TREE WISDOM: EXPLORING THE IMPACTS OF LEARNING EXPERIENCES AND BIOPHILIC CONNECTIONS TO TREES

BY
JENNIFER ANN FESCHUK

B.A. COM., LAVAL UNIVERSITY, 2003
GREEN BUSINESS MANAGEMENT, ALGONQUIN COLLEGE, 2009

a thesis submitted in partial fulfillment of
the requirements for the degree of

MASTER OF ARTS
IN
ENVIRONMENTAL EDUCATION AND COMMUNICATION

we accept this thesis as conforming
to the required standard

Dr. Alan Diduck, Thesis Supervisor
University of Winnipeg

Dr. Richard Kool, MAEEC Program Head
Thesis Committee Member
School of Environment and Sustainability

Dr. Chris Ling
Director, School of Environment and Sustainability

ROYAL ROADS UNIVERSITY
APRIL 2015
© JENNIFER ANN FESCHUK, 2015
Abstract

This thesis explores our relationship with trees. The aim of the study was to determine whether a select group of concerned residents from Winnipeg, Manitoba, Canada, lived significant learning experiences and demonstrated biophilic connections with trees. The data collection took place in a nature conservatory within a city park. 13 self-proclaimed tree lovers volunteered and were invited to step out of the chill of winter and into a controlled tropical forest. Elicited through semi-structured interviews, data was collected and coded into relevant themes. Transformative learning, where experiences lead to lasting behavioural change, and biophilia hypothesis which proposes an innate attraction to the living world, were the frameworks used to organize and analyze the discussions. Results revealed the power of experiential and affective modes of learning, leading to strong ecological identities and biophilic affinities for trees. As well, an aesthetic biophilic response to trees was seen as consistent throughout the data.
## Table of Contents

Abstract ............................................................................................................................................. 2

Table of Contents ................................................................................................................................. 3

Tables and Figures ................................................................................................................................. 5

Acknowledgements ............................................................................................................................... 6

Prologue ............................................................................................................................................. 7

Chapter 1: Introduction ......................................................................................................................... 10
  The Potential of Trees .......................................................................................................................... 10
  Research Question and Objectives ................................................................................................. 14
  Outline of the Thesis ....................................................................................................................... 15

Chapter 2: Literature Review ............................................................................................................... 17
  Humans and Trees .............................................................................................................................. 17
  Ecological Identity ............................................................................................................................. 19
  Nature Relationships .......................................................................................................................... 20
  Transformative Learning .................................................................................................................. 22
    The Learning Journey .................................................................................................................... 24
  The Biophilia Hypothesis .................................................................................................................. 26
  Summary ......................................................................................................................................... 30

Chapter 3: Methodology ....................................................................................................................... 32
  Setting the Stage ............................................................................................................................... 32
  The Trees of Winnipeg ....................................................................................................................... 33
  The Conservatory of Assiniboine Park ............................................................................................ 33
  Project Participants .......................................................................................................................... 34
  Data Collection ............................................................................................................................... 35
  Methodological Assumption .......................................................................................................... 36
  Interview Protocol ............................................................................................................................ 36
  Data Analysis .................................................................................................................................. 38
  The Learning Journey ..................................................................................................................... 39
  Biophilic Tendencies ....................................................................................................................... 41
  Limitations ..................................................................................................................................... 42
  Trustworthiness and Dependability of the Study .......................................................................... 43

Chapter 4: Results ................................................................................................................................. 45
  Level of Involvement with Trees Winnipeg .................................................................................... 45
  Participants’ Biographies .................................................................................................................. 45
Tables and Figures

Table 1: Types of learning modes used in the data analysis ......................................................... 40
Table 2: Types of learning outcomes used in data analysis ................................................................. 40
Table 3: Types of biophilic tendencies used in data analysis .......................................................... 41
Figure 1: Interconnections between learning modes and outcomes .............................................. 78
Figure 2: Instrumental-experiential learning and Scientific-Ecologicistic biophilic responses .......... 87
Acknowledgements

This project would not have seen the light were it not for the inspiration provided by the beautiful grounds at Royal Roads University. While running through the paths of the old growth forests, my thoughts and ideas took shape. My hope for a better world was born there. This, alongside the learning and sharing during the residencies, has truly been transformative for me. To all my fellow students and my instructors who have shared their hearts throughout this journey, I am truly thankful for your passion and spirit. A special thanks to Rick Kool and Liza Ireland whose constant enthusiasm for the MAEEC program will always inspire me to dream big.

I would also like to give thanks to my thesis supervisor, Alan Diduck, whose support and guidance were my rock throughout this journey. I am grateful for your continual willingness to support all my ideas and meanderings as I found my feet within the assignment. I appreciated your words of wisdom and our intense brainstorming sessions. Thank you for everything you’ve done.

A special mention also goes out to Trees Winnipeg and to all my project participants. Kerri LaFrance, executive director of the group, helped me to get the ball rolling and build my participant sample. As well, to everyone who participated in the interviews, I am humbled by our exchanges and discussions and feel honoured that you chose to entrust me with your hopes for a better world. Thank you for bringing your hearts to the interview.

Finally, this project could not have had any hope of seeing its completion if it were not for the constant support and encouragement of my family. My loving husband, Radek, who would build me up when I was down and push me when I needed pushing. You are my light and my strength truly, my other half and I am so lucky you found me. And to my mother, Connie, who never stops believing in me and is always willing to listen to the musings of my thoughts. I love and respect all that you are. Finally, to my favourite tree huggers: my two children, Alex and Sophia, you inspire me to aim high and never give up.
Prologue

What do you feel when you wander through the trees? What do you notice? Perhaps you detect changes in your breathing or maybe you can almost taste the fresh oxygen being supplied by them? Your eyes may stop to observe the different shades of green and textures of all the different foliage around you. Or perhaps you note nothing at all and simply revel in the calmness; suddenly your problems don’t seem so important, your squabbles are simply uninteresting and your mind slows to the pace of the leaves blowing in the breeze. The following project is an exploration of these sentiments.

I am overwhelmed with the excess of manufacturing I see around me. It seems that in our daily activities we are rarely allowed to experience something that was unaltered by humans. We are forever surrounded by the production and manufacturing of human ingenuity. I feel there is a void. When I look around, I crave a connection to something wild and natural. I long to rest my eyes on something that is alive and growing instead of processing and updating. I believe that there still exists a great love affair between humans and the living planet that surrounds us. I believe that we still yearn for that connection.

Upon starting this project, I felt as if everyone had a tree story. Whenever I mentioned my thesis topic, people would launch into their own tree story. At first, I worried that a project about tree connections would fall on deaf ears, but the more stories I heard, the more I was convinced of the potential of trees to influence our well-being. Curiously, my own tree story does not stem from a magical moment in my childhood, or from a particular inspirational person in my life. Where and how did I begin to look at trees in this way? I remember staring at the treed highways on numerous road trips. I loved the idea of escaping the city and hitting the road to watch as the blur of the trees allowed my thoughts to be free. I also remember a time when I
lived in Costa Rica doing conservation work for a small NGO and one particular moment when I ventured into the tropical forest and was forever changed. I had been in the city for a couple of weeks and was set to join the others at the base camp, a 5 km walk in the jungle. I hitched a ride from a trucker heading to the next town and was dropped off at the mouth of the path. It was a beautiful sunny day, warm and humid as is the norm in Costa Rica. I was alone, with everything I owned on my back and as I looked at the tree-lined trail, I tingled with the idea of wandering independently into the sea of green.

That solitary walk in the woods stands out in my memory as a moment when I saw a new way of understanding, a new way of seeing the trees. I remember how the sun shone on the leaves, I remember the stillness of the path and the sounds of my breathing along with the howler monkeys and scarlet macaws off in the distance. I remember looking up to the sky and thinking about my father who had passed away two years earlier, feeling him closer to me than ever before. I felt as if I had found my true self. And yet, I had no background rooted in these experiences. I did not come from a family that pursued nature or participated in any momentous nature camps, nor was drawn to the sciences of the ecosystems. How could I be so strongly affected by this walk in the woods with no prior teachings? Perhaps it has always been in me; perhaps it is in all of us? We simply lack the opportunities that allow it to penetrate into our minds and shape who we become.

Throughout this thesis journey I explored many concepts and felt inspired by the work of many people striving to compartmentalize and categorize the sentiments from that moment in the trees. While writing the following pages, I know I have grown and changed. I was on a journey to understand my own transformative moments and in turn passed through a new one. This thesis is a tribute to the powerful learning that changed me forever and my belief that we can all
experience it. My hope for this project is that it may be viewed as an attempt to reveal the complexities of our emotional reactions to trees. In doing so, may we add value to such a primal and innate connection and its importance for understanding how we relate to the living world that surrounds us.
Chapter 1: Introduction

The Potential of Trees

The consequences of human activities for the biosphere are manifest in diverse ways, including increasingly unstable weather patterns, the release of persistent pollutants, deforestation, serious environmental health concerns and increased numbers of threatened or endangered species (Dearden & Mitchell, 2005; Kates et al., 2001; Schlesinger, 2011). The enormity of the environmental crisis facing the planet ignites a discussion on a potential paradigm shift in our attitudes, beliefs and habits with respect to our relationship with the planet. As modern societies make use of natural resources as commodity (Orr, 1993), and “the global economy shift the power of decision from people and communities to corporation and financiers” (Korten, 2007, p. 11), there is a growing realization of the unsustainability of our current lifestyles and a fundamental disconnect from the natural world (Louv, 2008).

Industrialization and urbanism have contributed to overconsumption and an utter disregard of how our habits impact other living beings and the physical environment (Senge, Smith, Kruschwitz, Laur, & Schley, 2008). David Orr (1993) describes such consequences of modernisation and a shift toward “perpetual economic growth” as a fundamental change in how we see our interaction with the natural world. The need prescribed by industrialised society to turn the natural world into useful resources meant that nature was rendered into abstractions and production statistics (Orr, 1993). In a study on the importance of connections to nature in young people, Pyle (2003) describes the decline of interactions with nature as “the extinction of experience” that perpetuates the cycle of disengagement and separation from the very systems that give life. He points out that this alienation from nature will continue to grow as an ever-increasing amount of the day is spent indoors and connected to virtual networks. In another study
about mental well-being generated from a window view of a natural settings, Kaplan (2001) suggested that the consequences of this disconnect has an overall negative effect on sense of place and community.

Some authors, however, have written extensively on the importance of our emotional connection with nature. Nicholsen (2002), for example, discussed people relating to the natural world through an understanding of “mutual living silences”. This type of understanding goes beyond our actual physical interactions with the biosphere, but rather calls upon a deeper relationship, described as engaging in an understanding with another living being:

To hear nature speak in this way is not a matter of understanding specific cries of the animal or bird. Nor is it a matter of mere superstition or of conventional symbolism.

Rather, in perceiving the creature, we enter into a confluence with a deeper mystery in which both of us participate. (Nicholsen, 2002, p. 27)

An exploration of such a living silence was conducted by Chambliss (2013) in a study that evaluated levels of mindfulness in participants’ journals whilst observing a quiet nature experience. Results indicated that active contemplation in nature can improve connectedness with nature by generating feelings of affinity and empathy.

If such a deep connection to nature truly exists for some of us, then the origins of such emotional and affective relationships may be an integral component for the emergence of an eco-centric paradigm shift in modernized societies. Effective social change of this type will require transformation in governance, technology and economic structures (Dale & Hill, 2001). However, it will also require fundamental shifts in the values, beliefs, ethics and actions of individuals. My research explored such shifts, including the cognitive and affective dimensions of the connections that some individuals have experienced with the natural world.
Wilson (1984) developed the *biophilia hypothesis*, suggesting that humans have an intrinsic and everlasting bond with all living things, which draws us to nature and provides opportunities for profound ecological awareness. The notion is further described as “multiple strands of emotional responses” to our affiliation with other living organisms (Kellert & Wilson, 1995, p. 31). This idea was adopted in several studies that explore reactions to nature through the biophilia lens. One example is a study conducted by Matteson (2013) who analyzed the effects of classroom design based on the fundamentals of biophilia. The study demonstrated how contact with nature, even within a classroom setting, reduces stress levels and improves performance, attention and concentration. In another example conducted in the town of Tabor, Czech Republic where Těšitel, Kušová, & Bartoš (2001) researched the effects on residents of the housing-estates, satellite residences described as totally urbanized with no distinct characteristics or natural landscapes. Using biophilia as the framework for analysis, they concluded that such an absence of nature, even if only symbolically, can lead to a disengagement in the community, a lack of interest in the physical environment and limit the “pleasant existence” of the residents.

Such links to an innate connection to nature can also be considered when reflecting on how we relate to trees. More specifically, recent research has suggested that there is a powerful affinity for trees expressed by participants in urban forest studies (Hunter, 2011; Jones & Cloke, 2002; Jones, Davis, & Bradford, 2013). Trees are prevalent in our lives both physically and metaphorically. They are an integral component of urban planning and are often used as a symbol of wisdom and strength in poetry and art (Sommer, 2003). The biophilic nature of our relationship with trees can be observed in the value we place on their presence in our lives. Studies have shown that trees offer benefits to mental well-being, contribute to a sense of place
and to the development of personal identities (Jones & Cloke, 2002; Jones et al., 2013; Sommer, 2003).

Understanding the roots behind such profound relationships with trees can be deemed important for the development of our ecological identities and possibly a transition to more sustainable lifestyles. Through a comprehensive study on the value of trees in an urban setting, Sinclair, A. J., Diduck, J., & Duinker, P. N. (2014) demonstrated that those who have acknowledged an affinity for trees tend to favor environmental stewardship. Delavari-Edalat & Abdi (2010) also demonstrated that certain groups exhibited a strong attachment to trees. Participants in this study expressed a deep concern for the health and preservation of the urban forest. These are the quiet activists of sorts, who are manifesting a better understanding of a seemingly visceral draw towards the natural world. Such studies inspire a discussion about the potential of trees to initiate a social shift in our relationship with the planet. What’s more, positive experiences with trees could be used to create successful environmental communication and education strategies. By drawing attention to the notion of an existing universal affinity toward trees, where they are viewed as icons of strength, wisdom and endurance (Jones & Cloke, 2002), such values could contribute to stimulating increased ecological consciousness.

In order to draw on this potential opportunity, we can look to those who are actively engaged in tree preservation as a starting point and learn what drives them to be involved in such stewardship activities. The learning journey of such a person is, therefore, a promising area of research. Transformative learning theory offers significant potential in this regard as it involves a profound change in perceptions and modified frames of reference that reflect a more elaborated conception of the world around us (Diduck, Sinclair, Hostetler, & Fitzpatrick, 2012). For a learning experience to be transformative, the learner is said to have come to question their
current assumptions of reality. The learner’s worldview and their place in it is transformed (Merriam, Caffarella, & Baumgartner, 2012).

Concerned citizens who choose to get involved in local projects for the preservation of trees have at some level recognized the importance of trees and perhaps subconsciously tapped into a need to reassert their biophilic connection with them. Through various conservation activities, such as tree banding and tree awareness events, these people are demonstrating biophilic tendencies connecting them with the planet and more specifically with trees. Wilson (1984) describes biophilia as an integral part of our subconscious desires that have evolved as we have evolved. However, through significant learning experiences, a potentially long-lasting transformation can impact these biophilic desires. A transformative experience can shape the character and value-system of a learner resulting in a certain biophilic tendency to be favored. Whether an innate biophilic tendency instigates the learning or the learning experiences dictate which biophilic cravings are satisfied remains to be seen. No studies have examined this relationship between biophilic tendencies and transformative learning experiences by citizens actively engaged in tree conservation. Such an exploration could bring forth a fuller understanding of the existence of biophilia and its importance for our well-being and that of the planet.

Research Question and Objectives

To fill these gaps in the literature, this study explored linkages among engagement in stewardship activities, several types of associated learning outcomes, biophilic connections to trees and development of ecological identities. The work was done in collaboration with a grassroots community organization called Trees Winnipeg, a local environmental stewardship group mandated to engage in tree preservation activities. My main research question was:
To what degree is involvement in a local stewardship group linked to transformative learning experiences and better understanding of one’s biophilic connection to trees?

My expectation was that participation in Trees Winnipeg was caused by a transformative learning experience or resulted in transformative learning that enhanced a sense of connectedness with trees. Such an expectation could invite a bias on data collection. It was therefore important to maintain openness and ensure that these expectations were bracketed with my continued awareness of the limitations of the topic. These limitations along with my strategies to address this issue have been described in the methodology section of this project. With this in mind, my specific objectives for the study were to:

a) Describe the involvement of participants in a selected environmental stewardship group (namely, Trees Winnipeg);

b) Investigate the learning journey of these participants and explain the extent to which the experience was transformative; and,

c) Determine the degree to which participants’ experiences affected their sense of connectedness with trees within the context of the biophilia hypothesis.

Outline of the Thesis

To accomplish the goals set out in this thesis, the project is organized so to allow the reader to gain an understanding of the transformative learning and biophilia frameworks alongside an exploration of the participants’ narratives and stories. Chapter 2 reviews the literature I examined as it pertains to the objectives of the study, focusing on various definitions of ecological identity, transformative learning theory of Mezirow (1991) and the biophilia hypothesis introduced by Wilson (1984) and Kellert & Wilson (1995). Chapter 3 offers a detailed description of the methodology, taking time to draw attention to the nuances of the
methods that provided both clarity and ambiguity within the study. Descriptions of the research setting, data collection process, and considerations respecting process transparency shed light on why the selected methods were chosen. Chapter 4 compiles the results of the study. Using direct quotes from the data, participants’ learning journeys and biophilic tendencies are revealed. Chapter 5 summarizes and discusses the results. The final chapter wraps up the thesis, and includes insights specific to the field of environmental education and communication as well as recommendations for further research that could build on the results and conclusions of this project.
Chapter 2: Literature Review

This chapter provides a brief overview of human-nature connections and identities, focusing on biophilic tendencies in relation to trees and the potential interplay between such tendencies and learning experiences, including transformative experiences.

Humans and Trees

Recent urban forestry studies suggest that homeowners who have declared a positive relationship with trees demonstrate a greater environmental concern (Hunter, 2011; Jones et al., 2013). In an exploration of the effects of tree loss to urban homeowners, Hunter (2011) determined that such experiences tended to result in an increase in environmental stewardship, revealing the important role that street trees can have on personal identity. Likewise, solastalgia, a concept discussed by Albrecht, G. (2006; 2007) that describes the psychological distress of environmental change due to climate, suggested that a current disconnect from the planet may be an expression of such anguish towards the mistreatment of it. This type of research points to strong psychological human-nature connections. Additionally, Sommer (2003) wrote about the extent to which personal identity is affected by trees, in particular. His study explored local residents’ attitudes towards trees based on different psychological approaches put forth by various authors, including Darwinian approaches (Wilson, Kellert and Quantz), eco-psychology (T. Roszak), phenomenological approaches (Davies, Fulford, Tuan and Altman), affordance theory (Gibson) and depth psychology (Jung). Results emphasized the importance of sustained tree care in urban settings because of the positive relationships created with the trees and the community, recommending that “theories of human contact with nature should recognize the special characteristics of trees and their role in fostering individual and community identity” (Sommer, 2003, p. 201)
Another author offers insight into how human evolution has revolved around an important relationship with trees. Nadkarni (2008) suggests that humans and trees have been interconnected from the time when our evolutionary ancestors would effortlessly jump from branch to branch to our now consistent desire to be at the top of tall buildings and be at the height of the tree canopy. Further, in Louv’s (2012) exploration of the nature principle, he describes a steady and intense attachment to the woods as an example of the primal biological relationship that exists between humans and the natural world, providing benefits for improved learning and concentration.

Symbolically, trees represent another facet of our deep-seated relationship with the planet. Arbori-culture, the iconographic analysis of landscapes and the interpretation of symbols (Jones & Cloke, 2002), is used to describe the symbolic way in which we exhibit our relationship with trees. The application of tree metaphors in a variety of cultural constructs and religions demonstrates the extent of our emotional attachment to tree narratives. Referring to phenomenological approaches to tree attitudes, Sommer (2003) described how tree metaphors can be used to express values that raise human consciousness such as “permanence, stability, trustworthiness, fertility and generosity” (p. 196). The considerable variation in how people utilize tree symbols through art, religion and social sciences confirms how such an icon could play a part in increasing sensitivity towards the use of natural resources and conservation efforts. Such cultural integration of trees in our value systems and worldviews provides an opportunity for conversations about the values and beliefs that society places on our concerns for nature (Jones & Cloke, 2002).

In modern societies, which have in many respects moved a long way from direct spiritual or symbolic connection with trees, this symbolism of trees as icons of nature is of the
The fact that the planting of trees so often constitutes the symbolic as well as the material response to environmental issues represents a significant manifestation of the pivotal position of the tree in lay, popular, professional and political discourses of nature-society relations. (Jones & Cloke, 2002, pp. 38-39)

This thesis explores similar phenomena attempting to delve into certain aspects of such an influential connection with trees.

**Ecological Identity**

In order to offer a thorough exploration of positive human-tree relationships, it is important to clarify the constructs of ecological and environmental identity for the consideration of this project. Such broad terms have been explored and explained by several authors. The distinction between ecological and environmental identity itself can be quite ambiguous. In this case, the definitions I explored were interrelated and for the purposes of this thesis are considered to be synonyms. Thus, identity has been described by Clayton (2003) as a broad term that is all-encompassing of the layers and constant change of a person involved in various social interactions and conflicts. Thomashow (1995) refers to identity as a complex notion of how people construe themselves via personality, values and actions.

More specifically, Thomashow (1995) investigated the elements of an ecological identity through research with his students and their exploration of certain experiences. He extracted data from three specific areas of personal identity to populate a definition of ecological identity. First, “childhood memories of place, second, “perceptions of disturbed places and third, “contemplation of wild places” (p.7). As a result, he defines ecological identity as a relationship with the earth in that “nature becomes an object of identification”. Identity is formed based on the person’s “connection to the earth, perception of the eco-system and direct experience of
nature” (p. 3). Additionally, in an auto-ethnographic exploration of ecological identity, Parker (2008) offers insight through his personal journey of discovery of self. He considers ecological identity to be an expansion of “the borders of self to include the natural environment and an identification with it” (p. 12). Another view of the topic can be understood from the work of Clayton (2003) who presents the concept of environmental identity as a similar “interplay between the social and environmental” (p. 11). Clayton defines such as a way in which people form a sense of connection with the non-human world; that is how we perceive and act toward the physical world. With these concepts in mind, this thesis presents findings on a profound relationship with trees as one element of a developed ecological identity.

**Nature Relationships**

Technological advances continue to transform our world and how we interact with it. However, in his book, *The Nature Principle*, Louv (2012), implies that during a time of environmental, economic and social transformation, the future will belong to those leaders will succeed in becoming nature-smart; that is those who truly understand the significance of living in harmony with the natural world. Continuing in the same vein, positive psychological repercussions such as improved mindfulness achieved from outdoor nature experiences are being recognized as justification for nature-based interventions (Wolsko & Lindberg, 2013). Such statements become important when we consider the emergence of a paradigm shift in behaviours and worldviews. The information era allows us to become more aware of our capacity as a species to destroy, extinguish and completely remove elements of the complex web of nature’s systems. The acknowledgment of such power, of which we don’t fully know the consequences, can result in feelings of despair and helplessness (Koger & Winter, 2011). However, by stimulating a revival of our emotional connections with nature and their positive repercussions
for our psyche, we can create hope and confidence in our capacity for positive innovation and transformation. (Clayton & Opotow, 2003).

Achieving such an eco-centric paradigm shift is not easy because changes in behaviour and culture happen ever so slightly. However, an understanding of the origins behind connections with nature can inspire a revival of protective and nurturing relationships with the planet (Clayton & Opotow, 2003). As outdoor recreation and nature experiences become acknowledged as providing benefits to overall health (Hartig et al., 2011), these elements of an ecological identity are increasingly important. Since an ecological identity is considered to be influenced by the extent to which the person considers “nature and non-human natural entities to have standing as valued components of their social and moral community” (Clayton & Opotow, 2003, p. 8), establishing a well-founded relationship with the natural world becomes a key component to the strategy for change. As mentioned by Nadkarni (2008), these connections are at the heart of pro-environmental policies and decision making. “Because environmental problems are increasingly important, and because environmental issues appear to engage moral reasoning and beliefs in a unique and powerful way, we need a better understanding of the connection between environmental issues and identity” (p. 19).

Significant life experiences and connections to nature have been explored as a means in understanding what drives environmental educators (Palmer, Suggate, Robottom, & Hart, 1999). Studies attempting to understand what drives ambition in environmental leaders have demonstrated further importance in achieving a well-developed relationships with nature. For example, a study conducted on the health benefits of nature experiences by Nilsson et al. (2011) noted that “the motivation to engage in environmental activism may be rooted in positive experiences in nature” (p. 138). Also, an urban forest study such as that of Hunter (2011)
presented examples of “people’s perceived relationship with nature and the role of these perceptions on stewardship and sustainable lifestyles” (p. 132). As well, in another study where *environmental sensitivity* in environmental educators was explored, Chawla (1998) noted that nature experiences was but one of many significant life experiences that contribute a genuine concern for the environment. She points out that similar to successful ecosystems where resilience comes from an abundance of diversity and adaptations to change, a variety of influential experiences and social interactions such as time spent in nature and significant mentors in the field combine together to ensue developed ecological identities. If a heightened ecological identity is shown here as being fuelled to some degree, by a person’s relationship with the natural world, the origins of this attachment become an important ingredient for initiating such identity development in others.

**Transformative Learning**

The development of a strong ecological identity can transpire in a variety of ways. The emergence of an environmental identity is, in part derived from personal experiences with the natural world as well as the social forces with which we are engaged (Clayton & Opotow, 2003). Hence, a person’s genuine concern for environmental issues and strong motivations to act on them can grow through significant life experiences (Chawla, 1998). Learning theory can be helpful to explain this growth.

When considering learning by adults, Merriam and Bierema (2013) offer a comprehensive guide to understanding how and why adult learning takes place. In the knowledge society, the adult learner is faced with an array of opportunities for learning. Formal learning environments, such as educational institutions in the traditional sense, remain dominant among adults. Yet, informal, experiential learning that takes place in everyday situations often has a
longer impact (Merriam & Bierema, 2013). As well, non-formal learning experiences, defined as learning facilitated by community and civil society organizations, can also have a profound influence on people. Although somewhat vague, this framework of formal, non-formal and informal learning has been used by many adult learning theorists (Merriam & Bierema, 2013) and has been adopted in this research.

For my purposes in exploring the experiences of an eco-engaged group of people, transformative learning theory provides highly promising concepts. Diduck et al. (2012) reviewed research in environmental governance showing how transformative learning theory could explain profound changes in values that guide aspirations and socio-cultural presuppositions. For example, the study demonstrated that participation in tree conservation efforts and past experiences helped shed light on how members perceive their connection to the natural world. Such activities have the potential to be quite powerful, resulting in a transformation of presuppositions, perspectives and one’s sense of place. That is, adult learning in the context of conservation volunteerism has the potential to be transformative (Sinclair, Spaling, & Collins, 2011).

A transformative experience can have a significant impact on one’s understanding and worldviews, influencing future interactions and decisions (Clark, 1993). Learning in adulthood, formal, non-formal and informal, is vital to the transformation of individuals and social institutions, and is an essential element in our path towards a sustainable society (Keen & Mahanty, 2006). For an experience to be considered transformative, frames of reference are changed in such a way that a critical assessment of one’s beliefs and assumptions and their supporting reasons are put into question (Diduck et al., 2012). The outcome of this reflection process is ideally a more independent, open-minded, socially-conscious learner who critically
evaluates the prevailing ideologies and actively participates in guiding social change (Sinclair & Diduck, 2005). As such, transformative learning is viewed as a powerful tool for explaining and inspiring individual and collective social action with potential to contribute to a more sustainable society (Sinclair et al., 2014). The manner in which the transformative learning takes shape varies according to the depth of one’s experience. Profound changes in a person’s beliefs and assumptions can be the result of “acquiring new frames of reference, transforming points of view or transforming habits of mind” (Diduck et al., 2012). These and other constructs from transformative learning theory, namely instrumental and communicative learning, defined below, were employed in data analysis.

**The Learning Journey.**

Adopting an integrated approach, I use the term learning journey to encompass modes of learning as well as learning outcomes. By modes, I mean formal, non-formal, and informal learning experiences and selected variants, described further below. By outcomes, I mean the cognitive, conative and relational changes resulting from the learning experiences.

Based on the work of Merriam and Bierema (2013) and modifications tailored for my research topic, a *formal-schooling learning* mode is learning facilitated by a deliberate teaching occasion, schooling, training or capacity-building experience based on educational institutional methods. A *non-formal-community-based learning* mode is learning generated from a community influence such as family, a community organization or other societal institution. Power and sway from the important people and groups in the person’s life can generate a learning experience from teaching moments within the community. An *informal-experiential learning* mode is defined as learning from hands-on experiences, such as involvement and interactions with the natural world. This involves acute discovery and observation of natural
systems in which details and complexity are revealed through a lived experience. Fourth, an adult learner can also undergo an experience as *embodied or affective* (Moyer, Sinclair, & Diduck, 2014). This mode of learning is used to describe enhanced emotional experiences with trees and is defined as learning obtained from sensual or emotional interactions with trees or other aspects of nature. Finally, a *transformative* mode can be identified and is described as an experience where ideas and perceptions are challenged by new ones, potentially leading to significant learning. Through discourse with others and engagement in the world, longstanding change in thought and action may start to take place (Mezirow, 1991). Observations and concrete experiences allow for new reflections and disorientating dilemmas surface resulting in critical self-reflection about current values and worldviews (Mezirow, 1991).

Learning *outcomes* include various types of results. As described by Mezirow (1991) and further explained by Moyer et al. (2014), a learning outcome can be *instrumental*; meaning empirical learning, new insight into cause and effect, or problem solving where new skills and theoretical knowledge are gained. Outcomes can also be *communicative*; meaning new understanding through language, expression, negotiation, feelings, beliefs, resolving conflict and getting better at making yourself understood to others. As well, the pivotal *transformative* outcome occurs when deep-seated alterations in perspectives and beliefs generate an enduring change that affects the whole person, both in thought and action. These types of outcomes are not mutually exclusive and neither are the modes presented earlier. These outcomes and modes provided an important part of my analytic framework for the thesis, and are summarized in Tables 1 and 2 in Chapter 3.
The Biophilia Hypothesis

The biophilia hypothesis was also used in the analysis. Originally proposed by Wilson (1984) and adapted by Kellert and Wilson (1995), biophilia “proclaims a human dependence on nature that extends far beyond the simple issues of material and physical sustenance to encompass as well the human craving for aesthetic, intellectual, cognitive and even spiritual meaning and satisfaction” (p. 20). Human nature itself connects our psyche to the living systems of the planet. Evolutionary constructs of our being evoke an inherent lure towards all that is living (Kellert & Wilson, 1995). The expressions of biophilia manifests in our social behaviours, perceptions, attitudes and values in a variety of ways. When we experience the wonder and awe provided by a beautiful sunset or rejuvenation from a walk through the woods, those experiences are considered to be biophilic in nature. The hypothesis proposes that we all have an intrinsic human need to affiliate with various forms of life (Kellert & Wilson, 1995). Our encounters with nature, as Kellert explains, spawn an assortment of involuntary responses.

These and a myriad of other encounters with the natural world reflect our fundamental affinities for nature and life. These obvious, occasionally subtle and sometimes barely apparent human responses and interactions reflect our diverse material, emotional and psychological ties to the natural world. (Kellert, 2003, p. 5)

Various authors have written about how humans are drawn towards creatures and lifeforms that remind us of ourselves (Keri, 2007; Suzuki, 2007), as well as to the complexity of biological diversity that we experience only as a part of nature (Chambliss, 2013; Gullone, 2000; Kahn, 1997). We are often incapable of resisting an attraction to other forms of life and it stirs in us a strong and powerful emotional response (Orr, 1993). To offer further clarity and structure to these emotional responses, Kellert (1995) summarized nine tendencies based on physical,
emotional and intellectual responses. The biophilic tendencies are referred to as utilitarian, naturalistic, ecologic-scientific, aesthetic, symbolic, humanistic, moralistic and dominionistic.

This framework was further considered, with a specific focus on our relationship with trees, by Delavari-Edalat & Abdi who illustrated the view that a natural pull towards the presence of trees reflects certain biophilic affinities in our subconscious. The use of biophilic tendencies as a framework provides validity since it has been designed to “avoid the inevitable suggestion that our exploration is but the disguised attempt to promote a romantic idealization of nature” (Kellert & Wilson, 1995, p. 21).

Using Kellert and Wilson (1995) as a guide, what follows is a summary of the biophilic tendencies used in this study (also see Table 3, Chapter 3). The descriptions of each tendency are derived from Kellert and Wilson (1995) but tailored to the specific topic of trees to suit this study.

A utilitarian tendency refers to the physical benefits derived from trees where their material value and how they benefit human knowledge and scientific discovery is emphasized. Utilitarian responses to nature are based on the assumption that humans are on a constant quest to exploit the Earth’s resources.

The symbolic tendency views trees as a means to facilitate communication and thought. The human need to describe complex differentiations in language is made easier by the rich textures of the natural world. The codes offered by nature are used to retrieve ideas for language.

The ecologic-scientific tendencies are bound together as they represent the motivation and interest for precise study and systemic inquiry. However, they differ in that the ecologic tendency’s focus is on the interconnections of materials and energy within the natural systems of the world. Essentially, the tree is viewed as part of a larger ecosystem and an acute awareness of
this generates a respect for trees. In contrast, the *scientific* tendency’s focus is on the physical and mechanical function of the biophysical world, in this case, the trees. Here, the wonder is found in the trees’ complexity as a living organism.

The *aesthetic* tendency describes the details of trees as forms of physical beauty. The expression of awe and gratitude is generated from a momentary perceived sense of inadequacy of human-made beauty. An innate reaching for a seeming idealism found in nature. Harmony and symmetry is considered an aesthetic tendency. The symbolic uses and cultural rituals involving trees encompass this tendency in a way that added value is placed on the splendour of the natural world.

A *naturalistic* tendency is a deep-rooted satisfaction from contact with trees, where fascination and wonder are generated from intimate experiences. An awareness of mental well-being and a stimulated curiosity towards the mystery of the natural dominate responses.

Similarly, a *humanistic* tendency is a deep humane attachment to trees. Feelings of love and care are expressed, and humanized altruism is described to a point of the tree achieving relational status, not unlike family members.

Breaching into a more spiritual realm of responses, the *moralistic* tendency encompasses a reverence and ethical responsibility towards the trees. There is an understanding of the reciprocity that exists between humans and nature that serves as an inextricable link that binds them.

*Dominionistic* tendency describes a desire to master the trees. Although sometimes in a destructive tone, it is also conveyed as a realization of the innate struggle to survive of all living things, including humans. Just as the predator understands her prey, there is a soft but strong respect that lies in the dominionistic tendency towards trees.
Finally, Kellert and Wilson (1995) mention the *negativistic* tendency where fear and alienation from other living things manifests in a form of antipathy towards nature. This tendency, though noted was not relevant to the study and therefore not used for coding (see Chapter 3).

In response to biophilia as a hypothesis, other authors have attempted to measure this unique and “intimate association with the natural environment” (Kellert & Wilson, 1995, p. 21). Since Wilson’s (1984) original vision was delivered to the academic community, the human draw towards nature has been examined in different ways with various analytic frameworks (Mayer & Frantz, 2004). These studies differed from Wilson’s proposal in that they developed scales as a means to operationalize such an attachment to nature instead of offering simply an explanation of the biological connection. One example by Nisbet, Zelenski & Murphy (2009) is a study that puts forth a measurement scale of an interconnectivity with nature. *Nature Relatedness* is described as “the cognitive, affective and physical relationship individuals have with nature” (p. 719). The study explored a variety of correlations between connection to nature and different personality traits. As well, the data revealed a correlation between feeling connected to nature and engagement in environmentally responsible behaviours. The continuous development of complex measurement scales explaining how and why we are drawn to the natural world attests to the importance of nature-human connections as a predominant spot at the forefront of the environmental crisis.

The biophilia hypothesis further serves to benefit the area of environmental education and communication as a phenomenon that could offer clarity on the importance of a positive relationship with nature to improve message and learning retention. The journalist, Richard Louv
(2012), found that research in education was emphasizing the importance of relating to nature for the design and development of education systems.

Whether conducted on adults or children, the growing body of research associating learning ability with time spent in nature does have implication for teaching methods at all levels, as well as implications for the design of school grounds and buildings… This research also suggests that individuals can proceed on their own to gain a natural intellectual and creative advantage by tapping into nature. (p. 31)

Summary

This thesis delved into the emotional realms of our potential attachment to and love of trees and how these affinities can impact individuals’ identities. In doing so, the project built on the academic literature on learning modes, transformative learning, and biophilic tendencies. It also adds to the literature on ecological identities. Clayton & Opotow (2003) explain that strong relationships with the natural world can impact and produce effective results for positive change.

Understanding identity and its role in mediating behaviour toward the natural world not only has provocative implications for research, but also has important practical implications. If we better understand what makes people passionate about the environment [such as learning journeys and biophilia], we can understand the psychological mechanism capable of fostering protective environmental policies and behaviour. (p. 2)

I found no studies that have considered biophilia as a framework that explains the development of an ecological identity through the lens of a transformative learning model. Drawing on biophilia and transformative theory and how they interact serves to enhance both frameworks by adding empirical and conceptual richness to them. The melding of the two
frameworks offers a unique perspective and approach in considering the positive impact of a well-developed relationship with trees.
Chapter 3: Methodology

Setting the Stage

Adorning the streets of many residential communities in Winnipeg, Canada, mature elm trees are the pride of the city’s residents. Residential property values continue to increase and the trees are often viewed as contributing to this trend. In the early 1940’s, the southern portion of Manitoba was estimated to have approximately 20 million elm trees (Trees Winnipeg, 2013). Unfortunately, Dutch Elm Disease (DED) and other infestations have been increasing in Winnipeg since 1975. Approximately 4,000 trees annually over the last 10 years have been lost due to DED (Trees Winnipeg, 2013). This is a staggering statistic. The City of Winnipeg invests over $2 million annually in the DED control program in order to provide proactive treatment to threatened trees (City of Winnipeg). In response to such concern for these and other urban forests in the city, an environmental non-governmental organization (ENGO) named Trees Winnipeg advocates for the protection and conservation of trees in the city and province wide. With approximately 650 members and volunteers, the group’s constituents were intriguing participants for my research. Along with remediation for DED, the group also works to slow infestations from cankerworms and other potentially harmful insects. September and October is tree-banding season and various members of Trees Winnipeg are involved in preparing the trees. A band, consisting of a layer of tanglefoot paste, a sticky organic substance, is wrapped around the trunk to stop the cankerworms and some other insects from climbing up, feeding on the leaves and weakening the tree. Elm Bark Beetle that often carry spores of the DED disease are less likely to make their way up the tree and the tree stands a better chance of fighting off those that may fly in. (Trees Winnipeg, 2013). This type of intervention for the trees of Winnipeg is tedious and time-consuming requiring considerable engagement from members.
The Trees of Winnipeg

The harsh climate of Winnipeg, Manitoba is not for the faint of heart. A tree that can survive through the winters is strong and mighty indeed. The amount of tree coverage in what is almost a northern desert is surprising. Residents boast with pride at the diversity and strength of the tree canopy of Winnipeg. There are approximately 8 million trees within the urban forest of Winnipeg including but not limited to oak, elm, ash, poplar, birch, spruce, pine and cedar (City of Winnipeg).

Since 1992, Trees Winnipeg, previously known as The Coalition to Save the Elms, has been advocating and actively working to preserve and protect the urban forest of Winnipeg. Their mission is to provide public awareness and education on the importance of protecting the trees of Winnipeg. The membership includes residents from all areas of the city and within the province. Most have indicated that their involvement with the group is out of concern for the trees on their property and the urban forests of Winnipeg. They have contacted the ENGO for banding services or participated in volunteer activities and educational seminars.

The Conservatory of Assiniboine Park

The conservatory of Assiniboine Park has been open to the public for over 100 years, and this where I conducted the interviews for the thesis, described further in the next section. It is a landmark of the city’s history and houses over 8,000 plants, flowers and trees, some as old as the building (McLaren, 2014). Further, recent news announced that the conservatory is scheduled for destruction along with most of the trees living inside (McLaren, 2014). Participants who knew of the news conveyed their heartbreak and sense of loss throughout the interview.

The Palm room and display area at the conservatory of Assiniboine Park are an indoor natural oasis and helped during the interviews to create an environment for an inspirational
discussion about nature. There were several secluded benches, which provided a relaxing and enjoyable location. The sights of children enjoying the room, the smells of the blooming flowers, the humid air and the sounds of running water all contributed to an enriching sensory experience for both the participants and myself.

Since the research topic dealt with the depth of emotional connections with trees, the questions themselves were only the beginning of the exchanges I had with the participants. In order to address the sensory experience of the interview, the conservatory of Assiniboine Park was purposely chosen as a location for the interview. To remain true to the objectives of the project and create an enriching experience for the participants, interviews needed to be conducted in a setting that offered inspiration from nature. The goal was to draw out the sense of attachment and love of trees in the participants. It was therefore necessary to conduct the interview surrounded by such a setting. Unfortunately, the harsh winters of Winnipeg prevented the research from being conducted outside in a local park, for example. The conservatory, although a controlled tropical representation and only a simulated natural environment, served as an acceptable setting.

**Project Participants**

In collaboration with *Trees Winnipeg*, the group’s members and volunteers were requested to participate in the study. A flyer was inserted into a member-wide newsletter mail out. Also, within the newsletter, the organization endorsed the project and encouraged members to participate. Those who were interested were invited to contact me via email or phone and an interview was scheduled. There were no filters placed on the candidates who participated in the study. Informants were selected on a first come basis regardless of their level of involvement with *Trees Winnipeg*. As a result, participants represented a variety of levels of support for *Trees*
Some were described as “clients”, in that they paid Trees Winnipeg to band their trees, while others were more actively engaged in annual volunteer activities held by the group. Pseudonyms are used and specific details are not given to protect the identity of the participants.

Given the qualitative and constructivist nature of the project, the backgrounds and social constructs of each individual greatly influenced their interpretations of the interview questions. Evidently, each participant had a different set of internal rules and a participant with an acute understanding of the biology of trees or perhaps someone who has been employed to cut down dying trees may offer a different response based on such backgrounds. Essentially, as mentioned by Hollway & Jefferson (2000), responses to questions are greatly determined by the complex issues that make up the individuality of each participant. Because of this, Chapter 4 begins with brief biographies of the 13 research participants.

**Data Collection**

Due to the qualitative nature of the research, I was involved in “a sustained and intensive experience with participants” (Creswell, 2013, p. 177), and this created the potential for interpretive bias based on the manner in which the relationship between myself and the participant developed. Such that, the interview was subject to the person’s ease in expressing if any, emotional attachments to trees. Moreover, the intensity of the interview setting became crucial to the stories the participants told. Throughout the data, there were numerous referrals to the location. The proceedings leading up to the actual questions were maintained as much as possible consistent for each participant. By standardizing in this way, the proceedings I attempted at maintaining a rigorous method of extracting data. Upon arrival, I offered a quick greeting to the participant outside and then we both entered the conservatory, secluded and sheltered from the harsh winter of the city. Because the topic was so rooted in affective
relationships, the sensorial aspect of the conservatory likely contributed to the manner in which the questions were heard and understood. In creating an interview experience that embodies the topics being discussed, a larger more holistic picture of the project came into view (Creswell, 2013). As well, the topic is such that I believe the interview was considerably influenced by the location and results would have been considerably different had it taken place in a setting that did not incorporate such sensorial add-ons.

**Methodological Assumption**

An important methodological assumption I made was the validity of self-reported data on formative learning experiences and fundamental connections with trees. To help protect against threats to validity, I standardized the interview procedures, as noted above, and shared meanings of key terms with the participants in a consistent manner. That is, the questions were posed in the same way and with the same clearly established vocabulary (Hollway & Jefferson, 2000). To further bolster validity and ensure transparency, I would often repeat words put forth by the participants in order to create a flow into the next question, as well as guide the person toward the desired topic. This, in turn, drew attention to elements that related to the objectives of the project, thus allowing for further explanations and greater depth of discussion.

**Interview Protocol**

The questions were designed to initiate a rich story and narrative. My research utilized the Free Association Narrative Interview (FANI) method of qualitative analysis as defined by Hollway & Jefferson (2000). Such methodology allowed for a comprehensive collection of narratives that shed light on my research question and objectives. Questions about nature experiences and queries into seemingly obvious matters were posed to initiate discussions. The goal was to have the obvious, but untold, be told. When the participant was asked to retell a story
of being in the natural world, I was seeking explicit evidence of biophilia or transformative learning. Such indirect lines of questioning can create a situation that is specific to the individual and how they respond (Hollway & Jefferson, 2000).

In using the narrative method (Hollway & Jefferson, 2000), the experience of the interview itself increased its meaning. Since I conducted all the interviews, I became the control ensuring stability in the process. However, each participant related differently to me, and the dynamic of the exchange heavily influenced the level of depth obtained in the discussion. It became essential for me to be a good listener as the interviewee took on more responsibility to ensure clarity of responses and their meaning (Hollway & Jefferson, 2000).

The questions aimed to address each objective by exploring past learning experiences and the emergence of biophilic tendencies. The interview questions were designed to initiate an emotional response. The following are the interview questions in the order they were asked:

1. Please share your motivations behind becoming a Trees Winnipeg member.
2. What type of activities have you participated in with Trees Winnipeg?
3. Which of these have you found the most rewarding?
4. What have you learned about yourself from these experiences?
5. Do you feel it’s important to take care of the trees in Winnipeg? Why?
6. What kind of nature activities do you enjoy and why?
7. Do you feel it is important for people to be in contact with the natural world? Why?
8. What do you think is the most important current environmental issue right now and why?
9. Do you have any final comments or questions for me?
The order of the questions was of importance. The first question is generic and follows the line of questioning for a traditional interview (Hollway & Jefferson, 2000). It served to address the first objective of the project. More importantly, it served as an introduction, allowing the participant to get comfortable with me, the style of questioning, and the interview location. The results varied here since some subjects had significant stories about their involvement with Tress Winnipeg, whereas others did not.

Once the connection had been established, I used my personal judgement to decide when to introduce the synopsis of the project and its conceptual frameworks. The deciding factor was based on when the participants began to touch on specific biophilic tendencies unknowingly. Without describing the specifics of the nine tendencies of biophilia or constructs of transformative learning, I would then present a broad overview of the ideas and awaited further responses. This overview was explain in a manner that was consistent throughout each interview. The participants then continued to address the remaining questions through the lens of the frameworks presented. This was beneficial because it allowed the participants to elaborate further and enter into a more in-depth discussion.

Two pilot interviews were conducted to test the effectiveness of the interview questions. The interviews were approximately 60 minutes each. Further, my personal reflections regarding the non-verbal communication and general mood of the discussion were also noted immediately following each interview. This information was used to further develop the findings and conclusions section of this project.

**Data Analysis**

Using a framework from transformative learning theory Merizow (1999) (Tables 1 and 2) and the biophilic tendencies proposed by Kellert and Wilson (1995) (Table 3), relevant themes
were derived based on an initial grounded analysis. This qualitative method of analysis meant that these theoretical concepts were pre-determined as relevant to the topics in question. Categories were determined and labeled, the data was then reviewed and organized “into segments of text before bringing meaning to the information” (Creswell, 2013, p. 186). Responses were then coded and integrated into the themes, which allowed for conclusions and findings that speak to the research question and objectives.

The coding process was conducted using the proposed theories based on a phenomenological analysis (Creswell, 2013), whereby in looking at significant statements or descriptors that were recorded, specific evidence of transformative learning and biophilia became explicit. The tables described below were used as word-guides to help determine into which category such statements were classified. Each coding category contains specific descriptors and definitions, which helped achieve consistent coding. The coding word-guide is seen in the Annexes section. Finally, by using a triangulation method (Hollway & Jefferson, 2000) of comparing several similar statements and descriptors, thus creating of convergence of perspectives, I worked to detect the essence of the discussions based on discrete text units in the interview transcripts and my interpretation of the combined sources (Creswell, 2013).

**The Learning Journey**

Tables 1 and 2 are based on the work of Mezirow (1991), Diduck & Mitchell (2003), Diduck et al. (2012), and Moyer et al. (2014), and were used for analyzing learning journeys. The journeys were examined using a two-pronged approach. Initially, the *mode* of learning was identified as the actual learning activity and by which means the learning had been facilitated (Table 1). The second component was the learning *outcome* (Table 2), where the result of the learning mode was recognized in the manner in which participants explained why the particular
experience was meaningful and in some cases potentially transformative. Since the distinction between these components was often blurred, there was often an overlap of the two. For this reason, interconnections between modes and outcomes were also analyzed, which helped illustrate the overall impact of the learning journey.

**Table 1: Types of learning modes used in the data analysis**

<table>
<thead>
<tr>
<th>Learning Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal-schooling</td>
<td>Learning facilitated by a deliberate teaching occasion, schooling, training and capacity-building experiences based on educational institutional methods.</td>
</tr>
<tr>
<td>Non-formal (community based)</td>
<td>Learning generated from a community influence. Family community, social community, societal community. Power and sway from the significant and important people in the person’s life generated a learning experience from teaching moments within the community.</td>
</tr>
<tr>
<td>Informal-experiential</td>
<td>Learning from hands-on experiences, interacting with the natural world to a level of engaged involvement. Acute discovery and observation of the systems of the natural world, the details and complexity is revealed through a lived experience. New reflections are generated based on observations and concrete experience.</td>
</tr>
<tr>
<td>Affective-embodied</td>
<td>Learning obtained from interactions with the body and its senses with other trees or objects of nature, presence and engagement.</td>
</tr>
<tr>
<td>Transformative learning</td>
<td>Ideas and perceptions are challenged by new ones, often leading towards a path of significant learning. Involves discourse with others, engagement in the world, observations and concrete experiences, disorientating dilemmas, and critical self-reflection about current values and worldviews.</td>
</tr>
</tbody>
</table>

**Table 2: Types of learning outcomes used in data analysis**

<table>
<thead>
<tr>
<th>Learning Outcome</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instrumental</td>
<td>Empirical learning, cause and effect, problem solving, new skills and theoretical knowledge.</td>
</tr>
<tr>
<td>Communicative</td>
<td>Gained understanding through language, expression, negotiation, feelings, beliefs and resolving conflict. Making yourself understood to others.</td>
</tr>
<tr>
<td>Transformative</td>
<td>Deep-seated alterations in perspectives and beliefs that generate an enduring change that affects the whole person, both in thought and action.</td>
</tr>
</tbody>
</table>
**Biophilic Tendencies**

Table 3 was developed using the writings and discussions of Kellert & Wilson (1995). The ideas were further guided using the research conducted by Delavari-Edalat & Abdi (2010).

**Table 3: Types of biophilic tendencies used in data analysis**

<table>
<thead>
<tr>
<th>Biophilic Tendency</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Utilitarian</strong></td>
<td>Describing the physical benefits derived from trees, their material value is emphasized and the benefits to human knowledge and scientific discovery. Based on the assumption that humans are on a constant quest to exploit the Earth’s genetic resource base.</td>
</tr>
<tr>
<td><strong>Symbolic</strong></td>
<td>Describing trees as a means to facilitate communication and thought. The natural world is a rich and textured system facilitating human need to describe complex differentiations in language. Nature as codes by which language retrieves ideas</td>
</tr>
<tr>
<td><strong>Ecological-Scientific</strong></td>
<td>Describing a motivation and level of interest for precise study and systemic inquiry. The level of interest is more emphasized on the interconnection and flow of energy and materials with the natural systems of the world. The awareness generates a cautious respect for trees because of an understanding of system’s requirements.</td>
</tr>
<tr>
<td><strong>Ecologistic</strong></td>
<td>An acute recognition of the organizational structure and complexity of trees as a part of a larger ecosystem. The level of interest is emphasized on the physical and mechanical function of the biophysical world. A focus on the parts of nature instead of the entire ecosystems. The wonder is found in the trees’ complexity as a living organism. A deep-rooted satisfaction is gained from experiencing the complexity of trees themselves and a capacity for precise observation is developed.</td>
</tr>
<tr>
<td><strong>Scientific</strong></td>
<td>A heightened awareness of the mental and physical appreciation of interacting with trees. A stimulated curiosity and craving towards the mystery of the natural world. Relaxation, peace is derived from observing the diversity in colors, patterns and designs of the trees.</td>
</tr>
<tr>
<td><strong>Aesthetic</strong></td>
<td>The aesthetic tendency describes the details of trees as forms of physical beauty. The expression of awe and gratitude is generated from a momentary perceived sense of inadequacy of human-made beauty. An innate reaching for a seeming idealism found in nature. Harmony and symmetry is considered an aesthetic tendency. The symbolic uses and cultural rituals involving trees encompass this tendency in a way that added value is placed on the splendour of the natural world.</td>
</tr>
<tr>
<td><strong>Naturalistic</strong></td>
<td>Describing a satisfaction from contact with trees, where the sense of fascination, wonder and awe is generated from an intimate experience with trees/nature’s diversity and complexity. A heightened awareness of the mental and physical appreciation of interacting with trees. A stimulated curiosity and craving towards the mystery of the natural world. Relaxation, peace is derived from observing the diversity in colors, patterns and designs of the trees.</td>
</tr>
<tr>
<td>Category</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Humanistic</td>
<td>Describing feelings of deep human-like emotional attachment to trees and individual elements of nature. Feelings of love and care are expressed towards personal experiences with the nature. Humanized altruism and companionship is described in a relationship with trees. An intimate and nurturing interaction with the non-human world is developed through a process of humanization of trees in the sense of achieving relational status, not unlike family members.</td>
</tr>
<tr>
<td>Moralistic</td>
<td>Describing a reverence and ethical responsibility for trees and surrounding nature. An understanding of the reciprocity that exists between humans and nature and an inextricable link that binds us. A spiritual connection and conviction of harmony that can only truly exist in the interaction with the trees and the natural world. Sense of virtuous and moral concern for the trees and our accountability of our impact on it.</td>
</tr>
<tr>
<td>Dominionistic</td>
<td>Describing a desire to master the trees. Although sometimes can be manifested as destructive tendencies towards nature, it is also a demonstration of the realization that the innate struggle to survive of all living things, including humans generates a proficiency to subdue and creates an adversary relationship with nature. Just as the predator understands and appreciates its prey.</td>
</tr>
</tbody>
</table>

**Limitations**

The thesis topic and methodology offered some potential limitations. These did not hinder having rich discussions with the research participants or prevent achieving the research objectives, but should be recognized and addressed in the report of the project. A possible limitation stems from the season in which data were collected. Tree banding season takes place in the early fall, but the bulk of data collection took place during the relatively long and harsh Winnipeg winter. It is thus important to recognize that the data could be lacking in some of the rich emotional context otherwise felt during the autumn, spring or summer months. It is well known that the human psyche and emotion are oftentimes affected by weather (Rosenthal, 1993). As noted previously, the interviews were conducted in the Assiniboine Park conservatory to try to address this limitation. Another limitation arose from the choice of one round of semi-directed interviews as the main data collection strategy. As noted earlier, such interviews create the
potential for self-reporting bias. The strategy was adopted largely because of deadlines and financial constraints.

Reflexivity was also a potential limitation in the study since I had clearly outlined my expectations for the results. This could potentially affect the credibility of the study in that I would be specifically looking to see what I expected. In order to address this, I remained engaged and aware of this risk, hoping to compensate for such a limitation. Finally, a lack of comprehensive member checking provided another constraint. Because of the limited availability of the participants, it was difficult to conduct a proper member checking process, therefore restricting the level of engagement of the participants.

**Trustworthiness and Dependability of the Study**

Selected potential threats to validity and credibility and how I addressed them were mentioned earlier in the chapter. This section expands on the discussion. Creswell & Miller (2000) present a process of establishing validity in qualitative research through a series of techniques that can be interwoven into the research methodology. Using a combination of constructivist and critical approaches the trustworthiness and dependability of the study can be assured.

In my research, the biophilia hypothesis and transformative learning theory served as grounded guides for categorizing the data. The method of triangulating the sources by converging similar significant statements and narratives was used to confirm the presence of predominant and cross-cutting themes. This sorting and confirmation of categories was followed by an audit by my thesis supervisor enhancing the dependability and trustworthiness of the analysis. Further, a sample of 13 participants, although small, yielded a rich data set allowing for
robust analysis with complex merging of ideas and testimonials allowing for significant conclusions to be drawn.

Another general technique I used was developing thick, or rich, narratives and descriptions. Creswell & Miller (2000) explain that by proceeding with rich descriptions of the setting, the participants’ situational background, and particular situations, “credibility is established through the lens of readers who read a narrative account and are transported into a setting or situation” (p. 129). In my case, I have crafted a series of descriptive biographies for each participant and a historical and cultural description of the location selected for the interviews.

Finally, a critical perspective, as it is also described by Creswell & Miller (2000) was considered throughout the analysis in an attempt to “uncover the hidden assumptions about how narrative accounts are constructed, read, and interpreted” (p. 126). A journal containing personal reflections immediately after each interview, allowed me to document any assumptions and pre-determined expectations about the themes recognized in the data. By ensuring these rich descriptions in the data analysis, I can effectively reduce potential for bias (Creswell, 2013).
Chapter 4: Results

Level of Involvement with Trees Winnipeg

My first objective was to describe the involvement of participants in a selected environmental stewardship group, namely, Trees Winnipeg. Overall, the level of involvement was slightly different for each participant; however, various types of participation were apparent. Short descriptions of the levels are presented below, moving from the least to the most engaged. First, however, I present short biographies of the research participants.

Participants’ Biographies.

The following text describes the 13 participants who were selected for the interview. The bios were developed based on details recorded during the interview. By elaborating on the specific backgrounds of each participant, it is hoped that the reader will be able to better interpret the statements recorded, allowing for more transparent analysis and presentation of results.

Adam: He is concerned about the shade and comfort provided by his trees, a big part of what he enjoys from his yard. He is Aboriginal and lives in a quiet residential area of the city. He is interested in the protection of the boreal forest and natural resources in general. He oftentimes referred to the spirit of the trees and the co-existence of everything in nature, an understanding that he has gained through traditional teachings.

Dana: She represents the young population. At 19 years of age, she is an active and impressionable young woman. She volunteers for Arbor Day and has travelled for tree climbing competitions. She feels proud to be a “tree girl” and is sceptical about her generation and their genuine concern for current environmental problems or conservation of eco systems.

Danielle: As an ex-Greenpeace advocate, she holds on tightly to her environmental convictions. She has inherited her aunt's house and cares about the trees on her yard because of
the history they represent. At one time, her dream was to live for the advocacy of Greenpeace. She has since moved on, having children and finding different ways to stand up for what she feels is right. She focuses on showing her kids a better way to live. She believes that the words we use for environmentalism limit us in our understanding of the connectedness of nature.

**Elizabeth:** She speaks of truth and delusion. She has spent long periods of time in the wilderness with no connection to the industrial world and it has changed her worldview significantly. She contemplates the complexity of the trees and embodies the life they possess. She comes from an activist family and was always taught that cruising through life was not allowed, that participating somehow in making the world a better place was how you had to live.

**Eric:** He used to own a local newspaper in a pulp and paper community, advocating for sustainable forestry practices. He has long since let go of that, but has no illusion of how humans act out of their own self-interest and that tree conservation may not always be a part of that. He offers insight into the constant conflict between the plight of the planet and humans acting on self-interest. He is filled with memories of adolescent experiences interacting with the wolves, birds and trees around him.

**Gail:** She has been a stay-at-home mom for many years and loves to teach her children about the wonders of nature. She is proud of her neighbourhood and the general connectedness to nature that is felt in her community. She feels that many people are moving too fast and don't stop to look around and enjoy the beauty and miracle of the natural world around them.

**Jake:** He is involved with Trees Winnipeg in numerous ways. He was a volunteer for a time and then became a coordinator of special events. He is a retired tree climber. Working as an arborist, he now owns a landscaping company and uses his influence to advocate for sustainable
urban forests. He is always learning about trees and is often struck by their intelligence and superiority.

**Janet:** She is a scientist; a biologist at heart, a chemist in her professional life. She pays attention to details and is always looking for an opportunity to educate herself on the mystery of nature. She is attracted to the life that she has in her yard and feels connected to the ecosystems around her. She feels the suffering of individual animals and trees and has stood outside in the winter cold for several hours to watch a tree being cut down. Her sorrow for them is deep.

**Joan:** She loves to spend time outside in her yard and is concerned about the worms in the trees. She loves everything that is nature and appreciates the complexity of nature’s diversity. Her mood and soul are deeply affected by her interaction with the natural world. She sometimes wonders what it would be like to be a tree.

**Leo:** He is well-spoken and grounded in his understanding of the world around him. He feels very in tune with the organic nature of our attraction to trees. He often describes the flavour and texture of nature, the body sensation that we get when feeling the awe of the natural world. He often considers the larger perspective of our existence on Earth

**Melissa:** She likes to climb trees. She describes herself as mischievous like a cat. She considers trees to be an anchor in her life. They were very present in her upbringing on a farm. Her childhood has left her with an acute understanding of the devotion that is required to till the Earth. Recently, she watched her tree being taken down by the wind and was struck by the awesomeness of natural forces.

**Nora:** She remembers the time she spent outside under a tree with her family, where there were no troubles or drama, just love and laughter. She speaks of her connections with trees
through memories of her childhood and relationships with her family. Her connection is based on peace and tranquillity.

**Sarah:** She likes to bring the community together. She speaks of the responsibility of our actions and impacts. Her childhood was spent observing and playing in nature. She is moved by seeing that people care. She feels a strong connection with the trees on her block and has connected her community together to have them banded. She finds that she is often overwhelmed by what she cannot control in the world.

**William:** He is a retired tree pruner and has no illusion of the realities of tree maintenance and some of the hard decisions that have to be made. His pragmatic and realistic view of his appreciation for nature is unique. He loves the trees but possess an extensive knowledge of trees and their strength and power, understanding our need to dominate and control them

The majority of participants identified themselves as “clients” of Trees Winnipeg in that they received banding services for the trees on their property. Several participants referred to the promotional and informational materials that were provided by the organization as a resource for tree care and expressed gratitude for access to the information. One person volunteered for Arbour Day, a promotional family event held by the organization. Two participants were more actively engaged in that they were involved in soliciting neighbours in collective action to band their streets’ trees. One participant mentioned having attended a tree pruning course offered by the group and had been connecting with the organization’s board members for quite some time. Finally, one participant reported being highly involved with the group as an advocate and certified arborist, attending meetings, serving on the board and writing articles for the newsletter.
Learning Journeys and Transformations

The second objective was to investigate the learning journey of the participants and explain the extent to which their experiences were transformative. As noted earlier, I defined learning journey in an integrated manner, as encompassing both learning modes and learning outcomes. Despite this blended definition, for ease of presentation, I first present the results regarding modes followed by the results on outcomes. After that, I reintegrate the journeys by presenting results on interconnections between the two as well as between those experiences and the participants’ level of involvement with Trees Winnipeg. In all of the ensuing subsections, the results are presented as per the codes identified in Chapter 3. As a guide, I followed Creswell’s (2013) suggestion to focus on predominant and atypical results. Finally, to provide sufficient context, the results are sometimes situated by background details taken from the participant biographies.

Modes of Learning

As discussed earlier, four modes of learning were used as codes for the narratives offered by the participants. Formal-schooling, non-formal-community based, informal-experiential, and affective-embodied were used to categorize the participants’ experiences. See Table 1 for definitions of the modes. The most common mode of learning reported was informal-experiential experiences. The participants would often recount memories of close and intimate experiences with trees, and shared memories of childhood interactions with trees that involved the innocence and wonder of a child’s perspective. For example, Nora relived the memory of a certain dominant tree in her yard and how many of her childhood activities happened under that tree.

I have incredible fond memories of playing under it, shelling peas after picking them from the garden. It was a beautiful focal point of our yard. The farmer who owned our
yard before we moved in had a real love of trees. And this tree was on the property and it was probably over 100 years old. (Nora)

As the interview progressed, Nora was transported back to her childhood by the memory of a tree. The attachment to the tree was rooted in the positive hands-on experiences that she had in her youth. In another interview, Elizabeth made reference to the importance of lived experiences as drivers of our identity, and in her case, a powerful experience was shown to be an influential mode of learning. This was apparent by how Elizabeth recalled why she has a particular love of trees. She stated:

I’ve spent a long time in wilderness settings. In many different situations, canoe trips and mountaineering trips. I’ve had the privilege of living immersed in the natural world. Very little brought along and so there’s no question that that has influenced me in how I respond to the natural world. (Elizabeth)

Another way that informal-experiential modes of learning were manifest related to people’s significant life choices. Several participants discussed a particular activity they undertook as a passion in their lives. Eric offered a narrative of the years he spent writing for a sustainable forestry advocacy newspaper and the ideals he was trying to promote. This was a rich and profound experience for him, and it proved to be a very influential mode of learning.

In the 80’s I had a weekly newspaper out of Sioux Lookout, and in the Dryden area pulp and paper and forestry was a main industry. You can see the wood trucks coming down the highway all the time. I suppose in BC you see that too. I’ve also worked my summers when I was in college at the Dryden pulp and paper mill. So, from the time the logs enter the building to the time when they come out as paper or pulp. So, I know exactly how that process works. When I had the paper we had very definite beliefs on how this
process should start off. We were very against clear cutting and I got a first-hand look at that on the ground and in the air of the effects that clear cutting has on the environment.

(Eric)

Dana also recounted an intimate experience with trees when she remembered a ceremonial tree she planted at school. She spoke of the long-term legacy of this action and the attachment she continues to have to the tree.

We did a lot of planning at school and I think we did a few charities for plants. We sold flowers and potted trees for the school. And one time in grade nine, we organised for the whole school to plant a tree and now it’s huge! I went back to see it recently and it’s already so big. It makes me feel good because we planted that. And me and my friends organized it. Seeing the tree was kind of a mark of how you can go back and see a beautiful tree when my kids have kids and it will be a beautiful tree and I was the one to plant that and start something new and help the environment and make sure people know that it’s important. (Dana)

Eric’s and Dana’s stories were told with vivid descriptions and emotion, indicating that their experiences were also manifestations of the affective-embodied mode of learning. Other participants also described their experiences as having profound effects on how it made them feel, using vocabulary that expressed a connection with nature that touched their mind and body. Danielle’s narrative recounted an emotional attachment to a particular tree, where feelings initially attributed to the tree were eventually realized as a projection of her own feelings. The emotional engagement she had with this tree clearly demonstrated the affective-embodied mode of learning.
In the middle of the farmers field there was this one tree and we used to drive by it all the time. Every time, it was at first this extreme feeling of loneliness, there’s one tree in the middle of a farmer’s field. It doesn’t have any friends. It’s not in a forest. And I guess I verbalized it enough and I had friends that understood and had similar feelings. It became the stopping point. We would stop our car and go and sit by the tree and have a picnic. We would hug the tree. In my mind I was giving to the tree to get rid of its loneliness but what ended up happening was it did the same in me. My friends embraced it and said that “we needed to do something about it if you feel that the tree is lonely” it was partly my own loneliness and all of a sudden all my friends are rallying around that thought and rallying around the tree. The tree was still there. And when I drive by I release all those emotions and memories for the tree. (Danielle)

Other instances of affective modes used a certain jargon that reflected a sensorial interconnection with trees. Participants would refer to their connections with trees as “spiritual” or “natural”, illustrating how the tree impacted them by saying things such as, “the tree calls to me” or “the smell of it makes me feel loved”.

Yet another common learning mode was non-formal-community based, which was defined partly as the influence and sway of important people in a person’s life. I found several instances of this mode in the data. Janet spoke of the profound influence her grandmother and father had on her love of nature.

So that was part of it, sort of liking that environmental and hearing her constantly describing how much she loved it. So I tended to pick up on things my grandmother said. And then my father, I remember him- we had a lot in the town and had a couple trees in
the front, but my father had an opportunity to get young spruce trees and I remember him going to plant these trees up and down the side and now to see how huge they are. (Janet)

Given this and similar non-formal-community based results, it was surprising rare to see the other end of the spectrum, i.e., a lack of evidence of influential parental figures in the lives of some of the participants with a strong affinity with trees. For these people, major influences tended to be teachers they had throughout their lives or could not be traced to a single person. Some participants with a strong attachment to trees referred only minimally to their parents. Danielle talked of her fellow activists at Greenpeace as well as the Aboriginal teachings she is learning at her workplace as having particular sway on her worldview.

They have a real strong belief and they’ve found words to explain my ideas through traditional Aboriginal culture. I’m not Aboriginal myself but I’m a teacher and I teach in the inner city and have grown a lot with these youth and learning their culture and sort of found the words and that concept of being connected in a web. (Danielle)

A similar atypical result can be seen in Jake’s story. Jake worked as a certified arborist, volunteered for various tree care activities, and participated in several tree-climbing competitions. Nevertheless, he only referenced the dominant figures that helped to shape the organization that he is involved with. Jake said:

I was also interested in them even before I was in the business. If you’ve gone back and looked at the history of it, it’s a very interesting organization and their beginnings are really interesting. If not for them, for some of the women who started the coalition, there wouldn’t be so many elms as there are today.

Although trees are a major part of his adult life, both professionally and personally, Jake did not discuss any particular teaching moments generated from any parental figure throughout
his life. Even more atypical is the story of William, a retired tree pruner who spent a large part of his working life taking care of the trees in Winnipeg, ensuring their longevity and beauty for the people of the city. And yet, he mentioned only briefly his family or any community influence that may have impacted why he considers trees to be so important. The focus of his interview rarely stopped on any potential mentors in his life. Instead, he paused to explain his understanding of why the trees are worth caring about based on his experiential modes of learning and his perspective of the situation. “I’ve developed an appreciation, I heard someone say, that given the environment today we wouldn’t be able to grow trees like this again. You couldn’t duplicate this now. So what we have is all we’ve got. I really think it’s important for the city to have the trees” (William).

**Learning Outcomes**

*Instrumental, communicative and transformative* were the types of outcomes considered in analyzing the data. See Table 2 for definitions of these outcome types. Outcomes were often inferred from convincing statements the participants made about how they saw the world around them.

The most common type of outcome observed was *communicative*: “gained understanding through language, expression, negotiation, feelings, beliefs and resolving conflict. Making yourself understood to others”. Such outcomes were often noted when participants responded to questions about why it would be important for others to feel a strong connection to trees or nature. Danielle spoke eloquently about how she has come to realize how relational experiences have shaped who she is.

Part of that is the whole interconnection and environmental. I find sometimes we get too narrow focused and what I’ve found an internal need to be aware and to be
knowledgeable. […] Inside of me is where the roots grew. So, still remaining with the connection. It’s an emotional thing (Danielle).

Another example of a communicative outcome is found in Dana’s explanation of why she chose to get involved in tree care. Discussing responsibilities to trees and to her fellow citizens, she offered powerful reasons for why embracing a connection to trees is beneficial.

Everyone, in every city there’s at least a few hundred people who actually care. If in Winnipeg nobody cared, what would it look like? What would it be? Who is going to take care of the trees? I mean somebody has to do it. If it makes you feel good while doing it, then it’s a pretty awesome thing. It makes me feel good while doing it. They are important, if they weren’t there, I would lose that calming, safe, happy feeling. I don’t want to lose that, it’s important. If they’re still there, maybe somebody in the future generation can feel what I’m feeling and what I saw in the trees and the feeling of the environment. (Dana)

A further example can be found in Sarah’s story of her community-minded father and what she learned from him.

My dad was one of the old men in the back lane. He used to play in the water in the spring to get the water moving down the back lane. He talked to everybody. I get that from him. That we have the responsibility to work together. (Sarah)

A dominant instrumental outcome (“empirical learning, cause and effect, problem solving, new skills and theoretical knowledge.”) illustrated how having gained a particular connection with trees has allowed participants to understand systems connecting all living things. Several people talked about how they had gained understanding both ecologically and emotionally of why we need trees in our lives as well as a desire to enable others to feel that
connection. When reflecting on an experience in a park, Melissa considered the interconnectivity of things and the potential humans have to live “lighter” on Earth.

When you see it, it really helps emphasize exactly that. How everything is intricately intertwined and reintroducing that one species into that environment actually changed that entire environment and made it healthier. I think human beings have such a different ability that we could be, I think we could be perhaps more like the wolves. I think we have the potential to be healthier for our environment. (Melissa)

In a similar way, Adam reflected on the interdependencies in nature when he recounted a story of witnessing a squirrel and a rabbit interacting under the tree in his yard.

The squirrels and the rabbits in my backyard. It’s unbelievable. It’s like they know why they’re both there; they are there because of the tree and the nature and all that. So the rabbit is eating and the squirrels are ripping around. One squirrel went directly towards the rabbit. The rabbit just jumped up, the squirrel went under, the rabbit landed and then kept on eating the leaves and branches. I was sitting there dumbfounded. Did I just see that? They’re speaking to each other. They co-exist. But any kind of wildlife that you see in the city, would think it would never happen without trees. Everything is interacting with each other and part of the system. Everybody needs everybody else (Adam).

There was substantial evidence of experiences that could potentially be transformative (“deep-seated alterations in perspectives and beliefs that generate an enduring change that affects the whole person, both in thought and action”) in nature, such as some of the profound communicative and instrumental outcomes cited above. However, clear evidence of a perspective transformation, i.e., a deep-seated alteration in a worldview, generated from a specific experience was atypical. The best evidence of a potentially transformative outcome can
be found in Eric’s reflection on the lasting impact of his experience with the sustainable forestry newspaper.

Well, it changed me permanently on how I view things. How effective I was, I don’t think it made a whole lot of difference but it made me feel good that I was actually doing something. I didn’t think I was going to change the world, maybe I could add a voice to what I thought was a reasonable alternative and raise awareness because of having a media outlet. I don’t think it’s going to change policies especially with a small publication as this one. But if it brings some awareness and opened up possibilities to people then perhaps I made some sort of difference. It certainly made a difference in me. I felt that I was contributing to something. (Eric)

Another unexpected and atypical outcome that surfaced in the data was an enduring change in perspective after having experienced tree loss. Several participants told the stories of their trees being cut down or getting sick and the emotions that surfaced from such an incident. Melissa recounted her story of losing a pine tree and the surprising realization that the loss had significantly impacted her. “You know when I lost my dog, I felt smaller. I didn’t feel as important. I didn’t realise that I felt important having a dog. But I also felt somewhat insignificant after cutting it [the tree] down. I think losing those pine trees made me fell less cool somehow” (Melissa).

Other evidence of a transformative outcome surfaced in Joan’s narrative about an experience seeing mines in northern Manitoba. Her story illustrated how the experience resulted in a disorientating dilemma stemming from the importance our society attributes to the economy and the environmental destruction that economic activities can have.
And I went up north for a meeting to Flin Flon. And I was shocked when I saw the mining ruins. – What do they call it? When it’s on the surface, they just clear away the rock? It’s above ground and it’s all stripped away. It looked like – soooo sad, so desolate, it was awful. I thought “how can we do things like that – to the Earth?” and how destructive we are in terms of what we do for economy, for our own use. It made me stop and think a little bit more about environmental damage to the Earth. Like to the environment. And I feel that we need to change the way we look at that the whole idea that we’re using up the resources of the Earth that don’t necessarily belong to just us. For our own money and for own use – heating and other things. I have a very big problem with the whole oil sands. (Joan)

**Interconnectivity of the Learning Journey**

Presenting modes and outcomes as separate elements of the learning journey has practical value for understanding and presenting the research results, but as noted earlier I view modes and outcomes as intricately intertwined. Modes influence outcomes and vice versa. As well, the outcome of an experience often influences how the experience itself is recounted and vice versa. When the research participants told a story, mode of learning and outcome of the experience were often expressed simultaneously. In particular, childhood memories or stories from the participants’ significant past were told with a certain closure on how the experience had impacted their character and identity.

With that in mind, this subsection reports on common and uncommon interconnections between modes and outcomes. The results illustrate the holistic nature of modes and outcomes and the degree to which they can come together to form a person’s journey and affinity to nature.
Mode to Outcome

The formal-schooling learning mode and instrumental outcomes were found to have common interconnections. Participants would often recount a formal learning opportunity as having provided a better understanding of instrumental knowledge, such as Janet’s experiences of learning about tree care from courses offered by the organization. The outcome was new knowledge and a better understanding of the current situation of tree planting in Winnipeg.

So at that point the Trees Winnipeg put on some good talks, so I thought that was great. I just went from there. Later they put on a course that was based on tree health and it was a few weeks. [...] And after all the courses, I’ve learned the proper planting and not to sink them so low into the ground. I see so many things now, it hurts me. I see things done so wrongly. I see trees planted and planted badly and you see they’re suffering and you know why. And you think that someone has gone to the effort to plant a tree, yet they didn’t know how to do it and they literally sabotage themselves because it’s not happy. People want to dig a deep hole, but you need a shallow hold so the roots can spread out. Sharp sides is like putting it in a container and you’ll just get girdling.

Another interconnection that was frequently noted was between informal-experiential or affective-embodied learning modes and communicative outcomes. Powerful lived experiences allowed participants to express their opinions with a certain confident maturity. For example, Sarah conveyed concern for intergenerational equity when discussing her experiences in asking her neighbours to take collective action to band the trees on their block.

I learned that people don’t respond unless you ask. I mean all somebody can say is no sorry I’m not interested. It doesn’t mean you’re a bad person, it’s just that they’re not interested. I don’t have a hard time asking. If it’s something I believe in like making the
trees grow so they’re there for your grandkids, I don’t have a hard time asking. That’s what I learned. That if you ask the questions. Again, with the spinoff is that everybody looks after everybody else. (Sarah)

Another interconnection, again involving more than one mode, can be seen in Sarah’s story of an experience with her neighbours (experiential mode) and the influence of her father (community-based mode) while simultaneously referring to gaining an understanding of our shared responsibility towards other people and the Earth (communicative outcome).

Our next door neighbour’s garage was torched. That was also something that brought us together because there was a neighbourhood watch, talking to people. Making them understand that we’re all in this together and not isolated. As an aside, maybe that’s the whole key to this, making people understand that we’re all in this together. The garbage that you throw out and you’re dumping your antifreeze down the back lane is going to kill my cat. I think that comes from my father. (Sarah)

Jake offered an insightful example of communicative outcomes that have resulted from learning modes where the moment of change is quite blurry. Attesting to the reciprocal nature of experiencing and knowing, Jake explained how personal contacts can influence certain experiences (modes), which themselves become a defining moment in shaping values and beliefs (outcomes).

[P]romoting trees is not curing cancer, but it’s important. Preserving this is incredibly important. As you say about the connection. It triggers people and gets them involved. You can relate that to why some people are volunteering for a charity or cause. Most of the time it’s because they had a personal connection, they knew someone or something. That’s how they go involved in the beginning. Usually when you talk to those people,
they are hugely passionate about it and there’s a personal connection to that. I feel like I’ve watched people go through it. I don’t know if I could pinpoint the moment, but I’ve had people come out and gone into the business or made that part of what they do through our connection. I have employees that work for me, that started out just looking for a summer job, or labourer and they drank the Kool-Aid and have gone to school and it has now become their profession. (Jake)

**Mode to Transformative Outcome**

The exploration of interconnections between learning modes and learning outcomes becomes important when considering the most effective way to understand, or even facilitate, individual and social change. As each participant in the study re-lived a powerful memory, it became apparent that the informal-experiential mode of learning was often an indicator of potential transformative experiences. Moreover, the analysis revealed evidence of processes that are part of transformative learning theory, namely, disorienting dilemmas, critical self-reflection, dialogue with others, and re-engagement in the world in new roles. For example, dialogue and re-engagement are evident in Jake’s reflections on how his motivation for volunteering with Trees Winnipeg changed as his values evolved because of his experiences.

Before I started volunteering with Trees Winnipeg I wasn’t a person to volunteer. And now I am always looking for things to do now. I was asked to sit on another board recently and my wife forbid me from taking on another job. But the good thing is, I have to be honest, part of these things, me and my company are recognizable. It’s good for business. Make no mistake that lots of people do this because it’s good for business. That’s not how I started out doing it, but it is good for business and every business should
do it because your first reason for doing shouldn’t be monetary, but it can be the spin off.

(Jake)

Another predominant learning journey interconnection was between the affective-embodied mode of learning and potential transformative outcomes. When participants recounted tales of being emotionally engaged in an experience, this was often associated with seemingly profound outcomes. In some cases these emotions were illustrated in how the story itself was told, attesting again to the interconnectivity of mode and outcome. Nora emphasized the symbolic effects of a particular cottonwood tree on her family relationships. As the story unfolded, she reflected on her engagement with the tree and how she viewed its importance to her family. These enduring values surfaced while she pondered the tree and became transformative for her views on family connections.

Being out at my parents’. It’s funny, my family is not really athletic but we go out in this big space under the cottonwood. My sisters and I find baseball gloves that we’ve had for years and pull out a bat and a ball and the kids and I and my husband. We never do stuff like that. But it’s become this space when we’re all out there. It’s really fun. There’s no competitiveness, it’s just great fun, and we laugh a lot at each other. It’s just created a safe place to hang out. Because really, we’re not athletic at all. And so the fact that somehow, the space is there. Come spring we’ll all be out there again. I think it’s around a tree because it’s so stabilizing. (Nora)

To further address the extent to which an experience was transformative, I asked participants to reflect on why they felt so attached to trees. A common theme in the responses dealt with important, potentially transformative changes in thought and action after witnessing a form of environmental destruction. For example, Eric had seen the impacts of a forest clear-cut,
William had hands-on experiences of cutting down healthy trees for cosmetic purposes, and Joan witnessed the mining ruins of a landscape in Northern Manitoba.

Further, there were several narratives that described an experience of tree loss and the emotions it evoked followed by decisive statements about the meaning of the tree. In one example, Janet told a compelling story of losing an elm tree in her yard to Dutch elm disease.

So, the tree had to go. I went into the backyard and hugged the tree and I cried. I was upset like you wouldn’t believe. This was a big beautiful elm, it was multi-stemmed, it was a big beautiful tree toward the back. I was devastated. It was dying and now it was going to be removed. And so I arranged to leave work and I went out there in the backyard and it was in January and I stood for two hours. I called it symbolically holding its hand. I stood there for two hours that it took them to – they had to cut pieces off and tear it down. The city guy leans out of his machine – “you’re a stalwart!” He thought it was funny that I stood there the whole time. I begged for a piece of it, and you’re not supposed to do that. And now I still have a piece of it in my house. I mean, I still have all these other trees that are native, but that big tree that was in the back, it’s just a hole there, and it’s a hole in my heart. The whole Dutch Elm Disease, it’s a big issue, when you look at the city of Winnipeg and our monoculture. They’re realizing now to plant a variety of trees, those beautiful tree lined streets that people so long ago had the presence of mind to be planting them. I mean the thought of losing them is devastating. (Janet)

She later conveyed a critical view of how Dutch elm disease is managed, revealing aspects of her worldview by describing her understanding of the importance of our connection to the natural world.
And then say that if we let DED come through this could happen. I think people don’t realise what it would be like to be in that situation until it’s too late. How do you get that? How do you impress upon people to care? It’s hard. I don’t know in our day and age especially how to go about it, people don’t want to hear it. But if we don’t make the connection that when the natural world goes, we’re going to go too. Because we rely on it. People are not grasping that fact that we rely on the world. (Janet)

*Involvement with Trees Winnipeg and the Learning Journey.*

There were no widespread interconnections between the level of involvement with *Trees Winnipeg* and learning journeys as they manifested in the experiences and emotions recounted in the interviews. Certain participants had significant involvement with Trees Winnipeg, such as Jake who wrote for the group’s newsletter, and Janet who attended several courses offered by the group. These engaged citizens described momentous learning incidents that resulted in transformative outcomes, so it is tempting to infer that these experiences motivated them to become involved in the organization’s activities. However, participants like Joan or Gail, who simply paid for tree banding service, also had profound learning experiences that increased their connections to trees. Degree of involvement with the organization thus appears to have had minimal bearing on how the participants described their connections with trees. A genuine concern for trees in Winnipeg and desire to do something about it was observed as being the sole common denominator with all participants, regardless of their relationship with Trees Winnipeg.

*Biophilic Tendencies and Connectedness to Trees*

My third objective was to determine the degree to which the research participants’ experiences affected their sense of connectedness with trees within the context of the biophilia hypothesis. Such an exploration can shed light on a participant’s ecological identity and what
drives a person to get involved in a stewardship group such as Trees Winnipeg. Biophilic
tendencies in the data were identified using the pre-determined definitions described in the
previous chapter (Table 3). Narratives and vivid descriptions of fulfillment from trees and nature
were grouped together.

**Biophilia Tendencies.**

While recounting their stories of learning and experiences with nature, participants often
revealed a biophilic tendency with a certain regularity. Depending on their background or
learning journeys, participants’ narratives could take on a concentrated biophilic focus. For
example, Adam’s most frequently noted tendency was *naturalistic* when describing his
experiences with Aboriginal Sun Dances and leadership courses. He revealed a heightened
awareness of the mental benefits provided by trees. He described an achieved sense of
satisfaction, fascination and wonder with the natural world and emphasized that the trees support
our need to nurture and be nurtured.

It’s a good feeling, it makes you feel like you’re at peace. You have that feeling that
you’re healthy because this environment is healthy and everything is going to be okay
and we should be doing as humans what we can to protect, so they will take care of us
and we’ll take care of them. (Adam)

He also spoke of the mental well-being provided by the trees in his yard: “in the summer
when the trees are full in my backyard, even to just come home and it’s always a good feeling to
sit in the back yard”. In reflecting on his teachings with Aboriginal Elders and their influence on
his worldview, he again mentioned the positive benefits of trees.
The way for a person to be grounded is to be around those plants that have roots – they
are grounded themselves and if you’re open to it – then you’re open to ceremony, even if
you’re not open to ceremony but you just have a love of trees. (Adam)

Among the research participants, the *aesthetic* tendency was the most common in all of
the narratives, and provided rich descriptions of the awe and gratitude felt towards the beauty
and complexity of trees. Several participants portrayed nature and the woods as idyllic
environments that they felt privileged to experience. The emotions conveyed here, frequently
alongside examples of communicative learning outcomes, were often a poetic and graceful
illustration of the combination of the two conceptual frameworks that were applied in the study.
An example is Sarah’s stories of the cottage life she lived as a child and why she now considers
such experiences to be important for younger generations.

We need to be dirty, we need the sun on our face, and we need to understand the textures
of snow. We have to understand that things grow. But these kids should be outside
playing. You know – let them run in the bush, and play and explore and wash their face
in the rainwater. They shipped me off every summer for that. I would spend the day
watching what things were. I would wash my hands and get some moss. It’s a weird
thing, but the connection is here. And from that, I bring it here. (Sarah)

Another expression of the *aesthetic* tendency, revealing an almost artistic view of nature
and an appreciation for the complex beauty of trees, is shown in Joan’s narrative about the colors
of spring. The aesthetic value that she placed on the trees demonstrates that her learning and
behaviour are heavily influenced by this biophilic attraction.

I mean it’s kind of like the spring – the green color of spring is such a green and you
think that green is green but really green is so different green. None of it is the same. The
green of spring is different than the green of summer. Which is more washed out looking.

When you see – along the trail on Bishop Grandin. And when I’m walking in the trail near Royal Wood there. The grasses that grow in amongst the trees and how they are all one color and they look the same, and then it changes and there is definition that you didn’t see before. So, it’s these kinds of things. The stand of the birch trees are all white against the grass that is changing colors. It just fills me up. It makes me feel alive, like I’m…it makes me feel good, it just makes me happy like nothing else. (Joan)

Frequent references of the scientific tendency were recorded when asking participants why they felt trees were so important. Personal experiences and expertise about trees conveyed a certain wonder from gaining understanding that the tree is a complex organism in a complex ecosystem and a provider of ecological services and benefits. An appreciative disposition was expressed by several participants about the qualities and capabilities of the trees themselves. William highlighted his fascination with the support that a tree can provide when climbing it. “When you’re sitting on a branch and you can feel the strength of an oak that could hold your weight even if it’s a small branch, it’s quite amazing” (William). Jake also admired the trees’ abilities and complexity. He described, with obvious enthusiasm, his fascination with the adaptive qualities of the trees, and his scientific biophilic tendency was evidently connected to his learning journey and experiences as an arborist.

Trees are so smart. They have evolved into – are constantly evolving into beings of their environment. Like redwood trees have stood for so long, for one thing they are fire resistant. If you see how black they are and everyone thinks their color is black but most of the old ones are black from forest fire. They’ve developed tannins and oils in them that are totally resistant to fire, which over time they’ve – the research has
shown, when they bore into the trees, they didn’t have these types of things 200 or 500 years ago. They have adapted defenses to new insects and new threats. Threats that weren’t there before. (Jake)

In contrast to the scientific and aesthetic tendencies, responses relating to the utilitarian tendency were rare. As well, the symbolic tendency, where trees were used as a means to clarify language, was also uncommon. Whereas humanistic and moralistic tendencies, where participants described a reverence and deep-rooted respect towards trees, were surprisingly (to me) more common than such anthropocentric descriptions of physical uses of trees. The data revealed high instances of an innate appreciation of the benefits of trees, beyond their physical and monetary values. For example, despite William’s past experiences of working to cut and prune the city’s trees, he articulated the value of public access to the emotional gains that can be derived from simply being in the presence of trees. “You want to be a steward of what we’ve got, and take care of it. It’s a public good – there is a value that is placed on the natural environment. That’s why we feel it’s so important to take care of it. You know the cost of everything but there’s a higher value than the price of it” (William). Danielle also spoke beautifully of the reverence and gratitude for what trees provide for the rest of the world.

It’s kind of neat, and there is something about touching a tree and the feeling of the crevices and understanding the branches and down to the root system and picturing the roots drawing from the ground more than just nutrients, almost like drawing an energy from the Earth and bringing it up so that we can enjoy it. And that’s part of the tree’s selflessness. I will draw the energy and release it into the world for you. How selfless. (Danielle)
On another note, evidence of a spiritual connection with trees was surprisingly abundant. Although the interview did not include any questions that inquire into a possible spiritual meaning of tree connections, the topic surfaced nonetheless. Moreover, such responses may adhere to the *moralistic* tendency of a certain reverence and harmony with the natural world. However, the narratives seemed more akin to a cross cutting theme in that they revealed the power of an experience that could fulfill a spiritual void. Nora, for example, was quite explicit in the spiritual connections that she described when thinking about trees.

And there’s a path that goes through. It’s like another world. I love going there. I don’t go often enough, but there’s something really inspiring, it’s connected to my faith because I believe in a creator. I look at some of this stuff and I think aye-aye, it’s amazing to me. The detail, the variety, the complexity. I mean just sitting in here [referring to Assiniboine Park’s conservatory], I mean…. There’s a part of my soul that gets renewed by being in nature in that kind of way. (Nora)

Elizabeth also referred to the spiritual nature of having a heightened connection to trees. “[This] speaks to the emotional experience of the natural world. The receptors in human beings to connect that emotion to spirit. That’s the receptor. That is what is receiving the emotion, the spirit is receiving the natural world” (Elizabeth).

At the same time that many participants spoke of a deep soulful connection to trees in a positive way, the topic also surfaced within the context of a perceived helplessness in the face of the environmental crisis. As biophilic connections were identified as innate and part of an inner attraction to nature, participants also voiced their concern and despair for the destruction and alienation they see around them. Although there was consensus that we are indeed connected to
the natural world, there was also a shared disapproval of how we have been treating it. Jake offered an astute observation on people being disconnected from nature.

In theory people are connected with things and nature and maybe trees especially. But I think our world is going on a total disconnect from nature. Our urban centres are getting larger and larger and it’s funny. I really hold that theory because lots of people that I encounter, both in my personal and business life, just have a complete utter disconnect from nature and it astounds me how many do. The number seems to be growing. You have a person with a giant house and giant yard and they’ve had it landscaped and are totally disconnected to anything in their yard and they don’t understand the relationship of their trees that are plants, the winter or seasons or the environment. (Jake)

Along with spirituality and alienation, hope and resilience were also reoccurring themes in the data. As much as participants were discouraged by environmental destruction, they would often end their thoughts on a positive note of hope. Elizabeth expressed how she viewed her responsibility to strive for hope.

Whatever happens, your journey will be tolerable and maybe even more than tolerable, it won’t be a despairing journey if you are trying to be a part of the solutions to the problems at hand. That’s all I can ask for my children. It’s just being part of the solutions and that’s what this is. You’re moving towards something. And that keeps you putting one foot in front of the other. (Elizabeth)

Sarah also described where she sees hope. “As wretched as we as human can be to each other, you know there’s going to be life. There has to be. We are capable of such joy and compassion and empathy and great things and we can’t give up on that”. Finally, Danielle offered an eloquent expression of what continues to inspire her to have hope in the human spirit.
“That idea that through my kids I can share that feeling of hope and growth. That there is still good things in the world to be a part of and to encourage and to fan that spark and you can make it happen again. And in a way I wish I could have had legions of more kids – I could have made armies of self-conscious!”

**Interconnections with Learning Journeys.**

Several interconnections between learning journeys and biophilic tendencies can be discerned. Jake’s story provides an interesting example. Throughout his interview, there were very few clear references to particular biophilic tendencies. He rarely spoke of the calming and soothing state of mind alluded to by many others. Instead, this former tree climber and business-owner arborist was struck by the incredible wonder that is the tree’s ecosystem. His biophilic tendency was manifest in his understanding of the complexity of trees and his observations of tree physiology. This *scientific* tendency was clearly connected to his *instrumental* and *experiential* learning as an arborist and tree climber. Whether his intimate knowledge of trees led to his biophilic tendency or vice versa is unclear, but his evidence clearly shows the interactions between the two.

The love of trees, I don’t know. I love them because I’ve learned so much about them. And everyone assumes that somewhere there’s an arborist who knows every type of tree. Like redwoods are the most fascinating because they have just developed so many things because they are the oldest trees. Maybe because they are the smartest tree – perhaps. The top part of their trees can take in just as much moisture through their leaves as they can through their roots. So they’re getting more moisture out of fog, then from rainfall. And now scientists have discovered that they have the ability to fix nitrogen in their leaves, so they are self-fertilizing themselves. They can take water, and certain enzymes and soil
because they have new ecosystems up in there branches. They are producing soil up two hundred feet up and are fixing nitrogen, so they are fertilizing themselves. (Jake)

And yet although he tended to remain factual and scientific when discussing trees, demonstrating that his passion for them is rooted in his learned knowledge of them, he also revealed a moralistic tendency in his deep reverence for trees. “In awe, usually. I’m in awe of our elms here, often. I stand and look amongst them. I’m always looking up. Everything about trees is fascinating to me” (Jake). In this regard, his extensive knowledge of trees along with these type of interactions have generated an almost spiritual connection to them.

Elizabeth illustrated another example of a link between learning and biophilia. Throughout her life, many of her wilderness experiences had profound effects on her character, including how she learned, what she learned and her deep connection with trees.

There is sort of a sense of a movement toward the genuine. My need to be genuine that comes from my experiences in the natural world. To be true. To be what I am. Not to take too many of the falsifications that people often rely on through material possessions at home and dress. (Elizabeth)

Later in the interview she offers rich descriptions of her time surrounded by trees, which suggests how tightly bound one’s learning journeys and biophilic tendencies can be.

I mean you’re surrounded constantly every single day by beauty. There’s not a day that goes by where you’re not in awe of the beauty that surrounds you. So whether it was the sunset or the reflection of the water or a magnificent tree that would be hanging out over the water, the clarity of the water. It was just full. It was like hearing a beautiful song the whole time. The colors, the details the bigger pictures – horizons the sky and I’m not romantizing it because I’ve gone back and it’s like that every time. (Elizabeth)
Eric also illustrated a deep understanding of an *ecologistic* tendency as he discussed why humans are so interested in being connected to trees. His description of the comforting cyclical nature of trees can be attributed to his personal learning journey of working closely within the forestry industry and his exposure to the seasonal forests throughout his life.

I guess I talked about how it was good for the soul, good for the mind. Perhaps it’s an anchor with the past that every year it’s there, in a world that changes very quickly, the time schedule for trees are much longer than with people. It’s a familiar thing and I think people need certain anchors in their life. A certain sense of permanency, which is mostly an illusion. Everything comes to an end, everything changes. (Eric)

The examples in this subsection demonstrate that biophilic tendencies are tightly connected to learning journeys, and tendencies are often reflected in people’s narratives of their learning experiences. The discussion continues in the next chapter with an exploration of the degree to which learning journeys influence biophilic tendencies and vice versa.

**Summary of Results**

The use of two conceptual frameworks has produced a complex analysis involving a web of interconnections between learning modes and outcomes as well as linkages to biophilic tendencies towards trees. As the participants’ stories were analyzed, certain trends became clear.

Initially, the analysis demonstrated that the level of involvement with Trees Winnipeg did not prove to be a significant factor in the nature and intensity of the participants’ learning journeys or biophilic connections. Despite their various backgrounds, a genuine concern for the trees of Winnipeg was the common denominator. Individual decisions to engage in tree banding can be generalized as a biophilic affinity for trees on one’s property or elsewhere in the city.

Another important note was the relevance of the location of the interview. The history of the
conservatory was an important factor for the participants of the study. As the interviews progressed, the conservatory itself inevitably became a part of the discussion. Surrounded by the lush foliage, there was a sense of reverence, and freedom to expose true feelings of passion and loss for trees.

A deeper analysis of that affinity generated a more complex picture. When considering modes of learning, participants recounted instances where informal-experiential and affective-embodied experiences resulted in a long-standing transformation of their character and values. Tree climbing, environmental activism and wilderness leadership were just a few of the meaningful incidents that led to affinity for trees. The re-telling of these experiences generated convincing and eloquent statements indicating changes in personal worldviews and genuine transformations. Also, it was somewhat surprising the extent to which the learning modes and outcomes were intricately intertwined. The narratives were expressed in such a way that modes influenced outcomes and vice versa. Moments of transformation and other types of learning therefore were blurry and difficult to pinpoint with precision. Certain unanticipated re-occurring themes also surfaced in the conversations; for example, participants’ shared profound feelings of hope for the future and despair towards society’s current disconnect with nature. As well, without any particular prompting the spiritual nature of a connection to trees was frequently identified.

An exploration of biophilic tendencies revealed a myriad of connections and associations to the learning journeys. Learning experiences that shaped a person’s character were indicative of what type of biophilic tendency he or she conjured up. It became apparent that different learning journeys tended to correspond with certain biophilic tendencies. For example, the participant describing various Aboriginal teachings had strong naturalist tendencies and the
formally trained biologist had strong scientific tendencies. This interwoven relationship between learning journeys vis-à-vis nature and biophilic empathies is revealed through the study. Results illustrated that there is indeed a connection that binds learning and biophilia. However, further discussion on the degree to which each phenomenon influences the other is required, and this topic is taken up in the following chapter.
Chapter 5: Discussion

Since biophilia is a framework that calls upon sensorial connections with nature appealing to our emotional state of mind (Kellert & Wilson, 1995; Wilson, 1984), it is not surprising that experiential and affective learning modes were most common in this research. Results of this study confirm current research attesting to the transformative potential of such modes as well as the potential of the biophilia hypothesis as a framework for understanding our attraction to trees. This chapter discusses these and other key results as they pertain to the objectives laid out in the first chapter, all the while taking into account the study’s limitations as stated in Chapter 3.

Learning Journeys: Diverse Modes, Outcomes and Interconnections

The results confirm the research showing the viability of transformative learning theory as a means of explaining lasting change in values and worldviews (Diduck et al., 2012; Mezirow, 1991; Moyer, Owen, & Duinker, 2008; Moyer et al., 2014). Where participant narratives included confident and convincing remarks about profound experiences with trees, these were interpreted as being potentially and in some cases clearly transformative in nature. Such remarks provided evidence of deep-seated changes in values and actions, and in some cases revealed evidence of critical assessment of the person’s basic assumptions about the world around them.

Connections between Modes and Outcomes

More specifically, other aspects of the transformative learning literature have been confirmed from the results of this study. For example, when considering formal modes of learning and resulting instrumental outcomes, Taylor, E. W., Duveskog, D., & Friis-Hansen, E. (2012) point out that instrumental learning outcomes can be a source of empowerment where the structured learning environment, when coupled with hands-on experiences, has the potential to
affect individual identities. Certain participants in this study demonstrated such a connection when describing instrumental learning about trees and tended to lean on this knowledge when reflecting on why they felt trees were so important in their lives. I saw structured learning about eco-systems and how trees are integral to them as an influential factor in the development of a strong attachment to the trees.

Further, community engagement in a citizen group such as Trees Winnipeg could also impact the development of ecological identities. Some participants referred to significant involvement within the community as a powerful learning mode resulting in a desire to be proactive about tree conservation. Such active “social” learning is described as essential for effective sustainability actions to take place involving government bodies and civil societies (Alexander, 1999). This also speaks to social cognitive theory put forth by Bandura (2001), where people are seen as “agents of experiences rather than simply undergoers of experience” (p. 4) and conscious reactions to experiences are significant to who we are. He writes “Its not just exposure to stimulation, but agentic action in exploring, manipulating and influencing the environment that counts” (p. 4). In this case, community involvement in tree conservation was a conscious decision to engage in a learning opportunity to perhaps further develop an ecological identity.

When considering potential transformative outcomes of experiential and affective learning modes are seen as essential for evoking a transformative outcome because both “hands” and “heart” are actively engaged (Sipos, Battisti, & Grimm, 2008). Where participants described an emotional attachment to trees as a result of explicit hands-on experiences, two of the three objectives of “transformative sustainable learning” have been addressed (Sipos et al., 2008). Those participants who also described gaining empirical knowledge of trees from formal
learning modes, such as courses, teachings and critical thinking, also achieved the third objective of “transformative sustainable learning”, that is where “head” is also actively engaged (Sipos et al., 2008). Thus, as a result, their frames of reference were altered in regards to views of trees and the experiences tended to further influence any future decisions or engagements related to tree conservation. Such shifts could be considered indicative of a transformative outcome. Figure 1 is an illustration of the three principle learning modes as potential indicators of a perceived emotional attachment to trees and developed ecological identity.

As the analysis unfolded to reveal the connections between modes and outcomes, the integrated nature of the learning journey became clear. As seen a previous study, such as that of Moyer et al. (2014), learning is cyclical in nature and there is complicated interplay between learning and action. In this case, I can confirm that “embodied learning processes contributed to outcomes in all the domains” (p. 14), where domain refers to broad sets or types of learning outcomes. Narratives about emotional nature experiences were also outcomes in themselves with respect to the mode that was described. For example, when telling the story of a canoe trip in the
woods and contemplating why this memory was so important, the participant revealed communicative and transformative outcomes that may not have been present before the interview took place.

My results also show that powerful or significant life experiences that connect people with nature can lead them to be mindful of their relationship with the broader environment. Previous research indicates that this type of learning contributes to creating a strong ecological identity which may lead to professional engagement in the field (Chawla, 1998; Eaton, Davies, Williams, & MacGregor, 2011; Palmer et al., 1999; Tanner, 1998). Eaton et al. (2011) also suggest that such sustainability education is meant to introduce a moral and affective concern for “place” and to create a full understanding of our relationship with the world around us.

Thus, sustainability education, and indeed all of education in the 21st century needs to become much more capacious—to help citizens everywhere reinvent how we go about living in the world and fundamentally how we think about the world we are in. (p. 2)

With this in mind, connections made here between experiential and affective modes and potentially transformative outcomes can be considered as examples of effective sustainability learning. In this case, my goal was to understand what kind of learning might stimulate a particular attachment to trees. My results did in fact reveal participants with a heightened awareness of human-nature relationships. Overall, my results demonstrate that experiential and affective experiences with trees were strong indicators of a possible transformative learning outcomes according to the study sample. Narratives were peppered with rich accounts of a perceived love and affection in relationships formed with trees. It was evident that the learning experiences helped to shape people’s character, their value-systems and perhaps even their worldviews.
Learning Journeys and Attachment to Trees

Previous research has indicated the human bond to trees is rooted in cultural symbolism and a particular desire to moralize them by perceiving them with empathy and even comparing our own bodily experiences and emotions (Gebhard, Nevers, & Billmann-Mahecha, 2003). Learning experiences that involve intimate encounters and interactions with trees could be considered the origins of such a bond. My thesis results reveal that such connections surfaced in a variety of ways, including from experiential, affective and community influenced experiences. Participants spoke of emotional encounters with trees, were both positive (childhood games) and negative (tree loss), as having deeply impacted who they are. Moreover, transformative learning theory also speaks to the powerful impact and influence that parental figures and other community members can have on identity formation (Moyer et al., 2014). On several occasions, participants mentioned significant people in their lives who had exposed them to nature and to a positive relationship with trees, which assisted them in carrying those values through to their own lives.

Conversely, the results also suggest that having a strong ecological identity is not entirely dependent on being exposed to influential people or on particular hands-on nature experiences. Several of the participants recounted their attachment to trees without alluding to any transformative, experiential, affective or community learning journey. These participants did not convey any momentous character-building learning experiences and yet have maintained a highly tuned awareness of the various benefits of trees. The precise origins of their strong attachment to trees are therefore uncertain, although the literature providing a rationale for the biophilia hypothesis sheds some light on the matter. Some authors have stressed the importance of an innate relationship with nature (Clayton & Opotow, 2003; Louv, 2012; Nadkarni, 2008).
The thesis results are consistent with this contention, revealing that all participants, regardless of their actual participation in stewardship activities or histories of nature experiences, considered this connection to be important to their identity. Moreover, as they considered how the connection made them feel, its importance tended to grow, as did their awareness of having a well-developed ecological identity.

Although the data revealed many instances of memorable moments in the participants’ lives, the manner in which these moments were expressed contributed to the possibility of the participants perceiving the moment as transformative. The moment of transition is decidedly blurry, and as such, transformation is highly subjective and difficult for a researcher to discern. Such limitations have been identified before, such as in the study conducted by Diduck et al. (2012)

As adults we can often look back and realise that we think quite differently about some aspect of our world than we did years before that we must have transformed a habit of mind, but we cannot point to any purposive learning process that has led to the new way of thinking. (p. 1316)

This points to the decidedly interconnected nature of modes and outcomes within the theory, which my study has confirmed.

**Biophilia**

The use of the biophilia hypothesis as a means to describe the intimate relationship with trees is complex and intricate. Previous academics have described biophilia as a subconscious attraction to the living world around us (Gullone, 2000). The results of this study serve to supplement and add flesh to the bones of the hypothesis (Kellert & Wilson, 1995). As participants recounted their stories of interactions with nature, as they observed the beauty of the
trees surrounding them in the conservatory and as they learned about the biophilia hypothesis, the value of the hypothesis for understanding our yearnings to connect with trees was confirmed.

**Biophilic Tendencies Revealed.**

An exploration of the nine tendencies as they have been described by Kellert and Wilson (1995) provided a rich understanding of how each individual’s ecological identity was formed. As well, using the biographies (see Chapter 4) developed for each participant offered insight into the way in which the participant expressed his or her biophilic tendencies. However, while analyzing the interviews, the distinctions among the various tendencies were not always apparent. Categorization was done using the guide presented in Chapter 3, but the process still contained a level of subjectivity as expected. Kellert (2003) postulated that this imprecise distinction of tendencies is to be expected. “These tendencies express themselves in many ways, sometimes obvious, sometimes subtle, occasionally direct, but often indirect, insinuating themselves into our lives like an intricate tapestry of implicit and explicit understanding and experience” (Kellert, 2003, p. 5). Although this offers some counter balance to the ambiguity of the hypothesis, it does not allow for conclusive distinctions to be drawn.

Some narratives however did substantiate the hypothesis. Certain biophilic responses that spoke directly to the pre-determined tendencies confirmed that for my particular sample of self-proclaimed tree lovers, an innate affinity for trees does exist. This allowed me to answer the main research question proposed for this study, and in particular in relation to biophilia.

**The Naturalistic and Humanistic Response.**

Intimate contact with nature is said to provide four adaptive advantages, including enhanced physical vitality, curiosity and imagination and increased self-esteem, calm and peace of mind (Kellert, 2003). Such advantages help to secure a well-developed eco-identity and
characterize the naturalistic tendency of biophilia. These types of advantages were found in this study, with many narratives evoking the serenity and mental fulfillment of this tendency. As well, declarations of having achieved tranquility were often intertwined with descriptions and reactions consistent with the humanistic response; a deep-rooted affection and love for trees. Not surprisingly, these two categories of tendencies are usually linked since feelings of love and affection are often a result of gaining peace and calmness. Relating such feelings specifically to trees offers nuance to the biophilic hypothesis. Kellert (2003) explained that a humanistic response to the non-human world is commonly seen with respect to companion animals that have been integrated into society or culture. However, he also remarked that landscapes and certain wild places could have a similar effect and the results of this thesis suggest this to be true of attachments to trees. The narratives and experiences conveyed in the data have demonstrated that this type of fondness for trees is possible.

*The Scientific Response.*

Where responses to trees took on a scientific/ecologistic character, participants had gained understanding from having direct observations of trees and their importance in the ecosystem. Participants who were particularly drawn to such an empirical understanding of the natural world had devoted a part of their life to developing that knowledge. Their intellectual interest and the power of the scientific tendency were apparent in the passion and enthusiasm with which they participated in the interview. This tendency, because of its factual and rational manner of observation, is assumed to be somewhat devoid of emotion and generally “repressed in favor of a detached posture of observation and analysis of the natural world” (Kellert, 2003, p. 61). And yet, in my results there was no shortage of emotional investment in the reports of scientific encounters with trees. These narratives were rooted in formal and instrumental learning
journeys, but were intertwined with affective and experiential learning modes and generated
responses that were filled with the same reverence and awe of humanistic and naturalistic
responses. Attesting to the complexity of human nature, the emotional and affective reactions to
trees as demonstrated in this study, surfaced regardless of an instrumental-fed biophilic tendency.

**Unanticipated Themes and Ideas**

As mentioned in Chapter 2, the symbolic usage of trees can impact how we view them in
our daily lives. Stories of tree loss and feelings of despair can be associated with the Arbo-
culture that transcends our culture where trees are a symbol of life (Jones & Cloke, 2002).
Participants described feelings of deep attachment and relational status with their trees. The
thought of losing the trees in Winnipeg, or even certain vivid stories of tree loss, produced strong
emotions of despair. This reaction is consistent with emotional reactions to environmental
change defined as *solastalgia*, a deep sadness due to the destruction of a meaningful natural
setting. (Warsini, Mills, & Usher, 2014). As well, various authors have pointed out that this cycle
of emotions presents an opportunity for active engagement in causes, which can lead to lasting
behavioural shifts (Hunter, 2011; Kovan & Dirkx, 2003).

Hope and despair were revealed in the results as powerful cross cutting themes, which
further attests to the existence of a potentially strong bond between humans and nature. As
mentioned in the case study by Warsini, S., Mills, J., & Usher, K. (2014), environmental damage
can have grave effects on a person’s identity and sense of place. Feelings of despair and
helplessness due to the changes in the physical environment highlights how human-nature
connections are engraved into our view of the world. Observations by the research participants
about the implications of alienation from nature are consistent with these arguments. When
participants were prompted to consider the importance of a strong relationship with nature,
feelings of despair engulfed the conversation. These results supplement the statements made by Kellert (2003) about the importance of emotional attachments to nature.

   Emotional vulnerability can also accompany this degree of intimacy and affection…

   Forests, rivers, even inanimate cliffs and canyons, can become objects of great affection as well. The destruction of these creatures and landscapes can produce feelings of profound loss and grief. (p. 103)

   As much as there was sadness expressed for what they’ve seen around them, feelings of hope were also prominent. Participants were often struck with profound hope and gratitude for their nature experiences. Given the research topic explored and how the interviews unfolded, such hopeful remarks, often made at the end of the interviews, were possibly a result of social norms required for acceptable interaction with others or perhaps they demonstrate a genuine hopeful and positive side to human nature. In any event, the contradiction between hopefulness due to the presence of trees and despair felt for the destruction of natural landscapes demonstrates a powerful emotional investment in our relationship with the planet.

**Relationships between Tendencies and Learning Journeys**

   At first glance, expressions of biophilic tendencies in self-proclaimed tree lovers, including scientists, arborists, tree pruners and wilderness leaders, would seem logical and obvious. However, the development of these tendencies and their potential connections with learning journeys (including transformative experiences) and the formation of ecological identities is full of uncertainty. Kellert (2003) has described such influence of society and culture on manifestations of biophilia, reinforcing the potential importance of learning journeys in this type of research.
The influence of society has a great effect on the content, intensity and direction of these tendencies to affiliate with nature. The emergence of our varying expression of biophilia reflect on how we are a creature of our biological heritage, yet capable of exercising choice and free will in seeking adequate opportunities for nurturing our basic inclination to affiliate with the natural world. The various forms of biophilia may be rooted in our biology, but once they take shape as a consequence of individual experience and cultural influence, they take on a life of their own and are not simply reducible to the inborn tendencies (Kellert, 2003, p. 6).

Results in this study illustrate such links between research participants’ profound learning experiences that shaped character development and the type of biophilic responses they expressed. More generally, some underlying connections between learning journeys and the intricate ways in which biophilia manifests itself were observed, supporting Kellert’s (2003) view that the learning-biophilia relationship is interdependent.

The Scientific and Naturalistic Response

The results revealed that particular tendencies were highly connected with influential moments in the research participants’ learning journeys, especially those involving experiential, affective and formal modes of learning. The influence of certain learning experiences seemed to shape selected biophilic responses. Not surprisingly, those with instrumental and experiential experiences related to the science and ecology of trees were more likely to adhere to scientific and ecologistic biophilic responses to trees (Figure 2). As well, participants who described numerous hands-on experiences where the affective mode was prominent repeatedly referred to naturalistic biophilic responses, describing the mental well-being and awe they gained from interactions with trees. This evidence is quite different from that pertaining to aesthetic
responses. Although such responses were a result of lived-experiences as well, aesthetic replies were more consistent across all of the learning journeys.

The Humanistic and Moralistic Response

The humanistic and moralistic responses mostly surfaced in relation to a particular type of interaction with trees. Those participants who told stories of strong spiritual and emotional connections with trees were more likely to make comments regarding a humanization and moral responsibility for trees. For example, stories of grief due to tree loss, admiration and appreciation of a particular tree, and Aboriginal teachings about the symbolism of trees brought forth rich discussions about hope and despair for the current state of our disconnect from the natural world. Such powerful learning experiences were recounted as having spawned a reverence and deep admiration for trees. This dialogue was conveyed via humanistic and moralistic tendencies as
reactions to my queries regarding the importance of trees. These participants spoke of their moral responsibility for the care of trees, offering rich insights into their personal struggles with hope and despair for the current situation of the planet.

**The Aesthetic Response**

The results also reveal that aesthetic responses were prominent when participants described certain defining moments in their lives. However, the types of experiences with trees varied within the narratives recounted, and yet the aesthetic appeal of nature was present regardless of the learning journey that occurred. Although Kellert (2003) explained that, “all expressions of biophilia remain subject to learning and experience”, other authors have described the aesthetic response as “universally expressed across human cultures” (Delavari-Edalat & Abdi, 2010, p. 163). This tendency stands apart from the others in its variable, yet dependable manifestation in the participants’ narratives.

Variations in judgement, however do not annul the human tendency to respond in consistent ways to certain elements of the natural world. The consistency of our aesthetic reaction to nature suggest regularity rather than randomness, a universal disposition rather than a dispensable one. The malleability of aesthetic judgement does not mean that we can deny the underlying biological thrust of our unavoidable attraction to nature. (Kellert, 2003, pp. 34-35)

My research results demonstrate that the participants’ attraction to trees specifically contained this reliable and consistent characteristic. And where the narratives demonstrated different reasons for those attractions as well as varied amplitude of the response, a consistent aesthetic attraction to trees was felt nonetheless. Such findings help to confirm statements describing biophilia as the study of “the human tendency to impute worth and importance to the
natural world… an essential condition for the effective unfolding of our individual and collective humanity” (Kellert, 2003, p. 3). Where previous studies have identified biophilic tendencies as contributing to urban trees being viewed as an important part of healthy urban communities, aesthetic tendencies in particular have been known to provide peace and serenity and are “integral elements of social infrastructure” (Jones et al., 2013, p. 654).
Chapter 6: Conclusions and Recommendations

An emotional connection to nature has been described as symbolic, cultural and innate (Kellert, 2003). The biophilia hypothesis suggests that all humans have an innate and primal attraction to other living things. This attraction can be affected by certain profound learning experiences described as transformative in nature. Overall, this project has confirmed research showing a decidedly positive attraction to nature. The principle research question of this study was to what degree is involvement in a local stewardship group linked to transformative learning experiences and better understanding of one’s biophilic connection to trees?

My goal was to determine any existing links among learning experiences, ecological identities and biophilic connections to trees. Through a qualitative analysis of 13 self-proclaimed tree-lovers, I considered how their deep-rooted affection for trees came to be and what might have motivated them to consider conservation efforts for trees on their property (such as tree banding).

I was guided in my analysis by two principal conceptual frameworks. Transformative learning theory was referenced to understand how certain experiences might have contributed to the development of biophilic tendencies and ecological identities. Learning journeys, comprising learning modes and outcomes, were identified and analysed using the theory as it has been described in previous academic research. The second framework adopted was the biophilia hypothesis, which helped me consider these learning experiences in light of the participants’ descriptions of intimate connections to trees. I attempted to determine the degree to which the learning may have affected these connections and the participants’ ecological identities as well whether participants were aware of the biophilic nature of these connections. According to the biophilia hypothesis, an emotional connection to trees is both determined by learning
experiences and is part of a profound and instinctive attraction to all living things. This study was demonstrative of the learning aspect of this hypothesis and shed some light on the innate characteristics of certain responses to trees.

During the data collection and analysis phases of this study, my early assumptions and expectations regarding the research were challenged and ultimately revised. In the beginning, I assumed that participant involvement with *Trees Winnipeg* would be a primary source of learning with potentially transformative outcomes, contributing to the development of ecological identities in the participants. However, the results revealed that the participants had varied levels of involvement (some with hardly any at all) and yet all participants demonstrated highly-tuned ecological identities. This required me to adjust my expectations of the linear and possibly causal relationship between involvement in the group, learning and the development of ecological identities. As a result, the focus of the analysis was altered to include more emphasis on earlier learning experiences and distinctions between modes and outcomes of learning. In this way, I was better able to determine which experiences facilitated learning outcomes that impacted ecological identities.

Additionally, through this new analytical emphasis it became apparent that finding clear evidence of connections between learning experiences and biophilic tendencies was difficult because of the methods I selected and time constraints for completing the research. In order to offer a more complete picture of the interplay between learning and biophilia, other methods such as participant journals are likely needed. Social cognitive theory (Bandura, 2001) along with how and why we react certain ways also presents itself as a limitation in making claims about the origins of certain emotional connections. A more thorough investigation of participants’
background, learning experiences and worldviews would provide for a deeper analysis on the subject.

Despite such limitations and restrictions, I achieved in whole or in part my research objectives, and three main points can be concluded from this project. First, **the potential for building positive relationships with trees is likely to occur if a person’s past experiences include character-defining moments involving nature and in particular trees.** The participants of this study came forward with a story to tell. Whether via an important person in their life, solitude in the woods, or formal training on the subject, the outcome of such learning experiences were seen as a revered respect for trees. Such experiences might have been transformative, but most likely contributed to the development of a strong ecological identity and general attraction to trees. Second, **the aesthetic attractions appear to be innate in that regardless of the participants’ learning experiences, they all felt awe and wonder about the intricacies of nature.** Finally, **the breadth and intensity of the learning journeys that are influential on ecological identities can vary considerably.** Whether they involved long periods of time spent in the woods, or simply a favourite tree in their backyard, the participants’ journeys were associated with a positive affinity for trees.

**Environmental Education and Communication**

The results and conclusions of this thesis have implications for environmental education and communication and the development of effective messages. Stories of love and affection, loss and grief as well as child-like wonder were indicative of a reliably positive relationship between humans and trees, ecological identities and well-being. Asserted by Kellert (2003), the importance of connecting to the natural world and all its diversity is essential to the development of an acute environmental consciousness.
We need to recognize how much an ecologically abundant and healthy world continues to represent an essential condition for our material and psychological well-being – neither a luxurious indulgence nor a charitable concern… We must emphasize how our moral and ethical self-interest relies, ultimately, on vibrant connection with the world of living abundance and natural integrity (Kellert, 2003, pp. 192-193).

The onset of phenomena such as nature-deficit disorder (Louv, 2008) and a consumerist lifestyle that leads to such a disconnect with the natural world (Orr, 1993) emphasizes the need for ongoing research and practice to reverse these trends. Many schools today are working to incorporate outdoor classrooms as part of the curriculum, attempting to get children interacting more with nature and perhaps appealing to their biophilic cravings. The positive effects of engaging such biophilic attractions can be effective for facilitating sustainability-oriented behaviours. For example, Clowney (2013) determined that an awareness of biophilia and its tendencies will foster personality traits that encourage participation in the preservation of biodiversity, stating that “[a] biophilic person will honor, appreciate, learn about and seek to protect non-human life” (p. 1002). In another study, Hunter (2011) concluded that drawing on certain ecological and aesthetic predispositions in education can lead to higher community engagement.

People are often emotionally engaged when the feel they can make a difference and when their well-being and place-identity are at stake. With this in mind, a focus on education about creating “place” that is both ecologically sound and aesthetically satisfying can lead to committed local efforts. (p. 137)

Attempting to understand our emotional reactions to nature within the frameworks used in this research is promising for the development of communication strategies and education that aim to improve our relationship with the planet. For example, my research confirms the potential
efficacy of environmental education programs that rely on experiential and affective learning modes. It also confirms the wisdom of environmental education in early childhood given the potentially transformative outcomes that can emerge at that stage in one’s life.

In addition, biophilia can help us understand how to base environmental education and communication on learners’ deeply-felt inclinations towards nature. The goal would be to find the most effective way to enhance and draw out certain biophilic tendencies to achieve certain understandings, values and behaviours. The thesis clearly shows that certain learning journeys influence naturalistic and scientific tendencies. And if transformative learning experiences that appeal to these cravings can be crafted, a desired behavioural shift is possible. Integrating experiential journeys involving trees into education and communication programs can foster wellbeing and greater ecological awareness. Further, if the aesthetic response is innate and consistent regardless of one’s learning journey, focusing on aesthetics in education and communication will have widespread appeal. As we have seen in the examples in this study, the participants expressed a genuine attraction to the complex beauty of trees. Further, if this perceived beauty is integrated into effective education programs, transformative learning experiences and strong ecological identities are possible results.

To take it one step further, certain patterns revealed in the results could help to emphasize certain strategies for effective communication messages. The reoccurring themes of hope and despair were observed as participants explored why they felt so connected to the trees in their life. People struggled with their deep connections to the natural world and their understanding of our treatment of nature. Results demonstrated that such thoughts were common in participants that had spiritual and meaningful interactions with trees as part of humanistic and moralistic biophilic tendencies. Considering this, environmental messages that attempt to appeal to the
despair of current environmental devastation are likely to appeal to an audience with strong humanistic and moralistic responses to nature. However, despair and distress related to the witnessing of environmental destruction and the effect of solastagia is surfacing in academic literature (Warsini et al., 2014). Perhaps biophilia offers an explanation. By drawing on the humanistic and moralistic tendencies that are a result of particular devastating learning journeys, such messages of despair would only appeal to a limited group; whereas appealing to consistent and innate attractions to nature, such as an aesthetic or naturalistic response, may foster more hope and thus greater engagement. However, such claims require further research.

**Opportunities for Further Research**

When contemplating further research opportunities, the limitations of this study are instructive. As noted previously, one principal limitation that may have had an effect on the results was the season and location of the interview. Because the questions attempted to stimulate an emotional response to trees and nature, the seasonal influence on data collection was potentially important. In order to fully understand how biophilia relates to people’s love and affection for trees, a comparison study of the interview location would be beneficial. For example, comparing responses from this study conducted during the winter chill of Winnipeg in an indoor controlled nature setting to an interview during the summer, outside in a park surrounded by trees or perhaps in a boardroom with no windows, would certainly generate different conclusions. In this case, the objective of the study would invariably be altered, in that the ultimate goal would be to analyse how our sensorial experience of an interview can affect how we respond to inquiries related to our innate love of nature. Such a study would generate more detailed data about the experience of participants during the data collection process.
Another limitation to address is the nature of the participant sample. It was noted that the participant group was subjective in that it consisted of only folks who already possessed a concern for trees. Conclusions drawn from the data were limited to the fact that the sample was not a whole representation of any particular societal group. A more random sample would potentially offer more varied responses. Perhaps if a location was pre-selected and people were randomly selected for an interview, data would reveal different results. Such investigations would generate a more complete and full understanding of the interplay among learning, biophilic reactions to trees, and ecological identities, providing a more rigorous approach to testing these relationships.

Finally, the juxtaposition of transformative learning theory and the biophilia hypothesis is complex indeed. This study has demonstrated that the relationship between these two frameworks is intricate and influenced by numerous factors including childhood experiences, formal and non-formal educational history and spiritual inclinations. Such influences on individual ecological identities and how they are shaped have been explored to great lengths in previous studies. With regards to trees specifically and the potential impact of well-developed human-nature relationships on the instigation of positive change, a broader scope of analysis is required. A more thorough scan of current academic literature on such topics is needed followed by a multi-faceted systematic investigation into the origins of emotional attachments to trees.
References


Annexes

Coding Guide

Objective 1: Involvement with stewardship group Trees Winnipeg
How has the person been involved with Trees Winnipeg? (tree banding, client or volunteer)
Meaning narratives, descriptive of events: canvassing, coordinating events, participating in events.

Objective 2: The Learning Journey of participants

Learning Modes: types of learning activities and methods by which means the learning has been facilitated

Formal-schooling: Learning facilitated by a deliberate teaching occasion, schooling, training and capacity-building experiences based on educational institutional methods. Old ideas and perceptions challenge new ones, leading towards a path of significant learning outcome.

Non-formal-community based: Learning generated from a community influence. Family community, social community, societal community. Power and sway from the significant and important people in the person’s life generate a learning experience from teaching moments within the community. Discourse with others and engagement in the world throughout the learning journey often result in change in thought and action.

Informal-experiential: Learning from hands-on experiences, interacting with the natural world to a level of engaged involvement. Acute discovery and observation of the systems of the natural world, the details and complexity is revealed through a lived experience. New reflections and disorientating dilemmas surface based on evidence of observations and concrete experiences. (John Dewey)

Affective-embodied: Learning obtained from interactions with the body and its senses with other trees or objects of nature, presence and engagement. Critical self-reflection about current values and worldviews usually resulting in a significant learning outcome.

Transformative Learning: Ideas and perceptions are challenged by new ones, often leading towards a path of significant learning. Through discourse with others and engagement in the world longstanding change in thought and action starts to take place. Observations and concrete experiences allow for new reflections and disorientating dilemmas surface resulting in critical self-reflection about current values and worldviews usually resulting in a significant learning outcome.

Learning Outcomes: the manner in which participants explain why the particular experience was meaningful and potentially transformative

Instrumental Outcome: Empirical learning, cause and effect, problem solving. New skills
and theoretical knowledge is gained.

**Communicative Outcome:** Gained understanding through language, expression, negotiation, feelings, beliefs and resolving conflict. Making yourself understood to others.

**Transformative Outcome:** Deep-seated alterations in perspectives and beliefs that generate an enduring change that affects the whole person. Both in thought and action, change becomes concrete evidence of a learning outcome achieved.

**Objective 3:** Sense of Connectedness with trees through the context of biophilia hypothesis

*Using the framework provided by Kellert et al. (1995) to describe revealed tendencies.*

**Utilitarian:** Describing the physical benefits derived from trees, their material value is emphasized and the benefits to human knowledge and scientific discovery. Based on the assumption that humans are on a constant quest to exploit the Earth’s genetic resource base.

**Symbolic:** Describing trees as a means to facilitate communication and thought. The natural world is a rich and textured system facilitating human need to describe complex differentiations in language. Nature as codes by which language retrieves ideas.

**Ecologistic-Scientific:** Describing a motivation and level of interest for precise study and systemic inquiry

- **Ecologistic:** The level of interest is more emphasized on the interconnection and flow of energy and materials with the natural systems of the world.
  - An acute recognition of the organizational structure and complexity of trees as a part of a larger ecosystem.
  - The awareness generates a cautious respect for trees because of an understanding of system’s requirements

- **Scientific:** The level of interest is emphasized on the physical and mechanical function of the biophysical world.
  - A focus on the parts of nature instead of the entire ecosystems. The wonder is found in the trees’ complexity as a living organism.
  - A deep-rooted satisfaction is gained from experiencing the complexity of trees themselves and a capacity for precise observation is developed.

**Aesthetic:** Describing the details of trees as forms of physical beauty. The expression of awe and gratitude is generated from a momentary perceived sense of inadequacy of human-made beauty.

- An innate reaching for a seeming idealism found in nature. Harmony and symmetry is considered an aesthetic tendency.
The symbolic uses and cultural rituals involving trees encompass this tendency in a way that added value is placed on the splendour of the natural world.

**Naturalistic:** Describing a satisfaction from contact with trees, where the sense of fascination, wonder and awe is generated from an intimate experience with trees/nature’s diversity and complexity.
- A heightened awareness of the mental and physical appreciation of interacting with trees.
- A stimulated curiosity and craving towards the mystery of the natural world.
- Relaxation, peace is derived from observing the diversity in colors, patterns and designs of the trees.

**Humanistic:** Describing feelings of deep human-like emotional attachment to trees and individual elements of nature.
- Feelings of love and care are expressed towards personal experiences with the nature. Humanized altruism and companionship is described in a relationship with trees.
- An intimate and nurturing interaction with the non-human world is developed through a process of humanization of trees in the sense of achieving relational status, not unlike family members

**Moralistic:** Describing a reverence and ethical responsibility for trees and surrounding nature.
- An understanding of the reciprocity that exists between humans and nature and an inextricable link that binds us.
- A spiritual connection and conviction of harmony that can only truly exist in the interaction with the trees and the natural world. Sense of virtuous and moral concern for the trees and our accountability of our impact on it.

**Dominionistic:** Describing a desire to master the trees. Although sometimes can be manifested as destructive tendencies towards nature, it is also a demonstration of the realization that the innate struggle to survive of all living things, including humans generates a proficiency to subdue and creates an adversary relationship with nature. Just as the predator understands and appreciates its prey.
Interview Location Photos

The following pictures show the setting of the interview. The Conservatory of Assiniboine Park has an abundance of tropical plants and trees, some over one hundred years old. Interspersed among the foliage are trails, fountains, statues and benches, making for a secluded natural oasis that is free for all to enjoy. All 13 interviews were conducted in this setting as well as many moments of contemplation before and throughout the writing of this project. Countless discussions about peace and serenity, beauty and wonder as well as hope and despair came to life among these plants. They serve as the ultimate inspiration and motivation for this project.