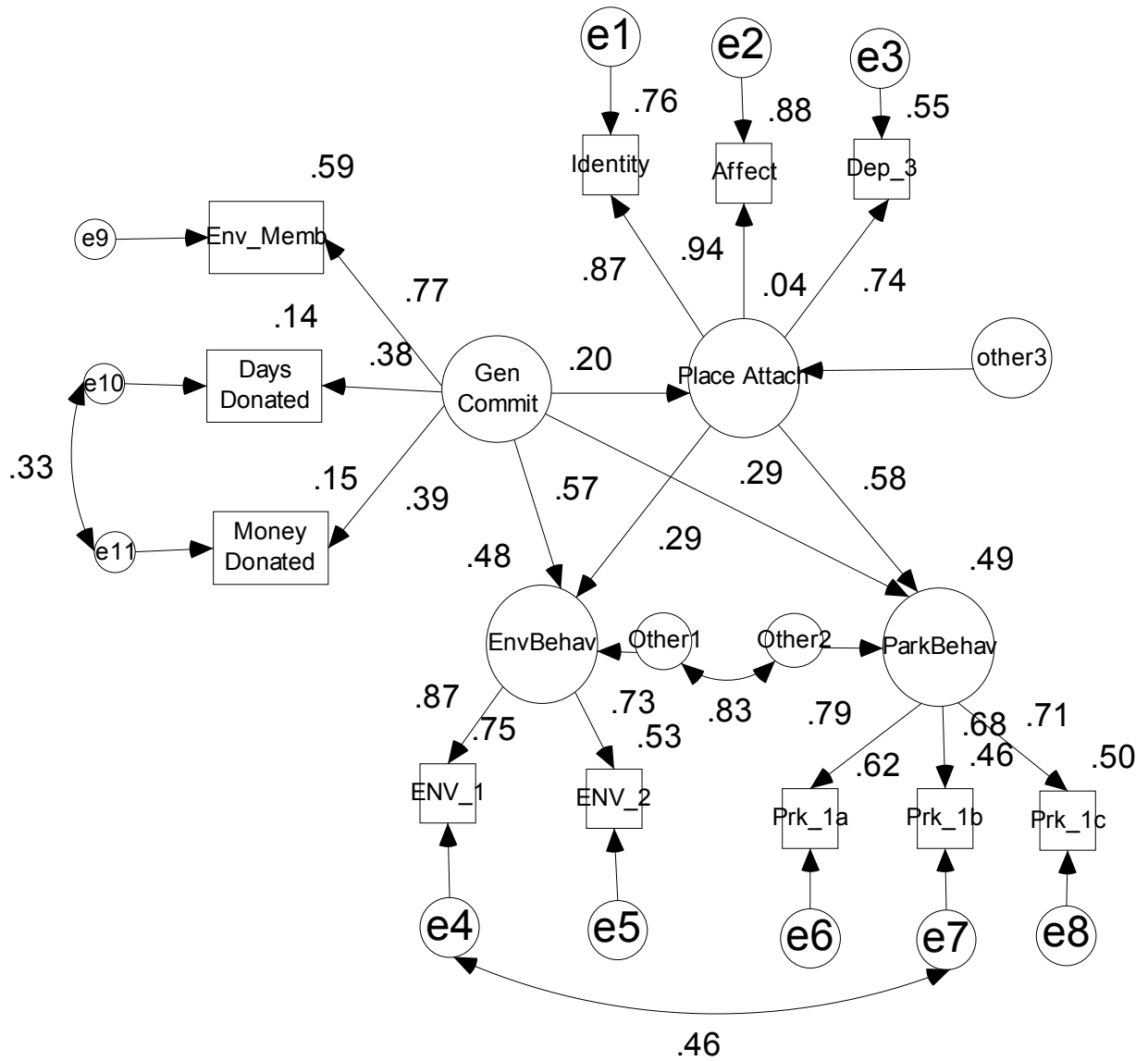
\*\*  $p < .001$ ; \*  $p < .05$

***Appendix C-15: Commitment***

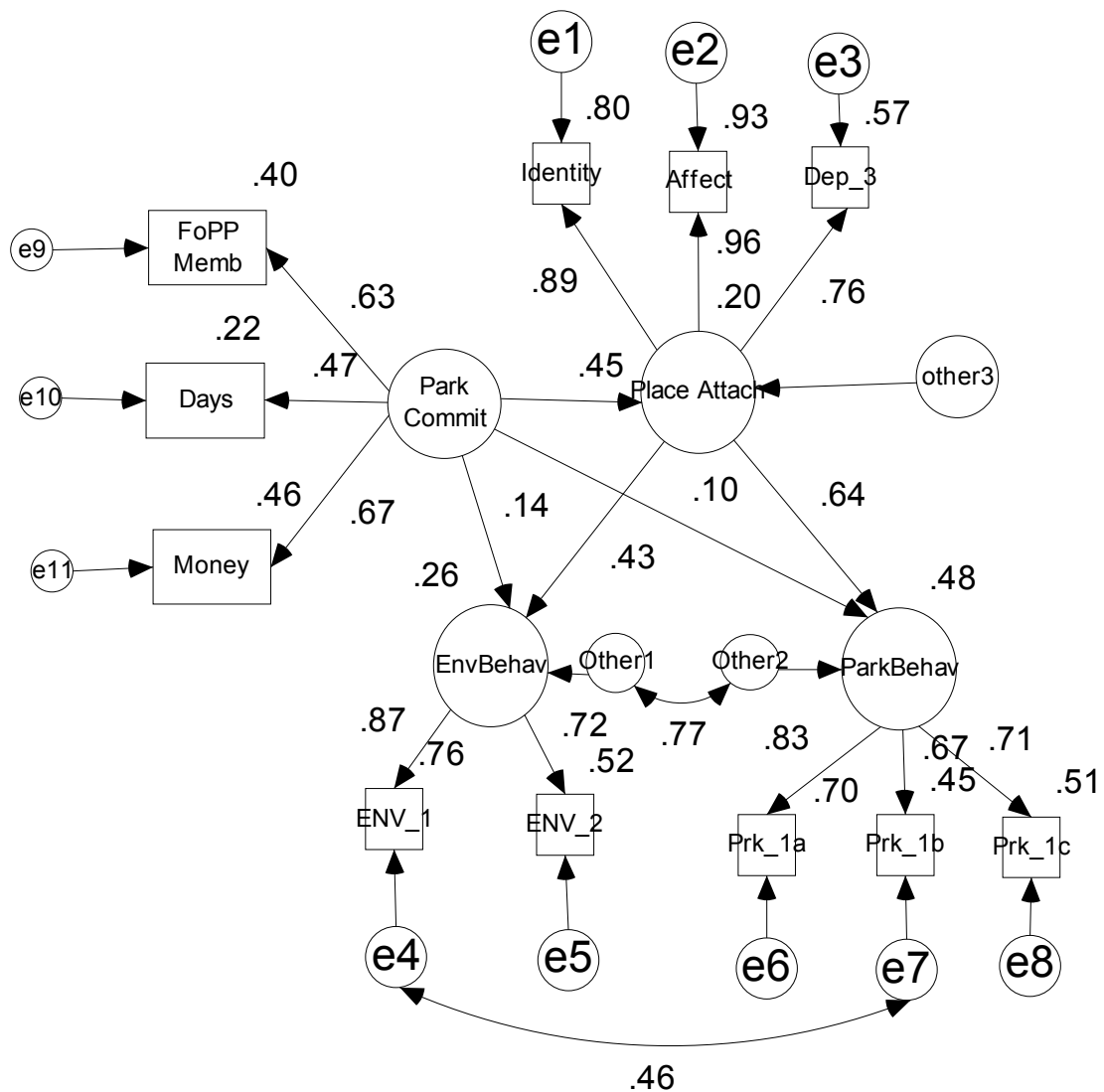
*C-15a Place Attachment predicts General Environmental Commitment and Pro-environment Behavioural Intentions (n.s. paths: 0)*



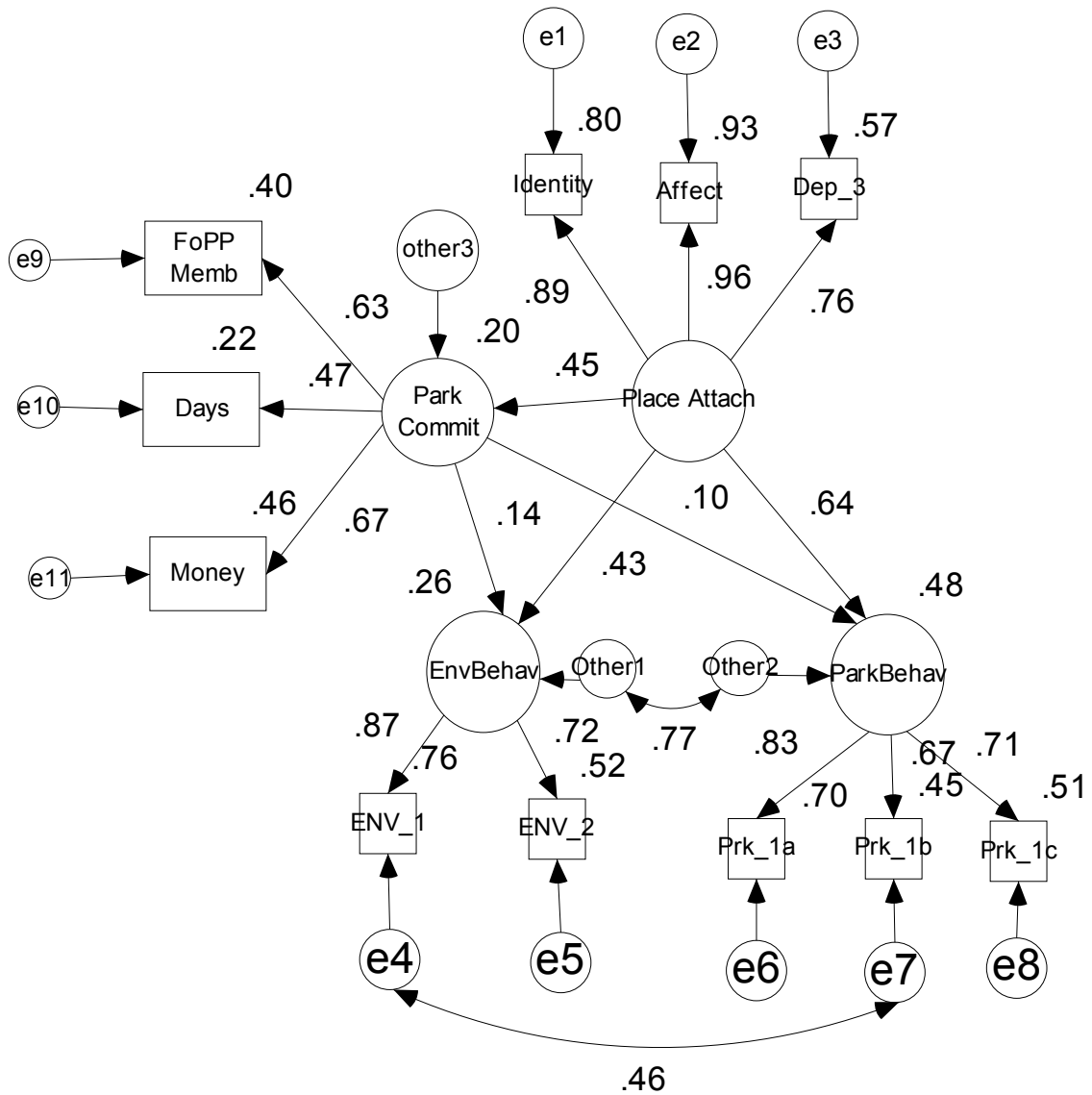
C-15b General Environmental Commitment predicts Place Attachment and Pro-environment Behavioural Intentions (n.s. paths: 0)



C-15c Park Commitment predicts Place Attachment and Pro-environment Behavioural Intentions (Special FoPP data base  $n = 222$ ; correlations matrix is supplied in Appendix C-15ii). (n.s. paths: Park Commitment  $\rightarrow$  Park-Spec. Intentions; Park Commitment  $\rightarrow$  General Intentions)



C-15d Place Attachment predicts Park Commitment and Pro-environment Behavioural Intentions (Special FoPP data base  $n = 222$ ; correlations matrix is supplied in Appendix C-15ii). (n.s. paths: Park Commitment  $\rightarrow$  Park-Spec. Intentions; Park Commitment  $\rightarrow$  General Intentions)



*C-15i-Unmodified - General Environmental Commitment (Environmental Group Membership and Donations of Time and Money to Environmental Organizations), Place Attachment and Pro-environment Behavioural Intentions Indicators: Correlations and Measures of Central Tendency – For Model C-15a and C-15b.*

	Ident	Affect	Dep_3	FoPP Mem	Env Mem	Time FoPP	Money FoPP	Time Other	Money Other	Env_1	Env_2	Prk_1 a	Prk_1 b	Prk_1 c
Ident	1													
Affect	.819**	1												
Dep_3	.621**	.706**	1											
FoPP Mem	.251**	.261**	.202**	1										
Env Mem	.210**	.123*	.061	.118*	1									
Time FoPP	.097	.119*	.127*	.157**	.135*	1								
Money FoPP	.202**	.241**	.164**	.350**	.101	.352**	1							
Time Other	.139**	.074	.037	.086	.285**	.206**	.101	1						
Money Other	.107*	.075	.038	.137*	.285**	.001	.167**	.425**	1					
Env_1	.321**	.278**	.271**	.116*	.463**	.039	.096	.247**	.246**	1				
Env_2	.304**	.312**	.281**	.027	.275**	-.017	.076	.138*	.244**	.630**	1			
Prk_1a	.497**	.486**	.428**	.154**	.166**	.041	.120*	.054	.086	.536**	.474**	1		
Prk_1b	.361**	.358**	.341**	.120*	.292**	.157**	.100	.161**	.139*	.668**	.444**	.548**	1	
Prk_1c	.409**	.367**	.288**	.076	.278**	.025	.178**	.100	.273**	.526**	.526**	.552**	.445**	1
M	3.73	3.67	2.91	na	na	27.60	2.94	255.61	6.75	3.26	4.10	4.09	3.02	4.04
SD	.700	.660	.926	na	na	116.79	22.676	1525.68	35.353	.865	.659	.776	1.032	.784

\*\*  $p < .001$ ; \*  $p < .05$

*C-15ii-Special Correlatin Matrix -Park Commitment (FoPP Membership, Donations of Time and Money to FoPP), Place Attachment and Pro-environment Behavioural Intensions Indicators: Correlations and Measures of Central Tendency (n = 222) – For Models C14c, C14d, C15-c and C-15d*

	Ident	Affect	Dep_3	FoPP Mem	Time FoPP	Money FoPP	Env_1	Env_2	Prk_1 a	Prk_1 b	Prk_1 c
Ident	1										
Affect	.862**	1									
Dep_3	.648**	.736**	1								
FoPP Mem	.343**	.326**	.231**	1							
Time FoPP	.099	.121	.179**	.255**	1						
Money FoPP	.289**	.267**	.197**	.397**	.393**	1					
Env_1	.382**	.385**	.351**	.305**	.103	.181**	1				
Env_2	.340**	.364**	.348**	.112	.026	.104	.626**	1			
Prk_1a	.562**	.551**	.437**	.219**	.103	.161*	.579**	.483**	1		
Prk_1b	.363**	.406**	.421**	.248**	.172*	.171*	.643**	.395**	.594**	1	
Prk_1c	.470**	.435**	.350**	.162*	.097	.238**	.558**	.484**	.583**	.435**	1
M	3.73	3.67	2.91	na	27.60	2.94	3.26	4.10	4.09	3.02	4.04
SD	.700	.660	.926	na	116.79	22.676	.865	.659	.776	1.032	.784

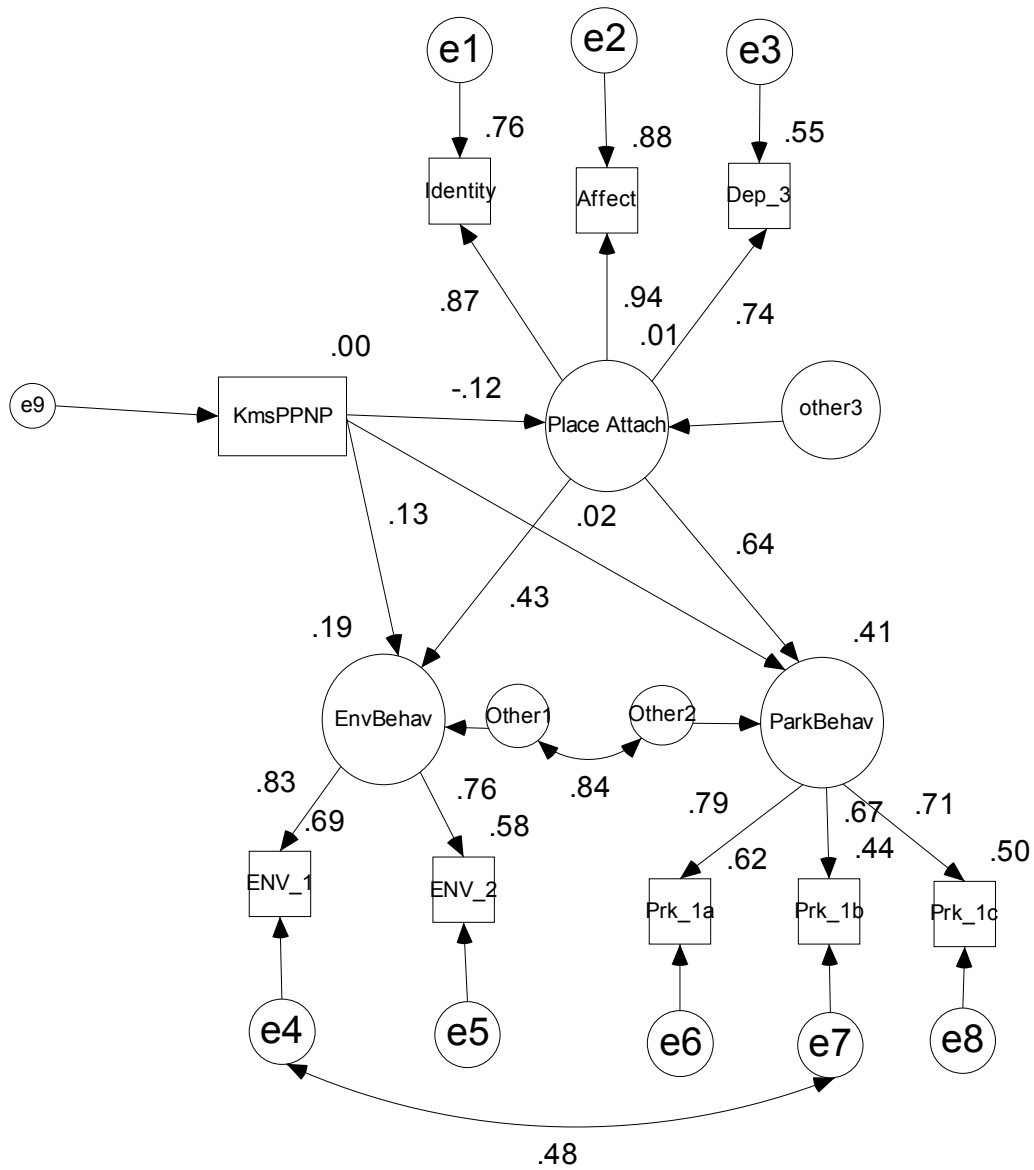
Note 1: \*\*  $p < .001$ ; \*  $p < .05$

Note 2: A special data base was used to estimate relationships related to “Park Commitment” based on the indicators FoPP Membership, Donations of time and money to FoPP (n = 222). All environmental group members not enrolled as FoPP members were removed from the main database. The remaining cases make up this new database.

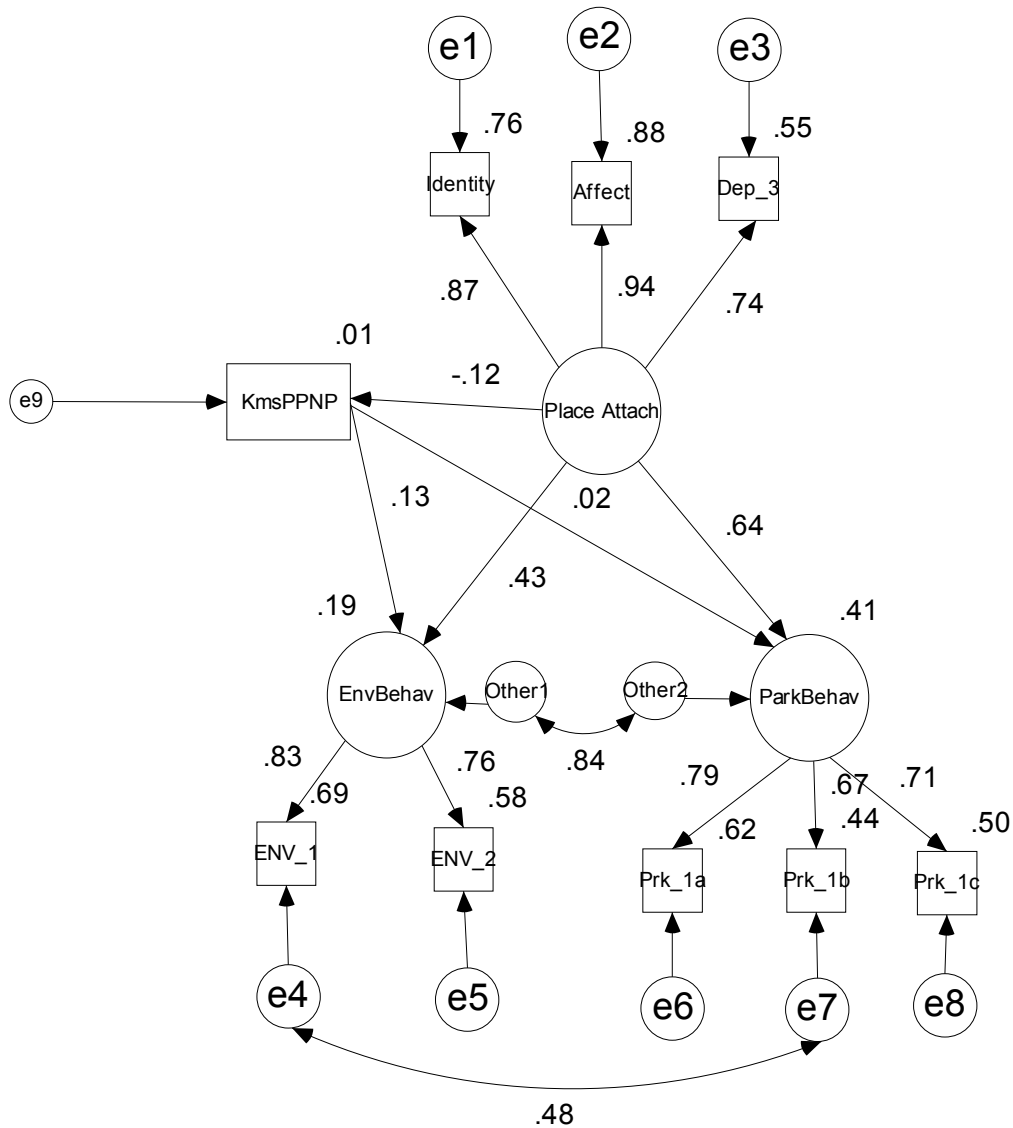


***Appendix C-16: Distance***

C-16a Distance predicting Place Attachment and Pro-environment Behavioural Intentions  
 (n.s. paths: Distance → Park-Spec. Intentions)



*C-16b Place Attachment predicted by Distance and Pro-environment Behavioural Indicators: Correlations and Measures of Central Tendency (n.s. paths: Distance → Park-Spec. Intentions)*

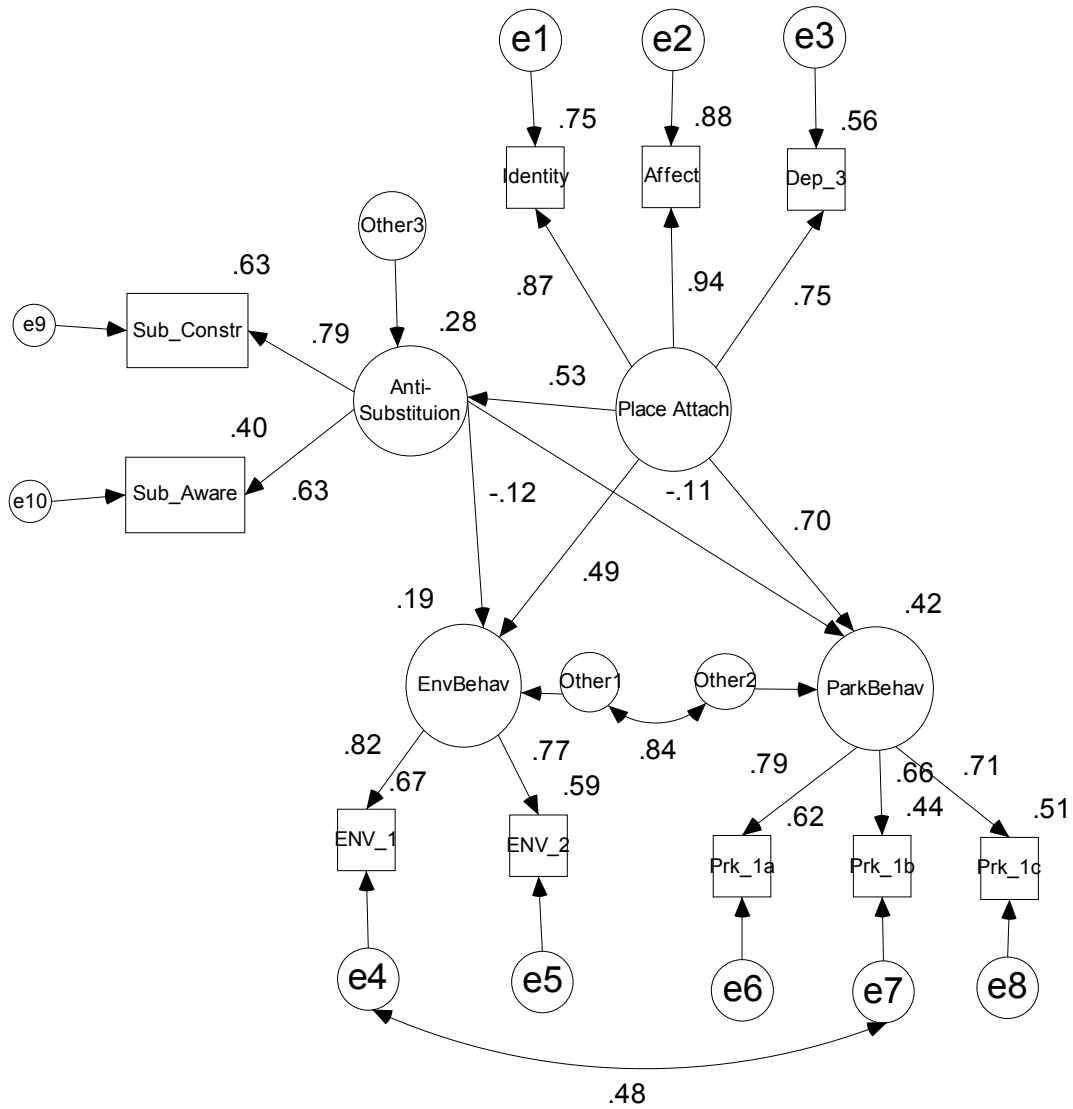


*C-16 Distance, Place Attachment and Pro-environment Behavioural Intentions Indicators:  
Correlations and Measures of Central Tendency*

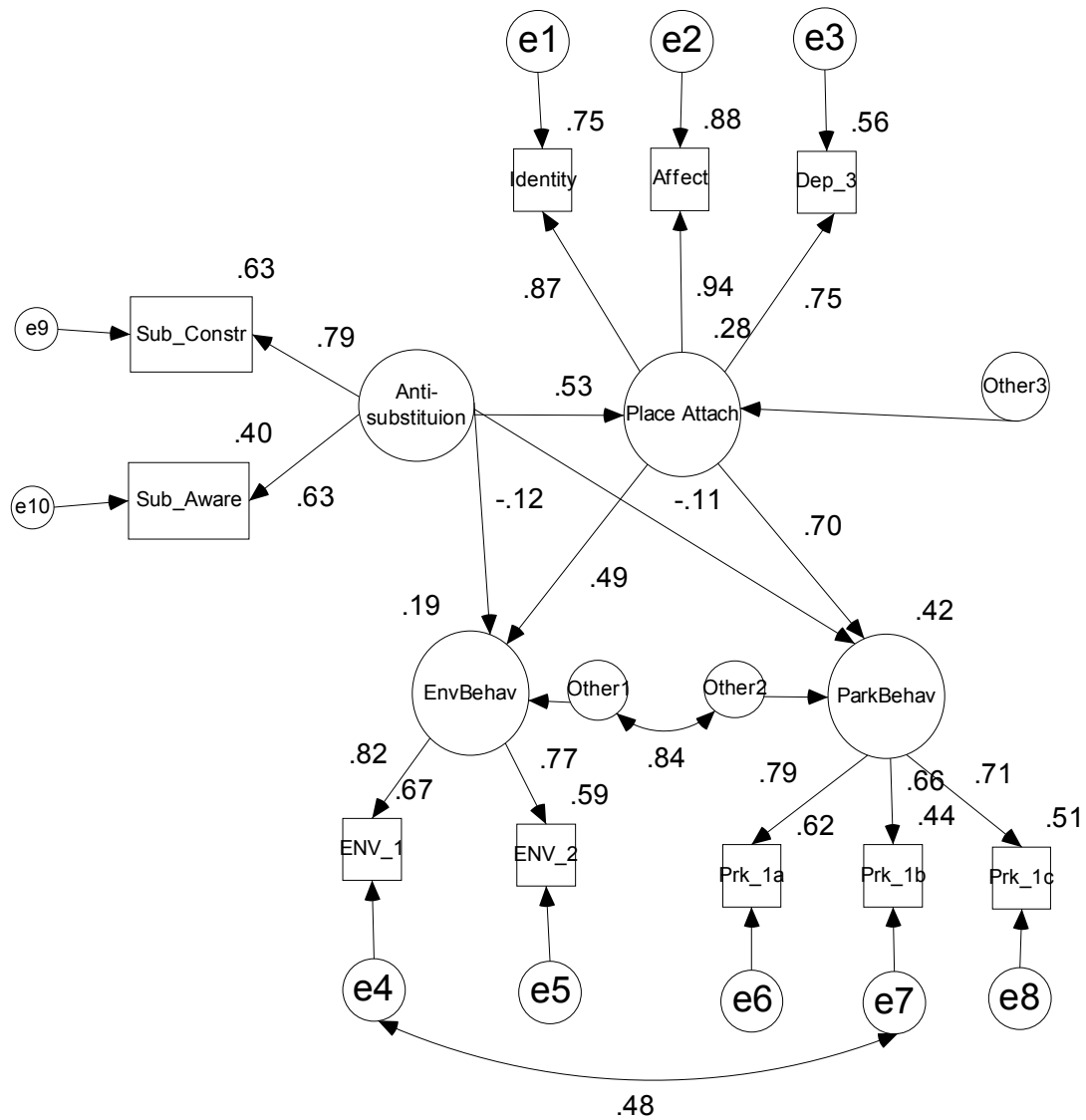
	Ident	Affect	Dep_3	Distance	Env_1	Env_2	Prk_1 a	Prk_1 b	Prk_1 c
Ident	1								
Affect	.819**	1							
Dep_3	.621**	.706**	1						
Distance	-.109*	-.101	-.095	1					
Env_1	.321**	.278**	.271**	.095	1				
Env_2	.304**	.312**	.281**	.019	.630**	1			
Prk_1a	.497**	.486**	.428**	-.096	.536**	.474**	1		
Prk_1b	.361**	.358**	.341**	-.019	.668**	.444**	.548**	1	
Prk_1c	.409**	.367**	.288**	.055	.526**	.526**	.552**	.445**	1
M	3.73	3.67	2.91	270.60	3.26	4.10	4.09	3.02	4.04
SD	.700	.660	.926	540.576	.865	.659	.776	1.032	.784

***Appendix C-17: Substitution***

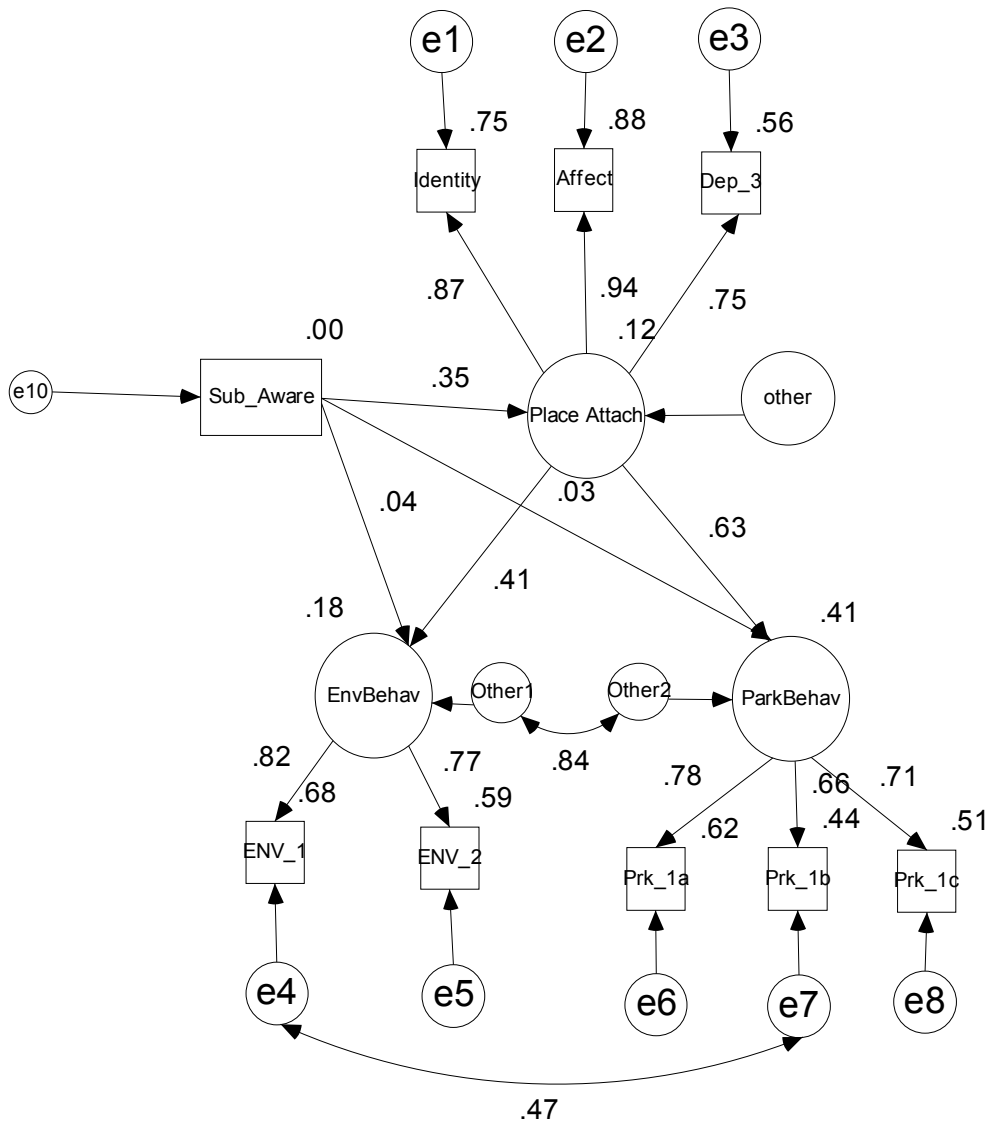
C-17a Place Attachment predicting Anti-substitution (Sub\_Aware; Sub\_Constraint), Pro-environment Behavioural Intentions (n.s. paths: Anti-substitution → Park-Spec. Intentions; Anti-substitution → General Intentions)



C-17b Anti-substitution (*Sub\_Aware*; *Sub\_Constraint*) predicting Place Attachment and Pro-environment Behavioural Intentions (n.s. paths: Anti-substitution → Park-Spec. Intentions; Anti-substitution → General Intentions)

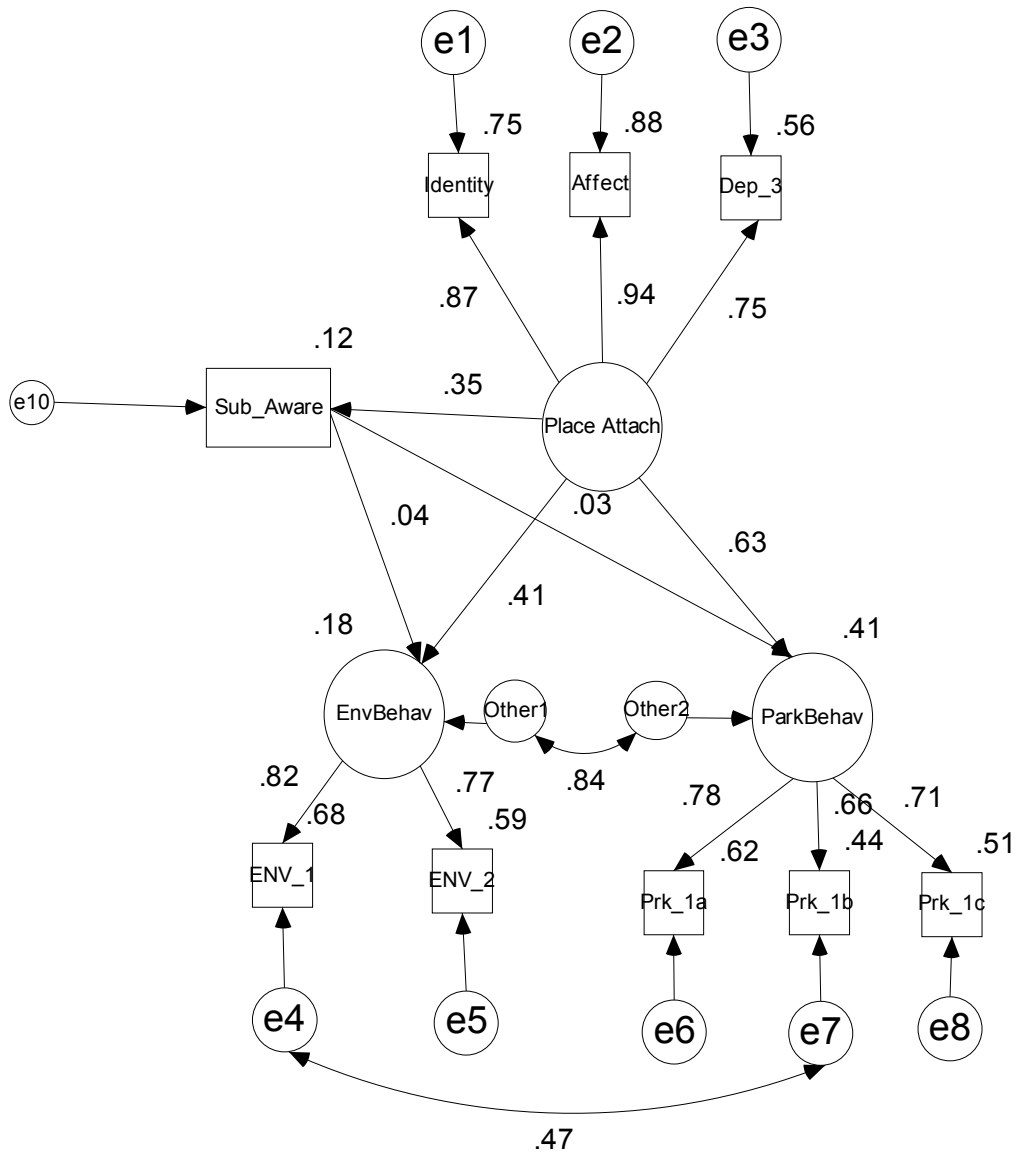


*C-17c Awareness of substitutes predicting Place Attachment and Pro-environment Behavioural Intentions (n.s. paths: Sub\_Aware → Park-Spec. Intentions; Sub\_Aware → General Intentions)*

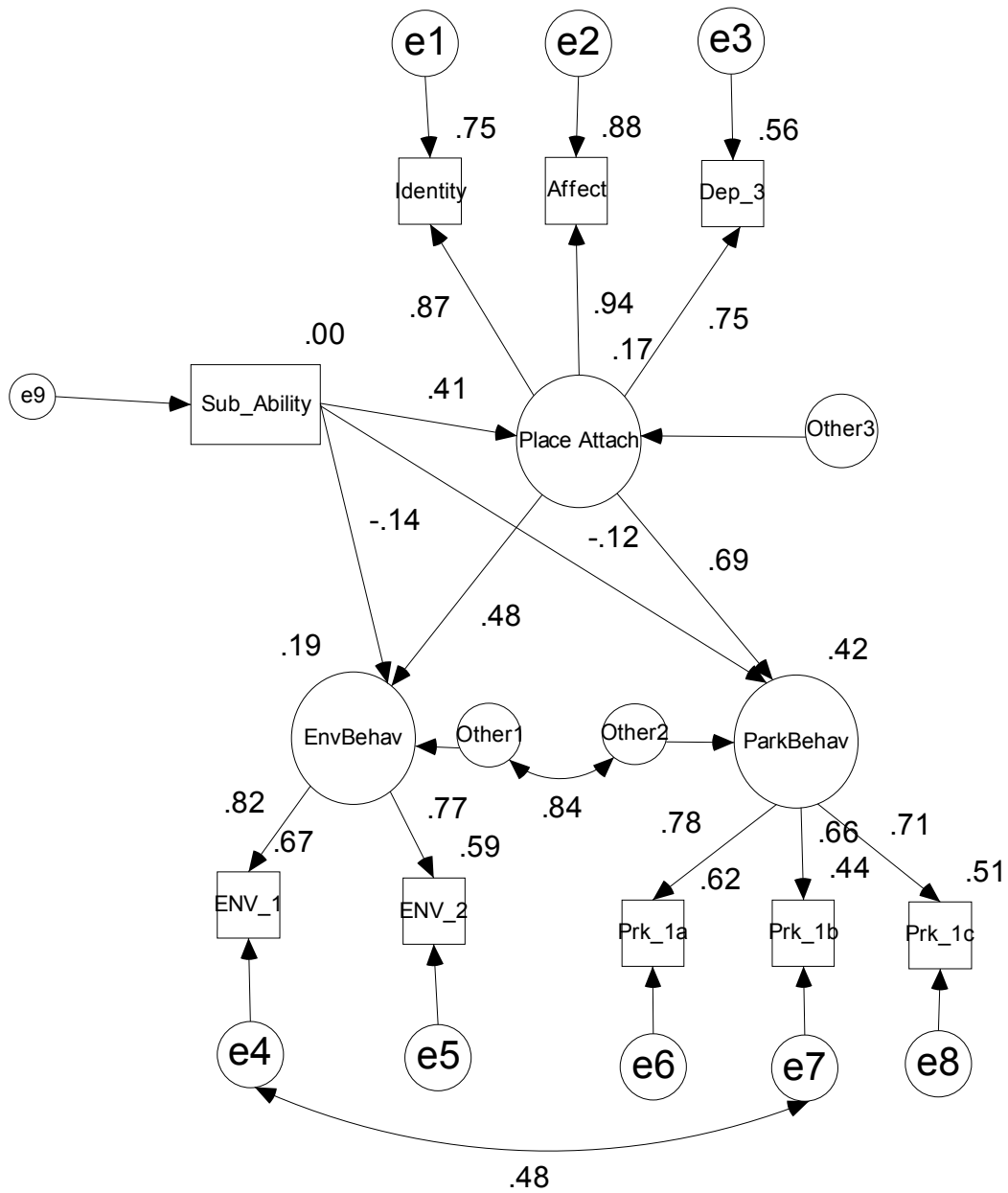




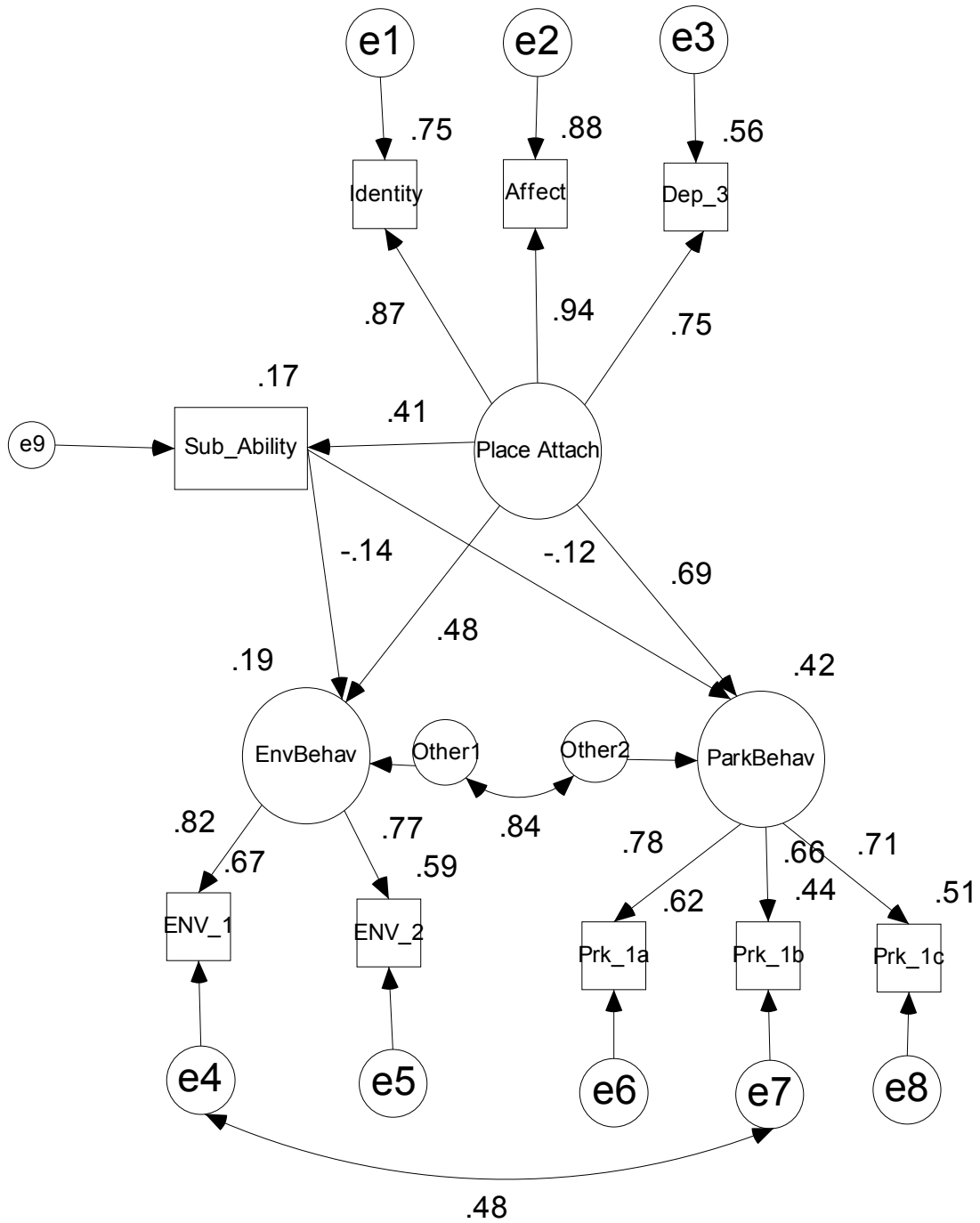
C-17d Place Attachment predicting Awareness of substitutes and Pro-environment Behavioural Intentions (n.s. paths: Sub\_Aware → Park-Spec. Intentions; Sub\_Aware → General Intentions)



C-17e Ability to Substitute predicting Place Attachment and Pro-environment Behavioural Intensions (n.s. paths: 0)



C-17f Place Attachment predicting Ability to Substitute and Pro-environment Behavioural Intensions (n.s. paths: 0)



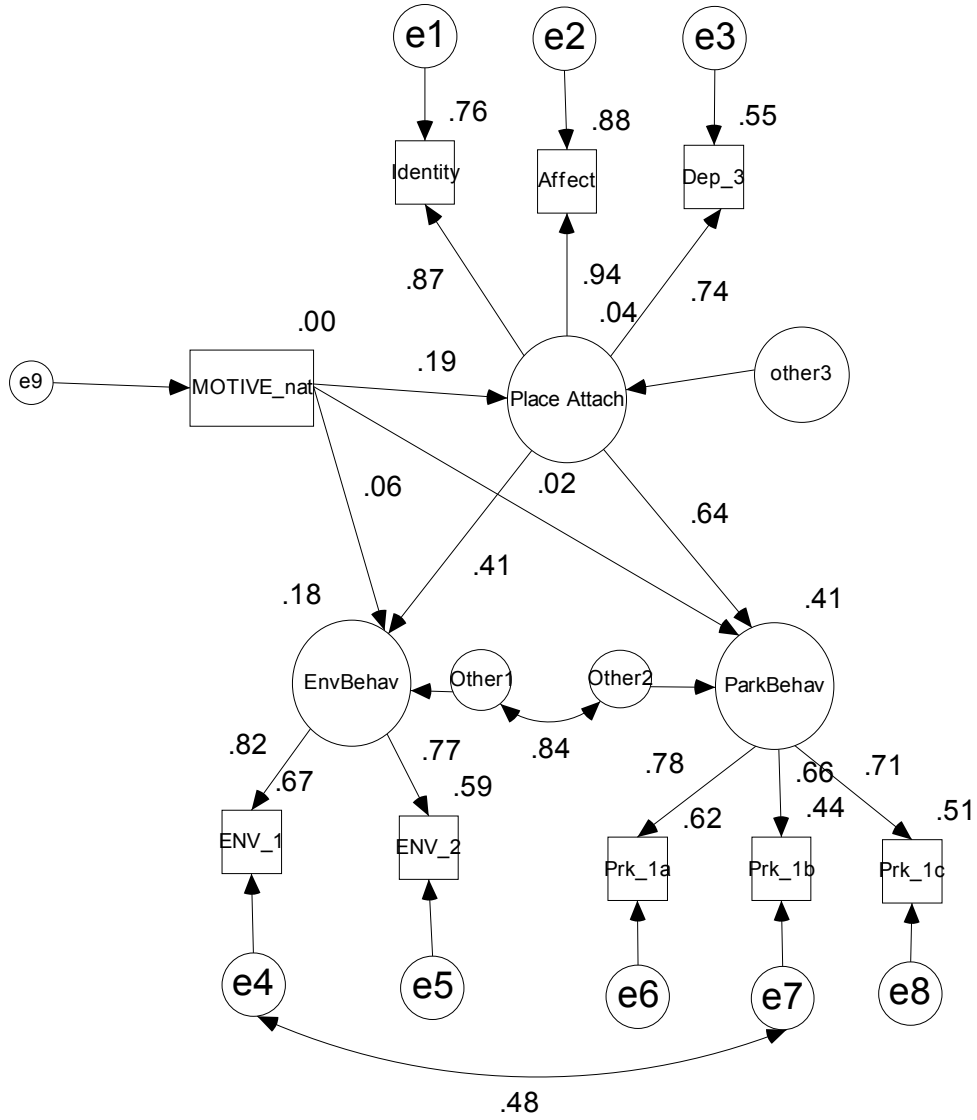
*C-17 Anti-substitution (Sub\_Aware; Sub\_Ability) Place Attachment and Pro-environment Behavioural Indicators: Correlations and Measures of Central Tendency*

	Ident	Affect	Dep_3	Sub_Aware	Sub_Ability	Env_1	Env_2	Prk_1a	Prk_1b	Prk_1c
Ident	1									
Affect	.819**	1								
Dep_3	.621**	.706**	1							
Sub_Aware	.331**	.385**	.379**	1						
Sub_Ability	.264**	.313**	.374**	.498**	1					
Env_1	.321**	.278**	.271**	.174**	.039	1				
Env_2	.304**	.312**	.281**	.106	.051	.630**	1			
Prk_1a	.497**	.486**	.428**	.189**	.148**	.536**	.474**	1		
Prk_1b	.361**	.358**	.341**	.200**	.118*	.668**	.444**	.548**	1	
Prk_1c	.409**	.367**	.288**	.161**	.069	.526**	.526**	.552**	.445**	1
M	3.73	3.67	2.91	3.32	3.40	3.26	4.10	4.09	3.02	4.04
SD	.700	.660	.926	1.285	1.177	.865	.659	.776	1.032	.784

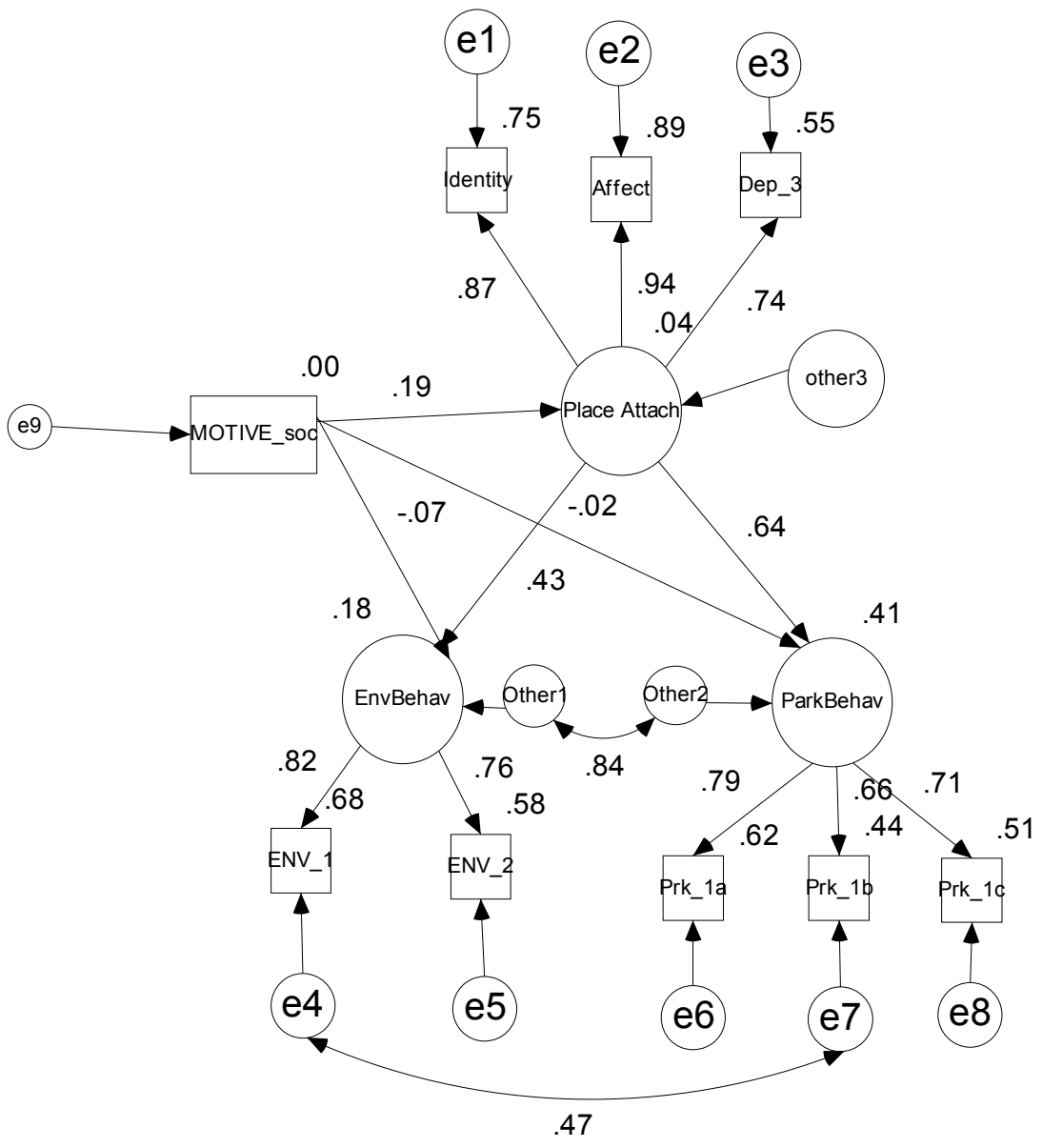
\*\*  $p < .001$ ; \*  $p < .05$

***Appendix C-18: Motives***

C-18a *Nature-related Motivations for Visit predicts Place Attachment and Pro-environment Behavioural Intentions* (n.s. paths: Motive → Park-Spec. Intentions; Motive → General Intentions)



C-18b Social Motivations for Visit predicts Place Attachment and Pro-environment Behavioural Intentions (n.s. paths: Social Motive → Park-Spec. Intentions; Social Motive → General Intentions)



*C-18 Motivations for Visit, Place Attachment and Pro-environment Behavioural Intentions Indicators: Correlations and Measures of Central Tendency (n = 323)*

	Ident	Affect	Dep_3	Nature	Activity	Social	Learn	Env_1	Env_2	Prk_1a	Prk_1b	Prk_1c
Ident	1											
Affect	.819**	1										
Dep_3	.714**	.631**	1									
Nature	.190**	.171**	.075	1								
Activity	.077	-.009	-.033	.000	1							
Social	.146**	.173**	.014	.021	-.009	1						
Learn	-.060	-.060	-.015	.227**	-.226**	-.155**	1					
Env_1	.331**	.289**	.277**	.063	.023	-.034	.074	1				
Env_2	.297**	.307**	.272**	.131**	.007	-.007	.030	.635**	1			
Prk_1a	.501**	.486**	.419**	.096	-.034	.181**	-.014	.520**	.465**	1		
Prk_1b	.355**	.357**	.349**	.036	.027	-.006	.021	.661**	.450**	.526**	1	
Prk_1c	.440**	.385**	.294**	.158**	-.011	-.028	.041	.510**	.530**	.539**	.421**	1
M	3.72	3.65	2.91	2.71	4.70	3.32	3.40	3.26	4.11	4.09	3.02	4.04
SD	.704	.660	.926	1.259	.695	1.285	1.177	.855	.659	.776	1.032	.784

Note 1: \*\* =  $p < .001$ ; \* =  $p < .05$

Note 2: Motivations correlation matrix produced from restricted case set (all respondents who gave the same rank of importance to two different motivations were removed. Final number of cases:  $n = 323$ )