

Childhood Attunements to Nature Impact Adult Behavioural Patterns: The Importance of “Other-than-Human” Attachments

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“Only those who believe nature to be a living whole with intrinsic meaning find childhood a period of insight.” (Chawla, 1994)

Abstract

This study investigated the phenomenon by which nature attachments, formed in moments of quiet attunement in childhood, impact adult behaviours in relation to the other-than-human world. Study participants were raised in diverse cultures from the Hebrides, France, Germany, Uganda, Australia, Bhutan and *Mi'kmaq* (Mi'kmaq territory in Eastern Canada). Through a Free Association technique, a Deep Remembering exercise of a childhood experience in a favorite outdoor place, and unstructured in-depth phenomenological interviews, this study examined how attunements experienced in childhood became attachments to the natural world, influencing patterns of adult behaviours in ways unique to the individual, their experience of place, and their cultural milieu. This research shows how attunements in the natural world formed through repeated engagements in childhood create attachments which can impact behaviours and decision making in adulthood. Paralleling Bowlby's theory, our original contribution is identifying “other-than-human attachments” and their importance for shaping adult behaviour. More consciously fostering other-than-human attachments, for both child and adult, can initiate a transformation away from a solely Western ontoepistemology.

Keywords: childhood experiences in nature, attachment, attunement, other-than-human attachments, ecological identity, ecological self, Deep Remembering

Introduction

In this research we set out to discover the mechanism by which children form deep attachments to the natural world. We also wanted to see if these childhood attachments impact adult behaviour in relation to the living world. Understanding the connection between childhood attunements and adult behaviour is vital for ecopsychologists and educators, for encouraging the intertwined holistic health matrix of both the human and non-human. This innovative research investigated this query in several ways: first by examining the lived experiential continuity of nature experiences formed in a favourite place in childhood; then second, to see if childhood attunements to the natural world resulted in attachments that impacted adult valuations and resulting behaviours.

While ecological identity (Thomashow, 1996) and the ecological self (Mathews, 2021) are underlying concepts in environmental and sustainability education (ESE) that may help address the current ecological crisis, little is known about the processes of attunement with nature in childhood which may impact individual and collective ways of being in the world and specific socio-cultural behaviours as adults. Further to assessing the formation process of attachments and any continuity between childhood experiences and adult behaviours, the manifestations across multiple cultures were examined for commonalities and diversities. Participants raised in diverse cultural milieus, such as the Scottish Hebrides, France, Russia, Uganda, Bhutan, Australia and *Mi'kmaq*, the ancestral home of the Indigenous Mi'kmaq (located in Eastern Canada), shared their narratives and self analyses, illustrating unexpected uniqueness impacted by environs. For the participants from *Mi'kmaq*, their ontology does not separate human from nonhuman and illustrates a closer respect and reciprocity with the natural world than generally found in Western cultures. In these ways, the findings point to an intriguing range of life-shaping attachments carried by adults, formed through childhood sensory and embodied awareness in the natural world, generating a respect-based regard for the nonhuman living world which has been marginalized in dominant cultures.

Theory and Context

Arne Naess coined the term “deep ecology” at Oslo University in 1972, challenging the dominant mechanistic paradigm of science and a shallow, reformist critique of modern culture. Naess suggested that reality is experienced by the “ecological self” going beyond ecological awareness to a deep, personal understanding of self as integrated in the natural world. He advocated we must develop therapies to heal our relations with the widest living community (Naess, 1988). Arne Naess described attunement as a recognition of an intimate relationship between the human self and non-human life (Sroufe & Siegel, 2020). Attunement is defined here as “bringing into harmony with”, or “being at one with another plant, animal, or locale” (Siegel, 2007).

Heidegger (2001) proposed that attunement is not something standing for itself but is an experience of being-in-the-world, where one is emotionally and intuitively connected, thereby opening up to the world. Thus, attunement is a synchronizing between beings, a “feeling for the other” experienced as intimacy.

Drawing from Naess, Freya Mathews further posits that paying attention to the inner field of meaning within ourselves, might further reveal the misguidedness of expecting the outer field to be exhaustively determinable. She suggests that it is through communication with other agentic beings, each with its own distinctive viewpoint and way of being, that any given self can deepen and expand the reach of its own subjectivity toward an ecological self (Mathews, 1994).

Mitchell Thomashow introduced the concept of “ecological identity,” becoming a pivotal concept in defining the human-earth relationship for educators. Ecological identity refers to the unique relationship humans form with the other-than-human world (Thomashow, 1996). It begins with a subjective awareness of self in relation to the natural world but then comes to define one’s identity as a being integrally related to the living world, potentially impacting all levels of conscious understanding and behaviour. However, little research examines the development of ecological self as understanding one’s integratedness within the natural world or an ecological identity as a primary identity, in terms of the connections between childhood and adult behaviour.

E.O. Wilson’s Biophilia Hypothesis asserted that humans have a genetic basis for their tendency for connection, including with other lifeforms (Kahn & Kellert, 2002; Kahn, 2001; Kellert & Wilson, 1993). Searles (1972) was one of the first to recognize the impact of the ecological crisis on the human psyche, contending that ecological apathy is based on ego defences against the anxieties felt in response to the ecological and now climate crisis. Others, however, have found that cultivating a sense of wonder is central to the earth relationship (Berry, 2006) which can bypass such ego defences.

This tendency toward connection or biophilia is explored in the human-to-human relationship as attachment theory. Bowlby (1983) found that children in orphanages following WWII had difficulties forming healthy relationships with other humans as adults. He describes early attachments to another human are necessary for ongoing healthy relationships in adult life. Attachment is understood as the emotional bond that forms from repeated engagement which creates a foundation for attachment patterns throughout life.

Another theory of interest to this research is the importance of play in the natural world, long recognized as an essential developmental stage of childhood (Sobel,

2008; Chawla, 1988; Kellert, 2008; Kellert & Wilson, 1993). Through play, the child develops within the matrix of the earth community with few barriers. The natural world is fundamental at these developmental stages for enhancing sensory awareness, problem solving, observation skills, and ensuring physical and emotional health (Louv, 2005). Wallace Stegner describes: “There is a time somewhere between five and twelve...when an impression lasting only a few seconds may imprint for life” (Kahn & Kellert, 2002 p. 134). From previous research, it is evident that feelings of attachment to the earth can develop through moments of quiet attunement, most available in the sensory world of childhood (Jardine, 2009).

Other researchers have noted that there is a period in childhood in which moments of attunement may bring about lasting attachments to the natural world (Louv, 2005; Kahn & Kellert, 2002; Sobel, 2008; Chawla, 1988; Kellert, 2008; Kellert & Wilson, 1993). Therefore, this research sought to understand more deeply the phenomenon by which attunements form between children and the other-than-human world and how these attachment phenomenon might extend into adult life. This phenomenological research was an initial exploration of descriptions of attunement, how attunement experiences might relate to attachment, and then if attachment impacts the formation of an ecological self that feels intimately connected and an ecological identity of defining oneself in terms of an other-than-human living community, and particularly how this might manifest in different cultures.

Transformative adult educator Edmund O’Sullivan (1999) believes that the current formative myths in Western society is dysfunctional, as it is predicated upon a global competitive marketplace instead of a sustainable planetary habitat (O’Sullivan, 1999, p. 2). He asserts that we require a new mythos to lead us into an Ecozoic Era, which is supportive of all life. Considering the seriousness of the crisis, his assumption is: as we heal our relationship with the non-human world, we move toward consciously understanding our locatedness and personal well-being within the context of the health of the planetary system and vice versa. This is the transformative work that is required in this historical moment to address our current existential crisis. This article explores experiential and educational pathways, through attunement and attachment, that might contribute to this transformation.

Research Design

Methodology and Research Questions

A phenomenological methodology was utilized for approaching the lived experiences of participants (Kovach, 2010; Van Manen, 1990), as it is an effective approach for generating in depth narratives and then probing how attunements and attachments to the other-than-human world were experienced by participants during childhood.

We explored five research questions:

- a. How do attunements to the natural world occur?
- b. Do attachments form from moments of attunement in childhood?
- c. Do these attachments then shape adult behaviours in any sustained way?
- d. What role does culture play in shaping interactions with the natural world?
- e. How might a conscious awareness of attunement/attachment to the other-than-human transform adult behaviours toward sustainable living?

Bracketing

I, Betsy, a Celtic /Polish settler descendant live and work in Cape Breton on the Atlantic coast of Canada. I live in the unceded territory of *Mi'kmaq*. The school in which I taught for 10 years was for Mi'kmaw students and so I have had the privilege of coming to know Mi'kmaq leaders and Elders (persons held in high standing with regard to the Seven Sacred Teachings of the Mi'kmaq community). Later as a teacher in a school with both Mi'kmaq and European students, I navigated between both cultures recognizing that Indigenous students were contributing Traditional Ecological Knowledge and worldviews to our learning. I noted that their relationship with the natural world was expressed in a non-hierarchical manner, one in which the elements of the natural world were viewed in a personal and subjective manner as the matrix of "all my relations". As the lead researcher on this project, I bracketed my personal prejudices and a priori assumptions as much as possible, to focus carefully on the narratives of participants to uncover their experiences with the natural world and their diverse cultures.

I, Elizabeth, am a Germanic settler descendant who has lived primarily on the Canadian plains, on Treaty 6 territory. The region where I grew up has been inhabited primarily by the Plains Cree since the retreat of the last Ice Age 12,000 years ago. They call themselves *Néhiyawak* or the "four direction people," says Elder Jimmy O'Chiese to Dr. Claudine Louis (Louis, 2008). In my research and education work in transcultural settings, primarily with Indigenous people, immigrants and refugees, and in community sustainability education, I have been in a decolonization process that challenges many of my White, middle class, Western assumptions. I too have learned to bracket and otherwise challenge many of my assumptions as an ongoing learning and unlearning process.

As investigators, we suspended our current views as much as possible while attending to the description of our research co-participants (Van Manen, 2015) and maintaining the focus on the lived worlds of our participants, allowing them to lead us where they may.

Participants

The seventeen (17) participants had a range of cultural backgrounds and were raised until the age of 21 either in the Hebrides, France, Germany, Bhutan, Uganda, Australia or *Mikmaq*, located in Eastern Canada. Participants who met the place-based criteria were initially found through opportunity sampling from among people who were educators and cultural informers. From there, snowball sampling led us to additional participants. The goal was to find nonrepresentational diversity among places-of-significance, ages, as well as cultural and professional background. The colours on the table refer to regional groupings and the names used are pseudonyms, except where participants asked that their actual names be used. For instance, Albert and Murdena Marshall have a community responsibility to teach about their culture and therefore asked for their real names to be used.

The participants were all prepared to offer thoughts without restraints (Shenton, 2004) within a series of narrative interviews. This diversity enabled exploration of the process by which people from various cultures form attachments to the natural world and to discover if the phenomenon is transcultural. We also hoped to find if and how experiences in the natural world are mediated by culture. This paper only presents a small portion of these findings, touching only briefly on the cultural findings.

The number of participants (17) was determined by the attainment of a saturation point, in which a repetition of themes and patterns (Mason, 2010) no longer added new information to the research questions (Bowen, 2008).

Table 1: Study Participants

Participant	Place of Birth and Residence (through teen years or later)	Age Category	Occupation
Elspeth	Eriskay, Hebrides	Adult	Retired Teacher
Meghan	Western Hebrides	Adult	Retired Teacher
Bruce	Hebrides	Adult	Construction
Tess	France	Adult	Restores Antiquities Book Binder
Christy	France	Senior	Language Teacher
Arthur	Moldavia,	Young adult	Caregiver
Sheila	Germany	Young adult	Veterinarian
Marcia	Australia	Young adult	Academic
Katelyn	Cape Breton, Canada	Adult	Works with people with mental challenges
Jim	UK	Senior	Psychiatrist
Julia	Uganda	Young adult	Caregiver
Tshering	Bhutan	Young adult	Community developer
Namgyel	Bhutan	Young adult	Community developer
Miranda	Mi'kmaqi, Canada	Young adult	Cultural Educator
Robert	Mi'kmaqi, Canada	Young adult	Cultural Educator
Murdena Marshall	Mi'kmaqi, Canada	Elder	Academic
Albert Marshall	Mi'kmaqi, Canada	Elder	Educator

Methods

Attunements to nature formed in quiet moments in the natural world may last a lifetime, becoming part of one's ecological identity and ecological self. Thus, requesting a simple memoir might not contain all the attunements that one may form to the natural world or a mult textured rendition. Thus, this research sought in depth exemplars of attunements that have become attachments through time in the lives of participants. Participant wording and language is included to shed light on this experiential phenomenon of attunement and how attunements in childhood become attachments, noting whether and how some of these attachments shaped adult life, influencing adult decisions.

Unstructured, open-ended interviewing methods were used along with attentive and empathetic listening and active waiting (Hunt, 2010). Overall, the participants engaged in up to three interviews and then a follow-up debrief. The first interview consisted of three separate components: (a) a Free Association Interview technique with a selected word list for freeing the memory, (b) Deep Remembering as a memoir recall process, in which deep breathing precedes the retelling of a childhood memory in an outdoor place, and (c) an open-ended interpretive Debriefing at the end of the interview.

The *Free Association Interview Technique* (Holloway & Jefferson, 2009) sets a reflective atmosphere in which a general word list was read, and participants were asked to name the first image that came to mind. This launched the interview into unexpected depths with responses frequently evoking connections to childhood experiences featuring unique relations with the natural world.

The *Deep Remembering Process* required the participant to breathe deeply to oxygenate the brain and achieve a relaxed energy state. The participant was asked to visualize oneself, as a child, in a favourite outdoor place. They were invited to retell the sights, sounds, textures, tastes, and smells of this place as well as the storyline of the memoir. These recorded memories and associations provided the substrate for discussion and cross referencing.

In the *Debriefing* segment, at the end of the interview, the primary researcher asked if there was any crossover from their memory to their free associations and other emergent questions.

Reflective observation was engaged by the primary researcher (Kovach, 2010; van Manen, 2015) by recording interviewer changes in emotion throughout the interview which allowed for consideration of countertransference (Searles, 1978). Attentiveness to the profound sense of interconnectedness and porosity that exists between humans as well as with other beings was considered. Sensitivity to culture enabled a

respectful awareness and inquiry into varying backgrounds of meaning. For instance, previewing word associations with Marjorie Pierro, a *Mi'kmaq* cultural advisor, illuminated intricate protocols for approaching Elders and determining appropriate translations as well as understandings of specific words.

Data Analysis

We analysed the data using thematic analysis, coding theme segments related to research question. While allowing the data to speak, we read and coded for themes of attunement, attachment, and elements that might have been influenced by cultural knowing rather than from first-hand experiences in the natural world. Across the multiple interviews with each person, we cross referenced the initial free association words to their childhood memoir to see if there were synergies that arose and if links were revealed between the childhood memoir and a favorite outdoor place.

A second *Follow-Up* interview took place within the next two weeks so that the interviewer could review the findings with the interviewee. This gave the participant an opportunity to review the transcripts, discuss the descriptions and interpretations, reflect further on their experiences, and then reinterpret the experience accordingly.

A third and final *Follow-Up* interview took place after three months to determine lasting impacts of restoring childhood memories of attunements and attachments to the natural world. In all cases, the participants reported that the recall experience was positive for them. The interviewee was asked if they had ever thought back to the interview over the intervening time and about any lasting impact or sentiment from the initial interview. This was used to learn further from the lived experiences of the participants, explore the background to their personal narratives, further describe the feelings and experiences, and locate any continuities between childhood experiences and adult behaviours. These follow-up interviews were pursued to examine the potential of unconscious understandings becoming part of our conscious awareness, which was pursued with all participants after some time had elapsed.

Themes and Preliminary Findings

The data that emerged were filled with deeply sensory descriptions where geological features or beings in the natural world were not a backdrop to the experience of living but were a lived relation. The experiences were deeply sensory and embodied rather than cognitive and conceptual.

For instance, Tess's connection to sand was forged in childhood sixty years earlier while exploring the beach dunes in Normandy. Her memory, as a young child wandering a beach in Normandy with her net to catch butterflies, was told with

exquisite, embodied detail. When the memory came to her, she was overwhelmed with emotion interrupting the process and saying, “I tell you now!” Her French mixed with English to retell her lucid vision from the Deep Remembering exercise.

I tell you now! It is a place when I was a little girl. There is a beach and there are sand dunes. And after that there was white vegetation. And there are plants going like this. That high. It was not cultivated. When you took me, I went to that place, I went to try to pick butterflies. There were plenty of insects because it was wild. And after that there was white vegetation. It was sand. There were plenty of insects because it was “sauvage”.

“Oh, wild?” I queried...

Yes, not cultivated. It was quite expansive. Besides the sand dunes there was the beach and the sea. Now it doesn't exist anymore because there [are] all constructions. When I was a little girl, it was the nicest. I remember walking between plants and trying to catch butterflies. It was in the sun and the sun was warm. I was walking and I had no shoes. I was walking with my feet on the sand. It was what I saw. It was dry sand, a little warm not “brillant,” not very warm but sweet and warm but not “brillant,” not too hot.

Tess described how the sand felt on her toes, with its warmth and the occasional sharpness of dune grass, as if it had just happened, part of her lucid memory and experience of attunement. The embodied memory seemed grounded through her bare feet in direct contact with the sand. Yet, as a young girl, she was forbidden to go to the beach alone because the refuse of war (WWII) often came ashore. “I like to go to the extremity. I like to go the edge” Tess said in describing herself and the risks she took.

As we explored these memories, Tess explained that as an adult, she has travelled to the Sahara, the Rajasthan, and the Gobi Deserts in search of the same solitude she found in the sand dunes of Normandy as a child. Being alone in a sandy natural world became an attunement she has sought throughout her life, evidence that the attunement translated into a lifelong attachment. Tess wasn't afraid to walk alone in the forest in Ardeche, France either, even though wild boar droppings from the previous evening were evidenced a few feet from her residence. This independence developed in childhood, the sense of safety and security without the company of others, she explained was perhaps due to the separation of years and interests between herself and her older sisters.

I was the youngest. I was the little one. I am much more independent than my sisters. My sister was 5 years more than me. There was one year difference between them. They were very close. I was the “little one.”

Incidentally, Tess had been out photographing butterflies the morning of the interview, no longer wishing to harm them through capture. Tess’s atypical attachment to sand, and its persistence throughout her adult life, propelled her to venture to the world’s deserts, alone, seeking the solace she found as a child. She taught us to think more divergently about the kinds of attachments one forms in childhood and the vast impact they can have on recurring adult behaviour patterns.

Tshering spoke about her childhood attachment to a particular tree near her childhood home in Bhutan.

On our way back I uprooted a tree. I was especially attracted to the leaves. I planted it in my flower garden. Years later after moving away, I used to come back to that place. I would have a sense of pride to see if it grew. It grew very nicely even without my care.

As she grew older and moved to a new home, she continued to go back from time to time to visit “her” tree, evidence of her continuing attachment and the joy experienced in the life of a nonhuman being. Years later, the new owners of her childhood home in Bhutan cut down her tree and this, Tshering explained saddened her deeply.

Also in Bhutan, Namgyle had a tree attachment. He feels that children still play outdoors much the same as he did as a child.

I feel like there is connection with the human mind and the natural world. We are connected to the natural world. Everything in nature is connected to our own being. There was a giant pear tree that we had outside our house. When there was trouble at home, Mom would scold me, or Dad would just bark at me. I would run outside and climb the pear tree. There was a large branch that I would lie down on.

Namgyle’s attunement behaviour in relation to the pear tree illustrates how the restorative powers of the natural world befriend children around the world in their times of difficulty. It indicates a cultural openness to perceiving oneself as integrated within a web of life which communicates through embodied senses and creates a full contact awareness of other, an intimacy. The other in these cases includes the qualities of forces such as water, sand, or air, not just living beings, which provide a sense of solace and safety.

As expected, many participants from various countries had favourite trees. An interesting exception to this attachment to trees occurred in the Hebrides where few trees exist. Ecological identity has diverse expressions in direct relation to the unique ecological place and elements experienced.

When asked about a favourite tree, Elspeth commented, “Oh, I did not see a tree until I was seven.” On this occasion she had left her island to travel on mainland Scotland which is treed. The treeless islands of the Hebrides have forced even the birds to adapt by building their nests on the ground. She remarked that a tree root was excavated from a Hebridean swamp once, so she knew that trees had existed in her locale in the past, evidence of previous ecological loss. However, it was evident and logical that children do not form attachments to trees if they have not had an experience of trees.

Elspeth, born on the small island of Eriskay in the Western Hebrides, brings the island to life in a very sensual way through her remembering, particularly the feel of the wind, the sound of the waves, and the playful wandering all day.

Wind on my skin. The wind blows constantly there. Sounds of seagulls, geese, crows, lapwings. One of my fondest memories was going out at night to burn the heather!

As a child, Elspeth loved spending the cold mornings searching the fields for newly born lambs.

We would wrap it in wool socks or a blanket. Something warm anyway. We would put it under the stove. After a while we would hear that little bleat. It was so wonderful! It was alive! The warmth brought it back, so I think that the lamb was my favorite as a child. The fact that they could come alive. This was wonderful. You felt that you had saved them!

Meghan also grew up in the Hebrides, where she loved to play barefoot on the strand, eating seaweed, urchins, and snails. She recalls,

I am on the shore, playing in the rocks with my friends. I can hear the sound of the sea and the waves, the shorebirds, and the seals. The wide-open sky is all around me. I can feel the warmth of the sun on the hard rocks and the feel of sand and warm water, in the puddles of the rocks, on my bare feet.

We knew what to eat. We would eat the barnacles that you would find growing on the rocks. We would just hit them and

eat them raw. We would eat the periwinkles. We would take a pin (from our hair usually) or something to get them out of the shell. They were better cooked, but we ate them raw too. We would eat dulse and carrageenan. Carrageenan looks like antlers. The dulse would be floating in the water like a small sheet of seaweed. We ate bluebells, primroses, daisies, and other flowers. We would suck the ends of the clover. We would eat the roots of some weeds, Curran nan caorach (sheep's carrot) and puinnseagan (I don't know the English - it was a shiny green leaf). We didn't go home till late. We would stay out and play all day.

This lovely description of the joy of nonmediated wandering and nonutilitarian engagement provided some context for her attunement. Living in Nova Scotia now, a continent away from her childhood home, Meghan discovered this same seaweed, looking like reindeer antlers, on a nearby beach. She now makes pudding with it and brings these puddings to people with throat cancer or other throat ailments. Before I left to go home, she opened her cupboard and gave me some seaweed that I could take home to try making pudding. From the attachment formed through experiential engagement, she pursued helping others with edible plants and animals. Her adult habits had been shaped by these experiences, leading to her healing knowledge and acts of generosity, mimicking the natural world which gave so freely to her.

Bruce was also from the Scottish Hebrides but had resettled as an adult in Cape Breton, Canada living next to the ocean. In the Free Association interview with Bruce, when "ocean spray" was mentioned, he responded, "Ocean waves."

I asked, "Those would be the waves that you see outside this window daily."

"Oh no, not those waves, I meant the waves on my island in Scotland!"

The Free Association tapped his childhood experience of ocean spray, not the ocean view from his current Canadian home, which he had built on a cliff overlooking the ocean. His childhood sensory memory was close to the surface of his conscious awareness. In his child memoir, he explained:

As a child I would help herd the cows down to the village along the "machair", a fertile strip of land along the strand or beach. I was good at this because I had a border collie that assisted me. When the cows would pass their own lanes, they would often turn up their own driveway and head home. My border collie, without bidding, would run back

and bite the cow on the nose turning it around to face the group. The dog would then run to the back of the cow and bite on its leg to move it forward. A British man, watching my dog do this, without bidding from his master, offered me 100 pounds for my dog. I refused the offer. Now this was a considerable sum of money at the time and my family was not one of means. That night when I returned home and told the story to my mom, mom was cross, soundly saying, “We could easily have gotten another dog!”

Bruce explained that he really loved that childhood dog, saying he was worth more than any sum of money. When Bruce’s wife passed a couple of years ago, his children, understanding this attachment, bought him a dog, knowing it would be the best thing they could do to promote their dad’s healing and take his mind back to happier times. Four months later I checked back with Bruce to gather his reflections on the interview. He said that he did indeed think back to the conversation we had many times. It led him to think very fondly about his boyhood days. Bruce said he loved the freedom of his youth and how he could run through the hills and glens of his home Hebridean home. He then told another story about finding an owlet in the heather.

The owls on his island had adapted to living in the heather because there were no trees for nest making. I found a baby owl in its nest on the ground and even though it was squawking, I brought it home. Mom and Dad told me that there was a curse on taking owls and that I must return it immediately. It was getting dark, but I had to go myself and find the place I had taken it from.

The cultural teaching here is not to disturb nests, in particular of owls. It was an important teaching to admonish the boy to return the owlet in the growing dark, attuning him to the fear the owlet and owl parents might be experiencing and the human and nonhuman consequences of disturbance. It was an experience of learning to flow with the synchrony of the natural world.

Arthur lived in Moldova as a child. During the visualization, Arthur’s mind was transported to the Ukraine where he vacationed as a young child with his grandparents. The use of the present tense in these descriptions at times is evidence of childhood attunement, still living in the subconscious, until it is brought up to the surface consciousness.

I was thinking about Kiev. My grandparents lived in Kiev, a normal suburb. Right across from that place there was a

beautiful forest. I was four or five. There were paths, gravel. There were toys for the children, lots of trees and plants. I went for a walk with my grandparents because they were early risers. We would walk about 2 km for water; it was tasty, very much like Iron Mines, here in Cape Breton. There were minerals in it. You can smell the forest strawberries, little ones, very sweet. I think it is the smell of strawberries and the smell of mushroom. It is kind of damp, moist and earthy. My grandfather knew the kinds of mushrooms you could eat. It happened before Chernobyl. It's funny. I am trying to see if I can find the plant here along the brook. It grows here too. It is a tickling touch when you were little because the plants were taller than you.

When he moved to Canada, Arthur said he knew he would settle here when locals took him to a water spring at Iron Mines to get pure drinking water. He purchased a home not far from this spring, based on his early sensory attachment to fresh drinking water which resided in his memories of fetching water with his grandparents as a child. The day that I met him at his new home he wanted to show me the plants that grew along the brook just like the tickling ones in his country. His choice of Canadian residence then was based on his attachment to a particular taste of water and the environmental surround in this Kiev forest.

Sheila was from Germany. "A horse, of course!" was Sheila's answer to the first free associations of favourite animal and first pet. Sheila was exposed to horses very young. Her earliest recollection in the outdoors was in the horse barn and her first spoken word, "hay", was in response to her mother asking her what horses eat? At four years old Sheila was given her own horse and was expected to ride daily. Within the first few seconds of this interview, Sheila's life path as a chiropractic horse vet was evidenced.

Sheila's favourite smell was of British Columbia cedar. She describes this smell attachment as "an acquired one, when I was older," easily sensing my purpose in asking and being as honest to herself as she could be. (I wondered if the smell of the barn or her horse may have been her first but she carried her mind far off through the years to another smell.) Soon she responded, "If I go further back, as a child, I will say the smell of spring." Not surprisingly, the horse barn was her favourite place. She described her care-free years as a child.

No one would worry about it. In those days, in the 70's, you would go out to play and just be back at 6:00 o'clock when the church bell rings, and you would be okay. It was time for supper. So that is the smell that I really like.

No one worried in those days. This is when time in nature was free and abundant. In the spring, the world was coming alive and life and all of nature was yours.

I love to be in a beech forest. We have a couple of forests that are just beech. When the leaves come out, the leaves are a very specific green in the light in the spring. It is when the light comes through in the spring, it is the most beautiful light you can imagine.

Sheila's description of the beech forest was very touching in its specificity. Her words name this relationship of freedom and are specific to spring. It is a time and place that is ingrained on her memory with love. Her description of being under the canopy of this filtered light shows her deep attachment for this forest, as did her affect and manner of speaking. So the quality of a force, like light, becomes an embodied, sensory memory.

Sheila's dad pointed out other animals to her as a young child. She began to love everything with four legs. As an adult, Sheila has no shortage of animals in their home in Germany. Rabbits, dogs, cats, horses, and other "*four-leggeds*" inhabit their property, a total of 23 animals. Sheila wanted her children to grow up to be comfortable with animals too. Sheila's love for horses and other animals translated into a career as a chiropractic vet. She and her husband, who is also a horse chiropractic veterinarian, are determined to provide experiences for their children to ensure that they will develop a similarly strong relationship with the living world.

I first met Marcia as a participant in my workshop at the 7th World Environmental Education Congress in Morocco. Marcia is from Australia, so it was fitting to find that her favourite tree is a eucalyptus. We come to love what we come to know. When given the prompt "wolf", Marcia's immediate association was "majestic." "You probably have dingoes..." I asked. "We do, but dingoes aren't majestic. They have a different strength." I questioned where she may have gotten these notions, if they don't have wolves where she lives. While dingoes can be considered a subspecies of wolves, some consider them to be their own species. "It could be just the storytelling" she said. Storytelling is often the cultural transmission of ideas held by a group and it provides us preconceived notions about plants and animals, thereby mediating our relations.

I think of court. A dingo is more a protector. If you take an analogy of court, the wolf would be where it is assisting the royals. A faithful retainer.

Cultural storytelling in Marcia's culture has given her quick and easy ways to think about dingoes so that she is able to respond quickly without thinking. Marcia's

thoughtfulness and metacognition get in the way as she becomes aware that her comments about dingoes have been mediated by the cultural hierarchy of her British system of culture, hijacking her thoughts. A profoundly interesting and telling comment of which many would not have an awareness, in particular, of the power of cultural knowledge and the way that we are conditioned to see an animal or plant in a positive and/or negative light. For instance, Marcia described a crow as “bleak.” I relate, though I live halfway around the world. The crow can be a harbinger of death in some cultures and certainly in some Western stories, frequently evoking a negative response.

The following poem are the words Marcia wrote in Morocco when I did a “deep remembering” process with a group of twenty-two participants from around the world. All of the responses were touching and poignant. Marcia’s took the form of a poem.

The Call of the Desert

The call of the desert is timeless,
Ancient whispers travel etherically towards me,
Leading me and guiding me to a connection of an eternal knowingness,
Acceptance of my arrival here is everything and nothing,
It is a feeling of belonging
That extends deep within,
To deep without.

She was anxious to retell the childhood memory tapped in the deep remembering process.

I am instantly very small, perhaps a baby. I have never had a connection with being a baby. There is the most beautiful quiet. It is the most intriguing quiet. It is a quiet you want to listen to. There is cleanness in the air. I don’t smell a campfire or food cooking. I can’t smell any eucalyptus smell; I can’t smell any mud. It’s cleanness. It’s beautiful! I feel a little bit awestruck. I feel that I am a part of something much bigger. It is safe, peaceful, it’s secure. It is actually a very beautiful place. I have never connected with that place or that feeling before so I thank you.

Marcia was deeply surprised at a recollection from such an early stage in her life. It is a powerful description of being “in attunement,” which in retrospect evokes awe. Her poem expresses not only an individual consciousness but touches the collective unconscious where one is embedded in something greater. Marcia’s recall transported her to a very early baby memory when she was with her parents and in a safe and expansive outdoor place. Her sense was that she was a very young baby on

vacation in the desert with both of her parents. A very happy time in the natural world was her very early recollection.

Her words convey the deep attunement she feels for the outback... the quiet, the cleanness, the peacefulness. No borders exist between herself and all that is, in a moment of total communion with the natural world. Marcia's poem was a thank you extended across many years. She was in the vastness of the Australian outback with the people she loved. The sense of her security in that vastness survived. "Going back to that mat. I can feel my mother right there. My father is not too far away. There must have been generosity in the air, something anyway." Her words emphasize that her confidence and sense of security in nature is large, as is her sense of belonging to her parents. The pervasive mood is of happiness and security, in part through a soundscape.

There is another statement that Marcia made when I asked her to reflect on the poem that she wrote in the desert of Morocco while in my workshop. "There was only a couple of times that I have been able to reflect on that poem." I asked her how the recollection of the memory from a year earlier had impacted her thinking since that time. She found this memory pleasing and pervasive, a lasting positive influence on her thoughts and understandings of her relationship with the natural world. This reflection on the experience led to a significant reintegration of the experience into present awareness. While this changed it in some regards from the pure experience, it brought her greater self-realization. Marcia's story illustrates what other participants also expressed in terms of a greater sense of self-knowledge resulting from reflecting on their recollections.

Miranda, a young *Mi'kmaw* person, is thought of as an Elder, even by her older sister. Miranda does exude the wisdom of someone much older. She says,

Be aware of the good things that you can do for others. That is what sunrise reminds me of. Reflect on life and what life provides you.

Her word association for morning dew was "new day, new vision, new way" showing the metaphoric nature of her thinking. Miranda sang a phrase from a nursery rhyme about an oak tree, although these are rare in Cape Breton, displaying the impact that mainstream culture has had on her. In the next phrase she explained the different terms for picking sweet grass in her *Mi'kmaw* language, displaying intimate personal cultural knowledge of the spirit side of a phenomenon.

Some people call it *jim siku* or other calls it *msiku*. Some call it *welima'qewe'l msiku*. So, you can smell it when it is ready to pick. I am sure that the symbolic use is still there. They say *kislaste'k*, which means it is

ready. By August it is dry. It is not as good as it is in July.

You have to acknowledge that the medicine is a living entity entering into your body. If you doubt medicine, it won't work. You must believe and have faith in order for the spirit of the medicine to work for you. The medicine is a spiritual entity taking the illness away. You have to always remind yourself not to have that doubt.

All these things in my culture come in different stages. It has to be sincere... when you are ready to learn. When people are ready... I felt it. It comes with the saying that seeing is believing. In all the years that I have practiced Roman Catholic faith I have not been so moved. I think this is very important and should be recorded because people don't usually share their spiritual journeys and experiences.

Miranda's words also demonstrate how culture mediates firsthand direct experiences.

Gentleness toward the natural world is specifically taught in *Mi'kmaq* culture. As kids, when you get a slingshot, we were always told never to just go out and hit a bird. You'd get in trouble for killing the bird because you were out practice shooting. Elders made you work for the bird's life by showing it respect in giving it an actual burial. I don't remember them making us go out and eat it but... you disrespected this animal.

For cultures still in touch with their old wisdom, such as the admonishment that Bruce received about owls and Miranda's teaching about bird burials, a respect relationship is taught.

Robert is a young *Mi'kmaq* man who has tried to keep the cultural traditions of his people while integrating into mainstream society. Robert expressed that too often Western knowledge overshadows Indigenous knowledge.

Growing older... you have been thrown into the mainstream public education system and you have not had the time to learn about the Traditional medicines; Traditional knowledge gets overlaid with all this other stuff that you should know.

But Robert has learned from his Elders, his Aunties and Uncles. Now he has reached the stage in his life where he feels that it is important to share and intervene with young people who may have missed some teachings. Now it is his turn to share what he has been taught about Traditional knowledge.

In the creative visioning, Robert pictured himself as a one- or two-year-old boy playing with toys just outside his father's shop. He compares the attunement from his childhood and his resulting feeling of belonging to the experience of contemporary childhood.

There was sand or gravel there. Summer smell is always fire. It is like going to your happy place. Just remembering brothers and sisters playing outside, brightness like sun. Growing up in poverty you don't have a lot, but you don't know that as a child, so you are happy. You are safe. Rocks are just as important as an iPad today. You played connecting with your brother and sister. It is not connecting with your two thousand friends. That is the difference today. You know that you are surrounded by the people who will protect you. That is not possible on Facebook. You know that you are safe. It is a feeling of belonging, belonging to a spot or a place.

Robert's association to an outdoor smell as "fire" was a surprise at first, but fire is one of the key natural elements in Indigenous knowledge and was a conduit to his spiritual, emotional, and social world. In another related story, Robert said:

As a young boy, we would always go to the river. We saw this fire under the bridge. This was odd. We wondered why there was a fire under the bridge. We went over and this guy was fishing. He had a small tent, a skinny guy. This guy was really skinny! We asked him who he was. He was a hitchhiker from Germany and ran out of money. We asked, 'Why don't you come over to our place to eat?' The next day he came over. He wanted to go someplace where there was big ocean, big water. We took him to Malagawatch. This guy was loving the place! To me the water looked like an ocean. To me, as a little boy, it was my ocean. He stayed with our family for two years, gained 100 pounds and ended up taking off. A year later, he sent us a letter from California.

Robert explained that a sacred fire is a spiritual practice among the *Mi'kmaq*. He understands that as an adult, he is drawn to the campfires of strangers, because of this deep connection to fire. Robert spoke of the impact of the "sacred fire" on his life as an adult.

My dad made daily fires outside. He was very particular about not burning garbage. For him fire was special. It had a certain smell. To him it almost signified the way he was, a simple man. To me, the fire is the connection to my father. The smell of fire is my father.

Once, when in a cottage in PEI¹, I could hear the crackling of fire. I could smell fire. It was almost that instant invitation, that instant welcome. If someone comes to your fire, you welcome them. It is that place where you are safe. When you lose that fire, you lose that connection to that person. You have that yearning for that fire. It is almost like no one can make the fire the same way. It is a hard thing to understand. It is made in a certain way, like buns that your mother might make in a certain way.

Here Robert is connecting the experience of fire with the inner fire. Fire seems to strip away defences. Its vitality is warm and inviting, evoking one's inner fire and the vital energy of those beings around one. Fire, fish, and relationship are symbolically interconnected in Robert's life.

Albert Marshall, as a *Mi'kmaq* Elder, feels a deep sense of responsibility to share his knowledge. He is well-known nationally and even internationally for the "Two-Eyed Seeing Program" that he and his wife developed in collaboration with Dr. Cheryl Bartlett at Cape Breton University. Albert believes that a person will have a deeper perspective if one looks with both eyes, the eye of Traditional Knowledge and the eye of Western science, respecting each knowledge system for its uniqueness but integrating both knowledge systems. Albert requested that his real name be used as he feels it is his responsibility to teach young people about their connectedness to the natural world.

Albert's interview showed immediate evidence of metaphorical thinking but not cliché metaphors. His comparisons revealed other more hidden realities. Albert posits the hummingbird as a metaphor for the *Mi'kmaw* People.

The culture is so delicate that it cannot survive if it is caged in. To become self-sustaining as a culture, [formal] education is the only choice. But at what cost?

When I mentioned salt water, Albert was immediately transported...

Oh! Beautiful... The smell of saltwater helps you, not to reflect on the hardship, but on the renewal, the renewal of life. We are very much part of the water, not just for cleansing, not just recreation, you have to be mindful that in that water there is the beginning of a new life form. Any aquatic life... We don't think in terms of what can I gain from this without having the full explanation of interconnectivity and more interdependency. More diversity will create greater diversity. No matter what you do with one

¹ Prince Edward Island

species, you ultimately do to something else to another species. Ultimately you will feel the consequences.

The quality of water is its interconnectivity. Oceans convey diversity of life form and link actions and consequences through a multilayered connectivity. Albert's near drowning as a child also forged a relationship to the fresh water lake near him. Interestingly, the smell of the lake also brings him peace rather than anxiety. Thus, childhood experiences shape adult behaviours decades later in a formative manner.

Albert talks metaphorically about readiness to learn. He named the ash as his favourite tree. The depth of his relationship with this tree again shows the level of metaphorical thinking.

The ash tree is a unique species; when an ash tree is ready to discharge her seeds and that seed falls into the environment, if that seed senses that the environment is not just right, then that seed will go into dormancy. Everyone takes their own meaning and level of meaning from stories according to their own readiness. Our stage in life prepares us for our understanding. The knowledge will go into the state of dormancy until that recipient is well prepared. The ash seed is prepared to wait until the environment is ready.

As he explains, one doesn't always understand the meaning at the deepest level until one is ready. Sensing his meaning at multiple levels, mainstream culture may not yet be ready for Indigenous wisdoms; the knowledge may need to wait, until we in the West are ready to hear it and respond appropriately. Like Miranda, he explains how a respectful relationship with a medicinal plant is to be undertaken and the balance that is to be found within the living world. Similarly, one doesn't always understand the words at the deepest level until one is ready, until the "medicine" is needed. The understanding of living beings as agentic is pivotal.

The smell alone when the sweet grass is wet in winter has a profound effect on the psyche, evoking the expansive days of summer when it was stored. You know that the grass has surrendered itself to maintain that balance between the spiritual and physical connection that we all try to maintain. I get a sense of gratitude conveyed to every blade of grass. When you pick it, you must do so with care so that the sweet grass is there for the next seven generations. The sweet grass is burned during the vernal (spring) equinox to evoke its psychological effects. And the stillness, even with the noise that nature makes. There is a lot of comfort in knowing that you are all part of this.

Murdena Marshall, a *Mi'kmaq*, grew up in the First Nations community of Eskasoni. Murdena's lively, spirited personality is as memorable as when I first met her two decades earlier. The twinkle in her eye and her personal effervescence was even evidenced from her hospital bed where I interviewed her after her heart trouble.

Many children in her community were removed from their homes to attend the residential school in Shubenacadie. In truth, Murdena was hidden by her grandfather, Chief Gabriel Sylliboy, to save her. Murdena joked that they didn't take her because she was "too saucy." As a young girl, Murdena envied these children from residential school because she liked their new haircuts. "It was only later as an adult that I began to realize the full dimension of their loss."

Murdena was brought up in an animate world in which nature spoke to her. When asked about the *gek pe wisq* (morning dew), Murdena commented.

Gek pe wisq, you know it is not going to rain today. The ground will tell you. Language gives us the relationship of our everyday lives. Bedtime stories were told to me, not read from a book. Grasshopper being a predominant character. He was a trickster at times. Elders often told stories of the *wiklatmu'j* (the little people). I think the purpose of *wiklatmu'j* is to keep us alive culturally. They just appear at times when you least expect it.

(Having never seen one, Murdena tells the stories as they were told to her.)

"You have to consider their purpose in life." Murdena said when asked about her association to *waidis ji'jk* (small animals). "Little animals teach us that we are vulnerable. You listen closely, to take the messages from the stories that were meant for you. You will not get the message if you aren't ready for it." Perhaps Murdena was considering my own naiveté to her culture's way of educating, which is never direct telling, but through stories. Connected to the rising and falling of the day and the seasons, Murdena's quiet time in nature is in the evening:

The dove that coos softly at the sound of the setting sun, until the last lights of evening have gone on the lake... You hear the chirp of the evening dove when the sun is setting. They sing till it completely settles. Then it is quiet.

As I completed Murdena's interviews, she continued to give generously of her spirit, her knowledge, and herself. Murdena feels a sense of duty to pass on Traditional Ecological Knowledge (TEK), making her words particularly poignant. Her passing a year after the last interview was a great loss. Her words linger like the cooing of the dove though her voice is now silent.

Months after the initial interviews, all the participants continued to integrate their recollections of early experiences into their present identities, continuing to exhibit the joy released through restoring these childhood memories. For instance, nine months after interviewing Meghan, I called for her reflections. She had just travelled to Europe including to her childhood home in the Hebrides. “Have you ever thought back to our interview?” Meghan replied, “Yes, ... I thought back to it the day before yesterday. I found myself imagining what it might be like to be young again.” When Meghan returned to her island, she spent time each day walking the strand, a truly wonderful experience of belonging back in her childhood home, she mused.

Preliminary themes that emerged as we let the data speak were how deeply sensory attunement experiences were, how nature attachments can be atypical in being more about specific elements than species, the joy and other deep emotions experienced in nondifferentiated attachments (by species) and nonmediated attachments (by adults or culture), the level of embodiment and embeddedness in attunement moments, and the significant difference between culturally mediated understandings that are not necessarily experiential.

Findings and Analysis

The “Aha” Moment: Childhood Attunements Foster Attachments

The range of behaviours reported by participants help describe the power of early childhood attunements in nature, which addressed our first research question of how attunements occur. Exploring seemingly atypical attunement relationships, as with sand that Tess had as a child or ocean waves for Bruce, indicated that young children are deeply imprinted by an attunement with place not just species. This attunement can be to wind, ocean waves, quality of light, quietness or natural sound, and elements like fire. The descriptions of full contact awareness that taps all the senses through soundscapes, tastescapes, smellscapes, and body feel are all expressions of moments when one is deeply being-in-the-world. There is little distinction between where the body ends and the natural world begins as the children were deeply embedded in a belonging experience of intimacy. Further, these experiences evoked a sense of expansiveness, peace and communion, connection, and freedom.

These feelings then, though not necessarily in full conscious awareness, drove participants to find similar places to reside or visit. It was the full sum of the direct, sensory aspect of attunement moments that are vividly remembered. Then, it was this repeated engagement with the natural being or force that created the attachment. This attachment relationship created a desire for continuance, which impacted adult choices. Even if the person is living continents away from their birth home, they sought out links to their childhood environment. Tess consistently sought out that same solace in the deserts of the world as an adult. Bruce found a place to live that

evoked the ocean waves of his childhood. In all cases, this was a deep emotional attachment that provided a sense of solace and safety through its familiarity. It was these repeated experiences of attunements which lead to childhood attachment, manifested in adulthood. Attachments took many forms, from smell attachments to taste attachments, addressing our second research question regarding how attachments form from repeated attunement experiences.

It is clear that adults were generally not supervising children when they were in an attuning moment - with sand, seaweed, trees, waves, wind, birds, lambs, or dogs. In most cases, children were exploring freely of their own accord in a nonmediated experience. The strength of the attachment then shaped the desire to be in similar environs or with similar beings, which these adults actively sought out. As the *Mi'kmaq* Elders explain, these were not instrumental relations such as “what is it used for” or “what is it good for” but they are relations of respect in which the vitality of the element or life form is acknowledged and valued as its own agentic being. As children, it was a deep feeling of being loved, being felt, being accepted, or belonging. While this is typically only allowed during childhood in the West, given a privileging of rationality for adults, in an Indigenous culture where these respect relations are privileged, a different approach to the natural world among adults is shaped, a way of being that emphasizes gentleness, gratitude, sacredness, belonging, and a regard for plants and animals as living, agentic entities who can act as teachers. The *Mi'kmaq* Elders in particular exemplified how place or more specifically Land shapes their identity, understanding Land as a living being in constant communication with their peoples. This is the fullest understanding of ecological identity. This helped respond to our fourth research question regarding cultural mediation and thus diversity of attunement and attachment.

Responding to our third research question, we found that childhood attachment experiences do impact adult behaviours, in a multitude of ways, discussed further below. We wondered if the converse might be true. Would adult behaviour be predictive of early childhood experience? Rather than looking for the average experience, the atypical experience (Krefting, 1991) proved more useful. James had recounted how he had plucked a crow from its nest while in medical school in Ireland. This unusual pet imprinted on him, following him everywhere. Years later, when James moved his young family to Canada, he trained another fledgling crow as a family pet. This crow followed his daughter to school on her first day and was abruptly thrown out of class by the principal.

If the hypothesis were true, James' first experience with the crow as a young adult at medical school was not likely James' first avian encounter. There must have a previous strong attachment in childhood. This was authenticated with a phone call... “I don't believe that this was your first experience with birds...”. “Indeed, you are

right!” James replied. James described that as a 9-year-old at boarding school in England, his headmaster taught some boys to locate the nests of birds by standing still after a “songbird sighting” to discover their concealed nests. This quiet time of attunement to the activities of the natural world, in this case birds, developed into a life attachment to birds for James.

Being “felt” may help us to attune to the other, says clinical professor of psychiatry Daniel Siegel (Siegel, 2007). This is especially true of birds and animals and their importance, then, in childhood. In this way, our earliest memories are embodied memories when we feel another and another feels us. As Siegel explains, during these times, mirror neurons that match verbal and nonverbal cues with a conversation partner develop the empathy that is required to form a lifelong attachment (Siegel, 2007). “Mirror neurons respond to actions that we observe in others” not only as mimicking the behaviour of others but also shaping thought processes (Acharya & Shukla, 2012, p. 1) and emotions such as empathy and trust. The process of attunement occurs through mirroring, seeing the other as another being (Siegel, 2007). Thus, through attunement with birds as beings in their own right, by the age of ten, James could successfully identify hundreds of songbirds cementing a lifelong relationship or rather, attachment with birds. (It did not however promote a relationship with cats! James frequently spoke of his dislike for cats, which kill thousands of songbirds annually. So his attachment led to a protectiveness.) Merleau-Ponty, as David Abram (1992) reminds us, describes this level of perception as a reciprocity, an ongoing exchange between a body, the environment, and other-than-human beings, as a continuous attuning of body to the outside world it inhabits (Howard, 2021).

How Childhood Attachments Impact Behaviours in Adulthood

As the waves in the “sea of narratives” began to resonate, attachments in the natural world became visible in adult patterns of behaviour. Our theorizing about the continuity between childhood attachments and adult behaviours began to take shape. All participants showed that they had formed attachments to the natural world in childhood. Evidence abounded that these childhood attunements became attachments which influenced decisions later in adult life.

Sheila’s career choice as a horse vet linked to her early love of horses. Although Arthur was interviewed far from his homeland of Moldavia, he explained that he settled in a small rural community in Canada because the water from a mountain spring reminded him of the taste of water in his homeland where he would walk to a well with his grandparents. Bruce’s family bought him a dog after his wife’s early death believing the pair would form a close bond like the one he formed with his dog in childhood, worth more than any sum of money. Robert joined the campfires of strangers feeling a deep attachment to his father’s sacred fires that he played beside as

a youngster. Elsbeth brings carageenan puddings to neighbours with cancer and throat issues after developing an attunement to life-giving seaweed as a child. Marcia's relationship to the desert, was easily visible in the poem she wrote in her childhood memoir describing the Australian desert. The desert in Morocco brought back this extremely early experience... evidence of embodied memory made conscious. Tshering's palpable sense of loss when she returned to visit the tree she had planted and nurtured as a child, proved her adult emotional life was impacted by her childhood attachment. Her attention in her memoir to the shape and colour of the leaves is indicative of this quiet, deep attunement that lasted for decades even when her family sold the property and moved away. Albert cites the ash as a favourite tree because of its habit of waiting till the time is right for some actions, just as Mi'kmaq have needed to wait to tell the world about the gifts in their culture. Murdena's relationship to the last coos of the dove on the lake seem to bear another deep metaphorical message that her culture was dying and that it is time to listen attentively to Indigenous wisdom messages so that the earth may again survive by fostering an alive relation between human and nonhuman.

Embodied Wisdom of Childhood

As one grows from the sensual world of childhood toward the abstract cognition of adulthood, the relationship with the natural world, formed during childhood, seems to be submerged by the concerns of adulthood and overriding cultural messages of nature detachment and alienation in the Western world (Lange, 2004). This process of psychic withdrawal can be reversed however (Wilson, 2002). Some participant narratives evidenced how close to the surface of conscious thought one's ecological identity can be, while remaining subconscious. The process of Deep Remembering allowed participants to bypass the thinking mind and bring them into a contemplative state to access stored memory and perhaps the nonboundaried thinking of the child self (Jardine, 2009). This thinking of children is really the recognition of an animate and perhaps inspirited world, which is often denigrated in Western ontoepistemology as "magical thinking," "paganism," or "nonscientific." Yet, these forms of thought continue in Indigenous ontoepistemology now supported by the New Science. For instance, David Bohm (1980) explains that relationality in the New Science understands that the cosmos is inherently connected, energy in constant flowing movement which connects all things. Philosopher de Quincey (2005) suggests that "consciousness goes all the way down" (p. 21). We argue children in particular are innately attuned to this consciousness in all beings before they are fully socialized into contending cultural valuations.

The return to attunement moments for adults, explicitly reinstates this former relationship in the natural world, partly a decolonizing process, which is seldom achieved through intellect alone, but through tapping embodied wisdom and sensory memory. Re-storying these experiences into full consciousness is one very important

pathway for adults into remembering one's ecological self that may have been formed so early in life.

Stepping Back into Deep Belonging

The adult mind is de-schooled by returning to these childlike moments. To revisit a memory is to “see oneself seeing,” part of developing a witness self. “Remembering and reflecting on experience is intimately bound up with the construction of self” (Stephenson, Kippax, and Crawford, 1996 p. 183). Therefore, individuals can understand themselves as embedded in a deep part of the natural world or as separate from it, one or the other, but not both at the same time (Harmon-Jones, Harmon-Jones, & Levy, 2015). When childhood memories are recalled in vivid detail, there is the opportunity to step back inside this deep belonging, through a more objective lens. Kegan (1994) tells us, that which we separate from, we can find anew. Bringing subconscious beliefs into conscious awareness, may enhance one's ability to act on these fundamental understandings. Cognitive dissonance occurs with the realization that one may not be acting in accordance with one's beliefs or especially previous attachments. With this realization, the response then is to shift behaviour to better cohere with beliefs (Aronson, 1992; Festinger, 1957). Kahn (2001) suggests that we ought not drive a wedge between the intellect and the experiential and embodied but rather embrace both through our nature relationships, just as the New Science now supports many aspects of Indigenous Traditional knowledge.

Recollections returned to participants a sensual world in which the memory was stored, demonstrating that whole-body learning considers all the senses and the emotions (Reid & Scott, 2013). MJ Barrett (2012) talks of getting out of the head to allow the body to speak. These memories of early childhood allow the body to perceive its wisdom (Lipsett 2002). When Tess spoke of the sand and its temperature, her embodied knowledge grounded through her bare feet was revalued, evidenced by her excitement. “I have it, I tell you now!” Coming to understand one's embeddedness in a sensory world realigns one into membership within the other-than-human world, what the *Mi'kmaq* call *Msit No'kmaq* “all my relations”, a concept shared by most Indigenous cultures.

Cultural Mediation of Childhood Attunements

Childhood experiences were mediated in several helpful ways. Children were taught when they were in violation of their relations with the living world. They were asked to return something so that its life might unfold in the natural context or told stories that convey what can be learned from natural teachers. In these cases, children were taught “respect relations” (Lange, 2023).

Unfortunately, this is not a predominant cultural value in Western cultures, overridden by images and stories of instrumental, exploitative, and even violent

relations in movies, books, gaming, and the daily news. It is this dissonance which can cause adults to bury these early memories, considered naive and childish. Indeed this is how Indigenous cultures have been regarded by colonial masters historically (Ghosh, 2021; Graeber & Wengrow, 2021). These valuations of importance are, in part, the transformative learning that is required to shift toward cultures of respect (Lange, 2023). Children no longer have as much free, unmediated experience of natural environments as the adults in this study. As Louv (2005) explains, until we decriminalize natural play, expand wild environs within urban regions, and relax adult fears which drives fully regulated and supervised play, children will not have the natural experiences that are necessary for healthy social, emotional, and physical development. They will be deprived of these experiences of deep embodiment and attunement, thus belonging.

Re-storying Adult Lives to include Childhood Attunements

Childhood memories recalled from the subconscious, can become a vital part of the conscious awareness and allowing a re-storying of one's life and one's place in the cosmos in a deeper and more expansive way. Identifying with the natural world overcomes the angst of seeing oneself as small, separate, and disconnected. These narratives shed light on a connectivity that develops from within an attuned world, often lost in Western adulthood. Recalling early experiences with the other-than-human allows one to restore its significance as one pathway for mending the rift that has taken the place from this earlier intimacy. Once recalled, adults gained a deep awareness of their belonging and relationship with the other-than-human world. A joyful happiness flowed from this awareness. This is a beautiful example of restorative learning that resurfaces previous knowledge and foundational experiences (Lange, 2004). One aspect of restorative learning is providing an "ethical sanctuary" where participants probe their early lives for foundational values and ethical consciousness, then use this to assess how some cultural values and individual habits do not cohere. It is also a recalled experience of "radical relatedness" which can encourage a relearning of organic time, embodied attentiveness, contemplative practices including play, energy-conserving activities like adequate rest and sleep, and noncommodified simple pleasures (Lange, 2004). In sum, it is relearning to reside in the "creative dynamics of a living universe" (Lange, 2004, p. 131).

As educators and therapists, we can engage participants in recognizing their often subconscious attachments and re-storying their life through a deeper sense of attunement to the other-than-human world. Being able to take a longitudinal "bird's eye" view allows them to witness that these early relationships have not disappeared but indeed are playing out in adult decision-making, sometimes without conscious awareness. A deep awareness of relationships with the earth community brought substantial joy to the participants, remembering being a part of the living world and flowing within its life-giving connectivities. It also provides a more explicit ethical

foundation for responsible decision-making about the other-than-human world.

The power of one's ecological self to shape a line of work or place to live or lived practice, as in Sheila's choice of a chiropractic veterinarian, or the pursuit of particular places to live as Arthur when he recognized the purity of a mountain spring as a signifier of a good place to live, or a practice of sharing a relationship with a crow with one's children, gave participants a more expansive sense of self. This important and unexpected finding affirms how early attachments in the natural world are manifested in recurring adult behaviours.

“Other-than-Human” Attachment: Preliminary Theorizing

Just as “attachment theory” postulates that human relationships in childhood influence patterns of relationship in adulthood (Bowlby, 1983) so early attachments to the “other-than-human” operate in much the same way influencing place-based relationships, adult relationships, and decision-making throughout a lifetime. However, in a culture that does not necessarily value such relations with the living world, recalling these relations into consciousness is an important practice for educators and therapists for healing aspects of our disconnected existence. Understanding the centrality of childhood and adult attunements on one's personal development is key to educators taking learners into the natural world and providing quiet personal moments in the natural world, whether exploration, observation, or writing.

Thus, we theorize that our findings parallel Bowlby's (1983) attachment theory, which determined that early attunements to another human are necessary for ongoing healthy relationships in adult life. Similarly, we posit that attunement with the natural world leads to lifelong relationships with the other-than-human world that create a comfortableness and sense of identity within the natural world. We hypothesize that these experiences form through a process of attunement, and when repeated, they form attachments which have an emotional register. This promotes all the various dimensions of well-being and enables self-regulation through neural integration (Siegel, 2007), where differentiated aspects of the brain are connected, which enables flexibility, adaptability, kindness and compassion toward not only human beings but nonhuman beings and elements.

Further systematic research will be required in this area to determine the strategic importance of first-hand experience in the natural world in childhood and its further impacts on adult ecological behaviours. It is important for educators and therapists to understand the significance of their own childhood experiences so that they will value and make time for children and adult learners to spend time in and experience the agentic natural world.

Conclusion

Ample evidence from data confirmed that one's attachment to the natural world, developed in childhood through moments of attunement, impacts decision-making throughout adult life. Participant narratives demonstrated that although they formed childhood attachments to the natural world, these attachments varied dependent on the local ecology, from a typical favorite tree or pet to unexpected attachments such as sand, wind, ocean waves or fresh water, fire, or seaweed. When we allow children moments for attunement in the natural world and integrate opportunities for the earth to act as teacher, we are enacting processes for creating a more life-giving culture in which they understand the earth as part of themselves, as an ecological self.

The implications are that more opportunities for attunement should be provided in formal and nonformal learning. It is expected that these moments of attunement can happen even in urban environments and even with adults who have been given freedom to explore and play (Lange, 2004). Systematic research is required to explore these implications for child and adult pedagogy, particularly their contribution to sustainability ways of being, as well as the implications for public policy.

We conclude that attachment to the living earth community, developed in moments of childhood attunement, occurs across diverse cultures and impacts decision-making throughout adult life, often in surprising ways. When a participant realizes that they have attachments, resulting from repeated moments of childhood attunement that they have not been consciously aware of, it is an emotionally charged experience. By understanding how personal attachments in nature have then impacted adult behaviours, and how culture has mediated socio-cultural meaning making and group behaviours either during or even before engagement, educators can more readily offer sustainability education that builds an integral sense of ecological self and intimacy with the nonhuman world. School, municipal, safety, and health policies as well as social norms that prevent or discourage free engagement with the natural world is compounding many of the biodiversity and sustainability issues humanity faces. The deep sense of interconnectedness to the "other-than-human" world through moments of attunement can also be facilitated in adulthood to shift cultural root metaphors toward biocentric ethics such as those carried by Indigenous traditional cultures, and thereby generate a more conscious awareness of one's ecological identity.

References

- Abram, D. (1996). *The spell of the sensuous*. New York: Vintage Books.
- Acharya, S., & Shukla, S. (2012). Mirror neurons: Enigma of the metaphysical modular brain. *Journal of natural science, biology, and medicine*, 3(2), 118–124. <https://doi.org/10.4103/0976-9668.101878>
- Ainsworth, M. D. S. (1973). The development of infant-mother attachment. In B. Cardwell & H. Ricciuti (Eds.), *Review of child development research* (Vol. 3, pp. 1-94) Chicago: University of Chicago Press.
- Aronson, E. (1992). The return of the repressed: Dissonance theory makes a comeback. *Psychological Inquiry*, 3(4), 301-311. doi:10.1207/s15327965pli0304_1
- Barrett, M. J. (2012). Doing animist research in academia: A methodological framework. *Canadian Journal of Environmental Education*, 16, 123–141.
- Berry, T. (2006). *The Dream of the Earth* (2nd ed.). Sierra Club Books.
- Bell, N. (2010). *The Green horizon: An (Environmental) hermeneutics identification with nature Through literature*. Thesis for University of North Texas, Dept of Philosophy
- Bohm, D. (1980). *Wholeness and the implicate order*. London: Routledge.
- Bowen, G. A. (2008). Naturalistic inquiry and the saturation concept: A research note. *Qualitative Research*, 8(1), 137-152. doi:10.1177/1468794107085301
- Bowers, C. A. (2012). *The way forward: educational reforms that focuses on the cultural commons and the linguistic roots of the ecological/cultural crises*. Eugene, OR: Eco-Justice Press.
- Bowlby, J. (1983). *Attachment: Attachment and Loss Volume One* (2nd ed). New York, NY: Basic Books.
- Chawla, L. (1994b). *In the first country of places: Nature, poetry, and childhood memory*. New York: State University of New York Press.
- Chawla, L. (1988). Children's concern for the natural environment. *Children's Environments Quarterly*, 5(3), 13–20
- Cox, J. (1977). Aspects of transcultural psychiatry. *British Journal of Psychiatry*, 130(3), 211–221. doi:10.1192/bjp.130.3.211
- De Quincey, C. (2005). *Radical knowing*. New York: Park Street Press.
- Diehm, Christian. (2006). Arne Naess and the Task of Gestalt Ontology. *Environmental Ethics* 28, 1 (Fall 2006): 21-36.
- Diehm, Christian (2007). Identification with Nature: What it is and why it matters, *Ethics and the Environment*, 12(2) 2007 ISSN:1085-6633.
- Esbjörn-Hargens, S., & Zimmerman, M. (2009) *Integral ecology: Uniting multiple perspectives on the natural world*. Boston, MA: Integral Books.
- Festinger, L. (1957). *A theory of cognitive dissonance*. Evanston, IL: Row & Peterson.
- Foran, A., & Olson, M. (2008). Seeking pedagogical places. *Phenomenology & Practice*, 2(1), 24–48.
- Foran, A., & Saevi, T. (2012). Seeing pedagogically, telling phenomenologically: Addressing the profound complexity of education. *Phenomenology & Practice*, 6(2),50–64.

- Foran, A., Robinson, D. B., Munroe, E., Thurber, T., & Eilifsen, M. (2020). Pedagogy: A teachers' practice. *Phenomenology & Practice* Special Issue: Being and Becoming a Teacher, 14(1), 39–56.
- Gaventa, J. (2005). *Reflections on the uses of the 'power cube' approach for analyzing the spaces, places and dynamics of civil society participation and engagement*. The Hague, the Netherlands: MFP Breed Network.
- Ghosh, A. (2021). *The Nutmeg's Curse: Parables for a Planet in Crisis*. Chicago: The University of Chicago Press.
- Graeber, D. & Wengrow, D. (2021). *The Dawn of Everything: A New History of Humanity*. New York: Signal of McClelland & Stewart.
- Harmon-Jones, E., Harmon-Jones, C., & Levy, N. (2015). An action-based model of cognitive-dissonance processes. *Current Directions in Psychological Science*, 24(3), 184–189. doi:10.1177/0963721414566449
- Heidegger, M. (2001). *Zollikon seminars*. Evanston, IL: Northwestern University Press.
- Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). *Cultures and organizations: Software of the mind* (3rd ed.). New York, NY: McGraw Hill Professional.
- Hofstede, G. J., Pedersen, P. B., & Hofstede, G. (2002). *Exploring culture: Exercises, stories and synthetic cultures*. Boston, MA: Nicholas Brealey.
- Holloway, W., & Jefferson, T. (2008). The free association narrative interview method. In L. M. Given (Ed.), *The SAGE encyclopaedia of qualitative research methods* (pp. 296–315). Sevenoaks, CA: Sage.
- Holloway, W., & Jefferson, T. (2009). Researching defended subjects with the free association narrative interviewing method. In H. J. Cook, S. Bhattacharya, & A. Hardy (Eds.), *History of the social determinants of health: Global histories, contemporary debates* (pp. 296–315). Hyderabad, India: Orient Black Swan.
- Holmes, J. (1996). *Attachment, intimacy, autonomy: Using attachment theory in adult psychotherapy*. Lanham, MD: Jason Aronson.
- Howard, P. (2021). Language-ing the Earth: Experiential Renewal for a Relationally Sensitive Environmentalism. *Phenomenology & Practice*, Volume 16(2021), No. 1, pp. 40–56
- Howard, P., Saevi, T., Foran, A., & Biesta, G. (2020). *Phenomenology and Educational Theory in Conversation: Back to Education Itself*. Routledge. <https://bit.ly/BacktoEducationItself>
- Hunt, M. R. (2010). "Active waiting": Habits and the practice of conducting qualitative research. *International Journal of Qualitative Methods*, 9(1), 69–76.
- Jardine, E. (2004). *Narrative inquiry into the formative aspects of ecological identity* (Unpublished Master's thesis). Retrieved from www.gpiatlantic.org/conference/papers/jardine.pdf
- Jardine, E. (2009). Finding nature on the inside: Coming to know our connections to the earth community. *Rocky Mountain Journal of Education*, June. Retrieved from <https://rmje.files.wordpress.com/2009/05/betsy-jardine.pdf>
- Jardine, E. (2016). Cultural ways of forming ecological identities and factors affecting their ontologies. Acadia University Library, Wolfville, Nova Scotia Retrieved from <http://scholar.acadiau.ca/islandora/object/theses:1596>
- Kahn, P.H. (2001). *The Human Nature Relationship: Development and Culture*. MIT Press, Cambridge, Mass.

- Kahn, P. & Kellert, S. (2002) *Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations*, MIT Press, 2002.
- Kegan, R. (1994). *The evolving self: Problem and process in human development*. Cambridge, MA: Harvard University Press.
- Kellert, S. H. (2008). *Borrowed Knowledge: Chaos Theory and the Challenge of Learning across Disciplines*. University of Chicago Press.
- Kellert, S. & Wilson, E.O. (1993). *The Biophilia Hypothesis*. A Shearwater Book. Island Press. Washington, D.C.
- Kimmerer, R. W. (2013). Braiding Sweetgrass: Indigenous wisdom, scientific knowledge, and the teaching of plants. Milkweed Editions, Canada
- Kimmerer, R.W. (2020). The Serviceberry: An Economy of Abundance, *Emergence Magazine*, Dec2020 <https://emergencemagazine.org/essay/the-serviceberry/>
- Kovach, M. (2010). *Indigenous methodologies: Characteristics, conversations, and contexts*. Toronto, ON, Canada: University of Toronto Press.
- Lange, E.A. (2004). Transformative and Restorative Learning: A Vital Dialectic for Sustainable Societies. *Adult Education Quarterly*, 54(2), 121-139. doi: 10.1177/071713603260276
- Lange, E.A. (2023). *Transformative Sustainability Education: Reimagining our Future*. London: Earthscan from Routledge.
- Lave, J., & Wenger, E. (1992). *Situated learning. Legitimate peripheral participation*. Cambridge, UK: Cambridge University Press.
- Lipsett, L. (2002). On speaking terms again: Transformation of the human-earth relationship through spontaneous painting. In E. O'Sullivan, A. Morrell, & M. A. O'Connor (Eds.), *Expanding the boundaries of transformative learning: Essays on theory and praxis* (pp. 215–228). New York, NY: Palgrave. doi:10.1007/978-1-349-63550-4_17
- Louis, Claudine, *KIWEYTOTAHK ISKWEW ISKOTAYOW: Returning to the Women Fire*. PhD Dissertation (Edmonton: University of Education, 2008), p. 3.
- Louv, R. (2005). *Last child in the woods*. Chapel Hill, NC: Algonquin Books of Chapel Hill.
- Lowan-Trudeau, G. (2012). Methodological Métissage: An Interpretive Indigenous Approach to Environmental Education Research. *Canadian Journal of Environmental Education (CJEE)*, 17(0), 113–130.
- Mason, M. (2010). Sample size and saturation in PhD studies using qualitative interviews. *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research*, 11(3). Retrieved from <http://www.qualitative-research.net/index.php/fqs/article/view/1428>
- Mathews, F. (1994). Relating to Nature: Deep Ecology or Ecofeminism? *The Trumpeter*, 11(4). Retrieved from <https://trumpeter.athabascau.ca/index.php/trumpet/article/view/803>
- Mathews, F. (2021). *The Ecological Self*. Routledge, Taylor and Francis Group, London and New York
- Naess, A. (1988). Self Realization: An Ecological Approach to Being in the World. *Thinking like a Mountain: Towards a Council of All Beings* by John Seed, Joanna Macy, Pat Fleming, and Arne Naess, New Society Publishers.
- Naugle, D. (2002). *Worldview: The history of a concept*. Grand Rapids, MI: William B. Eerdmans.

- O'Brien, C. (2016). *Education for Sustainable Happiness and Well Being*. Routledge, Taylor and Francis, New York.
- O'Sullivan, E. (1999). *Transformative learning: Educational vision for the 21st century*. London, England: Zed Books.
- Panksepp, J., & Biven, I. (2012). *The archaeology of mind: Neuroevolutionary origins of human emotions*. New York, NY: Norton.
- Reid, D. A., & Scott, D. W. (2013). *Researching education and the environment: Retrospect and prospect*. Oxon, England: Routledge.
- Searles, H. F. (1972). Unconscious processes in relation to the environmental crisis. *Psychoanalytic Review*, 59(3), 361–374.
- Searles, H. F. (1978). Concerning transference and countertransference. *International Journal of Psychoanalytic Psychotherapy*, 7, 165–188.
- Searles, H. F. (1979). *The nonhuman environment: In normal development and schizophrenia*. New York, NY: International Universities Press.
- Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, 22(2), 63–75.
- Siegel, D. (2007). *The mindful brain: Reflection and attunement in the cultivation of well-being*. New York, W. W. Norton & Company Inc.
- Sobel, D. (2008). *Childhood and Nature*. Stenhouse Publishers.
- Stephenson, N, Kippax, S., & Crawford, J. (1996). Memory-work, moral conflict, and the construction of self. In S. Wilkinson (ed), *Feminist Psychologies*. pp.182-200. Buckingham Open University Press.
- Sroufe, A. & Siegel, D. (2020). *The Verdict is in: The case for attachment theory*. Courses @ Mindsight Institute. January 30, 2020. <https://drdansiegel.com/the-verdict-is-in-the-case-for-attachment-theory>
- Thomashow, M. (1996). *Ecological identity: Becoming a reflective environmentalist*. Cambridge, MA: MIT Press.
- Trevarthen, C., Delafield-Butt, J. & Dunlop, A. (2018). *The Child's Curriculum: Working with the Natural Values of Young Children*, Chapter 11, Trevarthen, C., Delafield-Butt, Oxford Scholarship Online. <https://global.oup.com/academic/product/the-childs-curriculum-9780198747109?cc=gb&lang=en&>
- van Manen, M. (2007). Phenomenology of practice. *Phenomenology & Practice*,1(1), 11–30.
- van Manen, M. (2012). The call of pedagogy as the call of contact. *Phenomenology & Practice*, 6(2), 8–34.
- van Manen, M. (2015). *Researching lived experience: Human science for an action sensitive pedagogy*. Albany, NY: SUNY Press.
- Whitehead, M. E. (2005) Physical Literacy. A developing concept. Unpublished paper presented at the *British Philosophy of Sport Conference 2005*, Stanley, England.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. (M. Cole, V. John-Steiner, S. Scribner, & E. Souberman, Eds.). Cambridge, MA: Harvard University Press.
- Wilson, T. (2002). *Strangers to ourselves: Discovering the adaptive unconscious*. Cambridge, MA: Harvard University Press.

Zhu, J. (2003). *The conative mind: Volition and action* (Doctoral dissertation). University of Waterloo, University of Waterloo Press.

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