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Posthumanist Possibilities for Early Childhood Environmental Education



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Living within Precarious Times: Posthumanist Possibilities for Early Childhood Environmental Education

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FOREWORD

Early Childhood Environmental Education and the Posthuman “Turn”: Why Knowing As “We” Go Matters

Bessie P. Dernikos

Guest Editor, Florida Atlantic University, USA

Jaye Johnson Thiel

University of Georgia, USA

We Know As We Go

(A poem inspired by the pieces in this special issue.¹)

Walking with and
walking through
children’s sensorial bodies.
We know as we go.

The child’s body emerging
through stones, dogs,
water, sand, and sky.
We know as we go.

Open-ended swirling extensions,
carried by some force,
shit breaks down.
We know as we go?

Messy entanglements,
asymmetrical geographies,
knowing is uncomfortably at stake.
We know as we go?

Curious new worldings,
mutual reciprocity,
multispecies vulnerabilities.
“We” know as “we” go...

¹ Here, we take specific phrases and key ideas from each paper to craft this poem. We continue to engage with the contributing authors’ words throughout this foreword.

What does it mean to ‘know as we go’? Who and what even make up that we? Where, for instance, is the ‘we’ when educators encourage children to “go out into nature,” to run wild and free across an “empty” landscape that’s just theirs for the taking? Here, we borrow this specific phrasing—we know as we go—from Karen Malone and Sarah Jane Moore (this issue) who draw upon the work of Ingold (2010). One way or another, these three scholars all suggest that knowledge-making is open-ended, relational, and “formed along paths of movement” (Ingold, 2010, p. 136). We highlight this idea of *knowing as we go* throughout as a way to urge readers to rethink “the self” as expansive and knowledge-making as unbounded—or as Ingold puts it, “knowledge-growing” (p. 122). Within the field of early childhood environmental education, dominant approaches to knowledge production continue to remain rooted in romanticized notions of the innocent child “out” in the “natural world” (see e.g. Nxumalo & Cedillo, 2017). Such anthropocentric ways of engaging with nature and the environment (Malone, 2015; Nxumalo, 2017; Nxumalo & Cedillo, 2017; Rautio, 2013; Taylor, 2011; Taylor & Giugni, 2012; Taylor et al., 2012) center the child as sole meaning maker and, in turn, the “natural world” as a blank slate or passive backdrop devoid of any agency, histories, stories, and knowledges of their own (Änggård, 2016; Malone, 2015; Nxumalo & Cedillo, 2017). Yet, as Dunlop (2009) reminds us, knowledge is not contained within individual human bodies but, rather, is found within an entangled assemblage of human-nonhuman relations: “in the human eyes, in rivers, in animals, in the language of music, poetry, art, science, history, anthropology, in what is public, intimate, beloved” (p. 16; see also Braidotti, 2018).

Drawing upon more-than-human or *posthuman* theories of the subject, contributors to this special issue rethink and disrupt child-centered approaches to knowing, being, and doing. Challenging modernist colonial discourses of nature as “mute, pure, and separate” (Nxumalo & Cedillo, 2017, p. 100), posthuman theories highlight how the social world we live in is comprised of an assemblage of human and nonhuman actors (e.g. things, animals, plants, affects, discourses, institutions) that are constituted through unfolding relations across bodies (writ large) within environments that are always vibrant and ever-changing (Bennett, 2010; Leander & Boldt, 2013; Lenz Taguchi, 2011). This is not to say, of course, that agency is distributed evenly across humans and nonhumans (such as human dominion over the earth), as dehumanization, discrimination (e.g. based on race, class, gender), and colonial violence (such as killing and enslaving Indigenous people) continue to both impact the social and define our current era (see Braidotti, 2018; Dernikos, Ferguson, & Siegel, 2019). As Braidotti (2018) so aptly puts it, “‘We’ – the dwellers of this planet at this point in time are inter-connected, but also internally fractured” (p. xxiv). In other words, we are all matter, but we have not all *mattered*.

Exploring the ongoing complexities of our markedly uneven “more-than-human” worlds, however, is not exactly a new concept (see e.g. Kuby & Rowsell, 2017; Malone, 2015; Nxumalo & Cedillo, 2017). Deep ecologists as well as Indigenous philosophers have long examined humankind and nature as relational fields of possibility, rather than distinct entities (Absolon, 2010). Yet, the renewed attention given to relational perspectives within this special issue helps bring these alternative ways of relating to the ‘natural world’ into sharper relief, namely by urging us to consider the “ethical, political, and pedagogical implications of addressing the colonial histories and material geographies” (Pacini-Ketchabaw & Taylor, 2015, p. 2) that shape children’s more-than-human encounters. Conceptually, contributors utilize diverse theories of posthumanism and/or creative post-qualitative methodologies to (1) move beyond normative ways to think and “do” environmental education, and (2) explore the generative ways young children sense their dynamic relationships with nature/the environment and *learn with* more-than-human others. As Bettie St. Pierre (2014) posits, post-qualitative “method ...[is] not a prescriptive step-by-step procedure... described in advance... in some textbook that... could easily [be] implement[ed] during ‘fieldwork’” (p. 7). Rather, it involves an embodied engagement with “data”/theory that encourages new

orientations, angles, and ways of thinking that resist the fixed logic of representation (Jackson & Mazzei, 2012; MacLure, 2013).

With this in mind, we return to our opening poem so as to invite readers to dive into the relational messiness of “matter on the go” (Bennett, 2010, p. 18) and the *im/possibilities* of knowing as we go. As you read across these pieces, we encourage you to slow down and re/orient your thinking a bit (Stewart, 2007; St. Pierre, 2014) so as to become better attuned to what posthumanist inquiries might offer the field of early childhood environmental education. We wonder: What would it mean for students, researchers, and educators to construct new and different understandings of posthuman worlds where we work together to displace anthropocentrism, recognize trans-species solidarity, and acknowledge our relational violence towards human and nonhuman others (Braidotti, 2018)? While embracing the unknown, as well as a more expansive conception of “the self,” may very well be uncomfortable for some, we hope that doing so enables more ethically response-able (Barad, 2007) considerations that allow for movement, conversation, emergence, newness and, most of all, the possibility of different futures.

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References

- Absolon, K. (2010). Indigenous wholistic theory: A knowledge set for practice. *First Peoples Child & Family Review*, 5(2), 74-87.
- Änggård, E. (2016). How matter comes to matter in children’s nature play: Posthumanist approaches and children’s geographies. *Children’s Geographies*, 14(2), 77–90.
- Barad, K. (2007). *Meeting the universe halfway: Quantum physics and the entanglement of matter and meaning*. Durham, NC: Duke University Press.
- Bennett, J. (2010). *Vibrant matter: A political ecology of things*. Durham, NC: Duke University Press.
- Braidotti, R. (2018). Foreword. In V. Bozalek, R. Braidotti, T. Shefer, & M. Zembylas (Eds.), *Socially just pedagogies: Posthumanist, feminist, and materialist perspectives in higher education* (pp. xiii-xxvii). London: Bloomsbury Publishing.
- Dernikos, B. P., Ferguson, D., & Siegel, M. (2019). The possibilities for “humanizing” posthumanist inquiries: An intra-active conversation. *Cultural Studies ↔ Critical Methodologies*, 1-14. DOI: 10.1177/1532708619829793
- Dunlop, R. (2009). Alphabet for the new republic. In M. McKenzie, P. Hart, H. Bai, & B. Jickling (Eds.), *Fields of green: Restorying culture, environment, and education* (pp. 11-63). NJ: Hampton Press Inc.
- Ingold, T. (2010). Footprints through the weather-world: Walking, breathing, knowing. *Journal of the Royal Anthropological Institute*, 121-139.
- Jackson, A. Y., & Mazzei, L. A. (2012). *Thinking with theory in qualitative research*. New York, NY: Routledge.
- Kuby, C., & Rowsell, J. (2017). Early literacy and the posthuman: Pedagogies and methodologies. *Journal of Early Childhood Literacy*, 17(3), 285-296.
- Leander, K., & Boldt, G. (2013). Rereading “A pedagogy of multiliteracies”: Bodies, texts, and emergence, *Journal of Literacy Research*, 45(1), 22-46.

- Lenz Taguchi, H. (2011). Investigating learning, participation and becoming in early childhood practices with a relational materialist approach. *Global Studies of Childhood*, 1(1), 36–50.
- MacLure, M. (2013). Classification or wonder? Coding as an analytic practice in qualitative research. In R. Coleman & J. Ringrose (Eds.), *Deleuze and research methodologies* (pp. 164-183). Edinburgh, Scotland: Edinburgh University Press.
- Malone, K. (2015). Posthumanist approaches to theorising children’s human-nature relations. In K. Nairn et al. (Eds.), *Space, place and environment: Geographies of children and young people*. DOI 10.1007/978-981-4585-90-3_14-1
- Malone, K., & Moore, S. J. (2019). Sensing ecologically through kin and stones. *International Journal of Early Childhood Environmental Education*, 7(1), 8-25.
- Nxumalo, F. (2017). Stories for living on a damaged planet: Environmental education in a preschool classroom. *Journal of Early Childhood Research*, 1–12. DOI: 10.1177/1476718X17715499
- Nxumalo, F., & Cedillo, S. (2017). Decolonizing place in early childhood studies: Thinking with Indigenous onto-epistemologies and Black feminist geographies. *Global Studies of Childhood*, 7(2), 99-112.
- Pacini-Ketchabaw, V., & Taylor, A. (Eds.) (2015). *Unsettling the colonialist places and spaces of early childhood education*. New York, NY: Routledge.
- Rautio, P. (2013). Children who carry stones in their pockets: On autotelic material practices in everyday life. *Children’s Geographies*, 11, 394–408.
- Taylor, A. (2011). Reconceptualizing the nature of childhood. *Childhood*, 18(4), 420-433.
- Taylor, A., & Giugni, M. (2012). Common worlds: Reconceptualising inclusion in early childhood communities. *Contemporary Issues in Early Childhood*, 13(2), 108-119.
- Taylor, A., Pacini-Ketchabaw, V., & Blaise, M. (2012). Children’s relations to the more-than-human world. *Contemporary Issues in Early Childhood*, 13(2), 81-85.
- Taylor, A., & Pacini-Ketchabaw, V. (2015). Learning with children, ants, and worms in the Anthropocene: Towards a common world pedagogy of multispecies vulnerability. *Pedagogy, Culture & Society* 23(4), 507–529.
- St. Pierre, E. A. (2014). A brief and personal history of post qualitative research toward “post inquiry.” *Journal of Curriculum Theorizing*, 30(2). 2-19
- Stewart, K. (2007). *Ordinary affects*. Durham, NC: Duke University Press.

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Sensing Ecologically through Kin and Stones

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ABSTRACT

This paper draws on a research study that builds on a long and rich history of research in environmental education focusing on the value of learning through everyday experiences with the more than human. This study specially focused on very young children's experiences of ecologies and explored the unique opportunities sensorially rich bodily interactions with nonhuman entities provided. Drawing on postqualitative inquiry, using visual arts, narrative and walking methodologies, Karen and Sarah Jane are attentive in this work to the very subtle encounters and sensitivities of how child bodies move with and through places. By employing a number of nontraditional formats, the two researchers share sensorial ecological encounters as a form of child-worlding; bodies attune to the ongoing and the everyday presented as images, stories and prose. As an approach to diffractive analysis, they adopt a relational ontology as a means for thinking with the concepts of kin and stones. Sensing ecologically in this way becomes both a conceptual analytical tool and a pedagogical practice, allowing new imaginaries for children becoming and knowing the more-than-human-world prior to forming formal abstract 'language'. It seeks to disrupt the teaching and naming of objects as superior. They draw on the notion of ecomorphism to support a view of humans as interdependent with all ecological beings, objects and weathering of the earth. Ecomorphism also attributes qualities of a shared life through sensorial knowing with others and objects; whether they be human or nonhuman. Throughout the paper Karen and Sarah Jane have considered deeply how young children come to be with/encounter nonhuman animals, plants, weather, water and materials, and how do they respond and communicate with those entities through and with their animal bodies.

Keywords: sensorial knowing, young children, toddlers, postqualitative, walking methodologies, Country, ecomorphism

The emergence of the sensing ecologically nature-based research project came from discussions by the researchers about how parents, carers, Elders and early years educators could consider pedagogical practices that supported noticing and attuning to a young child's sensorial ecological play through everyday encounters. What makes this research study distinctive is its emphasis on very young children. The research data was generated as mobile telephone captured images and moving videos that focused on two 2-year old female humans. The data mapped their encounters with nonhuman entities and environments whilst they were freely exploring and playing in complex environments. The two children

in this project were pre-verbal language, and the research followed the children's expression of sensing and being in the natural environment. The research explored the notion that in the process of acquiring 'humanness', particularly discursive languages, adult humans can often disregard child's embodied sensitivities and sensorial forms of communication. Sensorial communication is a dominant form of communication for human babies and toddlers (Hackett & Rautio, 2019) and for many nonhuman mammals. We propose that a desire to focus on supporting the 'naming of objects and experiences' reiterates and imposes the humanist pedagogical project. Our research is evidence based and suggests that other ways are possible.

The research presented in this paper employed a nontraditional format with images, creative writing and poetry being central ways to share the everyday encounters of children. Through this format, Karen, Sarah Jane, Wren, Budya and Country are presented as beings in common who have co-created perspectives on sensing ecologically. Through mapping two children engaged with nonhuman worlds and using multimodal forms of meaning making we created sensorial openings. This structure enabled stories and narratives using place based postqualitative approaches to emerge. The research also enabled the mapping of an Aboriginal child on and through Country. This mapping provided Indigenous sensorial knowing as a central means for valuing the inclusion of nature-based play for Aboriginal children in early learning environments. The stories, narratives and creative writing presented within this article iterated that our collective imaginations are fired by a deep need that can only be satiated by being curious; by exploring, singing, dancing, creating and gathering together to tell our stories (Moore, 2019).

At the time that the research was conducted, the two children were aged between 1-3 years old. One child was Aboriginal, and she was given the pseudonym Budya which is Wiradjuri for ant. The other non-Aboriginal child was given the pseudonym Wren, the name for a common songbird in the area in which she has been filmed and photographed in processes of encountering. The research drew on a model of posthumanist ecological communities where human and nonhuman were beings in common, and bodies sensed ecologically. It embraced an approach where Country, or the entity that is land, was regarded as an equal research partner. The Aboriginal child, land and story was mapped and tracked as a being in common with an identity, a past, a present and a future to be listened to, mapped, theorised and imagined.

Walking-with and through environments provided opportunities for the children to encounter the materiality of spaces, to be with objects, intra-act and co-create sensorial, nature based knowings. Walking-with and through the children's sensorial body means that we know as we go (Ingold, 2000). Living in and being with the world according to Ingold (2013) means we encounter "a lifetime of intimate gestural and sensory engagement" (p. 29). This thinking supported both children to be storied in ways of sensing nonhuman entities and in particular the Aboriginal child to be with the aliveness of Country

The land beneath us is alive

The Gudhang (ocean) is our friend

The Madhan (tree) is our partner

The Walang is our tool for thinking

The Gidyira (kin) is our teacher

The land is our Gunhi (mother)

The land beneath us is alive (Moore, 2019)

Bodies Sensing Ecologically

“The body is a profusion of sensory experience. It is absorbed in the movement of the world and mingles with it through all its senses” (Le Breton, 2017, p. 1).

Children’s bodies are contested domains. Whether its biological determinism or social constructivism many approaches to researching children’s bodies take on a certain mode of analysis that focuses on the external ways children’s bodies either act, are acted on or acted with other humans. Within the new materialist approaches, researchers, including feminists working in diverse disciplines and across themes, have demonstrated that bodies matter not only in the way proposed by Judith Butler (1993) with social and cultural norms regulating “the materialization and signification of those material effects” (p. 2) on natural bodies in a much “deeper,” interactive, and integral sense. Anne Fausto-Sterling (2000), molecular biologist, is a pioneer in showing convincingly that categories of difference inscribe themselves beyond the surface of bodies by going literally beneath the skin: “[E]vents outside the body become incorporated into our very flesh” (p. 238). The body of the posthuman children that we explored in this paper and in our research focused on the ideas from Jean-Luc Nancy who speaks of *being singular plural*; this is supported by the notion of co-ontological beings. From a Baradian, agential realist perspective, we move from co-ontological tracings to co-relational ontologies. A posthuman co-relational ontological perspective determines there is no human body (child body) or nonhuman being that is not, at the same time, an embodied “being-with.” All bodies are living-on and in co-existence with self and other. All organic and inorganic creatures are woven together into an instrumental economy in which “we” live in and through the use of one another’s bodies, being reciprocal means and ends to each other.

Sensing ecologically is the conceptual tool used in our research that helped us to imagine how children’s bodies engage and communicate with the more-than-human-world prior to language acquisition. That is, how bodies find ways to be with animals, plants, water, and materials. Indeed, through this research we have mapped how two children respond to and communicate with a diverse range of entities through many senses. Snaza et. al (2014) suggested bodies as sensorial objects can attune to our relationality with others; Ingold (2010) speaks of attending to it. Jean Luc Nancy (1997) identifies beings-in-common as the means for acknowledging our coexistence in the world with a range of others, and Marisol de la Cadena (2015) drawing on her work with Indigenous peoples in the Andes proposes we are all in the world as ‘more than one – less than many’. Kay Milton (2005 as cited in Rautio, 2017) writes about how nonhumans species are perceived by human ones. She points out that while anthropomorphism means attributing human characteristics to nonhumans entities this is not how we form relations. In our study, it is through sensorial bodies, bodies sensing and recognising other bodies that sense making is activated. Ecomorphism and not anthropomorphism may be a better means for naming the modes that we have proposed in this paper. Ecomorphism supports a view of humans as interdependent with all ecological beings, objects and weathering of the earth. Ecomorphism is congruent with Aboriginal ways of encountering and taps into old stories and old ways of seeing spirits, animals and spirits as co-existing (Edwards, 2008, 2007, 2004). This form of ecomorphism as opposed to anthropomorphism – attributes the qualities of having a shared life through sensorial knowing with others and objects - whether they be human or nonhuman.

Worlding Methodologies

Working together we identified and mapped the experiences and encounters of two young children. Rather than taking a comparativist approach, the research honoured their individuality, their stories and their perspectives. The study builds on a long history of research in environmental education that has

focused on children's experiences of natural environments and the unique opportunities that sensory rich interactions with the environment can provide (Abram, 1996; Beery & Jorgensen, 2018; Carson & Pratt, 1965; Chawla, 1994, 2002; Cobb 1993; Lekies & Beery 2013; Nabhan & Trimble 1994; Rautio, 2013; Sobel, 2002, 2008; Wells & Lekies, 2006). Because one of the children was Aboriginal, the research acknowledged, respected, celebrated, listened to and mapped her ways of Knowing, Doing and Being (Martin, 2003).

The methodological focus was congruent with shared theoretical musings and storying where we felt compelled to focus on providing an intra-active space for human and child, nonhuman and other encounters to be with and think through each other. Barad (2007) speaks of this type of intra-action as an enactment, a matter of possibilities for reconfiguring entanglements, worldly reconfigurings. Worlding is the means through which a destabilising of humanist structuring of nature/culture, body/mind divides can be unpacked and interrogated. By attending to Haraway's (2016) notion of relational natures of difference, we use a diffractive lens to be responsive to patterns that map not where differences appear but rather to map where the effects of differences appear. Barad (2007) states that while diffraction apparatuses help us: "... measure the effects of difference, even more profoundly they highlight, exhibit and make evident the entangled structure of the changing and contingent ontology of the world, including the ontology of knowing. In fact, diffraction not only brings the reality of entanglements to light, it is itself an entangled phenomenon" (p. 73).

There is a need to rethink agency as central to this exploration of children when emerging from a relational ontology, as it possesses possibilities for not localising agency in the human subject; a space where agency is not being possessed by humans or nonhumans but distributed across an assemblage of humans and non-humans through alternative ways of naming and knowing. Aboriginal naming enters this space through the presence of an Aboriginal child who brings her own knowing, naming and interconnected relationalities through her marra, her dinang, and her gundyarri or spirit.

The postqualitative place-based research inquiry we are using draws loosely from research creation (Springgay & Truman, 2016), postmodern emergence (Somerville, 2007), walking-with child bodies (Malone, 2018), and place stories and narratives (Tuck & McKenzie, 2014). Somerville's (2007) notion of emergence incorporates elements of wonder, becoming, generating, and embodied relationships; she writes, "a reciprocal relationship with objects and landscapes, weather, rocks and trees, sand, mud and water, animals and plants, an ontology founded in the bodies of things. In this ontology, bodies of things are dynamic, existing in relation to each other, and it is in the dynamic of this relationship that subjectivities are formed and transformed" (p. 235). Fleshy, leaky bodies that come into being in a place through an unfolding, creating methodology.

Postqualitative posthuman researchers support that knowledge is based not on unchallengeable truths existing outside of humans and nonhumans, but knowing and being is relational building on an ontological-epistemological view that is deeply entwined. We cannot know the world without being in the world, we cannot be in the world without knowing it. There are a number of methods and approaches that fit within the post-qualitative/posthuman paradigm we adopt; the focus of these methods is to acknowledge the world is not just 'out there' waiting to be interpreted, but is in here or in us. Data emerges in this study as a collection of everyday episodes, experiences and encounters captured on video.

This process of knowing and becoming intimate and attuned to a lively world including weathering worlds is what we call worlding. Children are worlding. Our methods of research are acquainted with the process of capturing that worlding. Place-based research using postqualitative methodologies support the view

that humans are continually creating and re-creating their world as a dynamic meaning system, that is, one which changes over time and is located in 'place'. Walking methodologies figure centrally to the view of place based postqualitative work adopted in this project. We take from Aldred (2014) who writes: "there are several ways to inhabit movement. To move through a landscape is to dwell in the movement, occurring when relates to and reflects on the material world as it is experienced and moved through" (p. 31).

Attuning to Children's Bodies

De-centring the human through a process of iterative intra-activity allowed us to disrupt human exceptionalism and exemptionalism by proposing a posthumanist refiguration. By not viewing 'human' and the more than human as simply objects being directed and responding to the interaction of the human, but instead understanding entities in the more-than-human world as subjects in their own right who exercise agency with and through encountering humans (Barad, 2007). In this case the very young children are not familiar with humanizing binaries or separations between human/nonhuman, bodies/mind, and therefore without romanticising the experiences, the research acknowledges and brings attention to those openings when the human body communicates with other nonhuman bodies.

To embark on this research with children there was a need to be attentive to the very subtle encounters and sensitivities of children in space and places with their bodies. Massumi (2015) explained that attending more closely to understandings of nonhumans garnered from the practice and experience of co-relationality allows us to be open to learning to be affected.

Karen and Sarah Jane collected data through filming hundreds of minutes of Wren and Budya involved in free or unscaffolded play in a variety of environments mostly outside of human made spaces, but not always. The short video captures were filmed on mobile phones as Wren and Budya went about their everyday activities. The video stories were then interpreted using slow analysis tools, watching the videos as stories, as a whole segment and as singular frames we interrogated them with the intention of listening to land, Country, encounter and body. The analysis attuned to the children's bodies as they were being shaped by and in turn were shaping entities. Stories are transformative; they heal, connect, and embody personal and community knowledges. Sharing stories nourishes us. It brings us together and connects the oceans within (Moore, 2016).

The footage collected of Wren captured hundreds of interactions with a Mirri, or dog, and the research claimed the body as the space in between knowing and being, sensing and sense-making. Children's experiences of very close relations with other animal bodies have often been explained dismissively as anthropomorphism, the attribution or projection of human characteristics onto individuals of another species. This research framed a shared sensual knowing between two beings that shared their animalness. It emerged from an act of sense making where belonging to a predetermined 'species' has no fortitude to how that animal will be known or ethically treated. "Posthumanism doesn't presume the separateness of any one thing. It relates, embeds and disrupts the alleged spatial, ontological, and epistemological distinction that humans create to set themselves apart" (Barad, 2007, p. 136).

Budya and her play and encounters and bodily understandings of Country set the place for the data and were storied accordingly. Budya's spontaneous encounters with Walang and Country, stones and water, sand and trees have been captured in hundreds of video episodes. As a researcher with an early year's education background, Sarah Jane captured these stories, like Karen had with Wren, while resisting the temptation to name, prompt and suggest activities and responses from Budya. Attuning to Budya's

sensorial knowing, rather than naming for knowing, Sarah Jane quickly realised that previous to the sensorial knowing research project she had been trying to shape, mould and change Budya's nature based learning encounters through instructing, leading, suggesting, scaffolding, teaching and prompting. Like many teachers before her, she recognized the practice of naming, intentional teaching, and leading activities for children's ecological knowing can act as a barrier to sensorial knowing that relies on slow, uninterrupted, body focused encounters.

Composting as Meaning Making

Haraway (2016) muses "we are humus, not Homo, not Anthropos; we are compost, not posthuman (p. 55). 'Composting' as a methodological tool for analysis has found its way into many studies in the affective turn. Composting methodologies entice us to dig deep into the data heap, to turn things over, and to return to our heap over and over. The focus is on complexity rather than reductionism. So rather than see the data as singular entities, we are looking across them and through them to find instances that express our conceptual thinking: seeking "a space in which *non*-human forces are equally at play and work as constitutive factors in children's learning and becomings" (Hultman & Lenz Taguchi, 2010, p. 527). From these ways of making meaning, the vignettes we have gathered together in this paper have emerged. The approach in our study meant sifting the data in cyclic and iterative ways. Coming together and apart like the waves of the Gadhang (ocean), our discussions with the data often reflected patterns in natural environments, the texture of rocks on a landscapes, the ephemeral clouds in a blue sky. Through the sharing of images, poetry and data, the research relations and composting approaches for mapping the children's sensorial encounters were composed. We met regularly to view, to re-visit, to reflect on, to discuss, to encounter and re-encounter the images and footage of the children playing and to compare perspectives. The emerging concepts of which only two, Gidyira (kin) and Walang (stones), emerge through a form of diffractive theorising drawing on a relational ontology. As a re-turning (Barad 2007) like composting, diffracted data drawing on an emerging posthumanism and vital materialist turn supports a shift in focus, from culture as outside of nature to a re-orienting of relations between the human and more-than-human world. We take images of the children that embody the children's relationship with Gidyira (kin) and Walang (stones) and make tangible the children's thinking. Employing the potential of posthumanist and Aboriginal child centred ways of Knowing, Being and Doing (Martin, 2003) through encounter, the theorizing of this approach critiqued classic humanism. By de-centring the human we were enticed to question the centrality of the human, therefore making possible an alternative mode of thinking, seeing and imagining.

Walking on Country

Walking on Country for the Aboriginal child, too brings Aboriginal perspectives into engagement and encounters with the social world. In this way postqualitative or posthuman readings of Country acknowledge the presence, the lived space and dynamism of walking with, in and on the land. Through the data, Budya is worlding. She is worlding through and with Country and her worlding was captured through video in time and space for analysis and discussion, configuring and re-configuring, naming and knowing. Indeed, this research actively attuned to the strength, capacity and importance of Budya's Aboriginal heritage and her heritage of sensorial based encounter and its value. The encounters were analysed with the theory of knowing where land provided an essential thinking and learning tool for her to understand and language her world. Budya's worlding with walang were moments for deep reflective nonhuman encounter. Mirraoopa's Aboriginal research framework provided a strong theoretical and methodological frame for the way in which the case study of the Aboriginal child has been structured and conceptualized, and it was the land that drove her learning (Simpson & Moore, 2008).

Sarah Jane was mentored on the entity of Country by Elder Oomera Edwards during structured learning encounters on Darninjung Country in 2007 and 2008. During Oomera Edwards' teaching on Country sessions, Sarah Jane was told that Aboriginal peoples had special custodial commitments to Country and taught that some individuals had responsibilities to care for, nourish and sustain the stories and knowledges (Edwards, 2008, 2008, 2004) of place. Deborah Bird Rose (1996) presented Country as life giving and not just imagined, but a part of the lived experience. Budya's case study acknowledged this theory and defined Country as human and nonhuman; as air, land, water, nature and animals and demonstrated a space that de-centred the human. Encounters with Country are diverse and different for Aboriginal and Torres Strait Islander peoples, and Karen and Sarah Jane's sensing ecologically through nature based encounters created a focused and specific case study where an Aboriginal child, Budya, was filmed without interference, instruction or verbal cues encountering Country. Special places and spaces such as the river bed that Budya was filmed on were important spaces for encounter, enactment and entangling.

Some concepts of Country have been passed down from generations to generations in traditional ways, and some have been disrupted or changed and transformed by colonisation, contemporary living and urbanization: by moving, shifting and encountering concrete, buildings, parks, fences and playgrounds and yet the walang or the stones remain as an essential thinking, sensing and encountering tool for Aboriginal children. In traditional and contemporary Aboriginal communities, each community may have different and distinct association with the lands that they were born onto and into and so Country and encounters are intertwined with Aboriginal identities (Edwards, 2008, 2007, 2004).

Gidyira, My Entangled Kin Tracings - by Karen

Sensorial ecological encounters. Where child-worlding bodies attune me to the ongoing. The relationality of an everyday multiple knowing. A present and past body sensing as entangled matter. There is a moment, a pause, a silence, recognition of ecological kin tracings, like tendrils of a floating sea jelly, rising and falling in the waves, they pulsate in the everyday. Worldings of imaginaries. A quarter of a billion years ago the earth went through a period called 'the great dying'. An extinction event where ninety-six percent of the species of plants and animals on the planet were lost; it nearly ended all life on the planet. Humans and all nonhuman species currently living on the planet are descendants from that surviving four percent of life. These "Ghosts point to our forgetting, showing us how living landscapes are imbued with earlier tracks and traces" (Gans, Tsing, Swanson, & Bubandt, 2017, p. G6). Recognition, knowing, sensing, learning to be-with in new worlds in new forms with my ancient and present Gidyira (kin).

"Companion species" writes Donna Haraway (2016) are "relentlessly becoming-with. The category companion species helps me refuse human exceptionalism and invoke versions of posthumanism. In human-animal worlds, companion species are ordinary beings-in-encounter in the house, lab, field, zoo, park, truck, office, prison, ranch, arena, village, human hospital, forest, slaughterhouse, estuary, vet clinic, lake, stadium, barn, wildlife preserve, farm, ocean canyon, city streets, factory, and more" (p. 13).

animal but not only



rollings over
rollings over
encounterings
mimicry
free

grasses
greening
stretching
scratching
bodies

shadowing
deepening
recognition
grasses greening
grasses greening
not only

entwined
joys
tangled
knowing
rollings over
rollings over
kin

Noticing attunes us to worlds otherwise left as unrecognised through connecting beyond bodies into deep knowing, recognition; there is a sensing of bodies. Ecologically it forces us into a new kind of relational ontology, self as 'human but not only' (Marisol de La Cadena 2015) – a human child who thinks with and through kin and a more than human entity that thinks through human; there is the recognition of kin (Chakrabarty, 2009). Child-dog encounters in this series of photographs taken from a 3-minute video on my iPhone attune us to the joy of being animal. The child engaging in dog body mimicry experiences, the joy of rollings over through her body with the dog, scratching, being body with grass in the sunny field of an urban park. She looks over to see 'are we still worlding this moment together', she continues on. The dog looks to her and notices 'we are being together in our grassy rollings over' and barks and begins rolling over some more.

Child-fish fleeting recognition



recognition can be fleeting
a moment where eyes meet eyes
entranced by the knowing
not wanting to look away
ancient time held in the longing

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a moment where eyes meet eyes entranced by the knowing
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The child-fish sensorial being-in-encounter was a momentary, fleeting encounter, ancient recognition of human-animal worlds. A temporal pause in the loud busy city aquarium where child bodies are being herded and rushed by adults and child bodies fly past fishy bodies with little notice or knowing.

The eyes of the fish catch her; a fish gaze intensely waiting; seeking her attention. Eyes fixed on hers. She watches the slow fishy body as it moves through the watery glass; as it moves to her, her body lowers closer and closer till only the thin glass separates them.

Mesmerized, entranced both eyes are fixed; child-fish recognition; past tracings of ghostly beings passing through the clear glass watery spaces, separated bodies feeling all but heart beats. The fishy body moves ever so gently in the currents of the water, but the eyes never leave the gaze. As sensorial beings, they communicate through their watchful worlding.

After a long, long holding of the two bodies in this temporality of nothingness through liveliness the child stands up in order to pass her lips on the glass to show her love and affection to the moment, acknowledging the emotions of the encounter. The fishy eyes follow the moving body. She steps away turns to see the fishy eyes still seeking, she waves and moves on. Fishy eyes, fish body still paused watch the body fade from view.

Child-duck bodies



Can I come with you?
Will you wait for me?
Follow us, follow us, come this way
We will wait for you
We are walking being with water
We are hopping up on to this smooth surface, higher
Can you climb up?
We will wait
Walk along with us
Follow us, follow us, come this way

The child-ducks entanglement exists within the coolness of the water spraying from the fountain into the air, breathing in and breathing out. We are all in the shadow of a large tree whose branches sweep across

the dirt. As the observer, I watched her outstretched hand in her desire to be with/in relation. She speaks to them, but no words are used. They walk pausing to check she is coming. They hop up on to the ledge of the fountain. Just a couple of steps behind she follows then. She crawls cautiously up on to the ledge of the fountain with them. I worry can I reach out and catch her if she falls. The ducks are looking back seeing that her body is now on the ledge with them. They start to walk on again, in unison ahead of her, she follows, eye keenly watching. Knowing how to be close, to be in relation. They move across the circular patterning of the fountain ledge; child-duck in rhythmic imitation. I quietly accompany her standing just behind to help her if she needs support. But she only looks my way briefly she is sensing I am there. She walks slowly and cautiously, emulating the traces of the ducks on the concrete ledge, those who are so experienced at navigating these watery edges.

We do this theoretical work not by elevating all things or matter to the status of exceptional human or de-elevating human to the status of object or things but by exploring the biopolitical, bioethical, and ontological in order to pay attention to the subtleties of an ecological community that takes into account new relational materialist ontologies. Ontologies where “vital” and “lively” materialism is relational and emergent; it is an enduring structure of assemblages that is the product of their internal inertia. Child-dog-bird-fish are tied together by a genealogy, a history in their bodies entangled with kin in this urban landscape. It is within this ancient thinking that the influence of Marisol de La Candena’s Andean philosophies of ‘more than one – less than many’ is helpful. That is we are implicated in our past, present and future existence on the planet through our connection with worlding companions and “despite the human predilection to reiterate human exceptionalism, including within many epic and heroic narrations of the Anthropocene, the fact is that our human lives are tied together” (Taylor & Pacini-Ketchabaw, 2015, p. 512), in this ‘but not only’ spaces with our kin as worldly others.

With Gidyira (kin) I search for entangled tracings of past, present and future worldings with child bodies who through their sensorial openings find spaces to be with the world beyond the humanist limits imposed by anthropocentric positions that humans are exceptional bodies outside of other beings.

Budya and the Ways in which She Sensed Ecologically as an Aboriginal Child – by Sarah Jane

In 2007 and 2008 Oomera Edwards mindfully taught Sarah Jane ‘listen to Country’. She reflected on this process in a creative piece of writing with Alyson Simpson, a colleague from the University of Sydney in 2008. When recording Budya’s data, Sarah Jane was reminded of Oomera’s words about deep listening.

Oomera asks us to cup our ears and listen. She asks us what we hear. 'Listen to Country' she whispers. She speaks of Country in an active sense. She tells us that Country can be sick and needs to be nurtured. She teaches us that an Indigenous notion of Country is a lived in and resonant space. Oomera suggests that the 'land beneath us is alive'. She alerts us that this Country is a space that is criss-crossed and tracked by animals, humans and ancestral beings. She describes Indigenous Country as multi-dimensional and speaks about how land can vibrate and sing below the buildings and roads and bridges that are built upon it. The group learns to imagine the land beneath. We are told that the land is named and has stories that place it and songs about it, and is looked after by groups of people who belong to it. She explains that the songs are there for people who know how to hear them. She tells us that the land can speak. (Simpson & Moore, 2008, p. 8)

This research explored the ways in which Budya sensed ecologically, listened deeply and nurtured Country through play. It acknowledged her Ways of Knowing, Doing and Being (Martin, 2003) through nature. In the words of the Qandamooka early childhood education specialist Karen Martin-Booran Mirrabooopa

My belief as an Aboriginal researcher is that I actively use the strength of my Aboriginal heritage.

The research used Budya's heritage as a strength and actively sourced her ways of thinking and knowing through encounter. The lived experience of encounter with nature from the perspective of an Aboriginal child was an important perspective to map and it is through the lens of the Walang that the nature based seeing unfolded. Country can focus on a particular area and the non-human entity that are Walang or stones centred this section and as such embraced and lived into and respond to and with Aboriginal conceptions of interrelated, entwined and interactive Country. It is the land that drives Budya's learning (Simpson & Moore, 2008) and the Walang that brings her body into deep knowing.

The Deep Knowing

*Beyond the mountains of plastic,
Where children play with coloured bricks on synthetic grass
Lie the Walang.
The grasses.
The seeds.*

*Beyond the fences and the inside voices
Where shoes are tightly laced
The walang
World.*

*Beyond the human limits.
Beyond contemporary concrete and critical thinking
Walang lie in waiting
They call.
They long
To connect
With bare feet
soft hands
And tells her stories*

That she needs to know (Moore, 2019).

Budya and Her Ecological Sensing through Stones

Budya's data collection and analysis used an Aboriginal research framework (Martin, 2003; 2007; 2008a) and adopted arts-informed and narrative approaches. As discussed, the research was based on a case-study approach and embraced story telling as a method (Martin, 2008a). The research was grounded in an Aboriginal worldview and inhabited the space where animal, land and peoples link. Budya's dinang (Wiradjuri feet) are an integral part of the research as she explored, mapped and tracked her learning on Country through her feet. The work mapped the sensorial ecological narratives of an Aboriginal child and storied her languaging and worlding. Through hundreds of minutes of video Budya gave evidence of her

thinking through stones and water. She encountered Country and through this demonstrated its languaging through pre-language engagement.

The research focused on an Aboriginal child and mapped her interests, experiences and knowledges (Rigney, 1997). It was enacted through video footage taken over a six-month period. The stories, footage and images collected mindfully centred on Budya and her identity as an Aboriginal child.

Stories from the Data

After beginning to work closely on the theoretical orientations of the project in October 2018, I decided to begin my data collection with Budya in an International location or off Country. In November 2018, I filmed Budya intensely for ten days in and around Ophiri Bay in Aotearoa, New Zealand. I created hundreds of videos and collected hundreds of minutes on a mobile phone. Whilst collecting the data I resisted the urge to name and structure her encounter. Despite being coached in ways to be attentive to Country and feeling comfortable with the methodology Karen and I had formulated, I found that in the first few days of filming I wrestled with my educator's urge to control Budya's play. Despite having a background of mentoring by Aboriginal Elders in Aboriginal ways of thinking and being, in the first few hours of filming I noticed that I consistently tried to theme or shape her encounters. As this process unfolded, I became uncomfortable in my knowing and reflected the unknowing necessary to capture Budya and film her encounters with nature and her sensing of ecologies as they occurred. I watched them over and over. I became entangled in them. As the days progressed, I learned to film Budya from a distance, without interrupting her. I learned to stay silent. After the first three days of filming, Budya no longer looked at me nor the phone during her encounters with nature. She sought no instruction nor sought engagement. She was absorbed. Focused. Intent.

As the days unfolded, I observed that the Walang provided the focus for her play. She rubbed them, piled them and buried them in sand. She smoothed them with her thumbs. She placed them in water. She washed them. She held them close to her heart and sat on them. She sat with stones, and the more stones she encountered, the more relaxed her body and stance became. She tuned in to thinking through stones. Throughout the ten days of learning through stones and beach side play Budya gained confidence in leading her own play with stones and attuned to them. Again and again she smiled when she picked up the stones. Over and over she caressed them with her fingers and thumbs. Repeatedly, she held the stones close to her body and rolled them in her hands. Day in day out she rolled them over her legs, her arms. She sang to them. She picked them up with her hands and her feet. She threw them into the water. She tossed and skipped and collected in piles beside her. She selected some and discarded others.

Sensing an Ecological Story

Budya is 2 and a half years old and sits barefoot on a beach in Aotearoa, New Zealand. With this Aboriginal child at my side I search for the ancient calling of Country that is ever present in her sinews, her blood. I observe her untangle the stones and free her thinking to play and know in ways beyond plastic. She looks out to Ophiri Bay. The Walang surround her. Small, black and noisy. The sea waters pick up the stones and throw them back and from time to time she looks out and observes this. It is windy. She crouches and strikes them together. She strikes and grinds. She rolls the Walang in her hands and finds a rust coloured stone and begins to chip and grind it on another black stone. Budya has observed the grinding of ochre in Aboriginal community contexts. She encounters the Walang by striking them together and mimics the grinding of ochre. She repeats this rhythmically in her play and it is an act that she comes back to. This, when seen in the context of an Aboriginal way of Seeing, Being and Thinking (Martin, 2006), may

symbolise her bringing her sense of Aboriginal encounter to being through the Walang. Perhaps she is thinking through the Walang. Perhaps she is hearing the stories of the stones. Perhaps the Walang from Ophiri Bay are connected to the Walang by the river in trowunna. Perhaps through encounter, Budya connects them. Perhaps she thinks through the tracings. Perhaps she recognises them as tools for thinking. Tools for being. Tools for knowing. Perhaps as she throws them into the water she is ready to receive them at another time and in another place. Perhaps the Walang carry story.



By the river

In the Southern Regional of trowunna there is a mountain named kunanyi. The mountain is a sacred place for local Aboriginal peoples and a special place of learning and lore. Behind the mountain on a country road not far from nivaluna there is a river and we visit the river in the summer-time. We have visited this place three times now, and on each occasion, for Budya, it is all about the stones. She takes off her clothes begins to move them with her feet. The stones. She throws them, arranges them and feels them with her hands too. She rubs them over her legs and reaches her head down into the water to feel them through her forehead, her skull. She traps water with her stones as those before her have trapped fish. She throws the stones into the river and changes the flow. Time after time she places the rocks in her hands and rolls them in her fingers. She repeats the rolling, rhythmically and stretches out her feet on the rocks. She hops from rock to rock using small steps and this action seems to map the large stones in a pathway. She repeats the same journey from river to river bank on the same stones as if it were the only path. It is her preferred path. It is the path that she returns to like memory. Once more she places her head in the water from a squatting position and bathes her head in the water. She washes her hands in the river, rubbing her hands over the stones and then in the water. Exploring the water and the stones with her hands and her feet and her head she also takes a stick and pokes it into the water. She throws the stick. She repeats this many times.

Sticks and Stones

Her marra (hands), her dinang (feet) are engaged in this learning through stones. I ask myself; Do the stones have a memory? I ponder if they have a remembered path? I reflect on the encounter and question; do her dinang know this path? I wonder; do her marra know how to move these stones to trap water or to bring the guya through a tracing or a shimmer? For centuries, these stones have been moved by water, by marra; by children and mothers and clans who have sat and squatted on this river bed and yarned, and fished and cooked and eaten. I watch as other families come and go here. They bring dogs and picnics; cameras and bird charts. It is a place of sharing and a site of belonging.

Budya throws the stones and then the sand. She washes her hands. Stones. Water. Sand. Her gaze is fixed, her body relaxed. She spends three hours by the river that day. She drinks the water; she eats apricots and berries using the large stones as plates. She chips the stones and they make sounds that carry across the valley. Up and up the sounds trace other sounds and connect to kin and gidyira; present, spirit and past.

The large stones of the river bank are smooth and worn. Do they carry memory? Can they carry story? She eats, drinks, plays and on and with the stones. They clatter together and jostle in the spirit world connecting her to her ancestral belonging. We always leave them; the stones. She will return. She will return to them. To sift and wash and think and listen to Country. To encounter self. Culture. Time.

On the way back home, on the windy sealed road to nipaluna we pass a waterfall. The mist has come and we drive through clouds.

Budya reaches her hands out to the mist.
Reaches out.
Reaches out.

Concluding Ideas: Thinking with Bodies and Sensing Ecologically

Thinking with bodies and sensing ecologically involved two children, two researchers and a plethora of ways of knowing, doing and being. The approaches enmeshed and entangled within this article emerged from a time where many have argued that children's and babies' health and well-being is substantially improved through being in and encountering with nonhuman others and with natural environments (Malone & Waite, 2016). Studies of very young children, however, have not been very common and evidence-based practice difficult to imagine. This paper presents an imaginative and story-based approach to capturing very young children's bodies in the motion of sensing ecologically. It came at a time when Aboriginal communities were leading discussions about the health of their children, their well-being and the importance of fostering children's connection to culture, Country and kin.

For the authors, it seemed common sense to take a child outdoors to allow them to encounter the world. It seemed common sense to allow them to explore through their bodies ways of intra-acting with other worldly objects. It seemed common sense for an Aboriginal child to be encouraged to play and use her body in and with nature and to ensure that opportunity to experience Country was an essential part of her early learning. These opportunities have often been storied as simple encounters where a child was merely responding or reacting to environmental elements rather than engaging in a relational worlding with objects and entities. Rather than being sensitive to the potential of these encounters, parents and

educators have often dominated the space by naming objects. Researchers have often interjected and overlaid the data with human centred desires to produce and support language acquisition strategies that have been driven by information and scaffolded learning. We have suggested here that naming objects has no more primacy over knowing and being with other worldly beings. We take from Hultman and Lenz Taguchi (2010) when they explore their own diffractive meaning making with young child's bodies, "We engage our whole bodyminds to try to read the flows and passages where life continuously emerges in an immanent flow of potentialities and becomings, rather than trying to uncover the constitutive phenomena for our 'being-in-the-world'" (p. 237).

Child bodies longing to communicate with the nonhuman world through sensorial knowing, flowing potential we attend to when composting the video captures. Child bodies become an "open-ended swirl of extensions and supplementations" (Hultman & Lenz Taguchi, 2010, p 531) emerging through stones, dogs, water, sand and the sky. Sitting deeply with the unknowing, the listening and the acknowledgement of Earthly assemblages. It suggested that when an Aboriginal child was regarded as a leader of her own knowing and the architect of her own play, then rich and complex interrelated encounters were made possible. It evidenced a non-Aboriginal child's deep and connected relationship with kin and focused on interrelated, sensorial knowing and relational becomings demonstrated by being-with and beings-in-common. Our research stories map possibilities of authentic ways to be in relation and be worlding with children, Country and kin.

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References

- Abram, D. (1996). *The spell of the sensuous*. New York: Vintage Books.
- Aldred, J. (2014). Past movements, tomorrow's anchors. On the relational entanglements between archaeological mobilities. In J. Leary (Ed.), *Past mobilities: Archaeological approaches to movement and mobility* (pp. 21-48). Farnham: Ashgate Publishing.
- Barad, K. (2007). *Meeting the universe halfway: Quantum physics and the entanglement of matter and meaning*. Durham: Duke University Press.
- Beery, T., & Jørgensen, K. A. (2018). Children in nature: sensory engagement and the experience of biodiversity. *Environmental Education Research*, 24(1), 13-25.
- Carson, R., & C. Pratt. (1965). *The sense of wonder*. New York: Harper & Row.
- Chakrabarty, D. (2009). The climate history: Four theses. *Critical Inquiry*, 35(2), 197-222.
- Chawla, L. (1994). *In the first country of places: Nature, poetry and childhood memory*. New York: State University of New York Press.
- Cobb, E. (1993). *The ecology of imagination in childhood*. Dallas, TX: Spring Publications.
- de la Cadena, M. (2015) *Earth beings: Ecologies of practice across Andean worlds*. Durham: Duke University Press.
- Edwards, O. (2007). Interview with S. J. Moore in Ourimbah as part of the University of Sydney Embedding Diversity Research Project.
- Edwards, O. (2008). Teachings to S.J. Moore in Ourimbah as part of the University Embedding Diversity Research Project and the Connecting to Country Staff Development Days on Country.

- Edwards, O. (2004). Interview, in Lisa Roberts (2004), available at:
<http://www.lisaroberts.com.au/content/studies/AboriginalStudies/CulturalAspects/Unit3ProtocolsBehaviours/Unit3ProtocolsBehaviours.php>.
- Fausto-Sterling, A. (2000). *Sexing the body: Gender politics and the construction of sexuality*. New York: Basic Books.
- Gans, E., Tsing, A., Swanson, H., & Bubandt, N. (2017). Introduction: Haunted landscapes of the Anthropocene. In A. Tsing, H. Swanson, E. Gan, & N. Bubandt (Eds.), *Arts of living on a damaged planet*. Minneapolis, MN: University of Minnesota Press.
- Hackett, A. & Rautio, P. (2019). Answering the world: Young children's running and rolling as more-than-human multimodal meaning making. *International Journal of Qualitative Studies in Education*. DOI: 10.1080/09518398.2019.1635282
- Haraway, D. (2008). *When species meet*. Minneapolis & London: University of Minnesota Press.
- Haraway, D. (2016). *Staying with the trouble: Making kin in the Chthulucene*. Durham: Duke University Press.
- Hultman, K., & Lenz Taguchi, H. (2010). Challenging anthropocentric analysis of visual data: A relational materialist methodological approach to educational research. *International Journal of Qualitative Studies in Education*, 23(5), 525-542. DOI: 10.1080/09518398.2010.500628
- Ingold, T. (2007). *Lines. A brief history*. London: Routledge.
- Ingold, T. (2010). *Bringing things to life: Creative entanglements in a world of materials*. National Centre for Research Methods, University of Manchester, Manchester, UK.
- Ingold, T. (2013). *Making. Anthropology, archaeology, art and architecture*. London: Routledge.
- Le Breton, D. (2017). *Sensing the world: An anthropology of the senses* (translated by Carmen Rushiensky). London: Bloomsbury.
- Lekies, K. S., & Beery, T. H. (2013). Everyone needs a rock: Collecting items from nature in childhood. *Children, Youth, and Environments*, 23(3), 66-88.
- Malone, K. (2018). *Children in the Anthropocene: Rethinking sustainability and child friendliness in cities*. London: Palgrave Macmillan Publishers.
- Malone, K., & Waite, S. (2016). Student outcomes and natural schooling: Pathways from evidence to impact report 2016, Plymouth.
- Martin, K. L. (2003). Ways of knowing, ways of being and ways of doing: A theoretical framework and methods for Indigenous re-search and Indigenist research. *Voicing dissent, new talents 21C: Next generation Australian studies. Journal of Australian Studies*, 76, 203-214.
- Martin, K. L. (2007). The intersection of Aboriginal knowledges, Aboriginal literacies and new learning pedagogies for Aboriginal students. In A. Healy (Ed.) *Multiliteracies and diversity in Education*. (pp. 58-61). Oxford: Oxford University Press.
- Martin, K. L. (2008a). *Aboriginal worldview, knowledge and relatedness theory: A framework for pedagogy and praxis and the teaching - learning interface with Aboriginal students*. School of Education, Southern Cross University (Lismore) IATSIS Seminar, Canberra, 14 April 2008.
- Martin, K. L. (2008b). *Please knock before you enter: Aboriginal regulation of outsiders and the implications for researchers*. Tenerife, Brisbane: Postpressed.
- Massumi, B. (2015). *Politics of affect*. Malden, MA: Polity Press.
- Moore, S. J. (2019). *Intercultural story sharing in Guam. The International Education Journal: Comparative Perspectives*, 17(2), 30-39.
<https://openjournals.library.sydney.edu.au/index.php/IEJ>
- Moore, S. J. (2016). 'I am mountain'. Re-thinking equity through the creative arts. Paper presented at the OCIES Conference, The University of Sydney.
- Nabhan, G. P., & Trimble, S. (1994). *The geography of childhood*. Boston, MA: Beacon Press.
- Nancy, J. L. (1997). *The sense of the world*. Minneapolis: University of Minnesota Press.

- Pyyry, N. (2015). 'Sensing with' photography and 'thinking with' photographs in research into teenage girls' hanging out. *Children's Geographies*, 13(2), 149-163.
- Rautio, P. (2013). 'Children who carry stones in their pockets: On autotelic material practices in everyday life.' *Children's Geographies*, 11(4), 394-408.
- Rautio, P. (2017). "A super wild story." Shared human-pigeon lives and the questions they beg. *Qualitative Inquiry*, 23(9), 722-731.
- Rigney, L. I. (2007). *Indigenist research epistemologies: A historical journey of conviction, contradiction and transformation*. Flinders University.
- Rose, D. B. (1996). *Nourishing terrains*. Australian Heritage Commission.
- Simpson, A., & Moore, S. (2008). Uncomfortable learning: Connecting to Country. *Synergy*, 28, 4-9.
- Snaza, N., Appelbaum, P., Bayne, S., Carlson, D., Morris, M., Rotas, N., Sandlin, J., Wallin, J. & Weaver, J. (2014). Toward a posthumanist education. *Journal of Curriculum Theorizing*, 30(2), 39-55.
- Springgay, S., & Truman, S. (2016). Stone walks: Inhuman animacies and queer archives of feeling. *Discourse: Studies in the Cultural Politics of Education*, 38(6), 851-863.
- Sobel, D. (2002). *Children's special places: Exploring the role of forts, dens, and bush houses in middle childhood*. Detroit, MI: Wayne State University Press.
- Sobel, D. (2008). *Childhood and nature: Design principles for educators*. Portland, ME: Teahouse Publishers.
- Somerville, M. (2007). Postmodern emergence. *International Journal of Qualitative Studies in Education*, 20(2), 225-243.
- Taylor, A. (2017). Romancing or reconfiguring nature? Towards common worlding pedagogies. In K. Malone, T. Gray, & Truong (Eds.), *Reimagining sustainability in precarious times*. Melbourne: Springer.
- Taylor, A., & Pacini-Ketchabaw, V. (2015). Learning with children, ants, and worms in the Anthropocene: Towards a common world pedagogy of multispecies vulnerability. *Pedagogy, Culture & Society*, 23(4), 507-529. <https://doi.org/10.1080/14681366.2015.1039050>
- Van der Tuin, I. (2014). Diffraction as a methodology for feminist onto-epistemology: On encountering Chantal Chawaf and posthuman interpellation. *Parallax*, 20(3), 231-244. DOI: 10.1080/13534645.2014.927631
- Wells, N., & Lekies, K. (2006). Nature and the life course: Pathways from childhood nature experiences to adult environmentalism. *Children, Youth, and Environments*, 16(1): 1-24.

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What is Nature?

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ABSTRACT

The concept of nature and how humans relate to nature provide the framework for this philosophical discussion on challenges facing the evolving field of early childhood environmental education. Post-humanistic thinking is proposed as an alternative to what is perpetuated through a more typical Western approach to education. This Western approach tends to reinforce and widen the human-nature separation. A common theme emerging from interdisciplinary thinking about the nature-human connection centers around kinship versus domination. This theme is presented as central to post-humanistic thinking. Suggestions are offered on how to apply post-humanism to pedagogy, especially at the early childhood level. Adopting a post-humanistic approach in working with children is considered to be critical to the very survival of the planet while also nurturing the holistic development of children. Post-humanism is also presented as a catalyst for ushering in a community of life that's inclusive of multispecies beings sharing one common world. Provocations for the future include addressing five areas of concern: (1) how nature is presented to children; (2) the meaning and practice of nature play; (3) the capabilities of children; (4) a pedagogy of discomfort; and (5) deeper dimensions of wonder. The essay concludes with a call to take up the challenge of thinking with nature and finding more entangled ways of being in the world.

Keywords: humanism, post-humanism, common worlds, kinship, pedagogy, early childhood education, environmental education

A concern addressed in this essay relates to a young child's statement – "I've never been to nature." This statement suggests that nature for this child is something "out there," something apart from humans. In today's world, it's not surprising to hear a child articulate what many of us experience on an almost daily basis. We, as humans, no longer live immersed in nature. We live in built environments with both physical and psychological walls separating us from the natural world. The environment in which we live most of the time was built by humans and is controlled by humans. It's an environment that was designed to efficiently meet our basic physical needs, to make us feel comfortable, and to entertain us. The natural environment, then, becomes a luxury or a place to go to for diversion rather than a system of which we are a part. Even human adults who say they consider themselves one with nature tend to define nature or natural environments as places separate from humans and as being the opposite of civilization (Vining et al., 2008). This definition of nature allows humans to view themselves as observers and explorers of the natural world, instead of being an integral part of it (Demoly & Santos, 2018).

Sadly, the Western education system tends to reinforce and widen the human-nature separation (Profice et al., 2016). While children are taught that nature is a system of living and non-living elements, their descriptions of nature often exclude humans. Some research indicates that children believe they can't find nature at school (Tillman et al., 2018). Forms of discourse and materials used at school tend to reinforce this mistaken idea of nature. The Cambridge English Dictionary, for example, defines nature as "all the animals, plants, rocks, etc. in the world and all the features, forces, and processes that happen or exist independently of people . . ." This definition of nature feeds into a form of humanistic thinking which is dominated by human interests or values. Humanistic thinking focuses on the human experience and the advancement of humanity. Some forms of humanism include the idea that humans can seek their own level of excellence and create their own future apart from the rest of nature (Simonsen, 2013).

The purpose of this essay is to present a different view of the human-nature relationship based on post-humanistic thinking and to offer suggestions on how to apply post-humanism to pedagogy, especially at the early childhood level. The essay is developed around the idea that a post-humanistic approach in working with children is critical to the very survival of the planet while also nurturing the holistic development of children. The essay is divided into three main sections: Post-humanism and Kinship, Implications for Pedagogy, and Provocations for the Future.

Post-Humanism and Kinship

The concept of post-humanism is complex, and different people define it in different ways. The discussion of post-humanism presented in this paper is based on the belief that to properly define humans' place in the universe we need to listen to multiple voices and consider different perspectives. This essay reflects some of these voices in making the case for post-humanist views in early childhood pedagogies. One common theme emerging from interdisciplinary thinking about the nature-human connection centers around kinship versus domination. This theme is central to post-humanistic thinking.

Donna Haraway's voice is one we might listen to for gaining a deeper understanding about kinship and the important role it can play in establishing a more just and sustainable future. Haraway's work is impressive -- some authors even refer to her as a prophet (Kuswa & Kuperman, 2018). Haraway's prediction of the future includes a time when human and nonhuman ecosystems will reflect a symbiotic mode of coexistence. She refers to this time as the "Chthulucene". Haraway specifically endorses the idea of kinship, which she describes as "affinity, not identity" (Haraway, 2016). Haraway's idea of kinship includes a blurring of the human and the nonhuman. She also calls attention to the interdependence of humans and animals. In *Staying with the Trouble: Making Kin in the Chthulucene*, Haraway urges us to be troubled by our human-centric thinking and how this contributes to the loss of many other creatures.

Humanism overlaps, in some ways, with speciesism, which is based on the belief that we, as humans, have greater moral worth than other species (Caviola et al., 2018). This misguided thinking reinforces the human-nature divide, which is now pervasive and serious enough to be considered a "cultural disease" (Kopnina, 2018). If there's a re-set button, it's time to press it now. As a culture, we need to self-correct. Hopefully, we still have time. Thinking deeply about post-humanism may help us through this process. Post-humanistic thinking is somewhat reflective of Mahatma Gandhi's statement, "The best way to find yourself is to lose yourself in the service of others." Post-humanism doesn't ask us to give up the idea that we, as humans, are exceptional. Post-humanism calls us to recognize and respect that all living things and their habitats are exceptional (Bekoff, 2014).

Post-humanism doesn't mean post-humanity nor does it mean a complete rejection of humanism (Wolfe, 2009). In fact, post-humanism may be a call to realizing the fullness of our humanity. While the self-help literature tends to focus on the individual aspects of fulfillment, we'd be wise to question what this means in terms of being fully human. An excessive contemplation of self (as individual self) may be at the expense of broader social issues. The path to realizing our fulfillment as human beings is through close connections with others and the larger world in which we live.

Recognizing the exceptionalism of all creatures can foster a re-enchantment with the natural world. Marc Bekoff (2014) refers to this re-enchantment as "rewilding our hearts," which he defines as "opening our hearts and minds to others . . . thinking of others and allowing their needs and perspectives to influence our own" (pp. 5-6). The "others" Bekoff refers to include both human and the other-than-human animals. While Bekoff defines rewilding as a mindset, he also links it to action. Rewilding is expressed in such initiatives as building wildlife bridges and underpasses so that animals can move freely and safely between fragmented areas. Such initiatives, he says, provide not only "corridors of coexistence and compassion for animals" but corridors in ourselves, as well -- corridors "that connect our heart and brain, our caring and awareness" (p. 12). Post-humanism, then, is more than cognition; it's also recognition reflected in the way we do things. For educators – especially educators working with young children – this requires adopting practices and using language that reflect a sense of kinship with all other beings on Planet Earth.

Post-humanism, as used in this essay, is consistent with Bekoff's definition of rewilding. It's also consistent with common worlds thinking and the work of the Common Worlds Research Collective (<http://commonworlds.net/>). Similar thinking is expressed in a newly-published document, "Home to Us All: How Connecting with Nature Helps Us Care for Ourselves and the Earth" (Charles et al., 2018). As the title "Home to Us All" suggests, all living creatures share a common home – that is, Earth.

The "Home to Us All" report was developed by the Children and Nature Network (www.childrenandnature.org) and Nature for All (<http://natureforall.global/>). This report was launched at the United Nations Conference on Biological Diversity in Sharm el Sheik, Egypt, in November, 2018. Findings from the full report are being carried forward for incorporation into international policy agreements. We can hope that this initiative will usher in a new way of thinking and a new way of relating to the natural world -- a world where both humans and the rest of nature can thrive. The focus of the "Home to Us All" report is on an inclusive "we," where all living creatures are recognized as co-residents and collaborators on Planet Earth.

Some of the recommendations for practice included in this report clearly emphasize the importance of providing opportunities for young children to experience the many facets of the natural world. A related *Nature for All Playbook* provides a concrete example. This example focuses on transforming puddles "into explosive bursts of water" by jumping in the puddles and feeling the water on your skin. Rather than withdrawing from water to prevent getting wet, you might take this one step further and use the mud around the puddle to do some finger painting on your skin. Jaye Johnson Thiel in a recent Commons World blog (June 17, 2019) shares her response to getting splashed by one child jumping from a swing into a puddle and having another child using mud to paint hearts on her arm. Jaye explains beautifully how she gave into "the baptism of the mud, the puddles, the joy found in the sacraments of the rain; reacquainting myself with the rhythms of an always present kinship to the earth" (<https://commonworlds.net/how-do-we-listen-to-the-always-present-kinship-between-children-and-the-earth-during-playground-relations/>). Many other examples of how to foster a sense of kinship with the rest of the natural world while working with young children can be found on the Common Worlds Research Collective website (see

<http://commonworlds.net/>) and the *Nature for All Playbook* (https://www.iucn.org/sites/dev/files/natureforallplaybookeng_0.pdf).

As reflected in the water and mud examples, the focus of the post-humanism and common worlds perspectives is more about discerning the human relationship with nature than defining or learning about nature. It's about experiencing kinship with nature all around us versus trying to connect with nature *out there*. A kinship perspective takes us beyond both science (Sideris, 2017) and stewardship (Taylor, 2017). A kinship perspective invites "thinking with" versus "thinking about" the world of nature and our relationship with it. Veronica Pacini-Ketchabaw (2013) calls attention to this way of thinking when she asks, "What if forest pedagogies are not so much about learning about forests, but thinking with forests?" (p. 358). We might ask this same question about nature in general – "What if nature-based pedagogies are not so much about learning about nature, but thinking with nature?" We think with nature when we pay attention to the nature-human relationships that are co-created in a natural environment. "Thinking with nature" focuses on relationships and connectedness versus control and domination. Once we view other living creatures as kin, we can no longer claim dominance over them or think of ourselves as separate from them.

The issue of dominance has been discussed in the literature as a concern in promoting children's engagement with the rest of nature. Sue Elliott and Tracy Young (2016), for example, suggest that romanticized images of children and nature –which frame some early childhood environmental education programs -- perpetuate a hierarchical and dualistic view of the human-nature relationship. This view, they say, places humans (children included) in a dominant relationship with the rest of the natural world. They call for an alternative view grounded in a partnership with nature. Other scholars, too, have called for a more relational approach to nature-based learning pedagogy (Cumming & Nash, 2015). Claire Warden (2015), for example, explains how learning with nature often takes the form of a symbiotic relationship – that is, a relationship that is intimate and interdependent.

The child who said she'd never been to nature is missing something essential in her understanding and appreciation of the natural world. She's also missing a sense of kinship with the more-than-human world. To her, nature is something "out there;" not something she experiences as kin. We may think of kinship with the natural world and post-humanism as something new; but it really isn't. Indigenous people from different parts of the world have long believed that all the elements of the Earth are kin and that living on the land means participating in (versus controlling) natural communities. "Indigenous people view both themselves and nature as part of an extended ecological family" (Salmon, 2000, p. 1327). They view themselves as being affected by and, in turn, affecting the life around them. This view is sometimes referred to as "kincentric ecology" (Salmon, 2000).

A related term, "ecocentrism," is sometimes used in reference to an ethical view of nature which recognizes nature and the elements of nature "as having intrinsic value and perspectives beyond the human" (Sitka-Sage et al., 2018, p. 21). The opposite of ecocentrism is anthropocentrism, which is based on "the view that all value and meaning inheres in one uniquely special species—humanity" (Sitka-Sage et al., 2018, p. 22). Rewilding education and unlearning anthropocentrism requires, among other things, a noticeable shift in the way we talk about nature. Consider, for example, a scenario where educators working with children in school gardens and a nearby residential farm referred to the children's experiences as "encounters with the wild." The educators also expressed delight in the way children were given the opportunity to learn about producing food and "taking care of nature." In this case, the take-away messages for children could include the "metaphysics of mastery." A related concern focuses on what the students are not taught through their gardening experience. "Students are not taught to

recognize that ‘weeds’ are wild plants that can potentially contribute to a more biodiverse whole They are not taught to see that the barren land requiring fertilizer to be productive . . . is a managed landscape shaped by humans for humans” (Sitka-Sage et al., 2018, p. 27). To this we might add that students are not taught to consider how a sense of kinship might deepen their experience with the more-than-human world.

An interest in knowing our human kin – past and present -- is fueling a fast-growing industry involving DNA sampling. Messages from this industry tell us that having information about our human kin will enrich our lives. For a fee, we can send in a DNA sample and in return get geographical detail connecting us to places and people that are a part of our human family tree. This, of course, can be quite interesting. Kincentric ecology encourages us to take this a step further and learn more about all our kin, including the more-than-human. We know from science that we share an evolutionary ancestry with the rest of the living world. What’s now textbook knowledge needs to become a lived experience.

Kinship, in some contexts, refers to a physical relationship, as in “a blood relationship.” But kinship can also be experienced as an emotional relationship. We sometimes refer to this as “having emotional ties.” It’s not unusual to see expressions of such emotional ties in children’s spontaneous interactions with elements of nature. Argent et al. (2017), for example, document ways in which a group of children extend thought and empathy to trees. The children refer to the trees as friends and engage in conversations with them. After discovering “baby trees” during their walk through a forest, the children stop to “sing familiar songs softly and whisper words of encouragement” (Argent et al., 2017, p. 9). They also wonder about the possibility of trees having a heart and express a deep sense of empathy as they see trees being removed for land development. Such expressions reflect a kinship between children and the trees – a kinship which we would do well to encourage and reinforce.

Yet, pedagogy in a Western tradition tends to focus on learning about trees and other elements of nature versus honoring and deepening the relationship. A growing number of scholars, however, are suggesting a different approach, a relational approach. Some such scholars – including Kimmerer (2013) and Cajete (2010, 2016) – speak, not only from their own professional expertise, but also from their Indigenous heritage which recognizes and honors different modes of awareness, including an awareness of kinship. Both Robin Wall Kimmerer, an enrolled member of the Citizen Potawatomi Nation, and Gregory Cajete, a Tewa Indian from the Santa Clara Pueblo in New Mexico, stress the importance of living in a harmonious and sustainable relationship to the land. Both scholars also recognize discrepancies between traditional Western and American Indian worldviews. As articulated by Cajete (2010), “Traditionally, American Indians view life through a different ‘cultural metaphor’ than that of mainstream America” (p. 1126). While many Native American scholars advocate for a deeper appreciation of the Native perspective, they also caution against the tendency to characterize differences between ‘Western science’ and Indigenous knowledge systems in terms of oversimplified binaries. What they call for, instead, is an integration of Indigenous observations and perspectives with the work of sustainability scientists (Johnson et al., 2016). The recognition of kinship between humans and the rest of the natural world is one area in which the Indigenous and sustainability sciences may find common ground.

Implications for Pedagogy

Making kinship a unifying theme of our work with young children and intentionally promoting children’s positive ecological identity are offered as ideas on how to translate post-humanistic thinking in early childhood education. Doing so, however, is a formidable task and comes with many challenges (Pacini-Ketchabaw et al., 2015). Changing the way we think is never easy; neither is changing the way we do

things. Such changes, however, are necessary if we are to adequately address humans' alienation from the rest of the natural world and other related social issues. In education, this means that learning goals and objectives need to focus on more than the acquisition of knowledge and skills. The development of attitudes, dispositions, and relationships also need to be emphasized. We know from environmental education research that knowledge alone is not a sufficient motivator for people to take action to benefit the more-than-human elements of nature (Klockner, 2013). A focus on relationality and a sense of kinship are also needed (Gibson et al., 2015; Zylstra et al., 2014). In addition to re-thinking our human position in relation to the more-than-human world, we'll also need to re-define many other constructs, including our notion of community with other people(s) and the rest of the natural world (Knippenberg et al., 2015). Applied to early childhood pedagogy, this means adopting kinship with the more-than-human world as one of our curricular goals and finding ways to promote this goal through our everyday language and activities.

Children – especially young children -- take their cues from adults and the social environment as to how to view the rest of the natural world and their relationship with it (Wilson, 2018). Even well-meaning adults can suggest that nature is an “it” to be studied and used -- or that it's a backdrop supporting human activity. This view does little to foster kinship. We know, too, that this approach is ineffective in inspiring people to take pro-environmental actions (Knippenberg et al., 2015).

A focus on kinship with the natural world takes us to another realm of relationship with nature. This realm isn't defined by knowledge or benefits. It's rooted in meaning and a meaning-oriented relationship. As adults, we can foster a sense of kinship in young children by what we do and say and through the social and physical environments we provide for them. Kinship is fostered when we treat non-human living things and their habitats with respect. Kinship is fostered when we speak of animals and plants as living creatures sharing a common home with all other creatures – both human and non-human. Kinship is also fostered when we express and encourage ecological perspective-taking – that is, taking the perspective of animals or plants or seeking to understand how they are being impacted by circumstances around them. While the impact of such “natural disasters” as violent storms, forest fires, and flooding can be devastating for humans, the impact on other species should also be considered. With young children, ecological perspective taking can be fostered by considering how stormy weather might impact nesting birds or how flooding might destroy some animal homes or separate them from their source of food.

Engaging children in pro-environmental actions can also promote kinship, especially if such actions are understood, not as “rules” to be followed, but as expressions of compassion and caring. The environments in which children live, play and learn – as long as they are welcoming to other creatures -- can also promote kinship. A well-maintained birdbath and butterfly garden, for example, are expressions of hospitality. What's important, however, in “welcoming other creatures” is to be mindful of the fact that it's not our (the human) world in which they (the non-humans) are being welcomed. It's a common world to be shared by all. The goal is peaceful coexistence. This means working from the understanding that “it's not all about us” (Bekoff, 2014, p. 45). It's about all living things being a part of a web of existence, where no part is more important than another (Caduto & Bruchac, 1997).

We would do well to identify and use forms of language that reinforce connections, coexistence, and kinship. Language not only expresses a way of thinking; it also introduces and reinforces a way of thinking. Thus, how we talk about nature influences the way children think about nature. One of our challenges as adults working with young children is identifying forms of language which promote “kinship with” versus “separateness from” the rest of the natural world. Something as simple as replacing the term “food scraps” or “food waste” with “food for the worms” can remind children of their connectedness to other

living creatures. How we refer to “rot” -- another term related to our compost bins – also warrants scrutiny. As Narda Nelson (2018) reminds us, popular depictions present rot “as an intensely abject figure” and as “something to avoid with young children” (p. 39). Buying into this popular depiction reinforces a sense of separateness from the rest of the natural world. Nelson encourages something different. She suggests that we amplify the existence of rot by exploring the process of decomposition with children and by helping them understand “that ‘a fruit past its prime’ is simply a fruit primed for other appetites” (Nelson, 2018, p. 43). It’s good to remind ourselves that certain words like “rotten food,” “nasty bugs,” and “angry clouds” do little to foster a sense of kinship with the natural world.

As long as we think of and talk about the human world and the world of nature as two separate entities that may occasionally come together, we’ll maintain a humanistic versus post-humanistic view of the world and our place in it. Perhaps recalling a time when there was no need for wildlife sanctuaries and envisioning this as a possibility for the future will remind us of what we mean by sharing a common world.

What’s needed for promoting kinship is a shift from teaching children that the natural world is an object of learning to engaging them in experiences which help them understand that both they and the more-than-human world stand in relationship with each other, sharing one common world (Nxumalo, 2018). Also needed is a shift from individualistic and developmental goals to collective and relational aspirations. While the recent academic literature offers some ideas on how to do this, much more work needs to be done.

The following examples of how some researchers and practitioners are applying common worlds pedagogy in their work with young children might be helpful in inspiring other applications. Narda Nelson (2018) introduced tracking “as a generative method for cultivating the arts of awareness and opening up our understandings of place relations” (p. iii). Her goal was to place young children near the action of where animals really dwell in their own habitats and to help the children think about their “shared inheritances and vulnerabilities with other creatures on this planet” (p. 3). She wanted the children to think deeply about what it means to share space with their non-human neighbors. She wanted to give the children the opportunity to learn with and from animals; not just about animals. She also used tracking as a form of inquiry to help children abandon the fantasy of human mastery or control over nature. The animals the children observed during their tracking expeditions were free to move about on their own volition. Compare this to a dog on a leash or in obedience training!

In another instance, Nelson (2019) used “caring for a dying rat” as a “provocation to rethink relational, everyday ethics” (p. 3). In this case, she involved children in a “care-full” experience with a creature that most people would prefer to do without. Her goal in this instance was to promote a “thicker notion of care” than what is usually done by simply observing birds at a bird feeder. The dying-rat encounter, while unanticipated, became somewhat of a pivotal moment in a multispecies inquiry with the children. It did not happen, however, in isolation. It occurred within the context of other experiences reflecting a common worlds pedagogy – a pedagogy that recognizes a connectedness to or kinship with all other creatures, including those considered uncomfortable.

Taylor and Pacini-Ketchabaw (2016) offer another example of common worlds pedagogy. This incident occurred in the grasslands of a university campus in Australia. Children attending an early learning center at the university encountered large mobs of kangaroos. The children wanted to get a close-up look of the kangaroos and, over time, gained increasing confidence in moving closer and closer to the mob. The kangaroos also became increasingly comfortable with the children’s presence. They gradually allowed the children who approached slowly and quietly to get quite close. The teachers could have interrupted what

some might consider “awkward multispecies encounters,” but they chose instead to allow “a relationship of deepening attachment” to grow. The teachers’ decision was based on the understanding that this experience could generate a new kind of environmental concern based on a relationship in which “humans are not the sole scriptwriters and actors” (p. 13). As the children got closer and spent more time near the kangaroos, they began to notice differences between themselves and the kangaroos in modes of attention and behaviors. The children noticed, for example, the kangaroos’ large upright ears and the way the ears can swivel. They noticed, too, the kangaroos’ enormous tails and how they use their tails to balance and jump. Through pretend play, the children tried to experience what it would be like to live in a kangaroo’s body. They found or made big tails, attached them and hopped around; and they put their hands on their heads to mimic the action of the swiveling ears. After observing the carcass of a dead kangaroo, some children even pretended to be dead and dying kangaroos. The way the children identified with the kangaroos suggests that close-up encounters with other species can promote a sense of connectedness and perhaps generate a new kind of ethics and environmental concern.

A third example relates to helping children see how weather conditions impact other species. In this example, the focus is on how snakes and other reptiles tend to be out in the open on a hot day seeking warmth from the sun and how rain may wash creatures out of their usual homes. Educators, in this case, used “snake responses” to the weather to nurture children’s modes of attention to more-than-human encounters and concerns (Rooney, 2018). Typical early childhood lessons on learning “about” the weather often focus on “just the weather” and how it affects humans. Related activities may include recording the temperature or noting the difference between a sunny and a cloudy day. Other typical lessons might focus on seasonal fun activities (such as raking leaves) and the type of clothes to wear (such as hats and gloves in cold weather). These lessons are human-centered and may even perpetuate the idea that humans and nature are separate entities. A post-humanist or kindred focus links weather-related experiences to encounters with place and inhabitants of place, including the more-than-human inhabitants, such as snakes.

These examples direct attention away from the child and the educators to the children’s inter-relations with the natural world (Argent et al., 2017). This approach contrasts with the positioning of nature as a separate entity or as a place to which children should be brought so that they might gain the benefits nature has to offer. Efforts to “reunite children with nature” can too easily perpetuate the human-nature divide. New forms of education can play a critical role in promoting modes of thinking which reflect a “more than human” perspective. Nxumalo (2017a) describes a scenario in which young children engage in dialogues with and about the liveliness of rocks. The children see the rocks as becoming entangled with moss and other “more-than-human life.” The children use such words as “eating,” “helping,” and “drinking rain” to describe rocks’ liveliness. In this case, the children’s way of thinking about the rocks and the moss erases the life/non-life dualism.

A recent study found that younger children and Indigenous children are more likely to perceive nature as full of life and emotion than older and non-Indigenous children (Profice, 2018). This study investigated how children from two dramatically different backgrounds perceive and value nature. One group – children from an Indigenous community in Brazil – lived in a rich biodiverse environment. The other group lived in highly urbanized neighborhoods in New York City. The children from Brazil tended to view natural beings and natural environments as “good” without any mention of usefulness to humans. The children from New York, on the other hand, tended to equate what is “good” about nature with the human benefits of natural resources. Perhaps if children had more opportunities to engage deeply with nature-rich environments, their perceptions of nature as a living, feeling presence could be sustained as they got older. This would be healthy for children and for the environment.

Nxumalo (2017b) suggests that post-humanist thinking – in addition to deepening children’s relationship with the “more-than-human world” – could also serve as a form of resistance to an extractive relationship with the land and other aspects of the natural world. It could potentially address difficult assumptions about colonial thinking, as well. Nxumalo recognizes the phenomenal growth of nature-based preschools and appreciates their focus on engaging children with nature, but suggests that their curricular approach fails to adequately address difficult issues relating to colonial thinking. Such thinking allows for Indigenous displacements and environmental degradation. Nxumalo proposes a curricular approach that builds on children’s everyday affective experiences with the more-than-human world. These experiences tend to be relational rather than divisive and can serve as a form of resistance to a human-centric and extractive relationship with the natural world. Clayton and her colleagues (2017) share similar thoughts. They note how thinking of nature as the physical environment without including humans and the way humans construct the world allows us to ignore the degree and impact of human control over other humans, non-human species, and ecosystems.

Provocations for the Future

The purpose of this final section of the paper is to summarize and expand on some of the ideas already introduced about how to translate some of the principles of post-humanism to our work with young children. These ideas include attention to (1) how nature is presented to children, (2) the meaning and practice of nature play, (3) the capabilities of children, (4) a pedagogy of discomfort, and (5) deeper dimensions of wonder. The complexity of the challenge suggests there are no easy answers.

One danger in fostering children’s engagement with nature is suggesting that nature is an objectified entity to be explored, studied, and used. Such a view of nature is a barrier to kinship. This view of the natural world places humans “outside and above an inferiorised and manipulable nature” (Plumwood, 2002, p. 4). This concern has prompted some scholars to recommend replacing the word “nature” with “place” (Beery & Wolf-Watz, 2014). They recognize that the connectedness to nature concept reflects a deep-seated Western concept of people and nature as a two-part relationship. Perhaps we need a new vocabulary to go along with our new thinking.

We might also consider serious reflection on the meaning and practice of nature play. While there are many reasons to promote children’s play in natural environments, it’s a mistake to assume that being in a natural environment is the same as being meaningfully engaged with nature. If nature is viewed as a backdrop to play or an object of play, it remains something apart from self or something to be manipulated and used (Elliott & Young, 2016). If we want nature engagement to be a transformative experience for children – and eventually for society – we may need to become more intentional about the way we foster and support nature play. Sue Elliott (2016) provides an example. The manipulation of plant parts (leaves, seeds, sticks, etc.) represents a typical feature of nature play. Intentional teaching involves working with the children to create an ethic of picking plants for play. This means engaging the children as vocal participants in a critical discussion about how we, as humans, should relate to plants. Simply allowing the children to pick as many plant parts as they like may lead to a denuded landscape where neither plants nor animals can thrive. Stripping plants of what will keep them healthy can also strip away a part of the child that he or she needs to be whole and healthy. Helping children decide which plants can be picked for play gives them an opportunity to think about the welfare of the plants and other living creatures depending on the plants. Such reflections can help children see themselves as co-habitators of the planet versus users or managers of natural resources. Engaging children in such discussions, however, requires teachers to critically reflect on their own worldviews and ecological identity. While a small number of

teacher preparation programs are emphasizing nature and place-based experiential learning, more such programs are needed. We can't stop with the greening of schoolyards; we need to green the hearts and minds of teachers and students, as well.

If we expect nature play to make a real difference in healing what is recognized as a major contributor to the environmental crisis (that is, the human disconnection from nature), then it must include a focus on something deeper than learning in, about and for the environment. This deeper form of nature play engages children in learning *from* and *with* nature, as well. Without this deeper focus, nature play may serve as nothing more than a "Band-Aid" in healing the human/nature separation (Elliott & Young, 2016). Children can do more than play in nature; they can develop an understanding that they are nature. At some point during their early years, children can also begin to understand the basic concepts of kinship and of Earth being home to us all.

Unfortunately, adults tend to underestimate the competencies and interests of children. This tends to be true for environmentally-related as well as other areas of concern. If education for sustainable development at the early childhood level is properly implemented, it may prove to be a driver of quality in our educational programs for young children, as it recognizes and respects the ability of children to think and act beyond their own self-interests (Engdahl, 2015).

Clayton and her colleagues (2017) call for a "transformation of experience" – not just a transformation of thinking. While they urge us to re-examine the way we think about nature and the "human experience of nature," they also call for a different way of doing things. One of their recommendations is to integrate nature experiences – even negative aspects of such experiences -- into people's daily lives. Bekoff's urging to rewild our hearts includes similar advice. Rewilding, he says, "means appreciating, respecting, and accepting other beings and landscapes for who or what they are, not for who or what we want them to be" (Bekoff, 2014, p. 13).

This may mean making a "pedagogy of discomfort" (Winks, 2018) a part of what we do. Not all encounters with natural elements and events are comfortable or consistent with the way we'd like the experiences to be. We should expect a certain "discomfort in the field" (Winks, 2018) and challenge ourselves to find ways of using such encounters to deepen children's understanding of and respect for the natural world as it is. Narda Nelson (2019) -- as discussed above -- found a way to do this with a dying rat. Fikile Nxumalo (2017a) describes a situation where early childhood educators found a way to do it with dead and dying bees. Teaching and learning about bees at this preschool was, at first, based on a pre-set science curriculum emphasizing the importance of bees for pollination. The focus changed, however, after the children discovered an increasing number of dead and dying bumble bees in their outdoor playspace. This discovery – and the way the teachers responded to the children's concern -- led to an attentive and caring way of viewing and relating to bees. The bees were no longer objects to be studied or feared. The children now related to the bees as living beings sharing a common space with them. Learning about bees shifted "from matters of fact towards matters of concern." The children practiced stillness and slow movement when they were close to bees still showing signs of life. Some children made "offerings" to the bees in the form of flowers and sugary water. They provided covering for the dying bees to keep them from blowing away. These caring responses indicated that the children had developed a relationship with the bees and could no longer be indifferent toward them.

There are many aspects of nature and the way it works which aren't easy for humans to embrace. Predator-prey relationships, the force of tornadoes, and the devastating effects of forest fires are just some examples. For young children, spider bites and bee stings tend to be sources of fear and discomfort.

These aspects of nature may make it difficult for us, as humans, to think-with and be-with some of the elements of nature in a caring way. But if we do as the children did with the bees – that is, shift our thinking away from how what’s happening impacts us to our relationality as one species among many – we will have come a long way in moving from humanistic to post-humanistic thinking.

Common worlds and post-humanist thinking call us to move beyond nature-based learning to nature-based living and nature-based being. Nature-based learning, if limited to acquiring knowledge about the natural world, can be passive and devoid of the challenges and joys inherent in maintaining a healthy relationship with the rest of nature. Nature-based living and nature-based being, on the other hand, are relationship oriented and involves considering how our decisions and actions impact other living things. Nature-based living also means allowing children to experience some of the uncomfortable aspects of nature. How to do this while ensuring their safety and well-being and considering how this might influence their feelings about other living things is one of the questions we need to explore.

Also to be explored are some of the deeper dimensions of wonder. Many of us, as we work with young children, look to the fostering of wonder as a focus of what we do. We look to wonder as a unifying context in children’s explorations, discoveries, imaginings, and ponderings related to the natural world. We want children to experience the natural world as a place of wonder. We want them to carry wonder in their hearts “as an unailing antidote against the . . . sterile preoccupation with things that are artificial” (Carson 1956, p. 43). We can foster young children’s sense of wonder in a number of ways, but perhaps the most effective way is to encourage a deep sense of kinship with nature. Wonder is important, but wonder without a sense of kinship isn’t enough.

An over-emphasis on scientific ways of knowing (isolating, abstracting, objectifying) can reinforce the concept that nature is something separate from humans and something to be manipulated and controlled. Viewing the natural world through the eyes of wonder calls for rich sensory experiences with the world of nature, but it also requires certain dispositions which differ from – or go beyond -- scientific knowing. Such dispositions include compassion, generosity, vulnerability, openness, empathy, and respect for otherness. Post-humanism doesn’t ask us to abandon science; it cautions against “consecrating science” (Sideris, 2017).

Post-humanism calls for a replacement of human-centered education with eco-centric education, human-centered thinking with eco-centric thinking. Post-humanism means exchanging “the sacred rights of humans for the rights of all beings on the planet” (Williams, 2001, p. 159). Perhaps recognizing, honoring, and promoting kinship with all other living beings can help us transition to this form of thinking and being in the world.

Diverse currents have contributed to the evolution of environmental education (EE) over the past thirty years. Sauve (2005) identified fifteen different currents which, as she says, have added to the richness of the field. Early childhood environmental education (ECEE) -- a more recent branch of the EE field – has also been shaped by different currents, primarily by the integration of early childhood education and environmental education. But are we there yet, or do we still have work to do in shaping a field that can make meaningful contributions to child development, conservation of the natural world, and the establishment of a more equitable and peaceful society? Can post-humanism and common worlds thinking lead us into the next stage in the evolution of the ECEE field? The post-humanist and common worlds perspectives urge us to venture into wider and – for some of us -- somewhat unknown territory. This is where the image of a samara may be helpful.

A samara is a winged seed that, when lifted by the wind, can travel many miles before falling to the ground and putting down roots. Some seeds fall close to their parent plant; others are carried by some force to a greater distance from where they were produced. There's an advantage to this process. If all the seeds stayed next to the parent plant, the resulting crowded condition would make it difficult for many of the seedlings to survive. Samaras have been described as seeds that are willing to risk flying above the canopy and into the open sky without knowing for sure where they will land (Haskell, 2012). We now need people who are willing to *think with* samaras -- people who aren't confined to traditional ways of doing things and who are willing to travel as far as the wind will carry them. Thinking with samaras opens up possibilities for new places, spaces, and becomings to emerge. There, we may thrive as humans, by ushering in a community of life that's inclusive of multispecies beings sharing one common world.

It is my hope that, as we continue moving forward in the field of early childhood environmental education, we'll think long and hard about what we really mean by nature and the concept of Earth as home to us all. Thinking with nature and recognizing other living beings as kin require different, more entangled ways of being in the world. Are we up to this challenge?

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References

- Argent, A., Vintimilla, C.D., Lee, C., & Wapenaar, K. (2017). A dialogue about place and living pedagogies: Trees, ferns, blood, children, educators, and wood cutters. *Journal of Childhoods and Pedagogies*, 1(2), 1-20.
- Beery, T.H., & Wolf-Watz, D. (2014). Nature to place: Rethinking the environmental connectedness perspective. *Journal of Environmental Psychology*, 40, 198-205.
- Bekoff, M. (2014). *Rewilding our hearts*. Novato, CA: New World Library.
- Caduto, M.J., & Bruchac, J. (1997). *Keepers of the Earth: Native American stories and environmental activities for children*. Golden Colorado: Fulcrum Publishing.
- Cajete, G. (2016). *Native science: Natural laws of interdependence*. Santa Fe, NM: Clear Light Publishers.
- Cajete, G.A. (2010). Contemporary Indigenous education: A nature-centered American Indian philosophy for a 21st century world. *Futures*, 42(10), 1126-1132.
- Carson, R. (1956). *The Sense of wonder*. New York: Harper & Row.
- Caviola, L., Everett, J. A. C., & Faber, N. S. (2018). The moral standing of animals: Towards a psychology of speciesism. *Journal of Personality and Social Psychology*.
- Charles et al. (2018). *Home to us all: How connecting with nature helps us care for ourselves and the earth*. Minneapolis: Children & Nature Network.
- Clayton, S., Colleony, A., Conversy, P., Maclouf, E., Martin, L., Torres, A-C., Truong, M-X., & Prévot, A-C. (2017). Transformation of experience: Toward a new relationship with nature. *Conservation Letters*, 10(5), 645-651.

- Cumming, F., & Nash, M. (2015). An Australian perspective of a forest school: Shaping a sense of place to support learning. *Journal of Adventure Education and Outdoor Learning, 15*(4), 296-309.
- Demoly, K.R.D.A., & Santos, J.S.B.D. (2018). Learning, environmental education and school: Ways of enacting in the experience of students and teachers. *Ambiente & Sociedade, 21*.
- Elliott, S. (2016). Provocations for the “next big thing” in early childhood education for sustainability (ECEfs). *International Journal of Early Childhood Environmental Education, 4*(1).
- Elliott, S., & Young, T. (2016). Nature by default in early childhood education for sustainability. *Australian Journal of Environmental Education, 32*(1), 57–64.
- Engdah, I. (2015). Early childhood education for sustainability: The OMEP World Project. *International Journal of Early Childhood, 47*(3), 347-366.
- Gibson, K., Rose, B., & Fincher, R. (2015). *Manifesto for living in the Anthropocene*. New York: Punctum Books.
- Haraway, D. (2016). *Staying with the trouble: Making kin in the Chthulucene*. Durham, NC: Duke University Press.
- Haskell, D.G. (2012). *The forest unseen*. London: Viking.
- Johnson, J.T, Howitt, R., Cajete, G., Berkes, F., Louis, R.P., & Kliskey, A. (2016). Weaving Indigenous and sustainability sciences to diversify our methods. *Sustainability Science, 11*(1), 1-11.
- Kimmerer, R.W. (2013). *Braiding sweetgrass*. Minneapolis: Milkweed Editions.
- Klockner, C.A. (2013). A comprehensive model of the psychology of environmental behavior: A meta-analysis. *Global Environmental Change, 23*(50), 1028-1038.
- Knippenberg, L., Scott, M., O’Neill, J., Drenthen, J.M., Troha, T., Rado, R., & Samo, T. (2015). A new theory of motivation: An interdisciplinary perspective. Nijmegen: The BIOMOT-project: Institute for Science Innovation and Society, Radboud University Nijmegen.
- Kopnina, H. (2018). From wilderness to plastic plants: How might we get back to wildness? *The Ecological Citizen, 1*, 191–197.
- Kuswa, K.D., & Kuperman, E.L. (2018, December). Donna Haraway and communication studies, *Oxford Research Encyclopedia of Communication*. DOI: 10.1093/acrefore/9780190228613.013.610. Accessed May 5, 2019.
- Nelson, N. (2018). *Common worlding pedagogies: Cultivating the ‘arts of awareness’ with tracking, compost, and death*. University of Victoria.
- Nelson, N. (2019). Rats, death and Anthropocene relations in urban Canadian childhoods. In A. Cutter-MacKenzie, K. Malone, & E. Barratt Hacking (Eds.), *Research handbook on childhoodnature: Assemblages of childhood and nature research*. Cham, Switzerland: Springer.
- Nxumalo, F. (2017a). Stories for living on a damaged planet: Environmental education in a preschool classroom. *Journal of Early Childhood Research, 16*(2), 148-159.
- Nxumalo, F. (2017b). Geotheorizing mountain-child relations within anthropogenic inheritances. *Children's Geographies, 15*(5), 558-569.
- Nxumalo, F. (2018). Situating Indigenous and Black Childhoods in the Anthropocene. In A. Cutter-MacKenzie, K. Malone, & E. Barratt Hacking (Eds.), *Research handbook on childhoodnature: Assemblages of childhood and nature research*. Cham, Switzerland: Springer.
- Pacini-Ketchabaw, V. (2013). Frictions in forest pedagogies: Common worlds in settler colonial spaces. *Global Studies of Childhood, 4*(1), 355–365.
- Pacini-Ketchabaw, V., Nxumalo, F., Kocher, L., Elliot, E., & Sanchez, A. (2015). *Journeys: Reconceptualizing early childhood practices through pedagogical narration*. North York, ON: University of Toronto Press.
- Plumwood, V. (2002). *Environmental culture: The ecological crisis of reason*. New York: Routledge.
- Profice, C. (2018). Nature as a living presence: Drawings by Tupinambá and New York Children. PLOS ONE.

- Profice, C., Santos, G.M., & dos Anjos, N.A. (2016). Children and nature in Tukum Village: Indigenous education and biophilia. *Journal of Child and Adolescent Behavior*, 4(6).
- Rooney, T. (2018). Weather worlding: Learning with the elements in early childhood. *Environmental Education Research*, 24(1), 1-12.
- Salmon, E. (2000). Kincentric ecology: Indigenous perceptions of the human-nature relationship. *Ecological Applications*, 10(5), 1327-1332.
- Sauve, L. (2005). Currents in environmental education: Mapping a complex and evolving pedagogical field. *Canadian Journal of Environmental Education*, 10, 11-37.
- Sideris, L. (2017). *Consecrating science*. Berkeley, CA: University of California Press.
- Simonsen, K. (2013). In quest of a new humanism: Embodiment, experience and phenomenology as critical geography. *Progress in Human Geography*, 37(1), 10-26.
- Sitka-Sage, M.D., Kopnina, H., Blenkinsop, S., & Piersol, L. (2018). Rewilding education in troubled times; or, getting back to the wrong post-nature. *Visions for Sustainability*, 8: 20-37.
- Taylor, A. (2017). Beyond stewardship: Common world pedagogies for the Anthropocene. *Environmental Education Research*, 23(1), 1448-1461.
- Taylor, A., & Pacini-Ketchabaw, V. (2016). Kids, raccoons, and roos: Awkward encounters and mixed affects. *Children's Geographies*, 15(2), 131-145.
- Thiel, J. J. (2019). How do we listen to the always present kinship between children and the earth during playground relations? Retrieved from: <https://commonworlds.net/how-do-we-listen-to-the-always-present-kinship-between-children-and-the-earth-during-playground-relations/>
- Tillmann, S., Button, S.B., Coen, S.E., & Gilliland, J.A. (2018). 'Nature makes people happy, that's what it sort of means:' Children's definitions and perceptions of nature in rural Northwestern Ontario. *Children's Geographies*.
- Vining, J., Merrick, M.S., & Price, E.A. (2008). The distinction between humans and nature: Human perceptions of connectedness to nature and elements of the natural and unnatural. *Human Ecology Review*, 15(1), 1-11.
- Warden, C. (2015). *Learning with nature*. London: Sage Publications.
- Williams, T.T. (2001). *Red: Passion and patience in the desert*. New York: Pantheon Books.
- Wilson, R. (2018). *Nature and young children*, 3rd edition. London: Routledge.
- Winks, L. (2018). Discomfort in the field—The performance of nonhuman nature in fieldwork in South Devon. *The Journal of Environmental Education*, 49(5), 390-399.
- Wolfe, C. (2009). *What is post-humanism?* Minneapolis, MN: University of Minnesota Press.
- Zylstra, M.J., Knight, A.T., Esler, K.J., & Le Grange, L.L.L., (2014). Connectedness as a core conservation concern: An interdisciplinary review of theory and a call for practice. *Springer Science Reviews*, 2(1), 119-143.

Decolonial Water Stories: Affective Pedagogies with Young Children

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ABSTRACT

This article is situated within ongoing efforts in early childhood education to unsettle extractive relations with the more-than-human world and efforts to situate children's learning within current conditions of environmental vulnerability. The authors discuss some pedagogical and curricular interruptions that emerged from foregrounding Indigenous knowledges and non-anthropocentric modes of learning in an inquiry that focused on young children's water relations. We focus in particular on the affective resonances that emerged from kindergarten children's encounters with a creek in Austin, Texas. In conversation with Indigenous feminisms, we discuss these affective encounters in relation to their decolonial potentials. We argue for the mattering of affective pedagogies that nurture non-anthropocentric relations while centering Indigenous land and life.

Keywords: affect, early childhood education, water pedagogies, Indigenous knowledge

*Yana yana yo yana yo yo yo; Yana yana yo yana yo yo yo; Yana yana yo yana yo yo yo;
Yana Yana yo yana yo yo yo; Yana wana yo yana yohui no Eya na ei nei yo way.¹*

This article is part of an ongoing effort to unsettle the dominance of cognitive developmental, and individual humanist perspectives in understanding young children's learning, particularly in relation to the natural world. Alongside a paucity of environmental education for young children that is responsive to current times of ecological precarity, several problematic framings of children and nature persist in popular forms of early childhood education in North America. These include reinforcements of colonial human-centric dualistic approaches to 'nature' that maintain or reinforce extractivist relationships to the more-than-human world. For example, nature is commonly framed as a 'pure romantic nature' separate from children and as a resource for children's development, including improving test scores (Cairns, 2017; Taylor, 2017; Taylor & Pacini-Ketchabaw, 2015). These orientations not only reinforce anthropocentrism, settler colonialism² and Indigenous erasure, they also reinforce racist and classist tropes through assumptions of what counts as 'normal' relations with nature (Nxumalo, 2015, 2018; Nxumalo, & Rubin, 2018; Nxumalo & ross, 2019).

Challenging questions emerge from these aforementioned critiques of normative orientations to children and nature. One question, which has been the focus of much of our work with young children and early childhood educators, is what are some pedagogical and curricular shifts that might bring forth anti-

colonial *and* non-anthropocentric modes of learning with the more-than-human world in early childhood environmental education? As we illustrate later in the paper with respect to water pedagogies, anti-coloniality in this context refers to practices that resist erasure of Indigenous peoples and knowledges, such as by taking seriously the situated teachings that they offer for relating to the more-than-human world in more reciprocal and less extractive ways. These teachings include learning to relate to the more-than-human world in non-anthropocentric ways; meaning in ways that disrupt the dominant Euro-Western paradigm that views humans as superior to and separate from the more-than-human world, and relatedly that values more-than-human others primarily in relation to what they can do for humans. Affrica Taylor (2019) powerfully describes the inadequacies of anthropocentrism, when she states in response to the discourse of the Anthropocene epoch, as the age of “Man”, that:

...the capital A ‘Anthropos’ (Greek for capital M Man) of the Anthropocene nomenclature as a problematic phallogocentric signifier that risks perpetuating a particularly dangerous form of human-centric conceit....Not only does the resolutely masculinist, Euro-western concept of the Anthropos narcissistically presume to be the universal signifier of humanity, but by reifying the ‘reign of ‘Man’ (Stengers, 2013), it additionally naturalizes and validates ‘Man’s’ dominion on earth (p. 3).

Drawing from these understandings of the anti-colonial and non-anthropocentric, in our practices we aim to stay with the question of what kinds of practices might be enacted that unsettle instrumentalist, colonizing and individualist human-centered ways of learning about the more-than-human world?

Our intent is not to engage with this question to prescribe universalist prescriptive pedagogy and curriculum, but rather to “stay with trouble” (Haraway, 2016) of inhabiting these questions within the everyday, mundane and situated places and spaces of environmental early childhood education. In this focus on the mundane and ‘minor’ practices (Deleuze & Guattari, 1987) of children and educators, we join others who have argued that the vast scale of the current epoch of environmental damage does not require only similarly large-scale approaches (Haraway, 2015; Danowski & Viviero de Castro, 2018). That it is to say, while it is important to complicate individualist responses to the environmental crisis, and their underlying modes of neoliberal governance, it is also important not to dismiss the ways in which small shifts towards relational practices matter for livability and hope within increasingly unlivable worlds (Taylor & Pacini-Ketchabaw, 2015; Murriss, Reynolds & Peers, 2018; Nxumalo, 2018). Donna Haraway (2015) refers to such practices as “partial and robust biological-cultural-political-technological recuperation” (p. 160).

These are challenging practices to enact in early childhood education. How might pedagogical and curricular practices materialize partial recuperation that enacts hope and helps create more livable human and more-than-human worlds? An added challenge is how to do this while also unsettling individualist, human-centered ways of knowing? We discuss these normative responses in the next section. As mentioned previously, there are no prescriptive ‘solutions’ or answers to these pedagogical challenges. Nonetheless, one orientation that we have found useful is to adapt a transdisciplinary approach that learns from perspectives such as feminist environmental humanities, Indigenous knowledges and Black feminist geographies (Nxumalo & Rotas, 2018; Nxumalo & Cedillo, 2017; Nxumalo & Villanueva, forthcoming). These perspectives have been particularly compelling in arguing for the necessity of less human-centric, more relational ways of noticing and responding to the more-than-human world in current times of unprecedented environmental damage, while insisting on attention to human inequalities within particular places and spaces (Collard, Dempsey & Sundberg, 2015; Haraway, 2016; McKittrick, 2011; Tuck, Guess, & Sultan, 2014). For instance, we are interested in picking up on Anna Tsing and colleagues’

suggestion (2017) that “to survive, we need to learn new forms of curiosity. Curiosity is an attunement to multispecies entanglement [and] complexity...” (p. G11). In this article, our interest is in considering the potential of relational affect as one such mode of curiosity towards more-than-human complexity that might bring forth new worldings that disrupt anthropocentric (human-centred), colonial and universalizing relations to the more-than-human world. Intentionally troubling dominant romanticized couplings of children and nature, we are particularly inspired by the different affective possibilities that might be activated when young children are positioned within their situated inheritances of settler colonial and anthropogenically damaged worlds (Nxumalo, 2015; Taylor, 2017). Pedagogical attunement to these inheritances does not erase the risk of individualist and cognitive developmental teaching and learning approaches. However, our premise is that working within children’s asymmetrical geographies to bring attention to human/more-than-human relationalities, including the affects therein, is a significant movement away from normative approaches.

In what follows, we begin by introducing the focus on water pedagogies and provide an overview of the research project from which this article is drawn. We then articulate why and how we draw on relational affect in making meaning of the children’s encounters. We make connections between relational affect and the non-anthropocentric and anti-colonial modes of attunement that we are suggesting are an important response to children learning to learn within environmentally damaged and settler colonial worlds. We then present examples of affective attunements that emerged from (re)storying place through Indigenous song and story-telling at a creek in Austin, Texas. Guided by Indigenous feminisms, we interpret these affective encounters in relation to their decolonial resonances.

Why Water Pedagogies?

In North American early childhood classrooms, water is ubiquitous as a foundational exploration, play and learning material. In these settings water pedagogies remain tethered to human-centered perspectives centered on Western scientific modes of learning about water and on individualist pedagogies that construct water as simply a human resource. Individualism is supported by a dominant focus in early childhood education more broadly, on the individual developing child. For water, this means that teaching and learning centers water as an instrument for the individual child’s physical/sensory, socio-emotional, and cognitive development (Gross, 2012; Havu-Nuutinen, 2005). One example is the water table, a common part of North American early childhood classrooms. In these classrooms, the water table is typically set up for activities such as sink or float experiments that are intended to foster the child’s development such as fine motor skill and sensory development, and cognitive knowledge (Pacini-Ketchabaw & Clarke, 2016). These pedagogical approaches focus on what water can do for children’s learning and development. These are narrow and colonial ways of ‘knowing’ water; they do not make space for reciprocal and ecological understandings of water. These pedagogies are also marked by a disconnect from the fact that water, amidst several other climate-change related effects, is central to current and future environmental precarities brought by rampant extractivist global capitalism (Intergovernmental Panel on Climate Change, 2018).

We see the pedagogical approaches described above as insufficient for cultivating the kinds of shifts that we think are needed for children inheriting ecologically damaged worlds such as those related to water vulnerabilities. In other words, such pedagogies reinscribe extractivist and instrumentalist ways of knowing water rather than reimagining the kinds of pedagogies that can unsettle normative water relations and that situate children within the actual real world watery precarities in which they are living. Our particular interest is in investigating possibilities for ‘otherwise’ curriculum and pedagogy that can shift children’s curiosities towards more-than-human relationality as well as anti-colonial ways of knowing

and becoming with the watery worlds that they co-inhabit. Feminist environmental humanities scholars and multiply situated Indigenous knowledges have already pointed to the need for attending to water in ways that are less human-centred and that consider the ways in which are always already in relationship with water, including through uneven inheritances of anthropogenic impacts on water (Neimanis, 2017; Yazzie & Baldy, 2018). These shifts feel particularly urgent in our current context of Texas, which is already facing the impacts of climate change, such as through both severe prolonged drought and extreme flooding events (PlanetTexas2050, 2018). As we write this, the city is in the midst of a boil water advisory due to impacts of flooding on silt levels in the water supply.

Why Affect?

In turning towards the generative and interruptive potentials of affect in doing water pedagogies differently, we draw inspiration from early childhood scholars who have shown how affect has potential as a mode of decentering human-centered modes of learning. This might at first seem to be contradictory, if affect is considered simply as human sense-making. However, affect understood as inherently relational, brings forth a myriad of possibilities with regards to the who, what, and where of being affected and affecting others. For instance, Hickey-Moody (2018) describes affect as the changes in capacity to act that emerge when bodies encounter “contexts, including policies, institutions, beliefs (para. 9).” Similarly, the relational potentials of affect are captured by Siegwirth and Gregg (2010) as forces that circulate between human and more-than-human bodies, whereby:

affect is found in those intensities that pass body to body (human, non-human, part-body and otherwise), in those resonances that circulate about, between and sometimes stick to bodies and worlds, and in the very passages or variations between these intensities and resonances themselves. (p.1)

Understood in these ways then, affect is inherently shared or social; where this sociality is not limited to human bodies (Ahmed, 2014). Brought to our context of early childhood education, the work of Pacini-Ketchabaw, Taylor and Blaise (2016) on young children’s relations with animals is particularly helpful in conceptualizing affective pedagogies. They discuss how part of decentering the human involves children ‘learning to be affected’ in multiple ways by multispecies encounters. They describe certain practices that might increase the propensity to learn to be affected. For instance, in nurturing multisensory awareness they pay close attention to what is activated differently by: visceral child-animal encounters that include smell, slow walking, and stillness. In troubling romanticized children’s multispecies relations, they also attend to awkward encounters and their accompanying mixed affects. Importantly in this work they follow multispecies relations rather than simply following the child. This is an important shift away from the child-centered approach to pedagogy that remains foundational to early childhood education and its developmental logics (Nxumalo, Delgado, & Nelson, 2018). The authors demonstrate the ways in which affect can be profoundly pedagogical. At the same time, the authors are careful to underline that an important part of this work is the recognition that learning to be affected by entanglements with the more-than-human world, including human/more-than-human mutual vulnerabilities, does not presume an ability to control or predict what it is that will affect us.

Tonya Rooney’s (2018) work is also insightful in making visible the impacts of affective pedagogies on children’s ecological relations. Through everyday walking experiences with children, she makes visible the ways in which the affects of weather impact children’s place relations. Like Pacini-Ketchabaw and colleagues (2016), for Rooney, working with affect pedagogically includes slowing down and attending to multisensory affects. In this slowing down to attend to the affects of weather on children, Rooney also

highlights the impacts of multisensory embodied connections that encourage children to attune to the weather with “smell, sound, touch, taste and other modes of relating or being affected that are more difficult to name” (p. 7). These practices of learning to be affected by the weather are also pedagogical; as Rooney explains, children, through these everyday slow-walking practices are learning *with* the weather, rather than *about* the weather. Rooney eloquently describes the affective registers that emerge as children attune their bodies to the weather as:

elemental affect that may at times be puzzling or barely imperceptible, [but] nonetheless is part of the children’s bodily connection to and relationship with the world around them; a mode of ‘becoming with’ the world that also seems to be open to times and scales in the lives of other creatures. (p. 8)

Taken together, this important work from early childhood scholars highlights how affect can be a part of pedagogies that attend to the lively capacities of more-than-human others. These affective pedagogies decentre the human developing child; attend to children’s multispecies relations; nurture multisensorial engagements with the more-than-human world; and subvert linear pre-determined modes of learning. Alongside the insights offered by the aforementioned modes of understanding and foregrounding affect, we are interested in building on this work to consider how engagements with affect might also connect to early childhood pedagogies that subvert colonial ways of being with and learning with the more-than-human world. Therefore, in bringing forward examples from our research with young children’s water relations, we will also bring these insights on affect into conversation with Indigenous feminist scholarship to tether affective pedagogies and curriculum-making to our anti-colonial concerns.

Situating Educator-Child-Creek Encounters

Over the course of a year, we spent time with a group of kindergarten and preschool children and educators at a waste-filled creek (Figure 1) that borders a suburban Austin independent school (Saint-Orens & Nxumalo, 2018). Fikile is the principal researcher in the project and worked alongside teachers and educators as a pedagoga. She is a citizen of eSwatini and Canada (Nxumalo, Delgado, & Nelson, 2018; Vintimilla, 2018). Marleen is Pame; an enrolled member of Mexica Kalpulli Tlatlhpapaloti. She is also a member of the Miakan/Garza Coahuiltecan Band of Texas. Marleen also worked closely with the educators and children as a pedagoga. Our pedagoga roles draw inspiration from their origin in the preschools of Reggio Emilia, where “the pedagoga is someone who works collaboratively with all the protagonists within an educational endeavour to promote critical and dialogical encounters that consider the specificity of the pedagogical project as well as its relations with the broader philosophical vision and commitments of the early learning setting” (Nxumalo, Delgado, & Nelson, 2018, p. 434). In this role, we (Fikile and Marleen) spent time once a week at the creek with the educators and children working together on planned and emergent pedagogical encounters. In between visits, we worked with the teachers on collaborative pedagogical documentation using a shared Google doc.



Figure 1: Creek-Waste Encounters

Pedagogical documentation, also inspired by the preschools of Reggio Emilia, is a process for making children's learning visible that can include video, images, written records and artifacts of children's work (Nxumalo, Gargliadi & Ryung, in press). Importantly, it is not simply a record of what happened; documentation also includes educators' critical reflections and subjective interpretations of the pedagogical encounters. In this project we also used pedagogical documentation as a communication and planning tool that helped us prepare pedagogical provocations building on the previous weeks' encounters. Pedagogical documentation also served as a research method, serving as the primary way of collecting data from the project, and alongside our field notes helping us to closely attend to, critically reflect on, and revisit what emerged in our encounters (Hodgins, 2012; Nxumalo, 2019). Following Hodgins (2012), pedagogical documentation is a *postmodern* research methodology; a mode of materializing the ethics and politics of our childhood research, as we discuss later in the paper in relation to anti-colonial affective pedagogies. Here, we also want to note that we do not claim that we present here is a neutral and complete account of what happened. Embracing its postmodern orientations, pedagogical documentation is always "selective, partial, contextual, and situated" (Murriss, Reynolds & Peers, 2018, p. 18). It is not a "means to a single neutral picture of what children can do" (Hodgins, 2012, p. 7). Put another way, pedagogical documentation is part of an "agential cut," created in intra-action between researchers, educators, children, encounters, matter and discourses (Barad, 2007). Here the research is always entangled in and implicated in what is produced rather than objectively observing at a distance.

The broader purpose of this ongoing project, which is part of a larger international project, is to develop pedagogies that are responsive to children's complex relations with their local environments, particularly with regards to possibilities for responding to climate change (Climate Action Childhood Network, 2018). In our particular location in Austin, Texas we are interested in pedagogical and curricular attunements to

children's relations with water that emerge from embodied encounters with this watery place that children co-inhabit with human and more-than-human others. In these encounters, we attempt to inquire with water, rather than on water as a passive object. One of the ways in which we do this is to seek ways to think with water in ways that move away from singular already-known answers (Pacini-Ketchabaw & Clark, 2016). Deborah Bird Rose (2016) captures this ethos of our inquiry of staying with challenging questions when she asks: "If water is living, can it also die? Is water caught up in precarity, is it vulnerable? Is water, like life, variable and diverse; in this time of ecological loss, is it threatened" (para 2).

An important part of our processes of relating to this creek is through repeated encounters over time; therefore, we spend time once a week at the creek with the children and educators over the course of the school year. While we are always open to what might beckon to children on a particular day, our pedagogical strategies are also often intentional as we want to complicate child-centered practices and accompanying practices of "following the child"; practices that remain prevalent in early childhood education (Nxumalo, Delgado, & Nelson, 2018). As we discuss further below, this intentionality is seen in the stories, songs, things, and more-than-human others that we bring to children's collective attention. Our intentions have enacted multiple unexpected effects and affects (Saint-Orens & Nxumalo, 2018; Nxumalo & Villanueva, forthcoming). Perhaps then intentionality is not an adequate word to describe the ways in which we are working with our desired shifts in children's relations, and environmental subjectivities. This is to say that we are interested in foregrounding curricular and pedagogical approaches that might orient towards learning with the more-than-human world in ways that include foregrounding marginalized ontologies and epistemologies. At the same time, we also want to unsettle progressive, linear and prescriptive approaches to teaching and learning. This means we work with what is already there, what emerges, and what might be otherwise un-noticed, for instance due to settler colonial modes of knowing a place (Nxumalo, 2015). This also means that our primary interest is not in mapping academic learning outcomes as they are understood within current narrow formations of what counts as learning for young children in standardized documents. Instead we are interested in what emerges in the entanglements of children-creek-educators and more, in this particular place.

For the remainder of the paper, we present three of the orientations that have emerged in this work that we see as generating affirmative shifts in children's water relations: decentering the developing child, activating decolonial cartographies, and refiguring Indigenous presences. We intentionally use the word *orientation* firstly to underline that we want to engage with the politics that underpins relational affect. This means explicitly recognizing that the ways in which human and more-than-human bodies affectively become oriented to each other as well as to other things, ideas, and social formations, has consequence. These orientations can shift and change direction. They can also become sedimented, organized, and performative repetitions (Ahmed, 2006; Collard & Dempsey, 2017). In both cases, orientations have world-making effects on what kinds of life and modes of living are valued as mattering (Collard & Dempsey, 2017).

Relational Affect and Water Song Drawing: Decentering the Developing Child

An important part of how we have engaged with the children with the creek and the surrounding area has been through drawing. Children regularly bring journals with them to the creek, which they call their 'water journals'. Drawing has been a way for us to slow down together, and to carefully attune to the surroundings in multisensory ways. Drawing has also been a mode for the children to collectively and individually reflect on the pedagogical provocations that we (researchers and teachers) have brought to them. One particular day that continued to echo through children's and educators' rememberings, long

after it had passed, was a day when Marleen decided to teach the children a Coahuiltecan song for the water *Naham Kam Ajehuac Yana*. Drawing from our field notes, we describe the moment below:

The children gather on a grass mat alongside the creek. Marleen stories the song for the children; sharing the meanings that she sees as important for these children to learn. Her words embody:

- care, gratitude and reverence for water
- the liveliness of water
- water as human relation
- water as affected by positive and negative human actions...
- Coahuiltecan Yana Wana lands – water of the spirit/spirit of the water

The children and Marleen stand to face the creek. Marleen leads the children in asking the creek for permission to share the song. Their singing is accompanied by rattles that Marleen has brought, which the children take turns shaking. The song they sing is profoundly pedagogical. It teaches continual respect, love, remembrance and responsibility for the waters of Central Texas. It teaches relational ontologies of water that include: the capacities of water for emotional and physical healing; inseparability of water from human bodies; and the many places through which waters come together, including the rains and rivers (Villanueva, 2018). As we discuss further later in the article, this song is also a place story – that (re) maps and situates the waters of this place as Indigenous lands.



Figure 2: Water Song Drawings

Here we want to attend to the affective relationalities that emerged from children's drawings; created after the water-singing encounter. The attachment of smiles and happiness to the water, which were in many of the children's drawings (as illustrated in Figure 2), might be read as anthropomorphizing the water and reproducing romanticized child-water relations. However, an alternative perspective suggests that multiple materialities and discourses assemble to influence the marks that emerge on the paper. In

other words, the drawings are never a 'pure' and unmediated representation(s) of what children see and hear; they are also much more than the physical images on the paper (Kind, 2010). As Sylvia Kind (2010) explains, "concept[s]...marks, gestures, colours, textures" and more come together in creative acts to actualize particular ideas through a process that is "dynamic, creative, productive, or generative as the art takes shape through movement, rhythm, intuition, reflection, constant judgments and considerations" (p. 115). Sylvia Kind's work helps us to resist a literal interpretation of the children's artwork that would simply inscribe human-like emotions to the water. That is to say, even as children use emotions to describe their artworks (for instance referring to the water as "happy"), these drawings can be seen as collective affective relationalities towards water that shape and are shaped by:

... what children and teachers say (for example "I'm the water spirit"; "This is the water happy"), the creek, the waste scattered within and alongside the creek, Marleen's words about the song, the song, the singing, children's memories of other water stories we have told and more...

The art making is just one part of the affects, objects, human and more-than-human bodies, and discourses that come together to change how children act, feel and do. Within this assemblage art participates in changing what human and more-than-human bodies can do (Hickey-Moody, 2018). While the moments we have described here are small and minor events, we take them seriously as processes of children's inquiries that are more than the representations drawn on the pages. Just as the affective relationalities that emerge from these moments are more than what children say and do, the learning that happens in these inquiries also cannot be adequately captured by individual developmental descriptors of each individual child's art: children's bodies, the pencils, crayons, the paper, the creek, the song – which children hum while they draw, and the other 'things, events, sounds, memories' are all active participants in this more-than-human place learning encounter (Kind, 2010; Nxumalo & Rubin, 2018). In addition to their potential for activating more reparative, less destructive relations with more-than-human worlds, these pedagogical encounters unsettle EuroWestern understandings of the individual autonomous child who is separate from the natural world; a world that they need to be "returned" to experience academic, socio-emotional and physical developmental benefits (Taylor, 2017). We wonder what new kinds of collective relational subjectivities emerge from these affective pedagogies as children collectively create in emplaced material-discursive relationship with each other, the water song, and the creek.

As our readings of these moments suggest, we are not concerned with the slippages between emotion and affect, particularly in our focus on relationality. We resonate with Sara Ahmed (2010) when she writes:

While you can separate an affective response from an emotion that is attributed as such (the bodily sensations from the feeling of being afraid), this does not mean that in practice, or in everyday life, they are separate. In fact, they are contiguous; they slide into each other; they stick, and cohere, even when they are separated. (p. 231)

We see noticing emotional responses as a part of paying attention to the ways in which affect is always distributed unequally: not all bodies are affected in the same way. This means that a turn to affective pedagogies also includes an analysis of power relations that shape the ways in which affects and their accompanying processes are always asymmetrically distributed within particular places and spaces. We want to avoid colonizing understandings of who and what is affected, and who and what is deemed more easily as an 'affectable other' (Ferreira Da Silva, 2007; Rowe & Tuck, 2017). Put another way, while we

focus on the positive relational aspects of our pedagogies, we understand relational emotions as involving both “(re)actions or relations of ‘towardness’ or ‘awayness’” (Ahmed, 2014, p. 8). Brought to the encounters we have described, an attunement to the circulation of emotions and their entanglements with power relations helps us to notice that for Marleen, bringing forward Indigenous knowledges as an Indigenous person in this particular place is a complex moment – filled with emotion for its decolonial resonances and for the risks and vulnerabilities it brings as an “otherwise” way of being with this colonized place.

Relational Affect and a Water Song: Activating Decolonial Cartographies

We have recently written about Marleen’s teaching and sharing of a Coahuiltecan song for the water, *Naham Kam Ajehuac Yana*³ (We will remember the sacred springs) and her teaching of children to ask the creek for permission to sing this song. In this writing, we have thought through how these pedagogies are enactments of Indigenous feminist praxis that have decolonial effects (Nxumalo & Villanueva, forthcoming). Here we want to extend this work to think specifically with the embodied reverberations of these pedagogical encounters, which were experienced as affecting moments by us, and by the children and educators. In this reading of these moments, we turn again to Indigenous feminist theories. In particular, we want to consider how the sonic embodied movements that were a part of this singing can be thought of relational affective gestures. These gestures activate decolonial cartographies or counter-mappings of this particular place that are an antidote to the “cartographies of dispossession” that are always a part of settler colonialism (Morrill, Tuck, & Super Futures Haunt Collective, 2016, p. 4).

Cree scholar Karyn Recollet (2015) helps bring forth an understanding of the mattering of the physical, embodied, sonic and affective movements of Indigenous relational knowledges within urban spaces such as this Austin creek. Karyn Recollet (2015) works with the example of Indigenous peoples dancing with non-Indigenous allies in flash mob round dances in urban Toronto spaces during a period of Indigenous resistance called Idle No more. She discusses the affect produced during these moments as having pedagogical and decolonial resonances; where “circuitous motion enacts a radical pedagogy of love through the singing of love songs, which effectively embed between spaces for the wedging in of dancers, thoughts, reconceptualizations, and renegotiations of space” (p. 136). Perhaps then, Marleen-children-song-rattles-creek-trees-educators’ and more could also be seen as collectively activating a radical pedagogy that enacts decolonial counter mappings. These embodied and affective counter mappings are “geographies of resistance” (p. 135) that challenge the erasure of this urban creek space as Indigenous lands.

Decolonial affects are made possible through the presence of Marleen as member of a Coahuiltecan community with deep relations to this place, including through teachings from Coahuiltecan elders. They are also made possible by the relational affects activated through the assemblage of human and more-than-human movements, gestures and sounds that circulate in this space during and after the singing. These moments, while they seem minor and insignificant within the ongoing violence of settler colonial erasure, matter for children learning to unsettle human-centered ways of knowing and learning to enact reciprocal relations. These unsettling movements can perhaps be thought of as a mode of relationality that is “based in reciprocity and obligation with the land and other-than-humans” (Simmons, 2017, para. 3). We also take seriously the caution issued by Aimee Carrillo Rowe and Eve Tuck (2017) to be wary of the ways in which turns to affect, alongside other turns towards the “more-than-human,” can reinscribe universalisms that assume a subject devoid of geographic specificity and location, including complicit situatedness within settler colonial geographies. These scholars remind us to keep questions of

emplacement, land and settler colonial dispossession close in our engagements with affective pedagogies. Here land is understood to encompass all territories, including “land, water, air, and subterranean earth” (Tuck, McKenzie & McCoy, 2014, p. 8). In these encounters, affective pedagogies are always already geographic; they are situated within a particular place – a place where affective intensities always involve human, material and more-than-human bodies *and* a place where human differentials including Indigeneity and its erasures matter.

Relational Affect and a Creation Story: Refiguring Presences

An important part of our collective slowing-down at the creek has been to read and discuss stories of water and water relations with the children. The stories that we bring to children are a part of our decolonizing praxis; a mode of what Nishnaabeg scholar Leeanne Simpson’s (2011) calls “storied presencing” (p. 96), or what has also been referred to by Fikile as *refiguring presences* (Nxumalo, 2015, 2019). Refiguring presences in settler colonial early childhood education places and spaces means that some of the stories that we share with children are situated stories that are intended to foreground Indigenous presences and relations in this particular place. We also foreground Indigenous stories from multiple dispersed places to bring forward ways of knowing and becoming with water that disrupt the centrality of developmental, and Western scientific epistemologies and ontologies (Nxumalo & Villanueva, forthcoming). Both of these storying practices are responses to the absencing of Indigenous peoples, relations, knowledges and land in place-based encounters in early childhood education within settler colonial contexts (Nxumalo, 2018, 2019). Put another way, refiguring presences is a practice of grappling with what it might look like pedagogically to affirm Indigenous life, land and relations. Intrinsic to this pedagogical orientation is to affirm the co-constitutive entanglement of human and more-than-human life rather than perpetuate colonial nature/culture and human/more-than-human bifurcations.

In refiguring Indigenous presences through place stories that disrupt the material and discursive ways in which settler colonialism works to disappear or marginalize Indigenous presence, we are embracing, rather than turning away from the political nature of curriculum-making (Nxumalo, Delgado & Nelson, 2018; Tuck & Yang, 2012). Story-telling might be seen as a relatively benign everyday early childhood literacy practice. However, the stories we choose to tell are framed by a consideration of place as storied within unevenly distributed power relations that shape what stories matter and what stories are told (Nxumalo, 2019). In this conceptualization, humans, more-than-human things, plants, as well as practices and multiple knowledges, are all participants in the storying of places. However, within the striations of settler colonialism and its anthropocentric assumptions, certain stories are disappeared altogether or dismissed as mythical, rather than as a specific expression of “Place-Thought...the non-distinctive space where place and thought were never separated because they never could or can be separated” (Watts, 2013, p. 22). Given these understandings, there are multiple entry points towards considering what practices of (re)storying place might look like. For instance, our previous discussions of pedagogical encounters with water through drawing and Indigenous water songs in this article can also be seen as acts of (re)storying place in decolonizing ways. Here we want to focus on the impacts of materializing a place story focused on the Coahuiltecan people of Central Texas that was shared with the children. We discuss this pedagogical encounter as an illustrative example of how the mobilization of relational affects can be part of a decolonizing pedagogical practice of refiguring presences.

As misty rain fell one morning, we gathered on the grass mat next to the creek and Marleen told the creation story of the Indigenous Coahuiltecan people of central Texas, using visuals that she drawn (Figure 3).

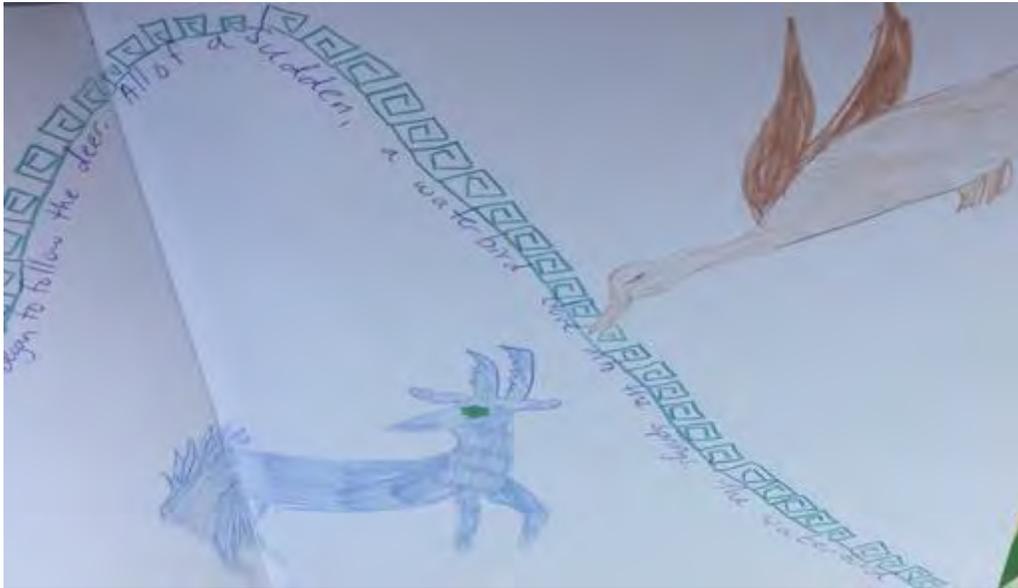


Figure 3: Sharing the Coahuiltecan Creation Story

The story tells of Coahuiltecan peoples beginning in the underworld as spirits. A deer appears and the spirits begin to follow the deer. A water bird dives into the spring, pulls the deer out of the springs and the spirits hold onto the deer's leg. On emerging from the springs, the spirits take on a human form. These sacred springs in this story are named Yana wana⁴.

We call the Sacred Springs in San Marcos, which are an entity in our viewpoint, Ajehuac Yana. In Coahuiltecan, ajehuac means springs, and Yana means sacred or spirit; that which is sacred like a spirit. The San Antonio Coahuiltecan communities call the San Antonio River entity Yana Wana – wana meaning water – Sacred/Spirit Water.

(Maria Rocha, Coahuiltecan elder)

Marleen explains to the children that this story is not only a creation story, it is a teaching of gratitude for the sacred springs and of an ethics of respect and protection towards these waters for current and future generations. This story “reflect[s] important relationships between the human and non-human...[and] have been formed by and participate with the creative forces of the universe” (Cajete, 2000, p. 35). Coahuiltecan elder Maria Rocha explains that the creation story shows children their interconnectedness with the earth, including water and animals (personal communication, June 22, 2017). Yana wana is also the name for one of the sacred springs which the creation story refers to; Blue Hole headwaters of the San Antonio River. Other sacred spring sites, which are integral to the knowledge systems of the Indigenous peoples of Central Texas, are *tza wan pupako* - Barton Springs in Austin; *ajehuac yana* - Spring Lake in San Marcos; and *saxōp wan pupako* - Comal Springs in New Braunfels (Indigenous Cultures Institute, 2018). We name these places here because for most people in Central Texas these are popular recreation sites. For Coahuiltecan peoples, they are sacred places of ceremony; they are relatives (Garza, 2018).

Angie Morrill, Eve Tuck and the Super Futures Haunt Collective (2016) compellingly underline the necessity of practices such as the telling of this creation story in countering material, embodied and discursive dispossession. They say:

In the sense of “being made” dispossessed: dispossession once referred only to land theft, but now attends to how human lives and bodies matter and don’t matter—through settler colonialism, chattel slavery, apartheid, making extra legal, immoral, alienated...The opposite, the endgame of opposing our dispossession is not possession—not haunting, though I’ll do it if I have to; *it is mattering* (p.5). [emphasis added]

Practices of refiguring presences, such the telling of the creation story, are orienting devices (Ahmed, 2014) that attempt to shift perceptions of who and what *matters* within settler colonial places and spaces. What we are suggesting here is that shifting perceptions of mattering and undoing practices of ‘forgetting to remember’ requires changes in capacities to be affected. In other words, refiguring presences through the pedagogical presencing of human and more-than-human Indigenous life and water relations in Marleen’s telling of the Coahuiltecan creation story necessarily mobilizes relational affect in this particular place. From this perspective, the decolonizing orientations of sharing this creation story include the activation of affective relational responses and responsibilities towards water, water-as-life and lively, and water-animal-human relations. For example, we saw glimpses of the liveliness of water as children made connections with popular culture that also gestured to the liveliness of water in their aesthetic expressions. For instance, we saw this as one child told and drew a story of water helping the Disney character Moana who has fallen into the ocean. Another child drew a person evacuating from a tsunami by singing to the water.

Certainly, it is difficult to pinpoint exactly what the sharing of this story enacts in children’s relational affective meaning making. While we make connections to relational affect in children’s body language, joyful expressions, and some of their art-making, we do not claim to know exactly what children think and how this story affects each child. This is not our primary interest. Our interest is in arguing that it *matters* for decolonizing place and place relations in early childhood education to enact affective pedagogies of refiguring presences. Refiguring presences require early childhood teachers to recognize that “sentiments can be mobilized in ways that challenge and extend the settler state” (Rowe & Tuck, 2017, p. 5). In early childhood education, sentiments that extend the settler state include impacts of child-as-steward discourses that mobilize children to relate to nature as something separate from them – as pure, pristine, empty landscapes awaiting their scientific learning, exploration and “discoveries”. These sentiments reinforce places as devoid of Indigenous histories, relations, cultures, and knowledge (Nxumalo & ross, 2019; Taylor, 2017). Such colonizing sentiments also enroll children into settler colonial nation-building; nurturing children’s love and connection to ‘wild’ and ‘empty’ nature. Colonizing sentiments related to children and nature also circulate more broadly in society. This includes the intensely racialized sentiments that construct predominantly white settler children as innocent children who need to be returned to ‘pure’ nature (Nxumalo & ross, 2019; Taylor, 2017). Pedagogies of refiguring presences, such as the telling of the creation story, while offering potential disruptions of colonial education, are not immune from the risk of extending the settler state. There remains a risk of metaphorizing decolonization, and simplistic take-up of complex Indigenous knowledges. There is also a risk of appropriation, if non-Indigenous children and educators superficially consume and enact the place stories that we bring to them. However, amidst the risks of mobilizing feelings that extend the settler state, in the encounters described herein, we see possibilities for affective orientations that challenge the settler state. These (re)orientations are

put into motion through Marleen's emplaced story-telling that presences Indigenous Texas land, life and water relations.

Refiguring presences then is difficult, risky yet necessary work within persistent conditions of settler colonialism that normalize Indigenous erasure. Our modest suggestion here is that these pedagogies are necessary political orientations for opening up more relational ways of becoming with the world. Such political mobilizations, however small and minor, feel particularly urgent as children's inheritances of environmental precarity (and its entanglements with settler colonialism) underline the need for a radical shift away from the colonizing and human-centered practices that fueled extractive relations with the environment.

Towards Decolonial Early Childhood Water Pedagogies

In this article, we have storied some of the ways in which activating relational affect between children, place stories, sacred songs, water's liveliness, drawings...and more, can work in ways that challenge settler colonial ways of relating to the more-than-human world. While we do not offer these imperfect, emergent and ongoing practices as a recipe to be followed, we see them as providing insight into how these embodied practices might be an activating force for relational affects that have decolonial resonances and that unsettle anthropocentrism. Alongside the generative potentiality of these small moments in our practices, we have also inhabited the tensions and risks that also circulate within affective pedagogies that are always haunted by settler colonial dispossession. We nonetheless remain hopeful about what a turn to mobilizing relational affect with young children might do towards decolonizing childhood education that is concerned with issues of the environment.

Notes

1. This Coahuiltecan ceremonial song, published by the Indigenous Cultures Institute in San Marcos, Texas as part of Miakan-Garza Band elders Maria Rocha and Dr. Mario Garza efforts to revise the Coahuiltecan language: translates to *Water is life, it is everything, everything, everything. Water Spirit forms living things. With all that there is*. Retrieved from: <https://www.indigenuscultures.org/coahuiltecan-language>
2. Aimee Carrillo Rowe and Eve Tuck (2017) define settler colonialism as: "The specific formation of colonialism in which people come to a land inhabited by (Indigenous) people and declare that land to be their new home. Settler colonialism is about the pursuit of land, not just labor or resources. Settler colonialism is a persistent societal structure, not just an historical event or origin story for a nationstate. Settler colonialism has meant genocide of Indigenous peoples, the reconfiguring of Indigenous land into settler property. In the United States and other slave estates, it has also meant the theft of people from their homelands (in Africa) to become property of settlers to labor on stolen land" (p. 4).
3. Na Ham Kam means We will remember. Ajehuc Yana refers to the sacred springs; Ajehuc means springs, Yana means spirit, that which is sacred
4. This version of the creation story is a very simplified version that was tailored for the purposes of telling the story to the children that day. This story has many more details, including several important more-than-human beings that have important roles and bring important teachings.

References

- Ahmed, S. (2006). *Queer phenomenology: Orientations, objects, others*. Durham, NC: Duke University Press.
- Ahmed, S. (2010). Orientations matter. In D. Coole & S. Frost (Eds.), *New materialisms: Ontology, agency, and politics* (pp. 234–257). Durham, NC: Duke University Press.
- Ahmed, S. (2014). *The cultural politics of emotion*. (2nd edition). Edinburgh: Edinburgh Univ. Press.
- Cairns, K. (2017). Connecting to food: Cultivating children in the school garden. *Children's Geographies*, 15(3), 304-318.
- Cajete, G. (2000). *Native science: Natural laws of interdependence*. Santa Fe: Clear Light Publishers.
- Climate Action Childhood Network. (2018). *Climate action childhood network*. Retrieved from <http://www.climateactionchildhood.net>
- Collard, R.-C., & Dempsey, J. (2017). Capitalist natures in five orientations. *Capitalism Nature Socialism*, 28(1), 78-97.
- Collard, R.-C., Dempsey, J., & Sundberg, J. (2015). A manifesto for abundant futures. *Annals of the Association of American Geographers*, 105(2), 322–330.
- Danowski, D., & Viviero de Castro, E. (2018). *The ends of the world*. Cambridge: Polity Press.
- Deleuze, G., & Guattari, F. (1987). *A thousand plateaus: Capitalism and schizophrenia*. trans. B. Massumi. London: Athlone Press.
- Ferreira da Silva, D. (2007). *Toward a global idea of race*. Minneapolis: University of Minnesota Press.
- Garza, M. (2018, November). Native American Graves Protection and Repatriation Act: Help us rebury our ancestors. Seminar presented at NAIS Speaker Series, University of Texas at Austin. Austin, TX.
- Gross, C. (2012). Science concepts young children learn through water play. *Dimensions of Early Childhood*, 40(2), 3–11.
- Haraway, D. (2015). Anthropocene, Capitalocene, Plantationocene, Chthulucene: Making kin. *Environmental Humanities*, 6, 159–165.
- Haraway, D. (2016). *Staying with the trouble: Making kin in the Cthulucene*. Durham NC: Duke University Press.
- Havu-Nuutinen, S. (2005). Examining young children's conceptual change process in floating and sinking from a social constructivist perspective. *International Journal of Science Education*, 25, 259-279.
- Hickey-Moody, A. (2018). Materialising the social. *Ruukuu: Studies in Artistic Research*, 9, online. Retrieved from: <https://www.researchcatalogue.net/profile/show-exposition?exposition=371583>
- Hodgins, D. (2012). Pedagogical narrations' potentiality as a methodology for child studies research. *Canadian Children*, 37(1), 4-11.
- Indigenous Cultures Institute. (2018). *Sacred sites*. Retrieved from <https://www.indigenouscultures.org/sacred-sites>
- Intergovernmental Panel on Climate Change. (2018). *Global Warming of 1.5 °C*. Retrieved from: <https://www.ipcc.ch/sr15/>
- Kind, S. (2010). Art encounters: Movements in the visual arts and early childhood education. In V. Pacini-Ketchabaw (Ed.), *Flows, rhythms and intensities of early childhood education curriculum* (pp. 113–132). New York, NY: Peter Lang.
- McKittrick, K. (2011). On plantations, prisons, and a black sense of place. *Social & Cultural Geography*, 12(8), 947–963.
- Murris, K., Reynolds, R.-A, & Peers, J. (2018). Reggio Emilia inspired philosophical teacher education in the Anthropocene: Posthuman child and the family (tree). *Journal of Childhood Studies*, 43(1), 15-29.

- Neimanis, A. (2017). *Bodies of water: Posthuman feminist phenomenology*. London: Bloomsbury Academic Press.
- Nxumalo, F. (2015). Forest stories: Restorying encounters with 'natural' places in early childhood education. In V. Pacini-Ketchabaw, & A. Taylor (Eds.), *Unsettling the colonial places and spaces of early childhood education* (pp. 21-42). New York: Routledge.
- Nxumalo, F. (2018). Situating Indigenous and Black childhoods in the Anthropocene. In A. Cutter-Mackenzie, K. Malone, & E. Barratt Hacking (Eds.), *International research handbook on childhood nature: Assemblages of childhood and nature research* (pp. 1-22). Springer: New York.
- Nxumalo, F. (2019). *Decolonizing place in early childhood education*. New York: Routledge.
- Nxumalo, F., & Cedillo, S. (2017). Decolonizing 'place' in early childhood studies: Thinking with Indigenous onto-epistemologies and Black feminist geographies. *Global Studies of Childhood*, 7(2), 99-112.
- Nxumalo, F., Gargliadi, L.M., & Ryung, H. (in press). Inquiry-based curriculum in early childhood education. In M. F. He & W. Schubert (Eds.), *Oxford encyclopedia of curriculum studies*. Oxford: Oxford University Press.
- Nxumalo, F., & ross, k.m. (2019). Envisioning Black space in environmental education for young children. *Race, Ethnicity & Education*, 22(4), 502-524.
- Nxumalo, F., & Rotas, N. (2018). Interdisciplinary dialogues in environmental early childhood education (Editorial). *Journal of Childhood Studies*, 43(1), 1-3.
- Nxumalo, F., & Rubin, J.C. (2018). Encountering waste landscapes: More-than-human place literacies in early childhood education. In C.R. Kuby, K. Spector & J. Johnson Thiel (Eds.), *Posthumanism and literacy education: Knowing/being/doing literacies* (pp. 201-213). New York: Routledge.
- Nxumalo, F., & Villaneuva, M. (forthcoming). Listening to water: Situated dialogues between Black, Indigenous & Black-Indigenous feminisms. In J. Ulmer & C. Taylor (Eds.), *Transdisciplinary feminist research practices*. New York: Routledge.
- Nxumalo, F., Delgado, C., & Nelson, N. (2018). Pedagogical gatherings in early childhood education: Mapping interferences in emergent curriculum. *Curriculum Inquiry*. Advance Online Publication <https://doi.org/10.1080/03626784.2018.1522930>
- Pacini-Ketchabaw, V., & Clark, V. (2016). Following watery relations in early childhood pedagogies. *Journal of Early Childhood Research*, 14(1), 98-111.
- Pacini-Ketchabaw, V., Taylor, A. & Blaise, M. (2016). De-centring the human in multispecies ethnographies. In C. Taylor & C. Hughes (Eds.), *Posthuman research practices in education* (pp. 149-167). Hampshire: Palgrave Macmillan.
- Pink, S. (2013). Engaging the senses in ethnographic practice: Implications and advances. *The Senses and Society*, 8(3), 261-267.
- Planet Texas 2050. (2018). *Planet Texas 2050*. Retrieved from <https://bridgingbarriers.utexas.edu/planet-texas-2050/>
- Recollet, K. (2015). Glyphing decolonial love through urban flash mobbing and Walking with our Sisters. *Curriculum Inquiry*, 45(1), 129-145.
- Rooney, R. (2018). Weathering time: Walking with young children in a changing climate. *Children's Geographies*, Advance Online Publication DOI: 10.1080/14733285.2018.1474172
- Rose, D.B. (2016, March 14). *Lively water*. Retrieved from <http://deborahbirdrose.com/?s=living+water>
- Rowe, A. C., & Tuck, E. (2017). Settler colonialism and cultural studies: Ongoing settlement, cultural production, and resistance. *Cultural Studies ↔ Critical Methodologies*, 17, 3-13.
- Saint-Orens, L., & Nxumalo, F. (2018). Engaging with living waters: An inquiry into children's relations with a local Austin creek. *Journal of Childhood Studies*, 43(1), 68-72.
- Seigworth, G. J., & Gregg, M. (2010). An inventory of shimmers. In M. Gregg & G. J. Seigworth (Eds.), *The affect theory reader* (pp. 1-25). Durham, NC: Duke University Press.

- Simmons, K. (2017, November 20). Settler atmospherics. *Dispatches. Cultural Anthropology*. Retrieved from <https://culanth.org/fieldsights/1221-settler-atmospherics>
- Simpson, L. (2011). *Dancing on our turtle's back: Stories of Nishnaabeg re-creation, resurgence and a new emergence*. Winnipeg: Arbeiter Ring Pub.
- Taylor, A. (2019). Countering the conceits of the Anthropos: Scaling down and researching with minor players. *Discourse: Studies in the Cultural Politics of Education*, Advance Online Publication, 1-19. DOI:10.1080/01596306.2019.1583822
- Taylor, A. (2017). Beyond stewardship: Common world pedagogies for the Anthropocene. *Environmental Education Research*, 10, 1448-1461.
- Taylor, A., & Pacini-Ketchabaw, V. (2015). Learning with children, ants, and worms in the Anthropocene: Towards a common world pedagogy of multispecies vulnerability. *Pedagogy, Culture & Society*, 23(4), 507-529.
- Taylor, A., & Pacini-Ketchabaw, V. (2018). *The common worlds of children and animals: Relational ethics for entangled lives*. New York: Routledge.
- Tsing, A., Swanson, H., Gan, E., & Bubandt, N. (Eds.). (2017). *Arts of living on a damaged planet*. Minneapolis, MN: University of Minnesota Press.
- Tuck, E., & Yang, K.W. (2012). Decolonization is not a metaphor. *Decolonization: Indigeneity, Education, Society*, 1(1), 1-40.
- Tuck, E., Guess, A., & Sultan, H. (2014). Not nowhere: Collaborating on selfsame land. In: *Decolonization: Indigeneity, Education & Society* Blog Available at: <https://decolonization.files.wordpress.com/2014/06/notnowhere-pdf.pdf>
- Tuck, E., McKenzie, M., & McCoy, K. (2014). Land education: Indigenous, postcolonial, and decolonizing perspectives on place and environmental education research. *Environmental Education Research*, 20(1), 1-23.
- Villanueva, M. (2018). *An auto-ethnography of water as life: Decolonizing our connection with Mother Earth*. Unpublished MA Thesis University of Texas at Austin.
- Watts, V. (2013). Indigenous place-thought and agency amongst humans and non-humans (First woman and sky woman go on a European tour)! *Decolonization: Indigeneity, Education & Society*, 2(1), 20-34.
- Yazzie, M.K., & Baldy, C. (2018). Introduction: Indigenous peoples and the politics of water *Decolonization: Indigeneity, Education & Society*, 7(1), 1-18.

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Entanglements in the Forest: The Orange GoPro Camera and the Children who Wear Them

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ABSTRACT

In this article, we revisit fragments of data from a three-year study, paying close attention to the entanglements and inseparability of child/plastic/snow/GoPro within children's everyday encounters and narratives in an immersive nature-based program in Canada. We query how these entangled ways of being might help inform environmental and sustainability pedagogical practices, and problematize ideals of human agency and nature-as-pure that are embedded within environmental and sustainability early childhood education. Relying on theories of posthumanism and new materialism (Barad, 2003, 2007; Bennett, 2010; Hultman & Lenz Taguchi, 2010) we examine the bodily, social, and affective intra-actions of nature/child/camera to propose thinking differently about the world and children's relations with the more-than-human world.

Keywords: materialism, posthumanism, environmental and sustainability education, entangled children

An orange GoPro camera is vivid against the backdrop of the falling snow. The GoPro is strapped about the chest of a small girl, ice pellets scraping and pelting its lens. The GoPro records the child's heavy breathing and quickened heartbeat, as its lens slowly fogs in response to the resistance afforded to the child by the knee high and, in some places, waist deep snow. The GoPro is jostled about the child's body as she falls repeatedly in the snow, the deep pockets of snow resisting any opportunities for quick movements. The GoPro has tilted toward the ground from the force of falling and rolling in the snowy field and the child pauses to clear the lens of snow and adjust the GoPro. The steady red blinking of the GoPro (a signal that the camera is operating) is once again visible and the field of snow offers itself up for endless possibilities. The snow, GoPro, and child are entangled within "thing-matter-energy-child assemblages" (Tesar & Arndt, 2016, p. 196). Quite vividly through the lens, nature appears as an agentic force alongside this small child who teeters, loses balance, and then crawls through the uneven terrain, carefully avoiding the tall thistles that appear before her. The field she crosses has offered an array of vibrant encounters throughout the different seasons, its intelligences often embraced by the eight children and their two educators of the nature school program participating in the study. The orange GoPro camera, like the snowy field itself, is agentic and more than the passive backdrop to the children's stories (Änggård, 2016; Malone, 2015; Nxumalo & Cedillo, 2017). The snow/child/GoPro are inseparable sentient and non-sentient actors in this ongoing process to navigate, understand, and experience the field.

Perhaps, the GoPro helps to encourage this shift that Malone (2016) notes: when we move away from “child in nature” as the only agential body, we can focus on the materiality of children and non-humans as relational. In this article, posthumanism and new materialism (Barad, 2003, 2007; Bennett, 2010; Hultman & Lenz Taguchi, 2010) offer a lens to examine the bodily, social, and affective intra-actions of nature/child/GoPro, and to think differently about the child’s relations with the world. Thus, we are less concerned about the specific attributes or qualities of the matter itself (i.e., the camera and/or snowy field); rather we ascribe to Barad’s (2003, 2007) notion of process, whereby “reality is composed not of things-in-themselves or things-behind-phenomena but things-in-phenomena” (Barad, 2007, p. 140). How does thinking this way help us to challenge environmental and sustainability education¹ that has traditionally been rooted in land conservation efforts? What avenues are possible when we find ways to foster learning to live relationally and ethically with others of this common world (both human and more-than-human) (Taylor, 2013)?

Environmental and Sustainability Pedagogies

As part of the third year of a post-qualitative study (St. Pierre, 2011) of young children’s immersion in a forest alongside their educators, we asked what does the socio-material entanglement of the orange GoPro camera, natural world, and child produce and reveal? How can we use these entangled stories (data) and understandings to question and contest early childhood education environmental and sustainability pedagogies and practices? In some ways, the orange GoPro camera helped to support a methodological *slowness* (Millei & Rautio, 2017), the camera naturally capturing the mundane, the multiple aspects that would otherwise remain “unrecorded, disregarded and uncared for” (Horton & Kraftl, 2006, p. 71). The entanglements of nature/GoPro/child help to highlight what was meaningful, the often overlooked, invisible, unpredictable improvisational material encounters – materials that participate fully within early childhood learning and play as vibrant actants. Environmental and sustainability education for the very young can be (re)conceptualized when we embrace ideas of children’s dynamic meaning-making² that are spontaneous, fluid, dynamic, complex, and relational with/alongside materials. As educators and researchers, we need to pay greater attention to the materials and the intra-actions *with* matter and young children. In opposition to the notion of *interaction* (which presumes objective and independent being of all matter), Barad (2007) proposes the idea of *intra-action* whereby all phenomena intermingle and materially redefine one another through this “process of becoming meaningful” (p. 139). These intra-actions help to refocus humanist traditions of both research and conceptualizations of environmental and sustainability learning. Somerville (2016) explains how a re-focus of ‘*mutual becomings*’ offers new ways of thinking that are so important in this “time of human entanglement in the fate of the planet” (p. 1170). In their most recent research exploring what “literacy + sustainability” might mean for young children, Powell and Somerville (2018) noted, “at this stage we have come to understand sustainability learning as children’s continued, deep engagement in activities that connect them to their bodies, to the matter of the planet and to its living creatures” (p. 6).

¹ In the Canadian context the term environment and sustainability education is commonly used. Here, we use this term in recognition of the complexities of a common world, the interrelations among/between the human and more-than-human world.

² In this article, we rely on Karen Barad’s (2007) notion of meaning-making where “meaning is not a property of individual words or groups of words but an ongoing performance of the world in its differential dance of intelligibility and unintelligibility” (p. 149).

Developmentally appropriate practice, child centered pedagogy, and the ecological context of the child are phrases often associated with the field of early childhood education (ECE). Historically the central tenants of ECE have been largely shaped by this developmental/humanistic discourse. This human centricism is also evident within the environmental and sustainability literature and learning in ECE (Duhn, 2012). Resultant pedagogies that have predominantly focused on an image of the child as a steward of the environment are ill conceived, given that “placing humans strictly outside the natural world of which they are a part of, and may thereby inadvertently perpetuate the very alienation it seeks to overcome” (Anderson, Comay, & Chiarotto, 2017, p. 109). The ‘child as savior’ nature narrative figures prominently as a romanticized notion. Immersing children in nature to reclaim children’s perceived lost connections to nature is offered as a remedy (Louv, 2005). The presumption is that children experience adverse effects from a lack of contact with nature, what Louv (2005) termed a ‘nature-deficit disorder’. The literature on the benefits of children’s connections and immersion in natural settings should not be discounted (e.g., Davis & Waite, 2005; Elliot, Eycke, Chan, & Müller, 2014; O’Brien & Murray, 2006, 2007; Slade, Lowery, & Bland, 2013) because of the detrimental effects of an absence of outdoor experiences on human lives is a valid concern (McCormick, 2017). But the sole focus on the human experience, over the material and natural world, constrains productive environmental and sustainability educational discourse and understanding.

By focusing on encounters, intra-actions (Bennett, 2010; Hultman & Lenz Taguchi, 2010; Rautio, 2013), and the ‘witness’ (Micciche, 2014; Wargo, 2018) between children and the world, more expansive ideas of learning and teaching can be embraced, particularly in relation to environmental and sustainability education. In challenging scholarship rooted in the ‘social turn’, Micciche (2014) points to the narrowed scope of literacies with the excessive focus on social construction, and previously little consideration for intra-actions among “natural systems, biology, animals, and other forms of matter” (p. 488). In her theorizing about the writing process, Micciche describes a process of ‘witness’ that is “elliptical, immersive in diverse environments, dispersed, ordinary (not rarified), mediated, ongoing, and coexistent with other activities” (p. 493) so that “writing is contaminated, made possible by a mingling of forces and energies in diverse, often distributed environments” (p. 502). Like others who have taken-up this idea of witness in describing the inseparable aspects of the writing process of young children (Wargo, 2018), we also stress the importance of “witness-ing, a relational assemblage made possible by the mingling of forces, energies, technologies, and affects” (p. 503) within environmental and sustainability learning. Here, we describe this *witness-ing* using Barad’s notion (2007) of *intra-action*, the material world acting upon children and children acting upon the material world. Climate change, environmental crises, water and food scarcity and the like, are reminders of the agentic forces of nature and the entanglements of the human and non-human world co-existing in a process of “ever-changing becoming” (Powell & Somerville, 2018, p. 2). Clearly, if we are to grapple with issues related to the fate of the planet (Somerville, 2016) and “move beyond humanist stewardship frameworks and their implicit exceptionalist assumptions” (Taylor, 2017, p. 1449) new ways of thinking are needed.

Theorizing Differently

In this paper, we use a post-humanist conceptual framing within new materialism theorizing (Barad, 2003, 2007; Bennett, 2010; Hultman & Lenz Taguchi, 2010) to invite the possibilities of considering the influence of the learning child’s socio-material engagements with an Orange GoPro camera within their more-than-human contexts, the spaces and places where children, teachers, and the world coexist (Barad, 2007; Haraway, 2008; Somerville, 2010; Taylor & Giugni, 2012). Although the epistemological foundations of posthumanism and new materialism differ, both theories focus on the importance of “relational

ontologies, a critique of dualisms, and engagements with matter and the non-human” (Bozalek & Zemblyas, 2016, p. 193).

Specifically, Taylor, Blaise, and Giugni (2013) write, “a post-human landscape repositions childhood within a world that is much bigger than us (humans) and about more than our (human) concerns. It allows us to reconsider the ways in which children are both constituted by, and learn within, this more-than-human world” (p. 49). Correspondingly, (new) materialism recognizes matter as agentic, part of the dynamic intra-active process of becoming, something Barad (2007) refers to as agential realism. Disrupting human exceptionalism paves the way for new ways of thinking within environmental and sustainability education. Children’s intra-actions within their ‘everyday’ complex, messy, entangled encounters in the woods provides a context for provoking environmental thought and actions.

In our study, neither the GoPro nor the child (or stick, thistle, snow, plastics, and so on) have agency on their own. Rather, it is the interplay between GoPro (matter) and the child that we argue is significant, what “emerges *in-between* different bodies involved in mutual engagements and relations” (Hultman & Lenz Taguchi, 2010, p. 530). The GoPro tips and pivots downward, the child readjusts her body in relation to the snugly bound camera about her chest, she uses a gloved hand to wrestle the GoPro back to its original position, the red light steadily blinks to cue the other children watching that the GoPro is functioning again. It is this interplay, intersections of matter, ‘witness’ of entanglement of all the agentic actants (both human and more-than-human) that “frame our existence” (Micciche, 2014, p. 489). The encasement of the GoPro in single-use plastic affords opportunities to record in the rain, snow, and mud while also provoking discussions with the children about plastics, disposal methods, individual’s responsibilities, and exploring the impacts of plastics on the wildlife in the woods. Hultman and Lenz Taguchi (2010) emphasize that this intra-activity or relational materialist understanding helps to conceptualize both the child and matter as active (agentic), entangled, interdependent, co-existing, “an assemblage of overlapping and intra-acting forces” (p. 532). Clearly, ‘*being-of-this-world*’ (Lenz Taguchi, 2010) and finding sustainable solutions for some of the world’s most precarious environmental issues will require a different theoretical framing, one beyond human exceptionalism.

Challenging the Notion of Human Exceptionalism

A dualism lens pits nature and humans at odds with one another where clearly more symbiotic relationships and intra-actions help fuel a broader understanding of an interrelated world (Tsing, 2015). Posthumanism helps challenge the centralism of humans by re-focusing on the interdependence between people and the more-than-human world. For children, this more-than-human world often includes the mundane, the unsanitized, “the not-always-gorgeous” (Taylor & Pacini-Ketchabaw, 2015, p. 526). As researchers, we were witnesses to the entanglements of child/plastic/snow/GoPro within their everyday playful processes and meaning-making. We ask how these entangled ways of being might help to inform environmental and sustainability pedagogical practices, and ideas related to 1) agency, 2) mutual reciprocity, and 3) ethic of care toward all living and nonliving matter.

The privileging of humans as the center, responsible for both the precarity and salvation of the natural world, seems counterintuitive. Simply put, the worm relies on microscopic organisms of a plant; the bird is entangled with the life of the worm, and the bird acts as a pollinator of plants that humans depend upon. The presence of microplastics in more than a quarter of all fish attests to the thoroughness of how infused humans and non-humans are with one another (UN Environment Report, 2017). Nature/culture binaries can be reconsidered through this lens of ecological interdependence (Plumwood, 2002) and humans/non-humans alike recast as ‘performative agents’ (Barad, 2003, 2007) within the ‘natureculture’

collective (Haraway, 2008). Ontologically, Haraway proposed the idea of the natureculture collective to highlight the impossibility of separating nature and culture, and as a challenge for rethinking boundaries between human and more-than-human, organisms and machines, dead and living. For Haraway, the natureculture collective is a “web of differences capable of interacting with the other” (Bruno, 2013, p. 105). Here in this article, we narrowly focus on the entanglement of the Orange GoPro camera, while also dutifully recognizing that the natureculture collective encompasses more than non-living matter (e.g., rocks, sticks, technology, etc.), and nonhuman living organism (e.g., animals, bacteria, plants, and so on) (Cutter-Mackenzie, Malone, & Barratt Hacking, 2019) are equally important to the notion of *becoming with* and *kinship* that Haraway proposes (2008, 2016).

The notion of kinship (Haraway, 2008, 2016) recognizes the mutuality, assemblages of relationality, interdependence, and entanglements of all worldly things. Haraway (2016) proposed “no species, not even our own arrogant one pretending to be good individuals in so-called modern Western scripts, acts alone; assemblages of organic species and of abiotic actors make history, the evolutionary kind and the other kinds too” (p. 100). Thus, within this process of becoming worldly *with* others (including the more-than-human) we can reimagine the concept of agency as dynamic.

Similarly, Barad’s (2007) concept of performativity “acknowledges and takes account of matter’s dynamism” (p. 135), its agentic fluidity and iterative capacity. Like humans, matter is part of the “ongoing reconfigurings of the world...the agential intra-activity in its becoming” (p. 141). This concept of intra-activity requires recognition and respect for both the human and more-than-human world. Significantly, within these intra-actions of organisms, matter, and discourses learning occurs (Lenz Taguchi, 2010). When we recognize that humans are not *separate from* but in a process of *becoming-with* (Haraway, 2008, p. 4), then we can conceptualize children’s being and learning within “an interdependent relationship with the world that we come to know through intra-activity within the material-discursive embodied realities we live in and with” (Lenz Taguchi, 2010, p. 39).

Clearly, a reorientation of “ways of seeing, feeling and being in the world that recognise human inter/dependence within the world” is needed (Ritchie, 2016, p. 79). Children’s intra-actions with ‘others’ does reveal new insights into their play worlds and lives (Harwood & Collier, 2017). Yet, these every day and often ignored materialities serve an important reminder that children are already “co-present with organisms, species, ecologies, nonhuman actants and ‘natural’ materialities” (Horton & Kraftl, 2017, p. 5). The posthuman-materialist turn helps to recognize the material-discursive phenomena of both human and more-than-human alike.

The Orange GoPro camera as agentic matter helps to refocus our queries and (re)consider the intra-actions of materials and children, their embodied entanglements within the contexts of an enmeshed real world; a world with an uncertain ecological future (Taylor, 2017). Increasingly, scholars advocate for moving beyond human centrism and finding new synergies between diverse theoretical frameworks to help address the limitations of environmental stewardship (Common Worlds Research Collective, 2018; Taylor, 2017). Like Powell and Somerville’s (2018) challenge to literacy scholars, we also propose that open, less representational ways of theorizing helps confront anthropocentrism, address the hierarchal relations that currently exist between humans and more-than-humans, and “facilitates an openness to the world, a way of thinking that frees the human from the boundaries of traditional practice(s)” (p. 3) within environment and sustainable education. Clearly, this calls for new ways of experimenting within research that are also open and experimental.

Experimenting and Inventing as Research Creation

In each of the three years of study, participants have included human (eight children aged three and four years old and parents, educators, researchers) and non-human actors in a natural woodland of a Canadian university campus. At the outset of the study, we envisioned a research orientation that aligned with our humanist training in ethnography. We planned observations, digital photos and GoPro videos, text and material productions; a research orientation of *child as producer* (Rowse & Harwood, 2015). Immersed in the woods alongside the children, educators, and matter was a destabilizing experience as researchers' roles had to be flexible, playful, probing, open, and curious. As observers and co-players alongside the children and materials of the woods, both subjects of the GoPro videos taken by the children, and fully enmeshed in the encounters in the woods, the researchers engaged in what Powell and Somerville (2018) describe as "deep hanging out" (p. 12); an immersive and engaged methodological observational approach where the researchers observe without preconceived notions.

Caton and Hackett (2019) also suggest that the idea of a detached objective researcher is not applicable given the inseparability of being and knowing (p. 362). Much of our process was experimental, flexible, and playful – recognizing that a preconceived methodology would be limiting. Post-qualitative inquiry "begins with an encounter with the real, not with method" (St. Pierre, 2019, p. 11). Thus, we immersed ourselves in the woods remained open and inquisitive, continuously engaged in sense-making processes; a flexibility which afforded more opportunities to "stumble upon" (Brinkmann, 2014, p. 724) matter, children, educators, and relations with others (both human and more-than-human). Brinkmann (2014) reminds us that as researchers we should "allow ourselves to stay unbalanced for a moment longer than what is comfortable, for this is where we may learn something new" (p. 724).

Elsewhere, we have described our methodological processes as qualitative moving toward post-qualitative research (Harwood & Collier, 2019), fully cognizant that our habits of seeing (Hultman & Taguchi, 2010) are rooted in humanist discourse and practices as early childhood education scholars. Certainly, the challenge in representing the data fragments (although we prefer to think of the fragments as storied and open to interpretation) is the inherent limitation of representation and we invite the reader to consider an approach of "'flattened' logic where discourse and matter are mutually implicated in the unfolding emergence of the world" (MacLure, 2013, p. 660). Thus, although within this paper we highlight two storied fragments of entanglements with the GoPro camera from the third year of the study, we opted to align our work with the concept of *methodological slowness* (Millei & Rautio, 2017), viewing the data fragments as ever-changing stories that remain open and fluid. Here, we offer our interpretation, inviting the reader to (re)consider the possibility of multiple patterns and meanings that exist. The material-children entanglements are (re)visited as data that 'glows' (MacLure, 2013), fostering our own wonder as researchers and making room for something new to emerge.

Entanglements in Context

The context for the study was a natural, somewhat uncultivated wild space, located on a university campus in southern Ontario, Canada (Figure 1). The woodland area was shared with many 'others' such as, trees, shrubs, plastic bottles, ferns, mosses, squirrels, turkeys, deer, beer cans, humans, and so on. We have purposefully named some of these others to highlight the complexities inherent within a natural space while also trying to draw attention to what Horton and Kraftl (2017) refer to as the hidden or reductively-summarized everyday social-materialities of childhood.



Figure 1: Woodland Context

Twice each week, from September to June (typically from 9 in the morning until noon), the GoPro camera, eight children and their two educators ventured into the woods to participate in a nature-based program that was described as a collective-emergent model of learning (Harwood, Facchini, Randall, Ratilainen, & Robitaille, 2017). Typically, one researcher accompanied the group of human participants on one of their scheduled trips into the forest each week. Immersed with the matter of the woods, alongside the children and educators, we were observing, playing, engaging, documenting, and recording as much as possible with notes, photos, and videos, fully cognizant of the inadequacies of each mode to represent the messiness of matter/child (MacLure, 2013). Throughout the project, the GoPro/children encounters also afforded ways to pay attention to children's bodies, an important aspect of materialities given that bodies are related to all matter (Horton & Kraftl, 2006). Pragmatically, the outward view of the GoPro camera also helped to disrupt a humanistic focus of the research process—the GoPro often capturing much more than the researchers (Figure 2), whose trained tendency was to focus on the children. Somerville (2017) advocates for new methodologies, experimentations with “children [that] disrupt the sense of control, rationality, and autonomous self of both children and adult researcher. Both are positioned as embedded within entangled more-than-human worlds where the researcher is not the only agent, and often the least important in the focus of attention” (p. 409).



Figure 2: GoPro Intra-acts with Child's Body

Choosing Data that Glows

As researchers, we choose the data fragments based on MacLure's (2013) elusive concept of 'glow'. Admittedly, we also used humanist traditions and thematically catalogued the GoPro videos, constantly comparing our individual and collective interpretations. As St. Pierre (2011) points out, it is challenging to remove the 'I' from qualitative research. However, we did pay attention to the GoPro camera and the videos' affect on both the children and researchers, noting visceral responses to the sights, sounds, and the movement. The two fragments chosen were also perplexing, defied easily interpreted meanings, and reductive explanations, their *glow* drawing our attention to the ways in which they "resist analysis, refuse to render up its meaning" (MacLure, 2013, p. 661). Similar to Somerville's process in the 'Love your lagoons' project (2016), these two fragments were carefully chosen given they tended to "stand out from the large body of data seeming to command new and different forms of recognition about what it means to be human in the context of human entanglement in the fate of the planet" (p. 1162). We viewed/experienced the videos multiple times, engaged in writing, reflecting, and discussing our individual interpretations, often frustrated by the process and the need to repeat our sense-making processes.

As Brown, Dilley, and Marshall (2008) contest, "visual data should not be treated as a direct representation or reflection of 'reality' in any straightforward sense" (p. 2). Thus, the visual data gathered from the GoPro should not be viewed as a simple record of what occurred, but instead a "constructed representation that may be used to evoke a sense of subjective positions and experiences" (Brown et al., 2008, p. 2). From this perspective, the GoPro helped us to slow the process of rushed interpretations and explore again and again the entanglements of child/plastic/snow/GoPro, attending to both the visual, sounds, movements, and flow of all things that were in motion. In the next section, we offer our

interpretations of how we have come to understand the fragments (at the moment of writing) and the ways in which these insights might help open up pedagogical possibilities within environmental and sustainability education.

GoPro as Friend

The 'GoPro as friend' fragment of data vividly depicts one of the heaviest snowfalls of the winter season experienced during the third year of the project. The GoPro camera was worn as a chest harness on elastic suspender-like straps on the outside of children's snowsuits. Two layers of plastic covering protected the GoPro, the outer layer a vivid orange casing. In the initial video clip recorded this particular day, once outdoors the child (Danika³) moved her body in relation with the GoPro, pivoting in different directions to capture all that she saw.

*Snowy fields, ice crusted cars, mitts engulfed in a sea of white are all captured by the GoPro camera's lens. The camera moved in unison with Danika's commentary about another child arriving, the smaller children entering the fenced yard area, and so on. The snow was deep for these small children as well as inviting, Danika flopped into the fluffy snow then quickly rebounded to her feet stating, "I can't get the camera dirty". The nearby evergreen tree looms onto the GoPro view, and the tree, pinecones, camera, and child intra-act in a tugging and wrestling of the branches (Figure 3). Freeing a handful of pine cones from the tree, Danika crawled underneath the extended branches and into an intimate space that the children liked to inhabit prior to the trek to the woods. Here, she introduced the GoPro to the space and pine cones as well as some of the other children beneath the tree. The pine cones are tossed about into piles, rearranged, and tossed again. Other children pose in front of the GoPro, talking to the orange casing, ensuring the red light is blinking, or hold up their own materials to the camera's lens.
(Researcher's Interpretation of GoPro Recording)*

In this initial 20 second video clip we are invited into the motion of the GoPro, child, snow, evergreen, and pine cones. The sounds of a wrestling snowsuit, heavy breathing, crunching of pine cones, swish of tree branches, and scraping of snow and ice against materials. Silence marks the first seconds of this clip, and meanings are generated from the ongoing performance of human/nonhuman intra-action.

³ All children's names are pseudonyms.



Figure 3: Human/nonhuman Entanglements

Barad (2003) reminds us that “practices of knowing cannot be fully claimed as human practices, not simply because we use non-human elements in our practices but because knowing is a matter of part of the world making itself intelligible to another part” (p. 829). The sights, sounds, bodies, GoPro, materialities all entangle in this moment of dynamic intra-action. Each time we return to the video it affords us an opportunity to hear, see, and feel something else. The GoPro is entwined with the children’s bodies and the actions that unfolded were incumbent of bodies and cameras entangled with each other, humans and materials’ agentic forces each affecting the other. How does the GoPro help us to understand *things in-phenomena* (Barad, 2007)?

For the researcher, the video clip showcases the importance of these intra-actions among all matter and how the entanglements of human and more-than-human encounters are experienced and interpreted. The centrality of humans is reoriented here to consider the interdependence between the children and the more-than-human world (GoPro, snow, ice, pine cones, and so on). Barad (2007) reminds us of the inseparability of human/nonhuman, “practices of knowing and being are not isolable, they are mutually implicated. We don’t obtain knowledge by standing outside the world; we know because we are of the world. We are part of the world in its differential becoming” (p. 185). The study of children and material in phenomena, what they do together, is significant in advocating for more expansive ideas of environmental and sustainability education. This vignette offers a way of understanding the importance of encounters, the ways in which ecosystems might change and be affected from the intra-actions of these diverse entanglements. We concur with Powell and Somerville (2018) who speak about “moments where we find children completely immersed in activities that connect them to their bodies, to the world, and to its living creatures, and we see them connected with intensity, vitality, and sustained engagement” (p. 20). These crucial moments are important for researchers (and educators) to pay attention to, given that deep engagement can provoke opportunities for environment and sustainability learning. We advocate for complete immersion and intensity of these encounters between children and the world, entanglements that are often messy and complex.

Unsettling Encounters

The woods invited opportunities for running, obstacles to climb, pathways to navigate and materials to immerse oneself (e.g., open fields, trees, mud rolling, lake water, garbage collecting). With the GoPro harnessed over her bulky winter coat, Etta (a second participating child) was emboldened and raced to lead the group on their walk through the forest. As the GoPro operator, her voice was louder, booming, and authoritative as she made directives on where the group should go, what materials should be engaged with or ignored. The sound of Etta's heartbeat pounding loudly on the GoPro's recording reminds us of the physical affordances of the matter of the woods. The GoPro was central to the activities that unfolded, litter displayed before the camera lens, a bag shuffled in front of the lens, and various small hands (including Etta's) pushing the garbage into the bag. Etta's voice shouted loudly, "animals are allergic to garbage!" In a subsequent 20 second clip, a favorite spot appears before the camera lens and a brief moment of silence ensues.

The pristine lake is framed by the orange-reddish glow of an autumn marsh, a blue sky with fluffy white cumulus clouds, all reflected in the stillness of the water (Figure 4). The GoPro and child's body turn to pan the wooded area directly behind where multiple other plastic bottles litter the woods. Etta paused momentarily before forging into the woods to collect a plastic bottle. The leaf covered ground rising up in clear view of the lens, movements are unbalanced, a plastic bottle is grasped, first resisting Etta's efforts to untangle the bottle from its resting place amongst the underbrush. The sound of ice rattling can be heard on the video along with Etta's voice remarking "ice in it, ice in it". There was a crinkle of the plastic refuse bag, and her educator's comment, "oh you missed" as the plastic bottle resists being deposited into the bag and falls to the ground. Etta reaches down to retrieve it and successfully deposits into the bag the second time (Figure 4). A bright yellow plastic drinking cup with vivid purple letters is burrowed underneath a nearby tree, the GoPro and child crouch beneath the prickly branches of the tree that protect the cup and slowly retrieve the litter. A flash of yellow disappears into the refuse bag. (Researcher's Interpretation of GoPro Recording)



Figure 4: Unsettling Encounters in a Favored Spot

Human and material encounters with/between Etta and others were often reserved and detached; she was a somewhat reticent player in the woods with a preference for material encounters that were 'sanitized' (e.g., drawing materials brought to the woods from the classroom). The GoPro seemed to invigorate Etta, promoting an increased sense of her own agency, and ultimately contributing to her exemplifying a "more-than-human caring practice; where caring involves affecting and becoming affected" (Nxumalo, 2018, p. 155). Like the discarded plastic bottles in the woods, the refuse bag the teacher carries, and the orange covering of the GoPro camera itself were all made of disposable plastics. Thus, the plastics, like nature, acted as co-conspirators in the encounters. We recognize that Etta and all members of the group were not separate from nature, immune from the "environmental crisis we are facing" (Atkinson, 2015, p. 69). The matter in the woods can be described as "characteristically murky, massy, out-of-sight, elusive, and in process" (Horton & Kraftl, 2017, p. 4). Throughout our time in the woods, the co-presence of plastics, snow, lakes, trees, dead tadpoles, a rusted car, and so on were enmeshed with the children's lives, play, and experiences.

These materials took up residence and prominence in children's understandings and dynamic meaning-making processes. The children expressed an increased awareness and ethic of care toward living and nonliving matter, perhaps resultant from the entanglements of matter and bodies. Children became noticeably angered specifically when discovering garbage, blaming adults for the mismanagement of litter. Tangentially, litter was also incorporated into children's play, their art work, stories, construction projects, everyday conversations, and so on. For children, matter resisted simplified classifications; rather experiences and responses were generated from these child/material encounters. For example, the plastic bottle was conceived of as litter and, in a subsequent encounter, a snail's home; the orange plastic GoPro cover was a marker of importance, a protector of the camera while also entitling the child as 'movie maker'. Thus, materialities were resistant to any sort of idealization, simplified categorization, or romanticized notions of child in nature. By paying attention to these and similar unsettling encounters, we advocate that entanglements and reciprocal relations of human/nonhumans better characterize children's experiences of/with/in nature.

Intra-actions with the World

The Orange GoPro camera was agentic, affecting the ways in which children intra-acted with the world and those around them. The GoPro was physically embodied, while also taking up residence within the children's play, narrations, and experiences. The snow, pine cones, plastic bottles, and so on were important material encounters that shaped children's thoughts, actions, and ways of being in this world. Thus, young children's material encounters are complex, relational, and vibrant (Rautio, 2013). Additionally, and antithetical to the idea of 'nature as pure', separate from culture, somewhat abstract and devoid of agency, the socio-materialities in the woods reveal a messy, mundane, unsanitized, conflated co-existence of child/materialialities. This conflation and messiness can be challenging for researchers. The co-presence of a GoPro camera alongside all sorts of matter were enmeshed with the children's lives in the woods and serve as an important referent in understanding and challenging theories of environment and sustainability learning and teaching. Lenz Taguchi (2010) queries, "how can we teach without taking into account how learning is enacted in intra-action with the materials we handle, the environments we inhabit and the organization of time, places and spaces in our early childhood practices" (p. 61)?

This research helps to add to our understanding and conceptualization of how shifts in environmental and sustainability learning are possible when we think about the ways in which children are constituted *with*

and *by* their relations with the material world; entanglements between human and more-than-human world. By focusing on the encounters, the intra-actions (Bennett, 2010; Hultman & Lenz Taguchi, 2010; Rautio, 2013) of children and matter, more expansive ideas of learning and teaching can emerge. As researchers, “once tuned into these possibilities, opportunities to think collectively with children in the presence of human, more-than-human, and inanimate others present themselves” (Somerville, 2017, p. 409). The Orange GoPro camera was an agentic force throughout our process, helping to uncover the messiness of the entanglements between child/nature/GoPro. At times the embodied camera prompted children to demonstrate mutual reciprocity and care toward both human and more-than-human others; alternately the camera acted as a friend in the forest capturing small moments of entanglement. Ultimately, the study helped to highlight the mutuality, co-dependence, and uniform vulnerability of both the human and non-human worlds (Atkinson, 2015).

Reflecting with the Orange GoPro

The Orange GoPro camera sits quietly on a shelf in the researcher’s office, bits of dried dirt on its casing—a reminder of the time in the woods. The camera acts as a prompt to (re)consider the other complex stories of entanglement that have been left untold, *what else matters? What other ways of relating to the world are possible?* Matter is agentic, and clearly by examining the bodily, social, and affective intra-actions of nature/child/camera, as researchers and educators we can provide new, complex ideas of how to relate to the ‘natural world’, and children’s place within it. Taylor (2013) argues, “twenty-first children need relational and collective dispositions, not individualistic ones, to equip them to live well within the kind of world they have inherited” (p. 117). We, too, see this relationality and entanglement between the human and more-than-human as leading to new possibilities for environmental and sustainability learning and teaching.

References

- Anderson, D., Comay, J., & Chiarotto, L. (2017). *Natural curiosity: The importance of Indigenous perspectives in children’s environmental inquiry* (2nd ed.). Toronto, ON: University of Toronto.
- Änggård, E. (2016). How matter comes to matter in children’s nature play: Posthumanist approaches and children’s geographies. *Children’s Geographies*, 14(1), 77–90. doi: 10.1080/14733285.2015.1004523
- Atkinson, K. (2015). Wasps-bees-mushrooms-children: Reimagining multispecies relations in early childhood pedagogies. *Canadian Children*, 40(2), 67–79. doi: 10.18357/jcs.v40i2.15180
- Barad, K. (2007). *Meeting the universe halfway: Quantum physics and the entanglement of matter and meaning*. Durham, NC: Duke University Press.
- Barad, K. (2003). Posthumanist performativity: Toward an understanding of how matter comes to matter. *Signs Journal of Women in Culture and Society*, 28(3), 801–831. doi: 10.1086/345321
- Bennett, J. (2010). *Vibrant matter: A political ecology of things*. Durham, NC: Duke University Press.
- Bozalek, V., & Zembylas, M. (2016). Critical posthumanism, new materialisms and the affective turn for socially just pedagogies in higher education: Part 2. *South African Journal of Higher Education*, 30(3), 193–200. doi: 10.20853/30-3-652
- Brinkmann, S. (2014). Doing without data. *Qualitative Inquiry*, 20(6), 720–725.
- Brown, K. M., Dilley, R., & Marshall, K. (2008). Using a head-mounted video camera to understand social worlds and experiences. *Sociological Research Online*, 13(6), 1–10. doi: 10.5153/sro.1818
- Bruno, C. (2013). Between goddesses and cyborgs: Towards a shared desire for sustainability. In L. Skof, & E. A. Holmes (Eds.), *Breathing with Luce Irigaray* (pp. 101-112). London, UK: Bloomsbury.

- Caton, L., & Hackett, A. (2019). Head mounted, chest mounted, tripod or roaming? The methodological potentials of a GoPro camera and ontological possibilities for doing visual research with child participants differently. In N. Kucirkova, J. Rowsell, & G. Fallon (Eds.), *The Routledge international handbook of learning with technology in early childhood* (pp. 362-376). London, UK: Routledge.
- Common Worlds Research Collective. (2018). *Common worlds research collective website*. Available from: <http://commonworlds.net/>
- Cutter-Mackenzie, A., Malone, K., & Barratt Hacking, E. (Eds.). (2019). *Research handbook on childhood nature assemblages of childhood and nature research*. London, UK: Springer.
- Davis, B., & Waite, S. (2005). *Forest schools: An evaluation of the opportunities and challenges in early years. Final report. January 2005*.
- Duhn, I. (2012). Making 'place' for ecological sustainability in early childhood education. *Environmental Education Research*, 18(1), 19–29. doi: 10.1080/13504622.2011.572162
- Elliot, E., Eycke, K. T., Chan, S., & Müller, U. (2014). Taking kindergartners outdoors: Documenting their explorations and assessing the impact on their ecological awareness. *Children, Youth & Environments*, 24(2), 102–122.
- Haraway, D. (2008). *When species meet*. Minneapolis, MN: University of Minnesota Press.
- Haraway, D. J. (2016). *Staying with the trouble: Making kin in the Chthulucene*. Durham, NC: Duke University Press.
- Harwood, D., & Collier, D. (2019). "Talk into my GoPro, I'm making a movie!" Using digital ethnographic methods to explore children's sociomaterial experiences in the woods. In N. Kucirkova, J. Rowsell, & G. Fallon (Eds.), *The Routledge international handbook of learning with technology in early childhood* (pp. 49-61). London, UK: Routledge.
- Harwood, D., & Collier, D. R. (2017). The matter of the stick: Storying/re-storying children's literacies in the Forest. *JECL special issue: Early Literacy and the Posthuman: Pedagogies and Methodologies*, 17(3), 336–352. doi: 10.1177/1468798417712340
- Harwood, D., Facchini, N., Randall, H., Ratilainen, C. & Robitaille, S. (Fall 2017). "Good-bye Mr. Raccoon, we'll miss you!" Supporting children's explorations of life and death in a forest, *ECELinks*, 1, 35–46.
- Horton, J., & Kraftl, P. (2006). What else? Some more ways of thinking and doing 'children's geographies'. *Children's Geographies*, 4(1), 69–95. doi: 10.1080/14733280600577459
- Horton, J., & Kraftl, P. (2017). Rats, assorted shit and 'racist groundwater': Towards extra-sectional understandings of childhoods and social-material processes. *Environment and Planning D: Society and Space*, 36(5), 926–948. doi: 10.1177/0263775817747278
- Hultman, K., & Lenz Taguchi, H. (2010). Challenging anthropocentric analysis of visual data: A relational materialist methodological approach to educational research. *International Journal of Qualitative Studies in Education*, 23(5), 525–542. doi: 10.1080/09518398.2010.500628
- Lenz Taguchi, H. (2010). *Going beyond the theory/practice divide in early childhood education: Introducing an intra-active pedagogy*. New York, NY: Routledge.
- Louv, R. (2005). *Last child in the woods: Saving our children from nature-deficit disorder*. Chapel Hill, NC: Algonquin Books.
- MacLure, M. (2013). Researching without representation? Language and materiality in post-qualitative methodology. *International Journal of Qualitative Studies in Education*, 26(6), 658–667. doi: 10.1080/09518398.2013.788755
- Malone, K. (2015). Posthumanist approaches to theorising children's human-nature relations. In K. Nairn et al. (eds.), *Space, place and environment: Geographies of children and young people*, 3, 1-22. doi: 10.1007/978-981-4585-90-3_14-1.
- Malone, K. (2016). Reconsidering children's encounters with nature and place using posthumanism. *Australian Journal of Environmental Education*, 32(1), 42–56. doi:10.1017/ae.2015.48

- McCormick, R. (2017). Does access to green space impact the mental well-being of children: A systematic review. *Journal of Pediatric Nursing*, 37, 3–7. doi:10.1016/j.pedn.2017.08.027
- Micciche, L. (2014). Writing material. *College English*, 76(6), 488–505.
- Millei, Z., & Rautio, P. (2017). ‘Overspills’ of research with children: An argument for slow research. *Children’s Geographies*, 15(4), 466–477. doi: 10.1080/14733285.2016.1277182
- Nxumalo, F. (2018). Stories for living on a damaged planet: Environmental education in a preschool classroom. *Journal of Early Childhood Research*, 16(2), 148–159. doi: 10.1177/1476718X17715499.
- Nxumalo, F., & Cedillo, S. (2017). Decolonizing place in early childhood studies: Thinking with Indigenous onto-epistemologies and Black feminist geographies. *Global Studies of Childhood*, 7(2), 99–112. doi: 10.1177/2043610617703831
- O’Brien, L., & Murray, R. (2006). *A marvelous opportunity for children to learn: A participatory evaluation of Forest School in England and Wales*. Farnham, UK: Forestry Commission England. Retrieved from <http://www.forestresearch.gov.uk/fr/INFD-5Z3JVZ>
- O’Brien, L., & Murray, R. (2007). Forest School and its impacts on young children: Case studies in Britain. *Urban Forestry & Urban Greening*, 6(4), 249–265. doi: 10.1016/j.ufug.2007.03.006
- Plumwood, V. (2002). *Environmental culture: The ecological crisis of reasoning*. New York, NY: Routledge.
- Powell, S., & Somerville, M. (2018). Drumming in excess and chaos: Music, literacy and sustainability in early years learning. *Journal of Early Childhood Literacy*, 0(0), 1–23.
- Rautio, P. (2013). Children who carry stones in their pockets: On autotelic material practices in everyday life. *Children’s Geographies*, 11(4), 394–408. doi: 10.1080/14733285.2013.812278
- Ritchie, J. (2016). Qualities for early childhood care and education in an age of increasing superdiversity and decreasing biodiversity. *Contemporary Issues in Early Childhood*, 17(1) 78–91. doi: 10.1177/1463949115627905
- Rowell, J., & Harwood, D. (2015). “Let it go”: Exploring the image of the child as a producer, consumer, and inventor. *Theory into Practice*, 54(2), 136–146. doi: 10.1080/00405841.2015.1010847
- Slade, M., Lowery, C., & Bland, K. (2013). Evaluating the impact of Forest Schools: A collaboration between a university and a primary school. *Support for Learning*, 28(2), 66–72. doi: 10.1111/1467-9604.12020
- Somerville, M. (2016). The post-human I: Encountering ‘data’ in new materialism. *International Journal of Qualitative Studies in Education*, 29(9), 1161–1172. doi: 10.1080/09518398.2016.1201611
- Somerville, M. (2017). Thinking critically with children of the Anthropocene (un)learning the subject in qualitative and postqualitative inquiry. *International Review of Qualitative Research*, 10(4), 395–410. doi: 10.1525/irqr.2017.10.4.395
- St. Pierre, E. A. (2011). Post qualitative research: The critique and the coming after. In: N. K. Denzin and Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (4th ed.) (pp. 611–625). London: Sage.
- St. Pierre, E. A. (2019). Post qualitative inquiry in an ontology of immanence. *Qualitative Inquiry*, 25(1), 3–16.
- Taylor, A. (2013). *Reconfiguring the natures of childhood*. London, UK: Routledge.
- Taylor, A. (2017). Beyond stewardship: Common world pedagogies for the Anthropocene. *Environmental Education Research*, 23(10), 1448–1461. doi: 10.1080/13504622.2017.1325452
- Taylor, A., Blaise, M., & Giugni, M. (2013). Haraway’s ‘bag lady story-telling’: Relocating childhood and learning within a ‘post-human landscape’. *Discourse: Studies in the Cultural Politics of Education*, 34(1), 48–62. doi: 10.1080/01596306.2012.698863
- Taylor, A., & Giugni, M. (2012). Common worlds: Reconceptualising inclusion in early childhood communities. *Contemporary Issues in Early Childhood*, 13(2), 108–119. doi: 10.2304/ciec.2012.13.2.108

- Taylor, A., & Pacini-Ketchabaw, V. (2015). Learning with children, ants, and worms in the Anthropocene: Towards a common world pedagogy of multispecies vulnerability. *Pedagogy, Culture & Society*, 23(4), 507–529. doi: 10.1080/14681366.2015.1039050
- Tesar, M., & Arndt, S. (2016). Vibrancy of childhood things. *Cultural Studies/Critical Methodologies*, 16(2), 193–200. doi:10.1177/1532708616636144
- Tsing, A. L. (2015). *The mushroom at the end of the world: On the possibility of life in capitalist ruins*. Princeton, NJ: Princeton University Press.
- UN Environment. (2017). Annual report: Towards a pollution free planet. Available from: <https://www.unenvironment.org/annualreport/2017/index.php?page=0&lang=en>
- Wargo, J. M. (2018). Writing *with* wearables? Young children's intra-active authoring and the sounds of emplaced invention. *Journal of Literacy Research*, 50(4), 502-523.

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Outdoor Play and Learning (OPAL): Activating “Loose Parts” in Undisciplined Childhood Environments

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ABSTRACT

OPAL – Outdoor Play and Learning, in collaboration with Earth Day Canada, is a national program that encourages outdoor play in public schools across Canada. This paper focuses on the implementation of OPAL in an elementary school in Toronto. The initial implementation strategies of the program are discussed, which include efforts to create a play policy framework that centres childhood relations with the outdoors or ‘environment’. Employing posthuman and/or more-than-human frameworks, I examine the potential of OPAL to become a practice of learning *with* environments as opposed to learning *about* the environment. This is a significant shift in childhood thought and practice that requires serious consideration and pedagogical attention to how environmental education can move toward transdisciplinary practices in more-than-human worlds.

Keywords: OPAL (Outdoor Play and Learning), movement, loose parts, partial objects, matters of care, transdisciplinary

Humans are in (and of) an anthropogenic epoch that is experiencing extreme weather events, including mass flooding and fires. Despite these visible signs of climate change, in which the human has had a hand in making, the production of atmospheric poisons – in its many forms – will continue to extinct more than human bodies. In fact, on the very day I am writing this paper in Toronto, Canada and on the land of the First Nations, Inuit, and Metis peoples, the Canadian government has forcefully moved into unceded Wet’suwet’en territory in order to erect a proposed gas pipeline that adds fuel to the climate crisis and directly dismisses Indigenous rights and promises of reconciliation. The more-than-human consequence of this very pipeline will be made evident in a future time where multispecies flourishing will have paid the catastrophic price. Scholars across transdisciplinary fields, including the posthumanities, new materialisms, environmental humanities and multispecies studies, have put into question human relations with the earth, and further questioned what is at stake in a past and present time of careless destruction (Alaimo, 2016; Asberg & Braidotti, 2018; Braidotti, 2013; Barad, 2007; Bennett, 2010; Colebrook, 2016; Haraway, 2016; Neimanis, 2015; Kirksey, 2014; Puig de la Bellacasa, 2017; Tsing, 2015; Yussoff, 2017). Similarly, environmental education scholars and educators working with young children in schools and communities want to know how human relationships with the earth might be rethought in ways that do not privilege the anthropos, but rather how these relationships might attend to and care for all of the earth’s organisms (Lenz Taguchi, 2010; Lloro-Bidart, 2018; Malone, 2018; Murriss, 2016; Nxumalo, 2017; Rotas, 2015; Rautio, 2013; Taylor, 2016; Taylor & Pacini-Ketchabaw, 2015). Rather than dwell in crisis scenarios of hopelessness and despair, educators might seriously grapple with the following questions:

How might the child collectively build and sustain relationships of attention and care for more than herself? How might she come to create meaningful relations and, in turn, learn from these relationships that collectivities of attention and care sustain worlds worth living? The above questions demand modes of inquiry that attend to reciprocal relationships of potential and/or capture that emerge between an organism and its immediate environment (Gins & Arakawa, 2002; Stengers, 2010). It is imperative to investigate these modes of knowing and what such practices do. It is also important to ask the question of *how* researchers and teachers working with children and families might activate such possibilities of attention and care. How to trigger the potential for rethinking what it means to be human and the knowledge that comes to count? And what is at stake ethically, politically, and epistemologically when questions are shifted toward a speculative practice that re-invigorates a relational environmental education that is undisciplined? Moving toward this shift of attention, I centre OPAL (Outdoor Play and Learning) as a speculative practice that is grounded in outdoor play. Outdoor Play and Learning, in collaboration with Earth Day Canada, is a national program that encourages outdoor play in public schools across Canada. The program seeks to develop context specific outdoor play practices and relationships of attention and care with local and global environments. The play policy framework is grounded in the *United Nations Convention on the Rights of the Child (UNCRC) (Article 31 – The Child’s Right to Play)*. The Convention, including Article 31, demands that children be recognized as competent and capable citizens affecting their local and global environments.

Working with a public school in Toronto, Canada, and with children (ages 4-12), the initial implementation strategies of the program are discussed below, which include efforts to create a play policy framework that centres relations with the outdoors and/or immediate environment. The policy framework and implementation strategies were created by teachers, students, and administrators who foregrounded, Article 31, and who have been developing school-wide environmental education practices for the past five years. Drawing on the post methodologies of artist-architects Gins and Arakawa (2002), and the philosophies of Deleuze and Guattari (1977), I grapple with idealized notions of outdoor play as a practice that connects children to ‘nature’. The common trope of nature-based environmental education discourses that foreground the developing child as steward and saviour of the earth will, therefore, be disrupted (Nxumalo & Rotas, 2018). I employ Gins and Arakawa’s concept of the ‘architectural surround’ as a methodology and/or what they refer to as ‘procedural architecture’. I also draw on Deleuze and Guattari’s concept of the ‘partial object,’ and in doing so, I explore the posthumanist possibilities of OPAL and suggest that the practice informs early childhood environmental education through its valuation of collective learning processes of attention and care. Linking theory with practice/methodology, I grapple with the framework’s anthropocentric worldviews and simultaneously see the potential of OPAL to reinvigorate a relational environmental education that is undisciplined. I see the potential of OPAL to become a practice of learning *with* environments as opposed to learning *about* the environment.

In the concluding section of the paper, I turn to the more-than-humanist writing of Erin Manning (2018, 2007), Brian Massumi (2017), and Maria Puig de la Bellacasa (2011) to grapple with what it might mean to attend to and care for practices that are not valued in neoliberal structures of schooling and capitalist production. Taking up posthuman and/or more-than-human frameworks in relation to early childhood and the field of education (more broadly) is a significant and timely shift. It is this very emerging field of research that, within the last decade, labours to support transdisciplinary forms of thinking and doing that are necessary in times of environmental precarity, loss of species habitat and flourishing, and political inaction (Snaza et al., 2016; Snaza et al., 2014; Taylor & Hughes, 2016). Lastly, I offer a lingering note that is inspired by Stefano Harney and Fred Moten’s (2013) concept of ‘study’. The use of several concepts within this concept-dense paper is intentional as concepts speculate; and following Deleuze (1994), they force and/or activate thought. Thinking with Harney and Moten, for example, and the theoretical

concepts of post-thinkers, it is then, my intention to labour with these concepts and connect them to the material practice and policies of OPAL. In so doing, I work toward a significant shift in childhood thought and practice that requires serious consideration and pedagogical attention to how environmental education might move toward transdisciplinary practices that operate across theoretical and methodological boundaries that optimize new ways of being with animate and inanimate matter – matter that makes, depletes, and surrounds bodies. Practices like OPAL take seriously the capacity of the child to enact a relational ethics of attention and care through the very act of speculating and imagining objects and their environments as if they were otherwise.

OPAL: Outdoor Play and Learning

Children (4-12 years-old) spend most of their day at school and/or on school grounds. A child spends a minimum of 7 hours a day learning in a formal setting outside the family and home. The 1989 United Nations Convention on the Rights of the Child positions children as active thinkers and creators of worlds (inside and outside of the home). The Convention of 1989 and, specifically, Article 31 states that the child has the right “to rest and leisure, to engage in play and recreational activities appropriate to the age of the child and to participate freely in cultural life and the arts.” OPAL’s framework is grounded in Article 31 and aims to create opportunities for play that collectively emerge in outdoor spaces such as schoolyards and playgrounds. Emerging research suggests that lack of play and/or play deprivation is seriously affecting the physical health and social emotional relationship of children with local environments (Madsen et al., 2011; Pellegrini & Holmes, 2006). In Toronto schools there are several programs in place to reduce obesity in young children, increase physical activity, and promote well-being through play-based learning and movement practices, such as DPA (Daily Physical Activity) (see Ontario Ministry of Education, 2013, 2005). While recess and the daily school lunch hour allot time for unstructured play, over-engineered playgrounds that reduce creativity, problem-solving and risk-taking are mitigating factors in reducing the quality of play for children (Knight, 2016; Propa et al., 2017). In the initial phases of OPAL, in this particular Toronto school and community, a play policy framework was drafted in order to determine school beliefs and objectives of play. The school’s play policy included the following eight components (see Table 1.1 below).

Table 1.1
Eight components of school play policy

<i>SCHOOL PLAY POLICY</i>
1. Play is an integral part of a child’s healthy development
2. All children have the right to play
3. We value time and choice in play
4. Play is freely chosen, self-directed and intrinsically motivated
5. We balance the risks, challenges and benefits of play
6. Adults will support and encourage child-led play opportunities
7. We will provide an enriched space for children to be active and engaged in play
8. Outdoor play is an important part of our students’ environmental education

Teachers, in collaboration with consulting mentors from Earth Day Canada, drafted the policy with “the aim to create a school environment that strengthens student resiliency, imagination, creativity, and

learning” (School Play Policy, 2018). Importantly, teachers indicated that valuing play is a “commitment to ensuring the health and wellbeing of our communities and our planet for this generation and all generations to come” (School Play Policy, 2018). Further echoing the United Nations Convention on the Rights of the Child (1989), the school’s play policy included the following key points (see Table 1.2).

Table 1.2
Key points outlining the eight components of school play policy

KEY POINTS: SCHOOL PLAY POLICY	
PLAY POLICY	KEY POINTS
1. Play is an integral part of a child’s healthy development	By supporting play, we aim to create a school environment that strengthens student resiliency, creativity, and learning.
2. All children have the right to play	A commitment to children’s right to play is a commitment to ensuring the health and wellbeing of our communities and our planet for this generation and all generations to come.
3. We value time and choice in play	This policy will ensure sustainability of individual play and quality play provisions.
4. Play is freely chosen, self-directed and intrinsically motivated	Play is child-led, fun, and inclusive.
5. We balance the risks, challenges, and benefits of play	Our school acknowledges that taking risks is an essential step in the development of the child and thus, benefits the child’s social, emotional, and physical well-being. We will work from a shared understanding of risks vs. hazards (i.e., risks contain the possibility of harm that can be assessed and managed. Hazards cannot be managed and should be avoided.)
6. Adults will support and encourage child-led play opportunities	We see children as competent and capable.
7. We will provide an enriched space for children to be active and engaged in play	Our play landscape will allow for children to engage with and explore the environment.
8. Outdoor play is an important part of	We need to encourage inquiry and exploration

our students' environmental education

of the surrounding environment.

We share the responsibility for care and sustainability of our play practice and environment with students, staff, and community members.

The play policy centres the child; however, the key points and conversations that support the policy simultaneously value learning with environments and sustaining relationships of care. The play policy, in particular, offers an understanding of the child as an organism affecting and affected by its environment. Gins and Arakawa's (2002) methodologies are grounded in speculative architectural methods that recognize the human-child-body as an affective organism. They propose a speculative practice that is interested in what the organism can do and how one's immediate environment is always a potential site that supports new ways of being with animate and inanimate matter. Gins and Arakawa's speculative thought/practice stretches the boundaries of environmental education, as it urges a thinking that contemplates how children might engage with their local environment (i.e., architectural surround), and in ways that create and sustain relationships of attention and care.

The Organism and Its Environment

An architectural surround, as Gins and Arakawa put it, cannot be stepped into. Surrounds and/or environments must be relationally created using emergent methodologies and/or 'procedural architecture' (Gins & Arakawa, 2002). Procedural architecture is a practice of building and inhabiting environments that facilitate observation and learning (Keane, 2013). Its methods optimize engagement with materials and bodies in unexpected ways that produce new thought and action (i.e., meaning) (also see Pacini-Ketchabaw et al., 2016). Surrounds must resist being set up in advance in order to optimize the conditions for the tentativeness of emergent learning. Tentative spaces are where the child can "figure herself out" relationally (Gins & Arakawa, 2001, p. 44). A child, for example, can turn a forest or a desert into an architectural surround (Gins & Arakawa, 2002). Gins and Arakawa explain that it is how the child moves through the forest and desert (i.e., place and space) that will affect how and what materializes. They write:

Advancing and cutting paths, fending for herself and defending herself, she uses her limbs to erect enclosures or break them. That which has been architected blocks, guides, facilitates, comforts, contains or suggests containing. (Gins & Arakawa, 2002, p. 44)

Gins and Arakawa's architecture is similar to the perspective of the urban ecologist who contends that environments must be engaged as living landscapes that change with the passing of time as *chronos*, as well as in a temporal sense of time that is affected by the movement of bodies through space. Similarly, Nigel Thrift (2008), an urban geographer and a material-spatial thinker of cities, describes an environment as "that which surrounds" (p. 103). However, for its inhabitants, Thrift insists that "the environment does not consist of the surrounds of a bounded place but of a zone which their pathways are thoroughly entangled. In this zone of entanglement – this meshwork of interwoven lines – there is no inside or outside, only openings and ways through" (p. 103). Thrift describes this process as an 'ecology of life' that traces and continues to thread the meshwork of an entangled life. Importantly, the school's play policy outlined the capacity of the child to lead her own learning through inquiry and exploration. In addition to

the key points listed in *Table 1.2*, teachers began to understand their role in play differently. A shift from ‘supervisor’ of play toward ‘participant-observer’ that supports child-led play emerged. Teachers, for instance, understood their role as one that required being attentively “part of the environment, but available for students who require more [direct] support” (Play Policy, 2018). The following recommendations were made to support teachers shifting perceptions of play (see Table 2):

Table 2

How to supervise play in the school yard (Staff Fact Sheet – Earth Day Canada, 2018)

SUPPORTING PLAY

1.	WATCH	Get a good understanding of what is going on, and if students are managing risk independently.
2.	WAIT	Check-in with yourself, and weigh your fear against actual risk.
3.	MOVE CLOSER	Get another perspective. See if your presence cues children to manage the situation differently.
4.	INTERVENE <u>without</u> SHUTTING DOWN THE PLAY	Inform students about the risks and give guidelines for them to manage those risks. Negotiate with students the modifications to manage the risks (i.e., moving activity from asphalt to grass).

Resonating with Gins and Arakawa’s architecture, the school’s play policy sought to optimize the learning environment through actions and perceptions that affirmed the material and spatiotemporal movement of children in relation with their environment. In conversation with teachers leading to the final draft of the play policy, they insisted that the “play landscape should offer space for physical challenge, social gathering, creativity, and child-led play” (School Policy, 2018). The framework prompted teachers to rethink their supervisory role and relationship with the play landscape. In order to support OPAL practices, teachers felt that they need to “let go” and/or resist controlling how children played and what children played with. In hopes of changing how teachers support play (i.e., through co-shaping rather than instructing/directing play), the introduction of ‘loose parts’ was a key aspect to the success of the program.

Akin to Deleuze and Guattari’s concept of the ‘partial object,’ loose parts are non-representational figures. For instance, a partial object is a porous part of a machine that is itself dispersed (Deleuze & Guattari, 1987). Similarly, loose parts are natural or synthetic materials that are moveable and that can be combined and incorporated into outdoor play practices (Earth Day Canada, 2019). A cardboard box, watering hose, and a pile of dirt, sticks and stones are all considered loose parts. As Deleuze and Guattari note (1987), partial objects are “entryways and exits, impasses the child lives out politically, in other words, with all the force of his or her desire” (p. 13). Entangling these two concepts (i.e., partial objects and loose parts) with Gins and Arakawa’s methodology, I would like to emphasize that teacher-student-environment dichotomies and the routine logics of play must be rethought in ways, that again, engage the environment as an architectural surround. The surround must be inhabited, negotiated, and rebuilt in ways that change perceptions of what learning might look like. Routine logics as it relates to play, and in a North American context, include discourses that position play as merely ‘fun’. Another logic understands

play as that which must be closely monitored and directed by teachers for risk of children harming themselves or other children. What OPAL offers is a belief in the child to inquire, imagine, and enact a relational ethics of attention and care. OPAL practices are context specific and created collectively, centering the needs and desires of schools and communities. What the play policy framework potentializes is multiple ways of engaging and learning that recognize the relationship between child, environment, and loose parts/partial objects.

Partial Objects and Loose Parts

Consulting mentors initially provided the school with a few loose parts, such as industrial spools and rubber tires. These initial parts were used to generate momentum, encouraging staff, parents and school volunteers to gather upcycled materials from home or local businesses and organizations. Pool noodles, a watering hose, massive cardboard boxes, buckets, vibrant curtains, pots and pans, and tattered bedsheets were loose parts gathered by the school and community. The school was quite successful in gathering a great amount of loose parts. In order to house the objects, a medium-sized shipping container was purchased and placed on the schoolyard. Students engaged with loose parts in many different ways that included bending, twisting, knotting, stretching, ripping, stacking, and hitting (with the use of the foam pool noodles). Using these objects in creative ways, children built and dismantled forts, towers, houses, hammocks, and makeshift scooters and wheelchairs. The introduction of loose parts activated a surround that was less concerned with what to do with an object or what was expected of it or the child-body, but rather invited a way of being with the immediate environment and its parts in yet-to-be determined ways.



Figures 1 and 2. Children playing with loose parts (i.e., pylons and pool noodles) on the schoolyard. Medium-sized shipping container was purchased to house the loose parts.

Deleuze and Guattari's philosophies offer early childhood educators a creative toolbox of concepts to work/think with (see Jackson & Mazzei, 2012). Their concept of the partial object lends well to theorizing loose parts as material and spatial objects that co-shape the surround and/or learning environment through emergent collectivities of play. Thinking about loose parts as partial objects, Deleuze and Guattari warn that it is not enough to say that the object is a creative tool of expression. The object must be connected to the process of production, and for purposes, here, the process of play and how it works and

what it does. For instance, tables are not mere tables (Deleuze & Guattari, 1977). In relation to OPAL, an industrial spool is not merely a spool used for capitalist industry, or a loose part for play. Capital and nature are connective modes of process and production that plug into one and other (Deleuze & Guattari, 1977). Capital and nature move (Massumi, 2017). They are both partial processes, loose parts that inform how and what children learn. For example, the table or the spool become noticed and attended to. The loose part is perceived and connected to other partial objects to make meaning. The human is a relational species and a classed, sexed, and raced body that intends, attends and desires its environments for the basic needs of life and learning, and ultimately for the process of production. Loose parts are additive objects; that is, they already add to worlds, and they do not need the human to become additive. Partial objects are alive, and as Bennett (2010) notes, in the sense that they are co-constituting forces of agency that produce cultural, ethical, political and economic lives. The table, and similarly the spool, was never intended for a specific purpose either than for its (industrial) use. In the context of a schoolyard, however, the spool becomes an unfamiliar object, a tool of inquiry that for no other purpose was – through play – used to experiment with bodies in movement. It is this very speculative movement that shapes the surround. It challenges bodies to invent new modes of being with their surround that attend to and negotiate these very bodied differences (in culture and capital) with potential care and constraint.



Figures 3, 4 and 5. Child playing with an industrial spool that has been transformed into a ‘loose part’ to support the movement of her body across the time and space of the school playground.



Figures 6 and 7. Using various loose parts, children engage in OPAL practices.

How Movement Attends and Cares

In the introductory paragraph of Brian Massumi's (2017) book, *The Principal of Unrest: Activist Philosophy in the Expanded Field*, he writes that the "world has always been in movement" (p. 7). He notes the movement of human bodies out of and across continents, as well as the complexity of movements of return. The experience of mobile bodies across historical time puts into question what we think movement is which, as Massumi notes, is often thought of as displacement, or a change in location. And it is, indeed, this reality that is recounted in the many painful and violent stories of forced migration. Movement is also a qualitative change; it is a change of relation that further puts into question what the human thinks moves. Massumi (2017) writes:

[A]s the human entered into entanglements as it moved through history, it underwent changes in its very nature. It underwent qualitative change. Displacement is just the visible trail of qualitative changes in nature. Displacement is not just a shift of place. It's the index of a becoming: movement not just from one spatial location to another, but from one nature-changing entanglement to another. It's always a question of transformation – transformation in relation. (p. 8)

Massumi's conceptualization of movement rethinks issues of fixed identity and the relation of the modern human species to other human and/or not-quite deemed human, and more-than-human species and objects across time. Movement, from this perspective, is understood as that which moves with animate and inanimate bodies, and that which moves through, implicates, and transforms how the human species thinks and becomes. Partial objects such as the spool move because they are always implicated in a process of production and thus 'questions of transformation' (Massumi, 2017). Transformed into a makeshift wheelchair, the spool and its relation with this particular child activated qualitative modes of inhabiting a temporal environment that enabled her to explore different ways of moving/becoming through time, space, and place. The spool also put into question the privilege of able-bodiedness and dominant narratives of ability in early childhood play. It is not, however, the act of physical movement from one location of the playground to the other that is the point, here. The importance of partial objects and/or loose parts are the relations they enter into (i.e., relations of privilege and constraint). OPAL and its loose parts value qualitative change that transforms how the child sees and how she moves, and what that movement does and/or how it might be constrained. OPAL encourages risk-taking and resiliency; it challenges the emerging child to disrupt what should come next in attempts/intents to figure out what she does not know yet. What does this mean for early childhood environmental education practices? What do practices like OPAL and loose parts do to facilitate an attention and care for differences across places of displacement and settlement, and temporalities that shape how and who knows what it means to live with a planet and its inheritances? The latter question is of course complex and OPAL – in its early stages of development – can only grapple with these questions and the many questions that arrive in the midst of speculative play. Although, there are ways in which OPAL engenders an attention and care for a future time where humans and objects are not for mere labour and use, but rather themselves productive of relational transformations that attend and care with environments. OPAL reminds us that learning is a process of attention and care that potentializes a present and future time that rethinks normative relations with the earth and its objects.

OPAL, Attention, and Care

Manning (2007) describes the improvisational dance of the tango as a movement of attention. It is an ethico-political act that demands commitment to a process that challenges and becomes with other(s).

Resisting the dichotomous role of self/other, the dance is an improvised production that moves bodies to think, act, and feel (Manning, 2007). Thinking, acting, and feeling are part of a process of displacement that always starts over, leaving trace of both violence and care (Manning, 2007). Both are learned actions; just as is the desire to be attentive. To then become attentive is a learned practice that demands ethico-political modes of knowing beyond observational methods of documentation. Memory will also not suffice. Attention operates at the level of affect, which does not belong nor is it contained in the individual child. In the desire to affect and attend, Gins and Arakawa carve out a political space for non-individualistic politics (Manning, 2013). They understand that new modes of being and knowing are not possible if what teachers and children build from are pre-existing content and pedagogies. And so, to attend to the immediacy of environments is a practice of 'letting go'. It is a practice that learns to *let go* of routine choreographies that constrain how and what children know about environments that sustain their bodies. It requires, at this point in historical time, to grapple with curriculum documents and policies (at all levels of state) that constrain bodies to myopic discourses that dictate what objects are, who people are, and how to use them for purposes of capitalist production and consumption. The act of attention is a desiring act to think *with* environments and it is also a proposition for early childhood environmental practices to engage in 'matters of care' (Puig de la Bellacasa, 2011).

Feminist techno-scientist, Maria Puig de la Bellacasa (2011), proposes a rethinking of teaching and research practice. Instead of employing methods to prove facts about the earth – what Puig de la Bellacasa refers to as 'matters of fact' – teachers and researchers might reinvent practices with the goal of generating more caring relationships (i.e., 'matters of care'). Matters of fact would then be understood as matters of care. Puig de la Bellacasa describes her proposition as a speculative effort to think possible futures of non-violence. Engaging in matters of care in environmental education is thus not so much a practice that explains the 'construction of things' (Puig de la Bellacasa, 2011), and it certainly does not exclude such thought either. Engaging with care is one of many commitments to attend to 'neglected things' (Puig de la Bellacasa, 2011) like loose parts and unformed thought (i.e., thinking).

Puig de la Bellacasa (2011) asks: "How can an ethico-political concern such as caring affect the way we observe and present techno-scientific agencies, things and notions" (p. 86)? She argues that this is a question that goes beyond concerns of child and teacher dispositions. There is a tremendous amount of literature and best practices that centre child and student dispositions in the early childhood field, and in ways that require more complexity. Teachers need to think beyond human-centred dispositions and lessons that teach teacher candidates how to be 'professional'. Teacher candidates need to tell their own stories, and this, too, is part of the reflective process of becoming a teacher. However, the ethics and politics of caring must critically intervene and question how childhood stories are made and told (Puig de la Bellacasa, 2011; Haraway, 2016). Ways of telling, studying, representing, and playing have ethical and political consequences (Barad, 2007; Puig de la Bellacasa, 2011; Haraway, 1991; Haraway, 2016). I will return to the concept of study in the concluding section below. But, first, I want to emphasize that neglected stories, things, and parts tell teachers and researchers something very important. Neglected things tell them that they do not yet know the possibilities in letting go and making space for stories of resiliency and creativity and imagination. Early childhood classrooms and teacher preparation programs are not yet ready to attend to matters of care that activate the discarded, the neglected, the not told, not thought with, and the yet to be thought. It is time to attend, to care, and to study with partial objects and thus partial knowledges worth refiguring.

Study: A Lingering Note

Practices like OPAL are not necessarily connected to environmental education curriculum, and this is an important point. Environmental education must become undisciplined. It must shift from mere studies of fact toward a study that attends to how bodies assemble and engage in transformations and/or becomings with environments of potential and constraint. To study, and the way I am employing Stefano Harney and Fred Moten's (2013) concept, means something more-than what the 'good' student does in preparation for a test or exam. They demand that learning must not become an object of study where the child "dissolves into the student" (Harney & Moten, 2013, p. 109). Dissolving must be resisted. To study is a commitment to being in 'always already' (Barad, 2007) transformation with other bodies (Harney & Moten, 2013). It is an undisciplined, speculative practice of playing...

talking and walking around with other people, working, dancing, suffering, some irreducible convergence of all three...being in a kind of workshop, playing in a band, in a jam session, or old men sitting on a porch, or people working together in a factory – there are these various modes of activity. (Harney & Moten, 2013, p. 110)

What practices of study, care, and attention facilitate is a co-shaping of experience that reminds the pedagogue that the child is more-than. The child is an interstice of potential that textures experience and, therefore, expresses a quality that co-shapes environments (Manning, 2018). Understanding the child as a co-constituting species affirms the potential of the child to recognize the echoes of past and present stories that shape futures where what has been taught to be recognized is no longer the knowledge that forms (Manning, 2018). For environmental education practices in the early years, what I hope might form are these very undisciplined, speculative practices that dig deeper into the complexities of more-than-human worlds. For example, practices that are orientated toward activating architectural surrounds, rather than architecting student dispositions might become a starting point for seriously reconsidering childhood best practices and relationships to environments and climate. What the pedagogue thinks she knows is at stake, and this is indeed an uncomfortable state 'where shit breaks down' (Harney & Moten, 2013). Echoing Harney and Moten, and Deleuze and Guattari, it is perhaps a matter of objects breaking down before they can be recognized in another form. Perhaps it is this future form of study that will attend to the inheritances of the planet in ways orientated toward care and attention. Perhaps what is needed in the field of early childhood environmental education is for *shit to break down*.

References

- Alaimo, S. (2016). *Exposed: Environmental politics and pleasures in posthuman times*. Minneapolis, MN: University of Minnesota Press.
- Asberg, C., & Braidotti, R. (2018). (Eds.). *A feminist companion to the posthumanities*. New York, NY: Springer.
- Barad, K. (2007). *Meeting the universe halfway: Quantum physics and the entanglement of matter and meaning*. Durham: Duke University Press.
- Bennett, J. (2010). *Vibrant matter: A political ecology of things*. Durham, NC: Duke University Press.
- Braidotti, R. (2013). *The posthuman*. Cambridge, UK: Polity Press.
- Colebrook, C. (2016). 'A grandiose time of co-existence': Stratigraphy of the Anthropocene. *Deleuze Studies*, 10(4), 440-454.
- Deleuze, G., & Guattari, F. (1987). *A thousand plateaus: Capitalism and schizophrenia*. Minneapolis, MN: University of Minnesota Press.

- Deleuze, G., & Guattari, F. (1977). *Anti-Oedipus: Capitalism and schizophrenia*. New York, NY: Penguin.
- Earth Day Canada. (2019). *Outdoor Play and Learning Program for Schools*. Retrieved from: www.earthday.ca.
- Gins, M., & Arakawa, S. (2002). *Architectural body*. Tuscaloosa, AL: University of Alabama Press.
- Haraway, D. (2016). *Staying with the trouble: Making kin in the Chthulucene*. Durham, NC: Duke University Press.
- Haraway, D. (1991). *Modest_Witness@Second_Millennium.FemaleMan@_ Meets_OncoMouse™: Feminism and Technoscience*. New York: Routledge.
- Harney, S., & Moten, F. (2013). *The undercommons: Fugitive planning & black study*. Brooklyn, NY: Autonomedia.
- Jackson, A. Y., & Mazzei, L. (2012). *Thinking with theory in qualitative research: Viewing data across multiple perspectives*. New York, NY: Routledge.
- Keane, J. (2013). *An Arakawa and Gins experimental teaching space: A feasibility study*. *Inflexions*, 6, 234-249.
- Kirskey, E. (2015). (Ed). *Multispecies salon*. Durham, NC: Duke University Press.
- Knight, L. (2016). Playgrounds as sites of radical encounters: Mapping material, affective, spatial and pedagogical collisions. In N. Snaza, D. Sonu, S. Truman, & Z. Zaliwska (Eds.), *Pedagogical matters: New materialism and curriculum studies* (pp. 13-28). New York, NY: Peter Lang.
- Lenz Taguchi, H. (2010). *Going beyond the theory/practice divide in early childhood education: Introducing an intra-active pedagogy*. New York, NY: Routledge.
- Madsen, K. A., Hicks, K., & Thompson, H. (2011). Physical activity and positive youth development: Impact of a school-based program. *Journal of School Health*, 81(8), 462– 470.
- Malone, K. (2018). *Children in the Anthropocene: Rethinking sustainability and child friendliness in cities*. London, UK: Palgrave Macmillan.
- Manning, E. (2018). Me lo digo un pajarito: Neurodiversity, Black life, and the university as we know it. *Social Text* 136, 36(3), 1-24.
- Manning, E. (2007). *Politics of touch: Sense, movement, sovereignty*. Minneapolis, MN: University of Minnesota Press.
- Massumi, M. (2017). *The principles of unrest: Activist philosophy in the expanded field*. London, UK: Open Humanities Press.
- Morris, K. (2016). *The posthuman child: Educational transformation through philosophy with picturebooks*. Routledge Contesting Early Childhood Series. London: Routledge.
- Neimanis, A. (2013). Feminist subjectivity, watered. *Feminist Review*, 103, 23-41.
- Nxumalo, F., & Rotas, N. (Eds.). (2018). Interdisciplinary dialogues in environmental education research. *Journal of Childhood Studies*, 43(1), 1-3.
- Nxumalo, F. (2017). Stories for living on a damaged planet: Environmental education in a preschool classroom. *Journal of Early Childhood Research*, 1–12.
- Ontario Ministry of Education. (2005). *Daily physical activity in schools: Grades 1-3*. Ontario, CA: Queen's Printer.
- Ontario Ministry of Education. (2013). *Ontario early years policy framework*. Ontario, CA: Queen's Printer.
- Pacini-Ketchabaw, V., Kind, S., & Kocher, L. (2016). *Encounters with materials in early childhood education*. New York, NY: Routledge.
- Propa, F. A., Mitra, R., & Simon, B. (2017). What makes them happy? Exploring the relationship between outdoor play environment at school and children's happiness and wellbeing in Toronto, Canada. International Play Association Triannual Conference, Calgary, September, 2017.

- Pellegrini, A., & Holmes, R. (2006). The role of recess in primary school. In D. Singer, R. Golinkoff, & K. Hirsh-Pasek (Eds.), *Play = learning: How play motivates and enhances children's cognitive and social-emotional growth*. Oxford: Oxford University Press.
- Puig de la Bellacasa, M. (2017). *Matters of care: Speculative ethics in more than human worlds*. Minneapolis, MN: University of Minnesota Press.
- Puig de la Bellacasa, M. (2011). Matters of care in technoscience: Assembling neglected things. *Social Studies Science*, 41(11), 85-106.
- Rautio, P. (2013). Children who carry stones in their pockets: On autotelic material practices in everyday life. *Children's Geographies*, 11, 394–408.
- Rotas, N. (2015). Ecologies of praxis: Teaching and learning against the obvious. In N. Snaza & J. Weaver (Eds.), *Posthumanism and educational research* (pp. 91-103). New York, NY: Routledge.
- School Play Policy. (2018). *Rationale and reasons*. In collaboration with Earthy Day Canada and OPAL.
- Snaza, N., Sonu, D., Truman, S. & Zaliwska, Z. (2016). (Eds.), *Pedagogical matters: New materialisms and curriculum studies*. New York, NY: Peter Lang.
- Snaza, N., Appelbaum, P., Bayne, S., Carlson, D., Morris, M., Rotas, N., Sandlin, J., Wallin, J., & Weaver, J. (2014). Toward a posthumanist education. *Journal of Curriculum Theorizing*, 30(2), 39-55.
- Stengers, I. (2010). *Cosmopolitics I*. Minneapolis MN: University of Minnesota Press.
- Taylor, C. (2016). Edu-crafting a cacophonous ecology: Posthumanist research practices for education. In C. Taylor & C. Hughes (Eds.), *Posthuman research practices in education*. Basingstoke: Palgrave MacMillan.
- Taylor, C., & Hughes, C. (2016). *Posthuman research practices in education*. Basingstoke: Palgrave MacMillan.
- Taylor, A., & Pacini-Ketchabaw, V. (2015). Learning with children, ants, and worms in the Anthropocene: Towards a common world pedagogy of multispecies vulnerability. *Pedagogy, Culture & Society* 23(4), 507–529.
- The United Nations. (1989). Convention on the rights of the child. *Treaty Series*, 1577, 3.
- Thrift, N. (2008). *Non-representational theory: Space, politics, affect*. New York, NY: Routledge.
- Tsing, A.L. (2015). *The mushroom at the end of the world*. Oxford, UK: Princeton University Press.
- Yusoff, K. (2017). Epochal aesthetics: Affectual infrastructures of the Anthropocene. *e-flux architecture*. (www.e-flux.com).

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