

Sensuous and Languaged Learning: Children's Embodied and Playful Connections to Nature

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ABSTRACT

This paper reports on a study of day care children, ages 2 years 6 months to almost 5 years old, who visited a naturalized area near their day care once a week, over several months. The focus of this paper is on the embodied learning and expression of children's learning, along with their use of oral language. The children engaged in some structured activities, as well as free play. Often, after play, adults had children discuss what they had observed or learned in the garden. Constructivist grounded theory was used for this study, with the researcher and research assistant making notes while children played, while they talked, and jotting down memos at the end of each day. Initial observations revealed that children not only explored the naturalized area through their senses, but they embodied their "feelings" of and about the world, and used their bodies to express and playfully imagine their worlds. Although language allows for greater focus and analysis of experiences, the role of non-languaged explorations and understandings is also important, and has, perhaps, been undervalued. More research is required on children's interactions and creative play in natural or naturalized areas, with monitoring of children's embodied explorations included. More research is also required on the role of children's early and sustained experiences in natural areas for developing pro-environmental attitudes and action.

Keywords: Early childhood, environment, embodied learning, play, nature

Summer day (Researcher notes end of day): *A group of 3 and 4-year-old children ran out the east door of the institution in which their day care was located. Immediately on escaping the building, many of the children ran to the dense underbrush that crowded up against the corrugated concrete east wall. They ducked down under and squeezed between branches, rubbing against the concrete as they negotiated their way to a set of concrete steps, obscured by the dense underbrush. Some of the children were able to pull themselves to the top landing of the three steps, getting onto their chests, then scabbling up to their bellies, before standing on the top. Others clambered up similarly, but on the lower second step. One child carefully pushed through the bushes, and climbed to the bottom step. Then, the children jumped to the ground on the other side of the steps – some from the top, some from the second, and one walked back down the steps, struggled through the underbrush to the wall, and caught up to her peers at the northeast corner of the building. We adults watched from the shade of the maple trees where the underbrush had been mowed out to favour lawn grass.*

"Look Cathy¹!" one of the children called to a day care teacher. "I found moss!"

"I did too. Moss!" Many voices joined in. Cathy affirmed their observation, and explained to me that they had looked at moss the week before, on a different outing. "Where might you find moss?" she called out.

¹ Cathy is one of the day-care teachers. All names and locations are pseudonyms.

“In shady places!” numerous voices responded.

The children rounded the corner of the building, where a grassy slope led down to a soccer pitch. One of the boys set off running, down the hill, across the soccer pitch, screaming with joy as his peers chased him. The children were spread out in a long line, running as fast as their short legs could take them, with a few of the girls sedately remaining with the adults. We suddenly realized the children were headed directly to the garden, on the other side of a road, and were unlikely to stop until they got there. “STOP!” shouted one of the teachers, leaping into a flat out run. She caught the children before the road. Here, she reminded them of appropriate protocol for crossing a road. Fortunately, a car came along, so the children could practice looking both ways, and crossing when it was safe.

When the children arrived at the garden, they scurried en masse to the boulder field – about two meters wide, with a shallow slope, between the asphalt path leading to the west door of the building and the garden. The children stepped cautiously from boulder to boulder, noting to one another which boulders were unstable, sometimes slipping a bit, but, with care, finding their way through. They moved on from individually going through the boulder field to playing games of follow the leader, where they would run through the little forest, and then up – as fast as they could (but not running) – through the boulders. They bounced across the soft ground in this forest, emerging onto a crusher dust path, where they scuffed their feet.

End of day memo: *The children reveal their experiences of this world in their bodies.*

When I remember my childhood experiences, many of them in the outdoors in wilderness, my memories are embodied. I think of lying in my sleeping bag, and feeling itchy – on my back from sunburn and on my legs from mosquito bites; I counted 32 bites on one leg before I fell asleep. I think of the musty-sweet odour emanating from my skin after a day in the sun and wind, or the fresh smell of sheets right off the clothes line in the fall. Or, in the winter, coming indoors after playing in the snow, with a smile frozen on my cold chapped cheeks, and having to get my mother to test the water temperature before putting my hands in it because, as the cold let go of my hands, I could not tell if the water was too hot or freezing cold. And the ache as my fingers warmed up! Always, after a day outdoors, I would have a heightened sense of my body, lively, oxygen rich. I love being outdoors, and that love is based largely on sensations; feeling good or feeling pain (a moderate amount), I knew I was alive. I wondered about the dominant narrative now that has led to a tendency to protect children from unpleasant experiences, keeping them in climate controlled, secure indoor spaces. I wondered how children sensually explore their outdoor worlds. The story above about children on their way to a naturalized play area, revealed their embodied experiences, how they put themselves into situations to feel, to sense, their world. The focus of this paper is on the sensuous and embodied learning the children expressed through playing in a naturalized area. The physical affordances of natural and naturalized areas are very different than the affordances of play grounds, playing fields and other managed places. The themes that emerged from this study which focused on children’s sensuous and embodied learning were children’s: close sensory observation of the world; language in learning; and emotion in play. Every story included several of these themes, so the intersection of these themes takes up the largest portion of the discussion section of this paper.

WHY MORE NATURE FOR CHILDREN

The most important argument for children being in natural or naturalized areas is for them to come to recognize the importance of nature, and that they are part of nature. Pramling Samuelsson and Kaga (2009), in their summary of the UNESCO Early Childhood Education for a Sustainable Society conference held in Paris, stated: “There was a strong consensus that educating for sustainability should begin very early in life. It is in the early childhood period that children develop their basic values, attitudes, skills, behaviours, and habits, which may be long lasting” (p. 12). Studies of adults have found that early experiences in the outdoors (Gurholt, 2014), and the kinds of experiences they engage in there (appreciative, such as bird watching, rather than, for example, operating motorized vehicles (Thapa, 2010)), could lead to adults recognizing that humans must take better care of the planet.

A second argument is for physical health: children who explore the natural world, outdoors, develop better physical motor skills, and both large muscle and coordination abilities (Fjortoft, 2001; Söderström, Boldemann, Sahlin, Mårtensson, Raustorp, & Blennow, 2013). The children are, overall, healthier and less likely to suffer from long term illnesses than their indoor peers.

A third reason is that children develop better academically from being in the natural world. This is perhaps due to increases in their ability to focus, with research indicating that time in natural or naturalized areas reduces the effects of ADD/ADHD – mitigating the necessity for medication (Faber Taylor & Kuo, 2009; Kuo & Faber Taylor, 2004); research on adults demonstrated similarly that time in nature restored a person's ability to focus (Berto, 2005; Hansmann, Hug, & Seeland, 2007; Kaplan, 1995; Tennessen & Cimprich, 1995). Learning affordances (Gibson, 2000) are plentiful in natural areas. A learning affordance is something – an object, an event, a relationship – that can be observed, and that provokes children to learn. Teachers can support children's learning of different concepts by building on the affordances children find in natural settings (Gustavsson & Pramling, 2014; Torquati & Ernst, 2013; Ward, 2013).

A fourth reason is that natural and naturalized areas offer opportunities for children to develop creatively. They are more likely to have time, space, and "loose parts" for creating their own worlds, and for sustaining their stories (Melhuus, 2012).

Finally, children who are allowed more time for free exploration in natural and naturalized areas are better able to assess risks when they are older. The risks are smaller when they are young, so learning to assess these low level risks then applies to the riskier behavior available to older people (Deci & Flaste, 1996; Dweck, 2006; Ryan & Deci, 2000; Sandseter, 2009).

Having natural and naturalized areas easily available to children, to their families, to their classrooms, should therefore be important to a society.

One aspect of children in the outdoors that has not been examined is the ways in which children embody their sensory experiences in natural areas, while they are still in early stages of language acquisition. The focus of this paper is on the children's exploration and expression of the world through their bodies, the sensuous experiences they have in a natural/naturalized place.

An examination of the research literature reveals the following terms for outdoor spaces: green, natural, naturalized, nature. The meanings of these terms vary depending on the authors' context. In this paper, "green" is any area with plants, including natural and naturalized areas, as well as sports fields, and suburban yard and park spaces – the term includes some areas with little biodiversity. I define a "natural" area as one which exhibits great biodiversity, much of it as it was before interruption by human settlers; a "naturalized" area as one which has been disrupted from its original biodiversity, and now, as much as possible, returned to this original biodiversity.

STUDY DESIGN

PARTICIPANTS

This study is part of a larger study, examining what children choose to do in a naturalized area, and how they talked about the area based on organized activities and their free play. This study reports on the observations of children from a nearby day-care playing in the naturalized space, and focuses on the kinds of sensuous activities in which the children engaged, and how they expressed this kind of non-verbal learning. The teachers from the day-care and the researcher planned some activities for the children, but much of the time, the children were invited to engage in spontaneous play. There were from two up to to four day-care teachers, sometimes an educational assistant, one researcher, and for some of the time, a research assistant, with the eleven to thirty children whenever they were in the Prairie Habitat Garden.

The children ranged in age from two years six months to five years old. All the children engaged in the activities in the garden; about 70% of the parents signed permission for their children to be observed while at play in the garden, and only observations of these children were retained. Children were put into groups based on permission for the study; each day, one group comprised only children in the study, and two groups comprised a mix of children, those in the study and those not. Notes were kept on all three groups by the researcher and research assistant. Notes kept on mixed groups were destroyed; only the researcher knew for which group the notes would be kept. As part of the ethics agreement, no photos were taken. The children are to remain anonymous.

CONSTRUCTIVIST GROUNDED THEORY

The study used constructivist grounded theory (Bryant & Charmaz, 2007; Kenny & Fourie, 2014, 2015; Seldén, 2005). Grounded theory draws on the data to support the development and/or modification of theory. Along with Bryant and Charmaz (constructivist grounded theorists), I acknowledge that the researcher is inevitably value laden and biased, which interrupts the potential for completely open interpretation towards theory building. Following the recommendations of Bryant and Charmaz, I took care to develop my awareness of my biases, through the support of the research assistant, so as, as best we could, to keep our minds open to potentialities, as well as looking for “the negative case” (which was open, not binary), so that I would be able to monitor my interpretations. The research assistant and I discussed first impressions of collected data each day, and wrote summary memos. This facilitated reflection on our different perspectives of the children’s experiences. Finally, to try to remain as open to alternate interpretations as possible, penultimate versions of the papers were shared with day-care teachers for their reflection and input.

However, researcher bias is what led to exploring the role of embodied sensations of the experiences. If I, the researcher, had not had profound embodied memories of my own childhood experiences, it is likely that I would not have noticed that the children engaged in “feeling” on the first day as they headed off to the garden. However, to ensure my biases did not affect further interpretation, it was important to systematically search the data and discuss it with the research assistant, as well as later to take the interpretations to the day-care teachers for their opinions.

The research assistant had met with the researcher (myself) daily for two months before the study began. As part of the research assistant’s work with the garden, she read about how children learn in natural spaces; as well, she read several papers about constructivist grounded theory, the method we had decided would be appropriate. When the study began, the two of us kept notes, made memos, and discussed these the next day. The research assistant picked up on note taking quickly, and was very perceptive, often noticing things I did not.

Research data included planning notes for what to do, notes made on observations at the time of the children’s activity (named “notes in the moment”), notes made during conversations with the children (also named “notes in the moment”), notes made immediately after activities of what was remembered and seemed significant (named “notes end of day”). At times, I have put material in regular font, within square brackets, to indicate that I am commenting on the notes after the fact, to add more explanation. Usually the researcher and the research assistant took notes each day. Notes from the groups of children whose parents had given permission were transcribed. While transcribing the notes from hand written to electronic form, the researcher and research assistant made “memos” when something interesting appeared. For example, the research assistant noted that it was girls who were not running, and tended to hang around the picnic table on the mowed lawn grass beside the garden. We discussed the memos early the next day, and we decided which to pursue in greater depth to perhaps make themes. In the case of girls being less active, follow up observations revealed that some of the girls were more sedate, and less likely to engage in active play in the garden, but the majority of the girls were involved in active play in the garden. At the end of the study, the memos and follow-ups were examined more closely, and sorted into themes. Themes were then classified together into categories. The themes and categories were then shared with the day-care teachers for their input.

This paper focuses on one of the categories that emerged from the larger study, the category that addresses the role of sensory activities, the sensuous feelings and expressions, that children demonstrate regarding and within

their early experiences in learning in a naturalized area. Children's learning and expression are discussed regarding the interactions amongst learning, embodiment, and language.

GARDEN SETTING

The setting of the study was in a naturalized area, once only lawn grass and a few elm trees, but now planted, as much as possible, to species native to the northern North American prairies. The garden is bound by asphalt paths on three sides, and a building on the fourth side.

On the north end of the garden is a boulder field, separating the garden from the asphalt path that leads out of the building. The north side of the garden, immediately south of the boulder field, is shaded and moist, and has been planted to woodland plants. The ground here is softer and moister. A path of red crusher dust runs through the garden from the north to the south end. Heading south along the path, one reaches a sunnier part of the garden, where short- and long -grass prairie plants have been planted. Some of the shrubs have gotten out of control – without the appropriate animal grazers and fires, prairie plants can be invasive in their own habitat. Still, there is a variety of interesting indigenous plants that flower abundantly in their season, and that stimulate different senses. The garden itself is about 0.074 hectares (0.20 acres) in size.

As well as native plants, the garden has had some cultural features built in. There is a Medicine Wheel, and an Earth Turtle², representing First Nations' cultures. There is a constructed post with signs noting people who have donated to the Faculty of Education, and there is an interpretive sign about the garden. As well as First Nations cultural features, there are ecological supports: there is an indigenous bee house, commercially built, which is situated near the Earth Turtle; there are bird feeders, with sunflower or niger seed, and some with suet; the garden is planted entirely to indigenous plants (keeping out invasive weeds, such as quack grass, is a struggle).

Many species of birds and Richardson's ground squirrels were expected to be attracted to the garden. Interestingly, the ground squirrels are much more prolific in the mowed area across the asphalt path. As well as these species, mice and garter snakes have made homes here, and rabbits, hares, and foxes visit. Quite a variety of invertebrates also live here, likely in far greater diversity than in the lawn across the asphalt path.

THE DAY-CARE

The day-care is located on the grounds of a post-secondary institution and contained within the Faculty of Education, but autonomous and serving the larger University. The day-care has a fenced green play yard, with sand, swings, water hoses. As well, the day-care is about 500 meters from a natural space designated a park by the local community; the day-care teachers take the children to this park often. Since the Prairie Habitat Garden has been built, just on the other side of the building from the day-care, the children also access this outdoor space. To get to the garden, the children either walked through the building or around the outside, always accompanied by adults. The children ranged in age from two and a half to five years old. Most of the children attended day-care full time, during the time their parents worked at the post-secondary institution. Countries of origin were diverse. The children already spent much time outdoors. There was a large notice on the door, stating that parents should dress children appropriately for the weather, since the children go outside EVERY day. As well, the day-care teachers had much experience and expertise in taking the children beyond the play yard. A common word for the children was "outing" as in "Are we going on an outing?" The children reported, with excitement, to their teachers when they found something in the garden that connected to other day-care learning experiences. An example of this was when

² An Earth Turtle is a feature made of soil and rocks, and represents some Eastern Tribal stories of the Woman Who Fell from the Sky. The woman landed in the ocean, and, when offered by the turtle, she climbed onto its back. Other animals then brought up soil from the ocean bottom, adding size to the turtle. This has resulted in Eastern First Nations' groups naming North America "Turtle Island". A Medicine Wheel, in this case a series of three concentric circles and divided into four quadrants, demonstrates how different aspects of the world are integrated into one complete whole – a circle. Across the northern North American plains, stone circles have been found, and the Medicine Wheel is one interpretation of their meaning.

the children discovered raspberries in the garden, and connected these to a story one of their teachers had just read to them that morning at story time.

The outings to the Prairie Habitat Garden were an added outing; the children were excited to go on another outing, and they indicated they enjoyed the garden as another special outdoor place to play.

GARDEN ACTIVITIES

The children in the day-care were divided into two groups; one group visited the garden on Tuesday mornings, and one group visited on Thursday mornings, both for an hour or so. We tried to ensure the kinds of activities were similar for each group, because the children interacted a lot within the day-care, and talked about what they had done. If the weather were cold, garden time began with a physically active organized game. On warmer days or after warm-up on cold days, children explored the garden, engaging in free play, and talk time. We also wanted to implement a quiet time, and did this by inviting children to try to feed the birds by them sitting still with sunflower seeds in their hands. Often, after activities in the garden, the children were called together for “circle time” during which I, the researcher, would ask them about their experiences. Visits to the garden were not the only outdoor and in-nature activities the children were involved in, but were the only activities reported on in this study. They played outside nearly every day for significant periods of time, and they went on other outings with their teachers. The garden was an extra, a special place the children could visit that was, in some ways, their garden.

The study was eight weeks in length with weekly observations.

STORIES

As noted, my memories of being outdoors in my childhood involve sensations, both pleasant and painful. The painful sensations did not put me off going outdoors. They are some of my most powerful memories, and were, in Dewey’s (1938) terms regarding experiential education, educative rather than mis-educative. Educative experiences lead to learners going on in their learning; mis-educative experiences shut down further exploration. Negative reactions from influential adults about incidents, and severe or prolonged pain might well have made events mis-educative. For me, sensations that other parents might not want their children to experience became fixed in my memories and a foundation for my love for the natural world. I had experienced these feelings; I had enjoyed the day; itchy mosquito bites were not just an unfortunate side-effect (unpleasant), but a part of the memory of the excitement and activity of the day. Thus, I was drawn to the children’s sensory experiences of the garden.

The following notes include “notes in the moment”, while the researcher and research assistant were observing the children at play. There are also “notes end of day”, which were additions the researcher and research assistant made from their memories of the events, after the events. It is difficult to keep up to what the children are doing, and it is difficult to be sensitive to all the different aspects of the children’s activities. The notes also include “memos” made as the researcher and research assistant read over and transcribed into digital form the notes after the children had gone back to the day-care; memos are different than end of day notes in that they are based on the notes, result and develop from our discussions, and focus on emerging patterns. Memos lead to the creation of themes, and the researcher and assistant could then examine the theme in greater detail. Later, themes were classified into categories.

In the italicized transcripts of our in the moment and end of the day notes, I have inserted explanations in square brackets and not-italicized text. These additions were not in the original notes, but have been inserted to clarify what the notes meant.

Fall day (Researcher’s notes in the moment): *The children run down the asphalt path on the hill, and leap into the leaves piled at the bottom. They crunch them and stomp on them. On the crusher dust path, the children scuff their feet; they make dust. In the softer ground in the forested area, the children bounce as they run. They head through the trees, circle back to the boulder field. Now they are negotiating their ways around and over the rocks. No longer one big group, they have separated. They seem to want to step from the top of one rock to the top of another. They are cautious. Should we tell them to be careful? The teachers*

are letting them explore. The children are being careful. Ishmael³ is on a tippy boulder. He calls out to Wyatt behind him to be careful because this stone is tippy. Now Rodney calls to those behind him to follow him because he has discovered a new path. About three children follow him. Maria ignores him. When she gets out of the boulder field and on to the asphalt path, she runs to Cathy [a day-care teacher], takes her by the hand and leads her through the boulders, saying "I found a new path through the boulders."

(Memo: The children do not comment on the textures of leaves, crusher dust, bouncy ground, boulders, to other children or to their teachers. Not that we hear, but we observe them experiencing these things during the entire visit.)

The textural exploration of the ground and materials at their feet – asphalt, crunchy leaves, crusher dust, soft earth – was interesting from an educator’s perspective. Vygotsky (1934/1986) argued that learners need to put words to their observations to use those observations for “spring boards” for later learning. However, embodied knowledge contributes to physical environmental responses. Knowing that rocks are hard, regardless of words, affects a child’s later negotiations through the boulders. These children seemed to understand the boulders to be hard; they did not want to fall. Not wanting to fall made them move cautiously, but did not prevent them from negotiating the area. Neither the day-care teachers nor researcher and research assistant observed a child fall amongst the boulders. (Just because it has not happened does not mean it will not happen.) The day-care teachers had had sufficient experience with the children to know which children and when the children needed to be advised to be cautious. Lacking the experience with young children, I (the researcher) yearned to warn the children. However, the children knew to be careful. All of them worked their ways cautiously amongst the boulders. Sometimes only experience will teach them what kind of “careful” to be.

An interesting aspect of the above description was that the children invented the word “tippy” to describe boulders that were unstable. The instability of the boulders, they would use words to describe. The hardness of the boulders, they did not.

Many activities that I planned for the children involved them exploring the garden’s sensory learning affordances. A learning affordance is anything (event, relationship, object) that children are drawn to that a teacher can use to support further learning (Gibson, 2000; Torquati & Ernst, 2013; Ward, 2013). Until I noticed the children exploring the textures under their feet, I had not thought of this affordance – textures of ground. However, I did plan for them to explore other textures that the garden offered. One of the first activities involved a game of follow the leader (a cool-day warm-up activity) with children in small groups with an adult leader. Each leader had children engaging in sensory activities, such as stopping after hopping to smell the flowers and leaves, hesitating after running to listen or touch. Then each teacher invited a child to lead the group. Every child in every group had the opportunity to lead. The children generally focused their leadership on taking their peers quickly through physically challenging areas. I was unsure if the children had picked up on any of the textures, sounds, etc. of the garden. I had noticed them scuffing their feet, but they did not lead their peers to scuff their feet. Children responded to their sensations in the garden, but they did not seem to communicate this to other children.

Fall day, Circle time in the garden (Researcher’s notes end of day): *I invited the children to be quiet and to listen. What did they hear? Their immediate answers were “cars” and “trucks”. Tuning my ears, I realized that this was so. I have become inured to the sounds of traffic. I listened more carefully, because I wanted them to hear the birds. It was hard to hear them with the sounds of the traffic. I asked the children to listen for bird songs. I listened carefully, and, as soon as I heard one, I lifted my index finger. “There! Did you hear that?” The problem with learning to hear bird songs is that we alert our friends to them just as the song finishes. “Listen again. Quietly. ... There, did you hear that?” lifting my index finger again. When the geese flew over, the day-care teacher pointed up to them. The geese were honking and the children paid attention to them – they heard them. The first bird they noticed “in” the garden was one far above the garden.*

³ All names are pseudonyms. No photographs were taken, because of the need to protect the children’s anonymity.

(Memo: Bird calls are subtle in urban areas, but they are present; it took about four times of focused listening before the children began spontaneously to notice the bird calls.)

As Gustavsson and Pramling (2014) noted about variation theory, there is far too much happening in any given moment for a human to attend to it all. In the case of the bird calls, the children stopped to listen, but heard, at first, only the loudest noises. It does take teaching to tune in to the less obvious sounds of the natural world. The teaching, in this case, involved using language. Perhaps I could have had the children focus on the sounds of the birds by merely lifting my finger each time I heard a bird call, but the words explaining what to listen for made the lesson more efficient and perhaps more effective. I wonder how else I could support the children tuning in to the sounds around them?

Experiences are complex; language focuses humans on aspects of an experience; putting language – words, sentences – to these experiences sequences the experience. But the complexity of the experience cannot be ordered. There is too much going on at one time for the fullness to be communicated. On the other hand, learning to focus on aspects of the moment, or the place, can draw things out of the background and help to make meaning from complexity.

Fall day, Circle time in the garden (Researcher's notes end of day): *To get the children to explore the garden, I suggested they go find a berry to bring back to our meeting place. The children could not find any! The teachers and I attended to each child, pointing to berries. Pirita saw the rose hips, and then pointed excitedly to several more. Hasan still could not see them. I had to pick several rose hips for him.*

Some children brought the first berry they found back to the meeting place. Hasan searched the garden to be sure to find an unusual berry – a choke cherry. Most of the children brought back rose hips. Back at the meeting place, I showed them how to peel the skin off the rose hips to find the hairy seeds underneath.

Language can help humans to focus their experiences. Words are signifiers of things, but also make things significant. I cannot imagine how I might share what I learn without using language – but sharing that information with others makes that aspect of the experience seem more important. Observing the children's sensual play, however, and remembering my own childhood experiences, revealed the role of embodied experiences for learning. Not everything needs to have words put to it; indeed, not everything can have words put to it. As a child, I had eaten rose hips, because my mother had told me they were edible. I soon learned, without her guidance, that the seeds on the inside had an unpleasant texture in my mouth. I then modified the eating of rose hips to nibbling the skin off the outside. I learned that the hips are sweetest after a frost. I did not put words to this learning. Until now. Interestingly, the day-care teachers told the children not to eat the rose hip seeds, or they would get "do you remember? Yes, you will get itchy bum! From the seeds coming out after you eat them!" I do not remember that experience from childhood. I wonder why?

Fall day, Activity time (Researcher's in the moment notes): *I notice Anne [one of the day-care teachers] has gathered a group of children with her, and they are sitting in a circle!! They have a collection of leaves. The leaves are stunning shades of bright orange, yellow, red, and one is a deep green along the veins but bright orange away from the veins. [I wondered and recorded in my notes:] Where did she find all this beauty? She is asking the children about the colours, and the children practice colour words. From their chorus answers, they know their colours.*

Anne, the day-care teacher, had used an affordance in the garden – the leaves – to reinforce the children's colour vocabulary. I had put exclamation marks in my in the moment notes because I had invited the children at this time to explore the garden, whereas Anne had the children organized into a structured activity. The children were co-operating, and thus, I assume they were enjoying the activity. Perhaps this circle of learning had been set up when some of the children noticed the vibrancy of the leaves, and Anne picked up on this to support further learning for all the children in her group. This would be consistent with Gustavsson and Pramling's (2014) discussion of sustained shared conversations, which are supposed to emerge from children's observations and their comments or questions to teachers. It is a moment when teachers are invited to participate in the children's worlds, and gives opportunity

for enhancing understanding and focus. *Gustavsson and Pramling* gave examples of teachers and children playing and learning in natural areas. During free inquiry activities, children will notice and comment on something, and that is the cue for the teacher to support them in focusing on scientific classification. For example, one teacher in *Gustavsson and Pramling's* study invited the children to count the number of body parts on a spider and on an ant. Similarly, the leaves offered an affordance, which Anne used, and she used the conversation to develop vocabulary. Anne had engaged in sustained shared conversations with the children.

I did not stay long enough to see the rest of this lesson, but the potential for developing greater understanding through examining the shapes, matching these with colours, and continuing to explore the sensory aspects of the leaves was great. The children could have explored, with or perhaps without guidance, the textures of the leaves, or the relationship between leaf colours and shapes. These could have been opportunities for further sustained shared conversations, for developing vocabularies that help children to know their worlds. I only thought of these opportunities after the moment. I hadn't even noticed the affordance of leaf colours as an opportunity for developing the shared language of colours. The day-care teacher had supported the children in learning more from the affordances in the garden through sustained shared conversation.

Summer day, Activity time (Research assistant's notes in the moment): *Robbie and Peter are discussing the Forest of Doom. I ask them what this is. They showed me where it is. I asked them why they called it the Forest of Doom. They lead me through the rose bushes. It is prickly in here! Even they are having trouble getting through. They point to a sign on the fence. They know it is a caution sign. They ask me what it means. I say I don't know. They say they think it is a warning about poisonous snakes. There is a squiggly line on it that could be a snake ???*

Summer day (Researcher's notes end of day): *After Meaghan [research assistant] mentioned that the children were talking about the Forest of Doom, I mentioned this at circle time. I had thought all the children were sharing this story, but as soon as I mentioned the Forest of Doom, a number of children wanted to know where it was. Robbie and Peter were then the experts and the stories of the poisonous snake spread quickly. Then, they led the children to and into the Forest of Doom.*

(Memo: *Most of the children seemed to want to be afraid. They jumped at the opportunity to search for this poisonous snake!*)

This observation increased our understanding of children's play: the children wanted an emotional challenge. The "Forest of Doom", and the purported presence of poisonous⁴ snakes added to the allure of this place. Some research (Deci & Flaste, 1996; Dweck, 2006; Ryan & Deci, 2000, Sandseter, 2009) has pointed out that children who have opportunities to take risks in their early years are better able to assess risk as they get older. Usually, the risks that young children are exposed to, with adults being close by to monitor them, are less likely to cause fatalities. These children took risks with the places they chose to move through, and these risks were physical (the boulder field, and the rose bushes), and emotional (the poisonous snake).

Summer day (Researcher's notes in the moment): *Sofia has pulled me into the forest (not the FofD). She wants me to tell her – and the group of three girls who are together, if this plant is poison ivy. Mabel explained that Adam's brother had been burned by poison ivy (now Adam arrives and affirms this is so). Adam says he is not sure, but he thinks this plant is poison ivy. The plant is a small shrub, but looks nothing like poison ivy. The children are still cautious in the forested area.*

(Memo: *The children became very alert to plants that might be poison ivy, ceased exploration of that part of the garden, and sought out adults if they thought they had found some poison ivy. They did not get adults involved in their exploration of the Forest of Doom because of the poisonous snake. What is the difference between the two dangers?)*

⁴ There are no poisonous snakes in this part of the province.

I assured the children we had not planted any poison ivy in the garden. Perhaps telling them this was a mistake; the children took up challenges such as the boulder field, and they seemed to enjoy the sensation of fear in the example of the poisonous snake. A learning side effect of the children worrying about poison ivy could have been supporting them in attending to minute differences in plants. This was an affordance that I did not take advantage of. I could have talked to them about what poison ivy looked like and asked them to find a plant they thought matched this description. Small groups of five children per adult would have been able to notice and name a number of plant characteristics. Sustained shared thinking (Gustavsson & Pramling, 2014) could have been used to enhance the children's learning. In the above example of the different fall leaf colours, the day-care teacher had engaged in sustained shared thinking about colours. To support children in learning to attend carefully to differences in plants, I could have some laminated pictures of poison ivy, and of several other plants that might be confused with it. Children who worried about poison ivy would be given the laminated pictures of different plants, so they could try to determine which ones might be poison ivy. Plant identification – paying attention of details and patterns – could be further supported then by the colours of the leaves in the fall.

An intriguing aspect of contrasting the children's engagement with the Forest of Doom, and their engagement with the poison ivy is the way the children assessed the risk. The reported information, delivered from a peer about poison ivy, seemed to be more influential than the interpretation of information of a wiggly line meaning "snake" on a caution sign. Both situations evoked emotions in the children, but one fearful situation was to be embraced while the other was to be avoided. Perhaps it was the embodiment of the poison ivy. The child's brother had actually been burned, had felt the pain, of the poison ivy. None of the children had been bitten by a poisonous snake.

Children's sense of what is real became an interesting topic for discussion between researcher and research assistant. Children engage in creative play, and story this play, and this seems to support them in controlling and interpreting their roles in the world around (not just in their imaginations) (Paley, 1991, 1999, 2010). Although their play becomes so real to the children that an adult viewer might believe the children are entirely within their created worlds, the children seem to differentiate amongst multiple layers of their stories. Their sensory experiences and their language affected their actions, affected the way their time in the garden became embodied.

Summer day, Circle time (Researcher's notes end of day): *During the debrief, I asked the children what they had noticed in the garden. Suzy said (she sounded mischievous) that she had seen a turtle. Jayden said "I saw an elephant." At this Suzy responded (she sounded indignant): "I saw a real turtle." And she added, "It was made of dirt and stones." Immediately, Ishmael said: "I saw a mosquito, made of stones, flying by me. There it goes!" and he turned his body, pointing at the mosquito, made of stones, flying by.*

The children's imaginary beings were made real in their interactions – a mosquito, so light and flying, but made of hard, dense stones; the little boy's whole body, indicating where his mosquito was such that we all looked to see it go by; a turtle, with the speaker seeming to know her audience would imbue it with different bodily characteristics (heavy, shelled, moving slowly) than the one she had experienced (a hill, with rocks outlining turtle parts, and plants growing on it). There were layers of imagination in their stories. When a boy said that he saw an elephant, the turtle girl had to let him know that her "truth" was more real than his – there was NO elephant in the garden. But then, another boy developed on the idea of the stones, and melded this to a living breathing creature from the garden, one present throughout the summer: a mosquito. His mosquito, however, had special heavy qualities, building on what his peer had said in her description of the turtle. I could imagine this mosquito in a way that was very different than if he had just pointed to a mosquito. And, as he used his whole body to indicate where it was, we all responded, following him, briefly, into his imaginary world. The children sense the world, by, for example, responding differently to bouncy forest ground versus shale path. The children express their worlds, communicating via their bodies, leading, pointing, revealing how they have sensed the world. Does this demonstrate that mind and body are inseparable, and inseparable from the world?

The world is filled with information, flooding our senses. To be able to survive, all living things must learn to pay attention to significant details. Significant details might hit a living thing, hard, letting that thing know to pay attention. Or, for humans (and likely many other species), significant details are pointed out by nearby adults (Gustavsson & Pramling, 2014). Children can be invited to attend to specific details (usually through language), but

perhaps the adults around them should support the children in their learning and inquiry by appealing to all their senses. A tendency for most human cultures is to focus on what is seen, more than what is heard, felt, smelled. A tendency in Western Modern Culture is to focus on things, objects, rather than on relationships.

Cold fall day, Circle time (Researcher's notes end of day): *It was windy during debrief, but the sun was shining. I asked the children what they had heard in the garden. Chantal said she had heard the clouds, pointing to one that was scudding across the sky. (This was too good!) I asked her what it sounded like. She made a musical sound. Maria said she also heard a cloud. She also made a musical sound. Elijah interrupted, saying he had heard a different sound, and he made a sound like thunder. There are times when I would love to be in their worlds.*

The world is complex, and children do need to learn to attend to important details. However, they notice much that adults have shifted to the background. We can help the children to attend to sounds, sights, smells, feelings, and even tastes that they might not otherwise notice. But we can also learn from them. Children can remind us of the complexity that our bodies have learned, without language, to respond to the sensuous nature of the world around us. Language is important; adults do signify, through language, important factors from the chaos of the world that children must learn. However, much of children's learning they do without language, by responding to the sensuous nature of the world around them.

DISCUSSION

The themes that emerged above are the roles of: close sensory observation of the world; language in children's learning; and emotion in children's play. Multiple themes emerged in each story, and they tended to be intertwined, so were not separated in the "Stories" section above, nor do they separate well in the discussion below; hence the last theme is intersecting themes.

CLOSE SENSORY OBSERVATION OF THE WORLD

For children, their bodies are sensory organs; the textures of the ground reverberate through their bodies. Close observation, while attuned to how interactions in the world can be embodied, will support understanding the importance of children experiencing the natural world for learning what it "feels" like. These unlanguage embodied experiences are individual, sometimes not shared verbally with others. It was interesting to see what felt experiences caused the children to use language to explain, and which they did not. For example, they did not warn one another than the rocks were hard, although this was something that could be a concern; they did use language to explain that a boulder was unstable. Vygotsky (1934/1986) argued that learners need to put words to their observations to use those observations for "spring boards" for later learning. However, embodied knowledge contributes to physical environmental responses. For some of the sensuous aspects of the garden, the children learned directly from the garden, rather than from other humans.

Children feel their worlds, but they also hear, and see them. However, in the story about hearing bird calls, the children did not hear the subtle songs until the teacher had used language to point them out. This brings us to the next theme, regarding use of language for learning.

LANGUAGE IN CHILDREN'S LEARNING

Children also learn by attending to adults and peers, to what they signify through language, to extract information from the chaos of the world around them. Interestingly, however, children will create words when they notice something that needs a word. For example, in this study, the word "tippy" was invented by a child to caution his peers about unstable boulders. In this way, learning is social and language, with children making sense of the world with others.

Taking this up in terms of variation theory: every experience has multiple aspects. Gustavsson and Pramling (2014) noted, for example, that a child, to learn what is red, must also learn what is not red. That will support the child in

interpreting colour the same way as the culture does. However, the object might also be shaped as a triangle, made of plastic, taste sweet, or (as one of my friends suggested) worship a particular form of god. Language will support children in sharing their learning, and in appropriating the ideas of the culture. Much will be left out, however, because every phenomenon is complex. Meanwhile, there is much that children embody, aspects of the world that children pick up on through their bodies (all their senses) that they respond to without using words. For example, the children understood to move their bodies differently on the soft ground than on the hard asphalt path. They knew to move carefully through the boulder field.

EMOTION IN CHILDREN'S PLAY

The children managed to create a sense of fear in one part of the garden – there was a poisonous snake there. However, the other children wanted to explore this part of the garden, to search for this snake. The snake did not have the same degree of fear associated with it that, hearing from a peer whose brother had been badly burned by poison ivy, finding poison ivy did. Hearing the story of a brother burned, and that there might be poison ivy, the children seemed more fearful than adventurous, in that part of the garden. Perhaps who spoke, what information was communicated, and the body language associated with the message, gave the poison ivy story a different kind of fear than the poisonous snake story. Likely, the children picked up on the playfulness around the story of the poisonous snake, and the serious concern about the poison ivy. This indicates that young children engage in sophisticated intersubjective communication.

INTERSECTING THEMES

Adult humans tend to associate specific observations with specific senses, and language tends to support isolated aspects of experiences, and sequence these aspects. However, all senses are intricately implicated in all our experiences. Learning to sense the world should be encouraged, facilitated, and perhaps further developed, especially if teachers and other adults understand that every sensation, every experience, involves the whole body. When I consider the in-classroom activities I did with young children to teach them vocabulary associated with (for example) taste – “touch this to your tongue here”, etc. – those activities were limited to what I provided, rather than being open to the generous affordances of a natural world. The experiences described in this research happened in a naturalized area, and in community with other humans, and were shaped by the experiences and knowing of others. However, there were also individual and unshared learnings, as children adjusted their bodies and sensations to, for example, the texture of the ground beneath their feet.

The naturalized garden offered learning affordances that the day-care play yard did not, such as greater variety in species, kinds of soil, and greater difficulty for retreating indoors if it began to rain. The garden, unlike the play yard, offered up its constructed areas as surprises, whereas the natural features were explored largely without spoken wonder. The different textures of the ground, the shapes of leaves, and tastes of berries, the odours of the plants, the bird calls, were all things that emerged from the complexity of this ecosystem over time. The adults helped the children tune in to some of these aspects, but we adults were able to learn from the children as well. Some of adult learning is actually re-learning, for example remembering the magic of the world, and how to explore the world sensuously. Importantly, though, before this study, I did not realize how much of the world I know that I have never put into words, such as how to respond to textures of the ground, etc.

Abrams (1996) argued that the use of language separated humans from their sensuous contact with the natural world. Indeed, experiences are complex and holistic, involving the whole body. Language, according to Vygotsky (1934/1986), allows humans to focus on aspects of the world, and to recall that aspect to their minds later, as well as to share those aspects. Can language, requiring signifying and sequencing, embrace the complexity and holism of experiences? Vygotsky prioritized the role of language in learning, arguing that when a person put words to a phenomenon, that phenomenon could then be analyzed and could be a “spring board” for later learning. He argued that without putting words to events, further learning would be limited. Does the theorizing of experience (through putting words/concepts to it) take us away from the experience (Abrams), or does language (communication) deepen experience (Vygotsky)? Perhaps we can have both?

In this research, occasionally activities brought the children to focus on specific aspects of the natural world. The children then were able to pick out those aspects, as per Vygotsky's theories – putting language to their experiences so as to build on them later. However, from observing the children at play, and in conversations with them, it seemed the children were learning and applying some of their learning without “wording” their experiences. The children sought out different textures, experienced them without discussing them, and then modified their behaviour based on their individual explorations. This was obvious as children ran on the asphalt path, shuffled along the crusher dust path, and bounced on the soft earth in the forest. In conversations (language) about their observations, they noted seeing and hearing clouds, and gave rather playful descriptions of the sounds. At the same time as using language, however, they embodied their creative descriptions of, for example, a mosquito made of stones.

Personally, I cannot imagine communicating about an experience to someone else without putting words to it. On the other hand, I have had visceral experiences, which I remember and react to because of their visceral, rather than verbal, nature. This research indicates that children learn much without putting language to experiences. They learn, but can they build on their learning; can they do more than react spontaneously in the future? Without language, it is difficult to ask these children what they learned, and how they might apply it. Dewey wrote that educative experiences are ones that lead to growth; embodied and unworded experiences do lead to growth, but is the growth limited? The way to investigate this is not obvious, but might lie in more thorough and systematic follow up studies.

FINAL WONDERS

There are wonders that remain. Will children who are exposed early and often to natural or naturalized areas, experiencing the magic and playfulness potential in these areas, value natural areas when they become adults? The research that has been done has been retrospective, involving adults. These adults note that their childhood interactions in nature affected their love for and involvement with natural areas now. However, adults who spend time in natural areas are more likely to look back fondly on childhood experiences in nature. Cutter McKenzie, Edwards, Moore, and Boyd (2014) argued that children need more than play time in natural areas; that they need to be taught about sustainability issues as well. I tend to concur, since this is more likely to give children language to think against the dominant discourse which encourages humans to see themselves as separate and able to control /manage the natural world. Language itself, in communicating cultural values, can interrupt children in seeing themselves as part of the natural world. There is definitely need for more research on the kinds of activities and language to use with children to support them in seeing themselves in relationship with the world, rather than dominating it.

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