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Common Worlding Pedagogies in Early Childhood Education: Storying situated processes for living and learning in ecologically precarious times

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A thesis submitted in partial fulfillment of the requirements for the Doctor of Philosophy degree
in Education

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Abstract

As a society, we must prepare children for unknown futures—to live well amid the ruinous effects of ongoing human-induced climate change and the growing waste crisis. Given these enormous challenges, early childhood education for the 21st century requires a significant shift in pedagogical and curricular approaches that are both creative enough and receptive enough to meet them. This integrated thesis is based on a project that engages with the problematics that surround educating future generations faced by ecological devastation. I do this by engaging with common worlding pedagogies in early childhood education, in two different classrooms in two different locations. In the first classroom, an educator, young children, and I focused on noticing and responding to the liveliness of seen and unseen more-than-human others that live(d) in the nearby forest we visited regularly. In the second classroom, the researchers, educators, and children focused on plastic waste, and how keeping plastics “in sight and in mind” allowed us to notice plastic’s liveliness. In this dissertation that comprises three articles, I offer complex, creative, and situated pedagogies together with speculative storying of entangled and embodied encounters to rethink the pedagogical and curricular processes that took place. In article 1, I introduce ghosting pedagogies and speculative stories to reveal how stories of the shadowy and mythical disrupted child-centered approaches to early childhood environmental education. In article 2, I describe how inundating an early childhood classroom with excess plastic waste provoked a kind of governance that troubled the roles of educator and child, as well as the very materiality of the classroom. Article 3 stories how plastic’s excess challenged the management approach to waste and created otherwise possibilities for responding to the overwhelming plastics crisis. The research presented in each of the three articles is not intended to provide a prescriptive curricular blueprint for early childhood education but rather to provide context-specific snippets of how common worlding pedagogies offer enduring approaches that respond to the situated messy and damaged common worlds in which children, educators, and more-than-human others live.

Keywords:

Summary for Lay Audience

As a society, we must prepare children for unknown futures—to live well amid the ruinous effects of ongoing human-induced climate change and the growing waste crisis. Given these enormous challenges, early childhood education for the 21st century requires a significant shift in pedagogical and curricular approaches that are both creative enough and receptive enough to meet them. This integrated thesis is based on a project that engages with the problematics that surround educating future generations faced by ecological devastation. I do this by engaging with common worlding pedagogies in early childhood education, in two different classrooms in two different locations. In the first classroom, an educator, young children, and I focused on noticing and responding to the liveliness of seen and unseen more-than-human others that live(d) in the nearby forest we visited regularly. In the second classroom, the researchers, educators, and children focused on plastic waste, and how keeping plastics “in sight and in mind” allowed us to notice plastic’s liveliness. In this dissertation that comprises three articles, I offer complex, creative, and situated pedagogies together with speculative storying of entangled and embodied encounters to rethink the pedagogical and curricular processes that took place. In article 1, I introduce ghosting pedagogies and speculative stories to reveal how stories of the shadowy and mythical disrupted child-centered approaches to early childhood environmental education. In article 2, I describe how inundating an early childhood classroom with excess plastic waste provoked a kind of governance that troubled the roles of educator and child, as well as the very materiality of the classroom. Article 3 stories how plastic’s excess challenged the management approach to waste and created otherwise possibilities for responding to the overwhelming plastics crisis. The research presented in each of the three articles is not intended to provide a prescriptive curricular blueprint for early childhood education but rather to provide context-specific snippets of how common worlding pedagogies offer enduring approaches that respond to the situated messy and damaged common worlds in which children, educators, and more-than-human others live.

Co-Authorship Statement

I am responsible for conceptualizing and writing all chapters in this thesis. In Chapter 3 (Article 2) *Thinking with Plastics: Common Worlds Waste Pedagogies Disrupt the Early Childhood Classroom*, I was the principal contributor and lead author; 95% of the literature review and writing is mine; however, it was important that I recognize as coauthors the educators whom I worked alongside in the classroom. In article 3, *Restorying Young Children's Relations With Plastics Through Excess: Common Worlding Waste Pedagogies*, I was the principal contributor and lead author. The research and writing of this paper were done with coauthor Veronica Pacini-Ketchabaw. I assumed responsibility for 75% of the article and led the following aspects: conceptualization, primary research, and preparation for publication.

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Chapter 1

1 Introduction

Environmental “F Bombs”

Fracas (noisy disturbance)

Fractal (fluid turbulence)

Fracking (unearthing)

Fracture (breaking)

Fractious (unruliness)

Human-induced climate change and epic amounts of waste are wreaking havoc on the earth. During what is commonly known as the Anthropocene epoch (Crutzen, 2002; Crutzen & Stoermer, 2000), human impact is considered to have irreversibly altered Earth’s ecosystems and geological formations (Corcoran et al., 2014; Zalasiewicz, Williams, Haywood, & Ellis, 2011; Zalasiewicz, Waters, Williams, et al., 2015; Zalasiewicz, Waters, Ivar do Sul, et al., 2016). As continuous ruinous human action races towards a critical tipping point in 2050 (e.g., Government of Canada, 2013; Hoornweg & Bhada-Tata, 2012; Malhi, 2017; Marchal et al., 2011; OECD, 2012; 2018), our youngest citizens are poised to inherit this global disaster. We, as a society, must prepare children for unknown futures and equip them as best as we can to live well amid the ruinous effects of ongoing environmental “F” bombs. In education, educators and children must learn what ethical and response-able movements are necessary to meet the challenges of the future.

As global organizations such as the United Nations Environment Programme (UNEP), (2018), the Organisation for Economic Co-operation and Development (OECD 2012; 2018), and UNESCO (1978, 2008, n.d.) reiterate concerns about environmental (un)sustainability, many researchers have turned to environmental education as a potential point for environmental activism (e.g., Caiman & Lundegard, 2014; Elliott & Davis, 2009; Hird, 2013; Sund, 2016; Taylor, 2013; Madden & Liang, 2017). Although the call for environmental education began to surface in the early 1960s (Gough, 2013;

Kopnina, 2012), it was UNESCO's *Tbilisi Report* (1978) followed by the UNEP's (1988) *Report of the World Commission of Environment and Development*, led by Brundtland, that pushed environmental education to the forefront. UNESCO (n.d.) played a key role in thrusting education for sustainability to the forefront by declaring 2005–2014 the decade of education for sustainable development and 2030 the target date for universal commitment to the goal of “education for sustainable development and global citizenship” (UNESCO, 2005, n.d.). As Pramling Samuelsson and Park (2017) note, “researchers agree that a path to sustainability depends on how societies educate the next generation” (p. 277).

In this article-based dissertation I engage with the problematics that surround educating future generations in the midst of ecological devastation. I do that by engaging with common worlding pedagogies in early childhood education, in two different classrooms in two different locations. In the first classroom, an educator, young children, and I focused on noticing and responding to the liveliness of seen and unseen more-than-human others that live(d) in the nearby forest we visited regularly. In the second classroom, the researchers, educators, and children focused on plastic waste, and how keeping plastics “in sight and in mind” (Hird, 2013 p. 107) allowed us to notice plastic's liveliness. In both sites we committed to inviting slow processes that pay attention and respond to the everyday mundane moments that emerge within children's encounters with more-than-human others. At each site, the generative and imaginative pedagogies that were created were designed to notice and respond to the more-than-human others that children and educators share worlds with. The pedagogies emerged from an ongoing circular cycle of pedagogical documentation, (photographs, video, field notes, and conversations with children and educators), critical reflection and interpretation. This dissertation provides examples of the situated and emergent work required to shift pedagogical and curricular approaches to learning from child-centered and hyper-separate from being in the world to, human and more-than-human relational processes of living and learning in common worlds.

The dissertation consists of an introduction and conclusion and three stand-alone articles. This introductory chapter first summarizes the three articles at the heart of the

dissertation. Next, I give a broad overview of where I position myself and my research, the questions that guide my work, the theoretical and methodological underpinnings of my work, and the methods I employed in my research. The three articles follow in Chapters 2–4, and in the concluding chapter, I discuss the articles and offer some speculative wonderings and ongoing inquiries.

1.1 Article summaries

Because my dissertation is article based, I have already begun disseminating my research through peer-reviewed publications, academic conferences, and scholarly blog posts. All three articles are in active stages of publication with open-access, double-blind, peer-reviewed journals. Article 1, “Ghosting Pedagogies: Disrupting Developmental Narratives in Early Childhood Environmental Education” (MacAlpine, accepted) is a solo piece that has been accepted (with revisions) in the journal *Contemporary Issues in Early Childhood*. Article 2, “Thinking with Plastics: Common Worlds Waste Pedagogies Disrupt the Early Childhood Classroom” (MacAlpine et al., 2020) was published in *eceLINK*. Article 3, “Restorying Young Children’s Relations with Plastics Through Excess: A Common Worlding Inquiry,” is co-authored with Dr. Veronica Pacini-Ketchabaw and was submitted to the journal *Pedagogy, Culture, and Society*.

“Ghosting Pedagogies: Disrupting Developmental Narratives in Early Childhood Environmental Education” (MacAlpine, accepted) offers situated and speculative stories of the real and imaginary relations that five young children, an educator, and a researcher have with the unseen critters that live in a small, ever-shrinking forest next to the child care centre. Ghosting pedagogies create the conditions for attending to what is not visible but is present. Storying the particular and peculiar interactions that emerge between children and the tracks and traces of more-than-human others (wind, owl feather, critter tracks, etc.) opens up the possibility for telling different kinds of lively, vibrant, and precarious stories of living and learning with more-than-human others in times of climate change and environmental degradation.

“Thinking with Plastics: Common Worlds Waste Pedagogies Disrupt the Early Childhood Classroom” (MacAlpine et al., 2020) tells of how inundating the early

childhood classroom with excess plastics disrupts governance of an early childhood classroom. The slow processes of noticing and documenting story how excess plastics invite us (children, educators, and researchers) to respond to its presence. Through the ongoing reflective and interpretive process of pedagogical documentation, the complex and entangled body-plastic encounters are storied as mutually interactive relations. As such, plastics' agentic vitality disrupts dominant discourses of childhood, the role of the educator, and the very materiality of the classroom.

“Restorying Young Children’s Relations with Plastics Through Excess: A Common Worlding Inquiry” (MacAlpine & Pacini-Ketchabaw, submitted) puts common worlding waste pedagogies and the concept of excess together to restory children’s relations with plastics. By exaggerating the presence of plastic’s excess in the classroom, the researchers and educators create otherwise possibilities for children to respond to the overwhelming plastics crisis. As excess plastics infiltrate the classroom, new relations between children and plastics emerge within particular and peculiar body-plastic entanglements.

1.2 Situating my research

My research is speculative and draws on and stories the everyday encounters children and educators have with more-than-human others. To “stay with the trouble” (Haraway, 2016) of living and dying in situated worlds requires that we (humans) must stay with the mess and ambiguity, to “relate, know, think, world, and tell stories *through* and *with* other stories, worlds, knowledges, thinkings, yearnings” (Haraway, 2016, p. 97, emphasis added). This is not easy or finite work but rather situated and fluid. As such, my research in all three articles is guided by three overarching questions:

- What pedagogies and curricular processes might emerge when more-than-human others become visible in early childhood settings?
- How might emerging pedagogies and curricular processes reconfigure early childhood educators’ relations with more-than-human others?

- How might emerging pedagogies and curricular processes reconfigure children's relations with more-than-human others?

These questions are intended to be broad and open ended to allow for the situated and speculative wonderings necessary to rethink environmental education in the midst of ecological devastation.

The body of work presented here is a culmination of four years of working alongside educators, children, and the more-than-human others we share worlds with. The premise for this work is based in a deeply rooted belief that learning is informed through the collective process of being and becoming with others in “common worlds” (Latour, 2004; Taylor, 2013) where humans are neither exceptional nor hyper-separated from the rest of the world. My research is part of two large projects funded by the Social Sciences and Humanities Research Council of Canada (SSHRC) focusing on critical approaches to environmental education in the field of early childhood education. Both SSHRC projects consist of multiple sites across the globe (Canada, Ecuador, Britain, United States, and Australia) with each site referred to as a collaboratory (hybrid concept of collaboration and laboratory as sites of learning). The two sites where my research took place were located within two Canadian collaboratories.

Article 1 is broadly connected to the Climate Action Network: Exploring Climate Change Pedagogies with Children (CAN Project; Pacini-Ketchabaw, 2017a) and, more specifically, to the collaboratory that explores and articulates children's interactions with trees and animals—Witnessing the Ruins of Progress (<http://www.witnessingruinsofprogress.climateactionchildhood.net/>). The CAN Project is the first phase of a long-term partnership of postsecondary institutions, community organizations, and professional associations to create research capacity and mobilize knowledge to professionals, policy makers, and the broader public on children's responses to climate change. In keeping with the CAN Project and the collaboratory where my research takes place, my first article focuses on educators' and children's interactions with the seen and unseen critters that live(d) in the nearby forest we visit.

Articles 2 and 3 are broadly connected to Re-thinking the Rs Through Arts: Transforming Waste Practices in Early Childhood Education (Waste Project; Pacini-Ketchabaw, 2017b) and, more specifically, to the collaboratory exploring and articulating educators' and children's relations with plastic waste—Early Childhood Waste Collaboratory (<http://livingwithplastics.climateactionchildhood.net/>). In keeping with the overall focus of the Waste Project, both articles critically analyze waste practices in early childhood education that focus on rethinking recycling and developing new theoretical and empirical directions for the field of early childhood education that rethink waste practices and refigure young children's relationships with waste. Articles 2 and 3 both offer the concept of excess to rethink early childhood waste practices. In Article 2, excesses of plastic disrupt the classroom, while in Article 3 common worlding waste pedagogies and the concept of excess together restory educators' and children's relations with plastic.

My research is situated within the common worlds framework (Pacini-Ketchabaw & Taylor, 2015; Taylor, 2013) that emphasizes that knowledge production is always woven within collective relational becomings with/in the world. Here learning focuses on thinking *with* rather than thinking *about* others—human and nonhuman (Taylor, 2013, 2017). As a member of the Common Worlds Research Collective (<https://commonworlds.net/>) my work in both sites contributes to a growing body of empirical research that is concerned with our (human) relations with the more-than-human world. Within the collective, early childhood scholarship focuses on children's relations within more-than-human worlds, particularly children's relations with place (e.g., Argent et al., 2017; Hamm & Boucher, 2017; Land et al., 2019; Pacini-Ketchabaw, 2013; Yazbeck & Danis, 2015), children's relations with other species (e.g., Drew & MacAlpine, 2020; Nelson et al., 2018; Nxumalo & Pacini-Ketchabaw, 2017; Pacini-Ketchabaw & Nxumalo, 2015; Russell, 2019; Taylor & Pacini-Ketchabaw, 2015, 2017, 2019), and children's relations with materials (e.g., Hodgins, 2015; MacAlpine, 2020; Pacini-Ketchabaw, Kind, & Kocher, 2016; Rautio, 2013). While the collective is diverse, spanning the fields of childhood studies, early childhood education, children's and more-than-human geographies, environmental education, feminist new materialisms, and Indigenous and environmental humanities, my research straddles early childhood education and environmental education and draws from feminist new materialism.

In the context of this dissertation, I position myself as researcher and pedagogist whose work blurs along the edges of theory and practice. I bring to my work an eclectic background that draws on my professional and volunteer experience as a registered early childhood educator and a longtime volunteer within primary school and regional and national science fair communities mentoring educators, families, children, and youth. My research is informed by my experiences alongside a deep belief that no one's story should be valued over another's and that the stories we carry and the relations we have impact how we live and learn.

Just as I acknowledge that all stories matter, I must also acknowledge that my implication in the stories of others is not innocent. I am complicit in the ongoing legacy of settler colonialism and the inseparability of pastpresentfuture violences that continue to live on (Tuck & Yang, 2012). I have lived and worked on the stolen lands of many Indigenous peoples and today is no different. The places where I live and work now are located on the traditional lands of the Anishinaabeg, Haudenosaunee, Attawandaran (Neutral), and Wendat peoples, and although the research I am engaged in espouses the ethical and response-able processes of being and becoming in common worlds with more-than-human others, my best of intentions are muddied within the privilege I continue to have as white colonial settler, which has come at a cost to the Indigenous community and the local animals and plants that once lived on the land my ancestors stole. While the work I share here is intended to be generative and inclusive, it inherently comes at the cost of others and therefore can never be deemed pure or innocent (Shotwell, 2016).

1.3 Environmental research in early childhood education

Much of the empirical research on educator practice within the field of early childhood education continues to focus on child-centered approaches to environmental sustainability and stewardship (Davis, 2009; Inoue et al., 2016; Sauv , 2005; Somerville & Williams, 2015). As a prescriptive approach to "effective and intentional instruction" (Blanchard & Buchanan, 2011, p. 233), environmental education in the early years classroom focuses on teaching specific skills children will need to become competent environmental stewards. Whether through standardized curriculum (Eames et al., 2008), developing waste management pedagogies (see Caiman & Lundegard, 2014; Madden &

Liang, 2017; Ogelman, 2012), or teaching effective skills for managing and recycling waste (Arlemalm-Hagser & Sandberg, 2011; Cutter-Mackenzie & Edwards, 2014; Inoue et al., 2016), the focus in the classroom is human(child)-centric and the purpose is to solve environmental sustainability issues. For example, Mackey (2012) describes children learning how to care for their environment through acts such as sorting recyclable materials to reduce waste volumes in school, “to protect what is precious to us in *our* world” (p. 482, italics added). Eames, Cowie, and Bolstad (2008) report that, when asked, teachers say they view environmental education as important for “developing an awareness and knowledge [about] why we must look after *our* environment” (p. 41, italics added). If, as environmental scholars have indicated, stewardship skills such as gathering plastics for recycling or picking up garbage to clean forest areas is proving to be ineffective for understanding the complexity surrounding environmental issues (see Hird, 2012, 2013; Ma & Hipel, 2016), then there is a need to shift pedagogical and curricular approaches that focus on teaching these stewardship skills in the name of long-term environmental sustainability.

Continued research within the broader field of environmental education suggests that there is a disconnection between what happens in the world and environmental education discourses (e.g. Gough & Gough, 2016; Hursh et al., 2015; Jickling & Wals, 2008; Kopina, 2012). Gough and Gough state, “environmental education struggles to come to pedagogic terms with the ‘narrative complexity’ generated by the categorical ambiguities and entanglements that now attend to such concepts as self, culture, nature, and artefact” (p. 34). Of particular concern is the neoliberal narrative that emphasizes sustainable development and thereby shifting the focus of environmental education away from the key relational component between humans and the environment (Kopina, 2012; 2015). A reconnection emphasizing the inextricability of humans from the environment requires a shift in narrative away from neoliberal subjectivities and toward inter-relational subjectivities that redefine subject formation (Hursh et al., 2015).

1.4 Conceptual framework

While developmental discourses continue to predominate in the field of early childhood education, the emergence of common worlds research is now challenging child-centered

approaches that focus on learning as an individual cognitive process. My work is situated within the common worlds theoretical framework. Within this framework, learning is understood as inherently relational (Taylor, 2013, 2017, 2018; Taylor & Giugni, 2012; Taylor, Pacini-Ketchabaw, & Blaise, 2012). The empirical research I draw from highlights alternative pedagogical narratives that support young children's learning within everyday encounters they share with more-than-human others (e.g., Duhn, 2012; Iorio et al., 2017; Lakind & Adsit-Morris, 2018; Nelson et al., 2018). Common worlds pedagogies allow for "all that is human, non-human, organic, inorganic, alive, dead, yet to materialize, the virtual, and the real, to be a part of the practice that is 'creative' knowledge-making" (Blythe & Meiring, 2018, p. 107). Common worlds pedagogies "open up to a new form of political enquiry which attends to the interconnectedness of the human and more-than-human world" (Taylor, 2011, p. 431) and are necessarily complex and relational in orientation.

To create the conceptual and pedagogical workspace required for my research, I also draw from the work of feminist new materialism scholars (e.g., Alaimo & Hekman, 2008; Haraway, 1988, 2008, 2016; Hawkins, 2001, 2009, 2010; Plumwood, 2002, 2008; Stengers, 2018; Tsing, 2015; Tsing et al., 2017). Each scholar argues the impossibility of separating nature and culture and the social and material. Through the deconstruction of dichotomies that hyper-separate human/nonhuman, self/other, subject/object, organic/inorganic, animate/inanimate, each of these theorists support relational ontologies whereby interdependent, co-constitutive relations between humans and more-than-human others (organic and nonorganic, lively and inert) are intricately entangled in the processes of being and becoming in common worlds (Latour, 2004; Plumwood, 2002). In other words, relational ontologies do not privilege human beings or other earthly beings or the spaces and places they live. Instead these scholars argue for the dissolution of binaries that position the human (self) in a hierarchical position over the more-than-human (other) and instead collapsing dichotomies and blurring natureculture.

This blurring is essential for supporting my work in all three articles. For example, in Article 1 I draw on Anna Tsing's (2015) work that stories the entangled worlds of mushrooms and humans to reimagine the forest that the educator, children, and I visit as a

lively communal space that is both seen and unseen. Tsing argues that “ways of life come together, [as] patch-based assemblages . . . show[ing] scenes for considering livability—the possibility of common life on a human-disturbed earth” (Tsing, 2015, p. 163). In Article 2, I draw on Donna Haraway’s (2016) work to attend to the discomfort that plastic’s presence provokes. I put the discomfort alongside Haraway’s question “What kind of caring and response-ability could unexpected collaboration evoke?” (p. 22) to notice and respond to body-plastic encounters differently. And in Article 3 I draw on Stengers’ (2018) and Haraway’s (2016) notion of slow scholarship to guide my work in the synthetic classroom. In particular, I emphasize the importance of speculation to address the unknown and unpredictable effects of living in plastic worlds.

In collapsing these binaries, “nature is no longer a passive social construct but rather an agentic force that interacts with and changes the other elements in the mix including the human” (Alaimo & Hekman, 2008, p. 7). Decentering the human and deconstructing the self/other and subject/object binaries supports the substance of my position put forth in this dissertation—that knowledge production and subject formation are always relational processes. In other words, humans and nonhumans are intimately and inextricably entangled in the fray—the messy relational becomings in situated collective and shared common worlds. Within the common worlds framework, knowledge production is always an ethically, politically, and materially charged endeavour, and living alongside other beings (animate and inanimate) has ethical consequences. The co-constitutive process of being and becoming in the world provides a “profound sense of entanglement, intra-activity, and perpetual emergence [that] fosters an ethical stance that insists that the activities and knowledge practices of the human are always part of, and accountable to, the wider world” (Alaimo, 2010, p. 73). Barad’s (2007) theory of *agentic realism* is also pertinent here. Barad notes that “neither human practices nor material phenomena are ontologically or epistemologically prior” (p. 152) and knowledge production is an ongoing process of being and becoming in relations with more-than-human others. Agential realism captures the “reciprocally transformative” relationship with and between humans and nonhumans (Frost, 2011, p. 77) whereby neither human nor nonhuman is privileged above the other. Similarly, Bennett (2004) notes, “humans are always in composition with nonhumans, never outside of a sticky web of connections” (p. 365).

Thus, in this thesis, subject formation is an inherently relational process and essential for understanding how mutually co-constitutive and co-constructed realities emerge in situ. Rather than educators and children reacting to passive objects, educators, children, and more-than-human others intra-act within entangled and embodied encounters to generate new and situated knowledges (Haraway, 2016). By allowing for the “significance, agency, and substance of materiality” (Alaimo, 2010, p. 70) and the co-constitution of being and becoming in body-matter assemblages (Iovino, 2012), I can story particular and peculiar relations that emerge within the entangled encounters that are described in all three articles.

The research within each of the three articles is not intended to provide a prescriptive curricular blueprint for early childhood education but rather to provide context-specific snippets of how common worlding pedagogies offer enduring approaches that embrace knowledge production as a relational ethico-ontoepistemological¹ process. Provoking new ways of thinking about environmental education and ethical sustainability practices requires careful and at times speculative attention to children’s everyday encounters. As Nxumalo (2016) reminds us, reconceptualizing pedagogical practices requires “creative possibilities for making visible, and ethically responding to, the entanglements of everyday practice with environmentally damaged places” (p. 40). Therefore, transformative relational pedagogies of *thinking with* and *becoming with* more-than-human others offer situated possibilities for noticing and responding to what emerges within “messy embodied, situated, entangled, and noninnocent human and nonhuman relations” (Taylor, 2018, pp. 206–207).

1.5 Common worlds methodology

The studies in this dissertation draw on common worlds postqualitative methodologies. Such methodologies are experimental to make room for emerging, situated, open-ended

¹ Ethico-ontoepistemology is a term Karen Barad (2007) offers to argue that “practices of knowing and being are not isolable” (p. 185); rather, knowledge production is inherently enmeshed with relational processes of becoming with the world, and where ethics and response-ability matter in the ongoing process of becoming with the world.

“thinking-doing” research (see Hodgins, 2019) that remain receptive and responsive to the “contingencies, relationalities, instabilities and history” (Lather, 2016, p. 129) that emerge within the ongoing research process and are unpredictable. Common worlding methodologies are nonrepresentational approaches (Hodgins, 2019) that support human and more-than-human mutual participation towards “new routes to knowledge” (Pink, 2009, p. 8). Further, these methodologies allow for the notion that researchers are always already entangled in the fray².

Situated within common worlds methodologies, my research focus shifts away from providing a rendition of the participants’ (human or otherwise) lifeworlds. I am, instead, deeply entangled in the messiness of world making. Frost (2011) reminds us that the “key insight in this work is that biology and culture, organisms and context, are co-emergent—they provoke, challenge, and consequently shape one another” (p. 77), and therefore my presence is neither neutral nor innocent. My research is complex, creative, and necessarily speculative, with the specific purpose of moving beyond *what is* to imagine and animate *what else*. With an intention to rupture, provoke, and reverberate, this dissertation and the articles therein challenge the qualitative approaches that merely discover, interpret, and inform the “what next” by staying with and storying the real and the rhetorical.

Common worlds methodologies allow me to build upon situated and rhetorical possibilities. To story embodied encounters “wherein many different things gather, not just deliberative humans, but a diverse range of actors and forces, some of which we know about, some not, and some of which may be just on the edge of awareness” (Anderson & Harrison, 2010, p. 10). As Vannini (2015a) notes, the use of nonrepresentation and experimental concepts allows me to “re-imagine both human and more-than-human materialities as animated by dynamic and lively capacities to affect

² While my use of the phrase *in the fray* is intentional and meant to evoke images of fracas-entangled movements, other scholars offer similar terms to describe the plurality of engagement within an encounter. For example, Casey (2001) offers the term *event*; Ingold (2008) uses *zone of entanglement*; and Massey (2005) offers *throwntogetherness*.

change and to participate in political life” (p. 320). These speculative possibilities are essential for storying the seen and unseen presence of the more-than-human others (in Article 1, shadowy and mythical critters; in Articles 2 and 3, plastics) that the children, educators, and researchers share common worlds with. Engaging with common worlds methodologies offers me the space to notice and compose situated worlds. By storying situated worlds I can then create the generative pedagogies that inform our (educators’ and researchers’) pedagogical and curricular movements.

In all three articles I use storytelling as a common worlds method. This method is intentionally interpretive to allow creative and generative space for thinking, being, and doing within the thick of things. In other words, by storying the real in concert with the imaginative, the moments that emerge separately and together allow me to story situated worlds. The conceptualization of storying that I engage in is inspired by Anna Tsing’s (2015) storying of interspecies entanglements within her anthropological work and by Donna Haraway’s (2016) use of speculative fabulations to story situated worlds. As Haraway (2016) so eloquently writes,

it matters what matters we use to think other matters with;
it matters what stories we tell to tell other stories with; it
matters what knots knot knots, what thoughts think
thoughts, what descriptions describe descriptions, what ties
tie ties. It matters what stories make worlds, what worlds
make stories. (p. 12)

Storytelling, as a situated common worlds method, “advocate[s] for the pedagogical potential of the mundane and ordinary” (Taylor, 2013, p. 49) that is both unexpectant and emergent. It is not intended to capture data but rather to read encounters as messy entanglements both of what is and what else might be. This process is necessary to support the conceptual and pedagogical “experimentation and creation” (St. Pierre, 2021) needed to restory situated world. Storytelling offers speculative possibilities for thinking, doing, and being. As such, my use of storytelling offers the creative and generative space from which to read the particular and peculiar everyday happenings that emerge at both

research sites. The interpretive component of storytelling does not negate the rigor or validity of my research. To support the storying that I offer within each of the three articles, my work is underpinned by the theoretical and empirical research I draw from.

Each of the three articles draws on storytelling to both notice and respond to the presence of all bodies and entities within entangled and embodied encounters separately and together. For example, in Article 1, the first encounter I story pulls together the forces of the wind, a tumbling hat, and children leaning forward to *see* the wind, while later on in the article I pull together several encounters to story the presence of a yet-to-be seen owl—an owl feather, owl pellet, and moving shadow cast along the forest floor. In Articles 2 and 3, storytelling creates the space to notice plastic's liveliness that might otherwise go unnoticed and unattended. In Article 2 I pull together multiple body-plastic encounters to story plastic's active participation in disrupting and shifting the governance in the classroom, while in Article 3, encounters with the excesses of plastic restory children's relations with plastic through the particular and peculiar child-plastic encounters.

1.6 Research sites and participants

Two early childhood learning and care centres in southwestern Ontario participated in my research. In the first site, one educator and ten children aged 18 months to two years engaged in a forest inquiry, and in the second site, four educators and many children engaged in a plastics inquiry. Both centres are participating partners in the larger SSHRC projects (Article 1 CAN Project; Articles 2 and 3 Waste Project). The educators who consented to participate in the two sites where my studies took place expressed a keen interest in shifting their practices to focus on environmental issues and develop climate change pedagogies (Article 1) or waste pedagogies (Articles 2 and 3). The families of children within consenting educators' classrooms were provided project information and an opportunity to consent to have their children participate (see Appendices A, B, C, D for the letters of information and consent for educators and families for the two sites).

The childcare centres are in two different neighbourhoods. The first centre is in an elementary school located within an emerging suburban area; the forest we visit regularly

abuts the school and is squeezed on all sides by various stages of construction. The second centre is located on a busy intersection in a northern part of the city and is surrounded by an eclectic mix of large shopping stores, apartment complexes, and tucked-away single-family homes.

1.7 Data collection methods

Data collection for the research presented in all three articles took place over two years and finished in March of 2020. Site visits occurred once a week as well as on two separate week-long intensive sessions. The weekly site visits took place during the morning and lasted four hours. For the week-long intensives, I was in the classroom for four hours every morning. In the first year, weekly site visits occurred from September to June; in the second year, weekly site visits occurred from September until March (a shorter time due to COVID-19 restrictions). During site visits I actively participated alongside the educators and children in both the forest and plastics inquiries. In the case of the forest inquiry, this participation always took place outside in the forest. For the plastic inquiry, participation usually took place in and around the classroom, with occasional walks through the nearby neighborhood.

The data collection methods used included observations and field notes, as well as photography, videomaking, and pedagogical documentation. All data collected became actively entangled in the storytelling process. The data, as a provocateur, informed and transformed the storying that emerged continuously from the research. Sustained interactions within each inquiry, as relayed within pedagogical documentation, provided the ongoing pedagogical and curricular movements that took place in each site. In early childhood educational setting, pedagogical documentation offered up a space for intervention: a space to revisit, question, interpret, and respond to the everyday moments we (educators and researchers) noticed (see, e.g., Blaise et al., 2017; Dahlberg et al., 2007; Iorio et al., 2017; Pacini-Ketchabaw et al., 2015) and was a continuous source that informed the educational process of curriculum making (Vintimilla & Pacini-Ketchabaw 2020).

I collected data continuously through interactions with and between the educators, children, researchers, and more-than-human others through the duration of each site visit. During each visit, the educators and I took field notes, photographs, and videos. At the end of each morning I collected the chunks from the educators' field notes along with the videos and photographs. The data collection included both the events from the morning as well as data in my field notes from when the children, educators, and researchers revisited some of the images and videos that were taken throughout the morning (as projected on the wall during lunchtime) and the end of session debriefs with the educators. Field notes documented my thoughts and noticings throughout the mornings and after leaving the site, as well as pieces of conversation between myself and the children and the educators as well the curricular decisions the educators and I made for moving forward in the inquiries based on the data.

1.8 Data analysis

Analysis of the data was an ongoing, collaborative, and generative process, in keeping with the affective and effective “knowledge production process” (Pink, 2009, p. 119). Diffractive analysis involved a continual cycle of data collection, critical reflection, and interpretation (Pacini-Ketchabaw et al., 2015; Pacini-Ketchabaw, Kind & Kocher, 2016) with children and educators (in informal group discussions) and with educators (in weekly debriefing sessions). Diffractive readings include both data collected in situ as well as data from the literature, films, and conversations from others outside the site-specific locations. For example, in Article 1 the close reading of Tsing et al. (2017) opened up possibilities to see the unseen when analyzing the data—the shadowy and mythical pieces emerged as “traces of more-than-human histories through which ecologies are made and unmade” (p. G1), and in Articles 2 and 3 our conversation with the speculative artist Pinar Yoldas (personal communication, October 2019) alongside viewing pieces from her art exhibit *Organs of the Plastisphere* were woven into both our pedagogical processes and the reading of the data. Further insight into pedagogical movements and provocations were made possible in our ongoing process of curriculum making.

In common worlds research no one piece of data sits in isolation. All data is interwoven with theory and imagination and together are complicit in shaping and moving the research. In other words, it is important to acknowledge that the data sources for my project were not merely neutral artifacts for analysis but rather entangled noninnocent real and imaginary participants that both informed and provoked unanticipated trajectories.

Diffractive and reflexive readings of encounters were not only critical for my work in (re)imaging the possibilities of relations with more-than-human others, but also supported my active participation in this ongoing and cyclical process. By enfolding the internal and external, the physical and the metaphorical, the artistic and the pedagogical, diffractive reading allows for multiple interpretations of each encounter (Bozalek & Zembylas, 2017; Lenz Taguchi, 2011). As Haraway (1988) states, “diffraction can be a metaphor for another kind of critical consciousness . . . diffraction is a narrative, graphic, psychological, spiritual and political technology for making consequential meanings” (p. 272). Diffraction enabled me to “see beyond” and therefore provided a multidimensionality to the process. Springgay and Zaliwska (2015) remind us that sometimes “opening up data to its edginess means resisting traditional modes of representation, modes of representation that ‘capture’ an event either through attention to detail or through a totalizing perspective that encapsulates a story” (p. 140). As such, the plastic bottle and plastic bag or owl feather and critter tracks participated in the process of diffractive reading, allowing the creative space from which plastic’s unruliness and shapeshifting, as well as speculative stories of shadowy and mythical critters emerged. In other words, by using diffractive methods, I move beyond the figurative to the imagined and metaphorical and therefore to the possibility of storying the real and the imaginary. This is necessary work for examining alternative possibilities for how more-than-human movements inform emerging pedagogical processes, which in turn inform emergent curriculum-in-the-making. Because shifting from thinking about to thinking with more-than-human others is a complicated yet necessary process, “it matters what ideas we use to think other ideas” (Haraway, 2016, p. 35), and therefore diffractive reading is critical for noticing the “what elses” that “bleed out from the intensity and immediacy” (Pink, 2009, p. 34) that situated common worlds invite.

Analysis requires close reading of the data that emerges from everyday encounters with more-than-human others. Common worlding methods for data analysis are at best speculative, with data in a constant state of becoming, “continual[ly] thinking/unthinking and continual[ly] doing/undoing” (Thomas, 2016, p. 41). Therefore, the analysis of data within my study was challenged with taking into account the seen and unseen forces (both human and nonhuman) within each classroom encounter and the impossibility of capturing a static data set. Weekly allocated time for analysis of the data (videos, photos, field notes, and discussions with educators and children) allowed for ongoing creation of thick descriptive narratives. Each narrative together and separately informed further diffractive reading of each highlighted encounter.

1.9 Summary

This introductory chapter has provided an overview of where I position myself and my research, the questions that guide my work, the theoretical and methodological underpinnings of my work, and the methods I employed in my research. Next, I present the three articles that form the bulk of the dissertation, followed by a conclusion in which I discuss the articles and offer some speculative wonderings and ongoing inquiries.

Chapter 2

2 Ghosting Pedagogies: Disrupting Developmental Narratives in Early Childhood Environmental Education

Abstract

This article reveals how ghosting pedagogies and stories of the shadowy and mythical disrupt child-centered approaches to early childhood environmental education. As part of a common worlds research project that explores generative innovative pedagogies, this experimental work offers alternative ways of noticing and storying the complex and entangled relations that emerge with and between children and the more-than-human others that live in a small forest that abuts an early childhood centre. Week after week, an educator and I and a group of five young children venture out into the ever-shrinking forest that is surrounded by the continuously expanding suburban neighbourhood. We do so, not only to bear witness to the situated (often quite ruinous) transformations of and within the forest, but also to reorient us (adults and children) back into the fray. Being(s) in the fray emphasize(s) the messy and entangled realities that we, as humans, are deeply implicated in. In this article I offer the speculative storying that emerges through slow processes of noticing the everyday encounters an educator, children, and I have with the more-than-human others that live(d) and traverse(d) the forest we spend time in. The first series of encounters follows the shadows of the mythical unseen owl, while the other two trace the shadowy tracks of unseen critters on the move. Each series of encounters is meant to provoke the reader to see differently—to engage with the slow process of storying and restorying the shadowy presence of the more-than-human others that might have otherwise gone unnoticed.

2.1 Being(s) in the fray

Addressing the devastating complications from human-induced environmental degradation requires a paradigm shift that disrupts the hyper-separation of humans from nature. Ecofeminist Val Plumwood (2002, 2008) argues that the best hope for earth's survival is the deconstruction of nature/culture dualism and the hierarchical positioning

of humans above the fray. Being(s) in the fray emphasize(s) the messy and entangled realities that we, as humans, are deeply implicated in. When we view ourselves and more-than-human others as a collective, the common good becomes refocused, from human beings to earth beings, and to a state where ethical and caring relationships might emerge and new response(abilities) are reimagined (Haraway, 2016; Latour, 2004; Plumwood, 2002; Puig de la Bellacasa, 2017). One of our best hopes for change is in reorienting knowledge production (Plumwood, 2002). The field of education is one of the pivotal places where changes can occur.

While developmental logics and child-centered approaches continue to predominate in the field of early childhood environmental education, emerging research is now exploring alternative pedagogical narratives that support a different understanding of knowledge production and of young children's response-ability in ecologically precarious times (e.g., Nxumalo, 2016; Taylor, 2013, 2017; Taylor & Giugni, 2012; Taylor et al., 2012). The common worlds framework (Taylor, 2013) exemplifies this alternative narrative. It challenges child-centered approaches by providing a generative orientation and support for emerging pedagogies that attend to complex and entangled relations with and between children and more-than-human others who occupy environmentally precarious spaces. Common worlds research grapples with the socio-political tensions embedded in the Anthropocene by emphasizing "the actual, messy, unequal, and imperfect worlds real children inherit and co-inhabit along with other human and nonhuman beings and entities" (Taylor, 2013; Taylor & Pacini-Ketchabaw, 2019). In this article I offer the speculative storying that emerges through slow processes of noticing the everyday encounters an educator, children, and I have with the more-than-human others that live(d) and traverse(d) the forest we spend time in. *Ghosting pedagogies* and speculative storying contributes to common worlds conversations in part by offering an alternative narrative.

Drawing on the data from a common worlds research project (Pacini-Ketchabaw, 2017), I take the reader through the process by which ghosting pedagogies emerge and how the pedagogical narrative shifts when slow processes of noticing attend to both human and nonhuman presences. The study takes place in a small forest adjacent to an early

childhood centre located in an emerging suburban city in southwestern Ontario, Canada. As in many cities, this place has witnessed, over the last two years, a continuously shifting landscape of developmental encroachment and the resulting effects on the more-than-humans inhabiting the enclosed, ever-shrinking forest (Pacini-Ketchabaw, 2017). For almost two years, an educator, a small group of five children, and I have spent time in the forest, not just to let children frolic in nature, but rather to be in relations with the forest and those who dwell in its spaces. Multispecies relations become visible by paying attention to what emerges within the interactive liveliness that is already present in the forest. My use of the term *liveliness* is intentional: It reiterates activity and vitality and the idea that the forest has a rhythm and is always already in motion. Further, understanding the liveliness of more-than-human others pushes back against developmental notions that learning is an individual human process and the forest a mute backdrop because it invokes a sense of learning in relations with others (Taylor, 2013; 2014; Taylor & Giugni, 2012).

The stories that unfold within forest encounters evoke ghosting to reimagine the presence of others that go unseen. Ghosting pedagogies provide the pedagogical space where this speculative reimagining takes place and where the liveliness of unseen others takes form. Reimagining the aliveness within the forest allows us (the children, educator, and I) to pay attention to unexpected presences and what emerges from these encounters. This article is guided by two broad questions to think with: How might ghosting pedagogies reimagine dominant narratives of early childhood environmental education? How might ghosting pedagogies support the slow processes of noticing and telling different stories for living alongside the more-than-human in times of climate change and environmental degradation?

Three key components structure this piece. The first is the common worlds conceptual framework I situate my speculative work in. The second introduces the concept of ghosting and how ghosting pedagogies invite new narratives. The third allows the reader to follow along as the concept of ghosting emerges through the slow processes of noticing in a series of encounters with the wind, owls, and critter tracks. Each encounter builds on the others as the children, educator, and I are pulled into the fray through the

shadowy and mythical happenings with and between us and the unseen presence of more-than-humans others that live and die in blasted landscapes (Kirksey et al., 2013).

2.2 Common worlds: Disrupting dominant narratives in early childhood education

While the dominant narratives in early childhood education emphasize children's individual experiences being in nature and learning about nature (e.g., Arlemalm-Hagser & Sandberg, 2011; Hagglund & Pramling Samuelsson, 2009; Inoue et al., 2016; Weldemariam et al., 2017), the common worlds framework pushes back on child-centered approaches, arguing that developmental logics fall short of preparing children to meet the demands of current environmental precarities (Taylor 2013; 2017; Taylor & Giugni, 2012; Taylor & Pacini-Ketchabaw, 2019). Developmental skills-based pedagogies that focus on the individual child's cognitive learning fails to attend to knowledge production as a complex onto-epistemological process whereby learning is always in relations with others (human and nonhuman) within shared common worlds (e.g., Taylor, 2013; Taylor & Giugni, 2012; Taylor et al., 2012). What the common worlds framework calls for, and what the substance of this article illustrates, is a reorientation that shifts the pedagogical focus and processes of noticing from the individual to the collective (see [Common Worlds Research Collective](#)).

Common worlds research disrupts child-centered approaches by emphasizing that learning is inherently relational (Taylor, 2013, 2017, 2018; Taylor & Giugni, 2012; Taylor et al., 2012). The empirical research I draw from highlights alternative pedagogical narratives that support young children's learning within everyday encounters they share with more-than-human others (e.g., Duhn, 2012; Iorio et al., 2017; Lakind & Adsit-Morris, 2018; Nelson et al., 2018). Common worlds pedagogies that emerge within research "allow for all that is human, non-human, organic, inorganic, alive, dead, yet to materialize, the virtual, and the real, to be a part of the practice that is 'creative' knowledge-making" (Blythe & Meiring, 2018, p. 107). As necessarily complex and

relational in orientation, common worlds pedagogies offer enduring approaches that embrace knowledge production as a relational ethico-ontoepistemological³ process.

Provoking new ways of thinking about environmental education and ethical sustainability practices requires careful and a times speculative attention to children's everyday encounters with more-than-human others. As Nxumalo (2016) reminds us, reconceptualizing pedagogical practices requires “creative possibilities for making visible, and ethically responding to, the entanglements of everyday practice within environmentally damaged places” (p. 40). Therefore, transformative relational pedagogies of *thinking with* and *becoming with* more-than-human others offer situated possibilities for noticing and responding to what emerges within “messy embodied, situated, entangled, and noninnocent human and nonhuman relations” (Taylor, 2018, pp. 206–207). In this article ghosting pedagogies emerges from the particular and peculiar entangled encounters the children, educator, and I have with more-than-human others in the forest. By attending to the seen and unseen, real and imaginary, shadowy and mythical presences of others, ghosting pedagogies offers the possibility to notice and respond to the unexpected presences that live(d) and traverse(d) the forest that had gone unnoticed in the past.

2.3 Ghosting

Ghosts remind us that we live in an impossible present—a time of rupture, a world haunted with the threat of extinction. (Anna Tsing et al., *Arts of Living on a Damaged Planet*)

In this section I introduce the concept of ghosting and describe how ghosting pedagogies unfolded through processes of noticing and storying a series of encounters that occur with

³ Ethico-ontoepistemology is a term Karen Barad (2007) offers to argue that “practices of knowing and being are not isolable” (p. 185), with knowledge production inherently enmeshed with relational processes of becoming with the world—where ethics and response-ability matter in the ongoing process of becoming with the world.

the wind, owl remnants, and critter tracks as the children, educator, and I move through the forest.

To see differently requires us, humans, to move beyond the humancentric hierarchical notion that we are situated outside the fray. Humancentric notions position us as “somehow exceptional to and hyper-separated from nature,” implying that we “can modify, ‘improve’, or exploit [nature] with impunity” (Pacini-Ketchabaw & Nxumalo, 2015, p. 153). Human-centric tendencies and capitalist agendas, in the name of progress, has left blasted landscapes in its wake (Kirksey et al., 2013). However, Anna Tsing (2015) challenges to us to acknowledge that these capitalist ruins are not merely dead spaces but rather spaces that are vibrant and alive, as life continues amidst the ruins. How might a shift in thinking, from witnessing the ruins of progress to witnessing the progress of ruins, place humans into the fray? What is required from us to see that there are lives and worlds that somehow persevere within blasted landscapes, and whose stories need to be heard? Within the hostile and precarious spaces of capitalist ruins, Tsing et al. (2017) suggests that humans, to see the stories that emerge within the shadows of the Anthropocene, must reorient their vision. She argues that “ways of life come together, [as] patch-based assemblages ... show[ing] scenes for considering livability—the possibility of common life on a human-disturbed earth” (Tsing, 2015, p. 163). Ghosting pedagogies support the reorientation necessary for seeing differently, for seeing blasted landscapes as communal living spaces and for storying the unseen presences that live in the shadowy spaces amid the ruins.

Tsing et al. (2017) refer to ghosts as “traces of more-than-human histories through which ecologies are made and unmade” (p. G1) In thinking through the work on ghosts and dead spaces (Tsing, 2015; Tsing et al. (2017), ghosting pedagogies emerges as the pedagogical space from and through storying the tracks and tracings of mythical critters that are yet to be seen. The traces (remnants) of critters, such as owl feathers and deer tracks, remind us (children, educator, and I) that life continues amidst ongoing construction and deforestation. Through the slow processes of noticing and storying the shadowy and the mythical, ghosting pedagogies unsettle vanquished spaces. Although these spaces are oftentimes thought of as dead spaces, Tsing (2015) argues that humans,

by opening-up our imaginations, are able to “appreciate the patchy unpredictability” (p. 5) that living in these spaces brings. Processes of noticing the particular and peculiar human and nonhuman relations troubles the notion of dead spaces. However, paying attention to unanticipated liveliness requires from us an openness to imagine the stories of more-than-human others we cannot see. By storying the lingering remnants of the shadowy and the imaginary happenings of the mythical, ghosting pedagogies focus on reframing aesthetic attention as a means of seeing differently, of restorying worlds (Haraway, 2016).

2.4 Thinking ghosting pedagogies

To begin, the forest that the children, adults, and animals meet is the remnant of what was once a densely forested area outside the city limits. As a result of continuously expanding urban sprawl, much of the forest has been aggressively clear-cut to make room for ongoing construction. With each visit we (children, educator, and I) are met with construction debris littered on the ground or clinging to the sharp edges of downed trees and the constant sights and noises of construction machinery used to build—indicating capitalist ruins in progress. However ruinous the landscape may be, it still holds multiple stories of past and present lives, even as it continues to shrink. As we enter the forest, we find many traces of human and more-than-human others throughout. Snail slime, owl feathers and droppings are signs of life persisting amidst the ruins of capitalist advancement and encroachment despite being strangulated on all sides. Abandoned farm equipment, trailer frames, rusted spikes, and hacksaws found on our excursions into the forest remind us of past lives. Remnants from farm fields persist, reminding us that these fields were once created and cultivated by generations of settler colonials after removing and replacing the Anishinaabe, Haudenosaunee, and Leni-Lunaape who were the original peoples of this land. The forest looms for us as a perpetual marker of the constant volatility, vulnerability, and interdependency of living and dying in vanquished spaces.

Week after week, the educator and I and five young children venture out into the ever-shrinking forest that is surrounded by the continuously expanding suburban neighborhood. We do so not only to bear witness to the situated (often quite ruinous) transformations, but also to be “in the world” experiencing the “finite and dirty”

immanence of nature-culture entanglements beyond the “transcendent and clean” domains of the carefully contained classroom infrastructure (Haraway, 1997, p. 36). The educator and I are committed to the slow process of noticing “the pedagogical potential of the mundane and ordinary” (Taylor, 2013, p.49) that is both unexpectant and emergent.

Engaging with the messy and entangled multispecies worlds requires careful reading of the data. Data, in this case, includes photographs, videos, field notes, and ongoing pedagogical documentation. In early childhood educational settings, pedagogical documentation offers up the space for intervention: a space to revisit, question, interpret, and respond to the everyday moments we (educators and researchers) notice (see, e.g., Blaise et al., 2017; Dahlberg et al., 2007; Iorio et al., 2017; Pacini-Ketchabaw et al., 2015) as well as our informing continual processes of curriculum-making (Vintimilla, & Pacini-Ketchabaw 2020).

The speculative storying I offer, within the vignettes shown below, emerge through ongoing diffractive reading of the data. Diffraction allows for speculative interpretations of each encounter by enfolding the internal and external; the physical and the metaphorical; the artistic and the pedagogical (Bozalek & Zembylas, 2017; Lenz Taguchi, 2011). Further, by allowing for the significance, agency, and substance of materiality” (Alaimo, 2010, p. 70) and the co-constitutive process of being and becoming in messy and entangled assemblages, I can speculatively story the seen and unseen mythical critters through complex interactive encounters with shadowy remnants. In other words, the remnants seen (e.g., owl feather) as read alongside Tsing’s notion of ghosts as alive and flourishing allows me to story the presence of an unseen owl.

What follows are stories that emerged from the particular and peculiar noticings that unfold over many months. The first series of vignettes story the shadows of the mythical unseen owl, while the other two trace the shadowy tracks of unseen critters on the move. Each series of encounters is meant to provoke the reader to see differently—to engage with the slow process of storying and restorying the shadowy, unseen presences that might have otherwise gone unnoticed.

2.5 Mythical critter

2.5.1 Beginnings: Seeing wind

The wind swirls around the children, educator, and me. It catches our breath and pushes against our bodies as we struggle to keep moving towards the forest. While the strong winds push against all our bodies, their effects are more noticeable against the children's tiny bodies as they attempt to maintain their balance. Focused on the struggle to control our movements and keep walking, we are surprised when a sudden gust of wind grabs one of the children's hats and sends it tumbling and flying across the field. Just as the hat flies off the child's head they exclaim, "Wind took my hat" as the child runs off to catch it. The unseen wind is making itself known.

During one walk to the forest, the educator and children and I are met with a strong gust of wind that makes itself known as it bumps up against us. As the children lean their bodies into the wind, the effect of bodies pushing into wind and wind into bodies makes it impossible for the wind to go unnoticed. Noticing the wind did not come from our seeing it but rather from the intensity of feeling it and moving against it. Seeing the wind through its effects when bumping up against others (human and nonhuman/bodies and hats) leads the educator and I to wonder what other unseen entities we bump up against when we enter the forest. What does it mean to see differently, sensorially (see Pink, 2013; Thrift, 2008; Vannini, 2015)?

Following the encounter with the wind and our bodies (tiny and big), the educator wonders whether the child was trying to catch the wind. How do you capture what you cannot see? Although it seemed nonsensical to think of wind having purposefully taken the hat, we did begin to wonder and play with the notion of how wind is a being that comes to be noticed in unconventional ways.

We offer our wondering back to the children by asking them whether or not they can see the wind. The children's responses seem to pass over the literal meaning of seeing. For example, some of the responses reveal how wind affects them—"It pushes me," "I get cold," and "it's hard to walk." When we return to the forest a week later, the educator reminds the children of the pushy wind and our experiences of seeing the wind. Although

on this visit the winds are significantly calmer, we ask the children to walk into the forest, stop, and look once again for the wind.

Standing very still to see the wind meant responding to the affective intensity of the wind's movement. The sensorial process of wind watching emerged after carefully attending to wind's affect. As Hamilakis (2017) reminds us, affect "connects agency with sensorial and emotive impact" (p. 173). In other words, for us to see the wind we need to feel and respond to its affective presence. We notice the wind's effects through others—the flying hat, the bent-over bodies, the swaying branches, and the moving shadows.

2.5.2 Seeing differently: Encounters with an owl feather

We spend much time in the forest seeing what relations emerge between children and those who live in the forest space. Although we have yet to see any critters in the forest, we spend time noticing their tracings, such as footprints and poop.



Figure 2.1 Stuck feather.

While our intention is to go into the forest to look for the wind, something unexpected happens. As the children, educator, and I stand motionless, the educator notices a feather stuck on a twig flapping in the wind (see Figure 2.1). She points out the feather, telling the group that it might be an owl feather. As we all move in closer to get a better look at the feather (see Figure 2.2), two of the children look back and forth between the feather and the sky.



Figure 2.2 Owl feather.

When we ask what it is they are looking at, they both respond with “the owl.” Their use of the term owl does not surprise us because stories about owls are part of many of the discussions the educator has with the children about who might live in the forest. While the children had not ever seen an owl, they knew there was a possibility one might appear because in the previous year, another classroom had reported a spotting. The two

children walk away from the feather but keep their gaze upwards, looking back and forth. What causes us to pause and take note about the back-and-forth gazing is the children's expectation that the feather means there must be an owl in the sky. Just as the wind is seen by making its presence known differently, we glimpse an owl through the presence of a feather.

2.5.3 Storying the unseen

In thinking with the shadowy, a lone feather stuck in a tree branch leaves the educator and I wondering how this encounter stories the yet-to-be seen owl. We imagine the storied life of the unseen critters through the found remnants scattered throughout the forest. The owl's presence, although unseen, seems to emerge through a series of particular and peculiar encounters. Poetry often becomes a way for the educator and I to restory these encounters. Poetry slows our thinking, isolating unexpected moments noiselessly and allowing us to imagine the multiple stories of Others that gather in the places where we stand (Janesick, 2016). For example, the following poem I wrote narrates the staccato-like thoughts that swirl around my wonderings about how the two seemingly separate encounters, one with the wind and one with an owl feather, come together to story unseen presences of yet another.

Shadows of Owl
 moving wisps
 Wind and Feather – Feather and Wind
 visible and invisible
 together and apart
 reminders of presences undeniable

 liveliness everywhere and nowhere
 seen and unseen
 remnants all around
 slowly, slowly, ever so slowly
 stories emerge
 the single and the multiple

 see differently
 sensorially, provocatively
 witness the lively presences
 Wind and Feather – Feather and Wind

2.5.4 Encounters with an owl pellet



Figure 2.3 Owl pellet.

As the children, educator, and I venture back into the forest, we continue to think with the lone owl feather left tangled on the branch. As a group, we decide to find the owl. While the educator and I look upwards to see if an owl might be perched in a tree, we notice that the children are looking downward. One child is kicking at the leaves, another uses a stick to push the forest debris across our path into the forest, and the other three are staring at the ground. When the educator and I ask what they are all doing, two of them yell, “A feather! Looking for a feather!” Although some of the children have already said owls live in “tree nests,” the educator and I are curious and ask one of the children why they are looking at the ground. The children seem to connect looking for a feather as synonymous with looking for an owl.

What does it mean to search for the owl's presence differently? The children's unexpected alternative search for the owl reminds me of my own past experiences with dissecting owl pellets. Just as the feather seems to represent the owl's presence, so too does an owl pellet provide my own connection to an owl. Soon I too am looking down, searching for the owl's presence differently.

An owl pellet, bluntly put, is owl vomit. Once an owl finishes eating several meals of small critters, it efficiently digests the nutrients from the kill, and the remaining, undigestible leftovers of bones, fur, and feathers become tightly wound into a ball and expelled (see Figure 2.3). But owl pellets are more than owl vomit; they are the shadowy remnants of past lives. The dead critters become tightly entangled with sustaining the life of the owl—a complex assemblage whereby the bones, hair, fur, and saliva of the living and the dead offer us a glimpse into a tightly entangled world that blurs the dichotomous either/or of life and death. The bones of the tiny critters that once walked on or flew over the forest floor are now tightly wound together, tangled in their own fur and feathers, and bound with owl saliva. For me, the pellet becomes the blurry in-between space where storing the shadowy presence of the owl becomes possible.

2.5.5 Forest pathways



Figure 2.4 Climbing tree.

Our wanderings into the forest have begun to gather us in very particular spots: the climbing tree, stick houses, the fallen tree, and the fishpond. Although we sometimes pause in these places, they have become something of a pathway, each adding a new marker to the path that leads us deeper and deeper into the forest.

The day is warm and sunny, and the educator has arranged an extended stay in the forest. With an extra snack and water to drink we begin the trek. The educator and I plan to bring the group as far in as possible without losing our bearings. With the children dressed and ready to go, we follow the usual pathway into the forest—through the schoolyard to the sidewalk that circumvents the forest—walking several metres just past the third house backing onto the forest. Taking a quick left turn, we go down and back up the water-filled ditch and over the fallen fence. Once we cross over the fence, we have officially entered the forest. From this point on the pathway becomes marked by the relations that have emerged between children and the entities that occupy spaces in the

forest. The prickly bushes snarl our clothing, pull mittens off, and even scratch our skin. The climbing tree, where we have spent much of our time, continues to amaze us by its ability to sprout new growth even though it appears fully uprooted and reliant on other trees to keep it from hitting the ground (see Figure 2.4). We take our first break to do some climbing before we continue past the tree and over the hill to the fishpond, where sticks are gathered, and the fishing begins. The children do not spend much time fishing as our intention for this trek is to find the owl. We move onward toward the two stick houses where we pause to have a snack. As the children eat, the educator surveys the surroundings to make sure we are still on a pathway that could lead us both in AND out of the forest, while I wander off on the lookout for signs of the owl.

2.5.6 Emerging from the shadows

Through the shadows, sounds, and sightings, the children, educator, and I convince ourselves that an owl family has come to roost in the forest. The educator has also shared images of a large nest and large bird soaring through the forest with the children (see Figures 2.5 and 2.6). While we cannot be sure the one image is of an owl, the children have named her Hootie and told us she is the mother.



Figure 2.5 Large bird nest.



Figure 2.6 Owl in flight.

With snack done and everything cleaned up, we continue the trek excited to locate the nest and owl that the educator described. Three new markers are added to our pathway as we go deeper and deeper into the forest: stick bridge, tipping tree, and owl dinner table (two large logs lying parallel to each other and multiple pellets plopped in the middle). Looking downward and forward have led us closer and closer to the owls, but by looking up we find the nest. Is it the owl nest? One of the children describes the nest as the “mommy owl house.” When the educator asks the group where the mom is, several children stare up at the nest or shrug their shoulders, but one child offers that the owl (mom) is “feeding her kids.” Today the nest seems empty, but the nest tells us that the unseen owl is definitely present.

As the educator and I document the morning’s happenings, we discuss the frustration of never having enough time to stay in the forest longer. With permission from the director of the early learning centre, we had decided to extend the day’s stay by packing a lunch and pushing sleep time back. Even this is not enough. Not for the first time, the educator states she wishes the group could stay out in the forest all day. How do we carve out more time to get to the newly found nest, to pause, to listen, to feel the owl’s presence?

Our intention is to follow the pathway without hesitation, allowing as much time as possible to sit by the “owl house.” The educator and I pay attention to how children’s relations with the unseen owl emerge through encounters with remnants of the owl’s past presence.

2.5.7 Hootie appears from the shadows



Figure 2.7 Watchful owl.

The owl emerges from the shadows (see Figure 2.7). “See! See it! It’s the owl!” The owl perches high up on the tree quietly watching us as we (adults included) jump and point with uncontrollable excitement. One of the children is quick to name her Hootie. “Hootie,” he tells us, “is the mom.”

The educator and I have become very curious about owls and their life story. For example, while the children now refer to the owl as Hootie, the telltale pointed tufts on top of Hootie’s head indicate a great horned owl (common name), a *Bubo virginianus* (scientific name) or a Gookoko’oog (Anishinaabemowin name, see Geniusz, 2008). The naming of the owl is not intended to anthropomorphize it

(give it human-like characteristics or human-like behaviours). Rather, to enter into relations with the owl, we seek ways to become acquainted.

Owls mate for life and return to their mating ground year after year. However, with urban sprawl and clearcutting of forests, owls, like many other bird species, have seen a steady decline in population (Cornell Lab of Ornithology, 2019). Mating requires a roosting spot that is safe from predators, and without the trees the owls are more vulnerable.

Knowing that owls prefer the abandoned nests of other large birds of prey (e.g., red-tailed hawks), we assume the same is true for Hootie. Regardless, whether the nest is a new build or an old one, the educator and I focus on the possibility of baby owls. Having learned that owls roost early and lay their eggs in late winter, we are now on the lookout for owlets. As it is now early spring, we are hoping to see the owlets just on the cusp of flying from the nest (developmentally speaking, owlets are either at the nestling [pre-flight] or fledgling [ready for flight] stage of growth).

2.5.8 Owl babies make themselves known

Since our first spotting of Hootie, the educator, children, and I are convinced that there are babies in the nest. The children think so because Hootie is the mom (owl). The educator and I think so because of our readings on owl mating patterns. While we have not yet seen the owlets, over the next two visits into the forest we do hear a great deal of squawking. The educator confirms from the app she has downloaded to her phone that the odd squawking sound is an owl's warning cry that danger is approaching. On the first of our two visits, we had only managed to see shadowy movements through the trees, but on this second visit we get a clear view of two owls. We presume the owls are Hootie and her mate. The owl movements are quick, and even for the educator and I it is difficult to keep track of them. While some of the children seem to point to the owl perched in the nest, only the educator and I are able to follow the second owl as they quickly veers off far from the nest. With the owl barely in view, we track their presence by the loud squawking sounds being emitted. While the owl moves away from the nest to lead potential predators away, we wonder how our responses might shift

our own presence from perceived predator to respectful onlooker. We return to the centre that day vowing to stay farther back and respect the owls' warning calls and need for safety. But how might relations between owls and children emerge at a safe distance? How does physical distance affect ethical closeness? With access to a pair of binoculars, what relations emerge between children and owls when we try to emulate closeness at a distance?

Despite the cold, damp, rainy weather, the children, educator, and I decide to follow the pathway to the owl nest to visit Hootie. The educator has been talking to the children about being too noisy and scaring the owls, so the children have decided they need to be "very quiet" and "tip toe." The educator has already told me that the plan is to stand farther back from the nest and to use binoculars to get a closer look.

Having found a relatively flat spot set back from the owl nest, the educator spreads out the blanket for the children to sit on while they eat their snack. As the children eat, the educator and I take turns using the binoculars to peer into the nest. The educator quietly whispers that she thinks she sees the babies, two of them. She tells me they are hard to spot but that, with time and patience, if I keep careful watch over the nest and wait for subtle movements, I will spot two tiny, fluffy heads peeking over the edge. Seeing is difficult.

We announce our sightings to the children and then pass off the binoculars so they each can have a turn to see. Whether our finger pointing, or binocular sharing makes the owlets visible to the children is impossible to tell. But whether the owlets are visible or not, the children declare that there are babies. When the second child holds up the binoculars, he is quick to name the babies—Pasta and Pizza—and the other four children are quick to approve. With the naming of Hootie, Pasta, and Pizza, the children seem to now connect to them as a family. The process of naming seems to provoke a shift in the children's relations with the owls.

The memory of the wind's effect on the blowing hat, together with the tangled site of feather and twig and child mashups, trouble our understanding of the complexity of the unseen lives amid the ruins. While Tsing (2015) tells us that "we have stopped believing that the life of the forest is strong enough to make itself felt around humans" (p. 180), hearing and seeing of the shadowy wisps and whispers pushes the educator and I to notice the layers of liveliness. Life amid the ruins makes itself known through encounters with the wind and the feather, reminding us of the ghostly presence of others.

The educator and I speculate that the children's relations with the forest owl emerge from the complex assemblage of the real and the imaginary, of the wind and the feather. As we sit to discuss the events surrounding our encounters with unseen owls, we begin to theorize how these moments inform our pedagogical work. How might these children's encounters with remnants inform their emerging relations with the unseen critters that live in the ruins? Storying the mythical owl through the presence of real and imagined owl remnants reorients our thinking by "push[ing] the boundary of acceptable" (Puig de la Bellacasa, 2017, p. 73). Rethinking our processes for noticing opens-up the possibility to see differently. The children's seeing the unseen and storying the presence of the owl long before it makes themselves known reminds the educator and I those remnants found in the forest story far more than merely the remnants' physical presence. Our walks in the forest with the children continue to follow remnants and the stories they reveal.

2.6 Shadowy tracings

2.6.1 Unseen critters in mud



Figure 2.8 Deer track in mud.



Figure 2.9 Coyote track in mud.

In the late spring the trails around the nearby forest and pond become very soft and muddy, very malleable. The educator, children, and I often notice different tracings of critter tracks imprinted in the mud.

On one of our walks, the educator notices two very clear lines of critter tracks, one of a coyote and one of a deer (see Figures 2.8 and 2.9). Although we are excited to see the remnants of these critters and are eager to point them out to the children, we are also cognizant of the potential danger of catching up to either critter, especially the coyote.

The children follow the footprints from the forest to the muddy banks of the pond, stopping at the fence. At the base of the fencing that separates the train tracks and the pond, the deer tracks seem to stop abruptly, but the coyote tracks continue alongside the fence up towards the road. The children wonder out loud what might have happened. Where did the tracks go? As the whole group looks around, one of the children notices that there are more tracks on the other side of the fence, noting that the deer jumped but that coyotes don't jump, they run. What possible story do these tracks reveal? Perhaps the story is one of predator and prey, life and death, or survival of the fittest.

Both deer and coyotes are labelled a nuisance in our community (overpopulation for the former and a danger to livestock for the latter). However, their labels as troublesome can easily be linked to the overzealous construction that leaves critters stranded in small forests with no escape route. The human boundaries of the local community leave some critters struggling to find food to survive and others with need of space for their growing population. Urban sprawl is destroying the habitats of critters who were already living in these spaces.

2.6.2 Unseen critters in snow



Figure 2.10 Critter track in snow.

During a winter walk through the forest, we find many tracks in the snow (see Figure 2.10). The freshly fallen snow has made visible the critter tracks. The tracks, in turn, make the unseen critter movements visible. It is the focused tracking of one particular set of tracks a child follows that leads to an encounter between the child and an unseen bunny. This encounter is a story of care and companionship, of entanglement rather than separation.

As one of the children decides to follow the line of one set of tracks, he invites me to follow. “What are we doing?” I ask. He responds with “Come on, let’s follow the bunny.” With a quick scan I see no bunny. I find it quite strange that he seems to equate the tracks with a bunny. He follows the tracks for several metres (not an easy feat for a young child in a bulky snowsuit traversing the uneven, gnarled, and slippery forest floor—see Figure 2.11), but the tracks seem to pull him along, to invite him to follow. And so, we follow the bunny tracks on and on until the tracks suddenly stop at the base of a tree. The child slips down, lies on his tummy, and leaning on his elbows he perches his head in his hands, seemingly ready to wait ... no time limit. Shadowy tracks and hollowed tree base are not a rabbit (or whatever the critter might be). As I slip down and join him on the snowy blanket, I ask him what he is doing. We chat back and forth. He responds with “Waiting.” I counter with “For what?” and then, before growing quiet and still, he

tells me he is “waiting for the bunny—he’s home now, but maybe sleeping. Maybe he’s eating lunch.”

We just wait and wait and wait. He talks about the tree being the bunny’s home and the hollowed-out space its door. Maybe he’s not home right now or maybe he’s sleeping a long time. As always, we run out of time, and as in many cases, we never ever see any critters. Before we join the rest of the children, I ask him how he knows that there is a bunny. He responds with a simple gesture toward the tracks and states, “See, bunny.” He knows that tracks lead us.



Figure 2.11 Following the critter tracks.

Shadowy tracks like those that appear through the snow remind us that animals do not need to be seen to exist and that tracks are remnants, reminders of the presence of other critters who occupy forest spaces. But for me the question becomes how these shadowy remnants might invite us to pay attention to those others that already occupy the ruinous spaces. By storying bunnies through shadowy tracks, two things happen. First, we acknowledge existence without seeing and second, we can think with and in relations with critters by merely paying attention to their remnants (tracks, poop, hollowed trees).

2.7 Returning to ghosting pedagogies

[Our] failure to situate dominant forms of human society ecologically is matched by our failure to situate non-humans ethically . . . [O]ur best hope for creative change and survival [demands] changing culture by countering long-standing insensitivities and rationalist distortions in a wide range of areas, including knowledge itself.

(Plumwood, 2002, pp. 3, 10)

In this article, I offer ghosting pedagogies to (re)think the forest as lively rather than a vanquished space left in the wake of capitalist insatiable consumption. Ghosting pedagogies offer the pedagogical space for the educator and I to pay careful attention to the complex space where life and death transpire beyond the human. To pay attention to the complexities that unfold during everyday encounters in the forest, ghosting pedagogies reorient ways of seeing. For instance, in the stories above, seeing meant a disruption in the child-centered narratives that remain hyper-focused on the child(ren). Instead, to attend to the tensions and difficulties of living collectively in the ruins, the children's everyday encounters with critter tracks and tracings are creatively and imaginatively enfolding how “many different things gather, not just deliberative humans, but a diverse range of actors and forces, some of which we know about, some not, and some of which may be just on the edge of awareness” (Anderson & Harrison, 2010, p. 10).

Paying attention to the liveliness of worlds beyond the human requires a change in thinking and being. As Plumwood (2002) reminds us, hope for ecological survival depends on—or, more aptly, demands—this shift in thinking. Knowledge production as a relational process effects change in how humans see themselves as hype-separated from the rest of the world. (Re)thinking of how new knowledge emerges, collapses nature/culture dualisms by reinserting humans back into the fray as members of situated common worlds with ethical and caring response(abilities). By paying attention to and storying the shadowy and mythical critters, ghosting pedagogies offer a generative and collective approach to support the radical shift that Plumwood calls for.

As construction squeezes the forest with paved and gravel pathways both around its perimeter and plowing straight through its heart, ghosting pedagogies remain committed to staying in the fray.

Chapter 3

3 Thinking with Plastics: Common Worlds Waste Pedagogies Disrupt the Early Childhood Classroom

Abstract

This article reveals how inundating the classroom with excess plastic waste provoked a kind of governance that troubled the very notion of early childhood education. Over the past two years, our team of researchers, pedagogists, and early childhood educators has been engaging in a participatory ethnographic research project that explores innovative common worlds pedagogies and alternative plastic waste practices in an early childhood classroom. Our research is informed by the common worlds framework, which challenges child-centered approaches to learning by decentering the human and attending instead to complex, entangled human/nonhuman relations that emerge in our everyday encounters with nonhumans, in this case plastics. Through our ongoing plastics inquiry, we notice how plastics and the concept of excess invite us to respond to plastic waste. While this research is still in progress, we have found that our plastic inquiry, alongside other common worlds waste pedagogies, disrupts dominant discourses of childhood, the role of the educator, and the very materiality of the classroom.

3.1 Introduction

In the last two decades, multiple fields of study, including but not limited to environmental and earth sciences, human geographies, education, and, more recently, early childhood environmental education, have taken up the call to confront the complex waste problems that threaten ecological stability (Hawkins, 2001, 2009; Hird, 2012, 2013; Hoornweg & Bhada-Tata, 2012; Geyer et al., 2017). Excess plastics have been identified as a significant contributor to a global waste crisis. While scientists explore alternative materials to replace plastics and the environmental education field emphasizes human-centered approaches to environmental sustainability, such as earth stewardship and waste management (e.g., Davis, 2009; Inoue et al., 2016; Sauvé, 2005; Somerville & Williams, 2015), some environmental scholars (e.g., Alaimo, 2010; Gibson-Graham &

Roelvink, 2010; Hawkins, 2009; 2010; Hird, 2013) argue that society must rethink their response(abilities) in the growing waste crisis. One such rethinking in the field of early childhood education is the common worlds framework. Common worlds pedagogies (e.g., Blyth & Meiring, 2018; Iorio et al., 2017; Lakind & Adsit-Morris, 2018; Nxumalo, 2016; Pacini-Ketchabaw & Nxumalo, 2015; Taylor, 2013, 2014, 2017; Taylor & Giugni, 2012) shift the responses to human-induced ecological instability from the individual to the collective and from human-only relationships to the interrelations among humans and nonhumans. In other words, they argue that the world is not just a human world but rather a co-constitutive common world.

Child-centered approaches currently predominate the early childhood education field. The common worlds framework questions these methods. Decentering the child opens up space to pay attention to the interrelationships that emerge within everyday encounters between humans and nonhumans, such as waste materials (Taylor, 2013). Challenging child-centered waste management pedagogies that focus on learning about sustainability and skills for stewardship, common worlds waste pedagogies emphasize learning with waste materials in a common shared world.

In this article we describe a plastic waste inquiry with young children that disrupted, not only child-centered approaches to learning, but also the role of the educator and the very materiality of classrooms. The inquiry, which is ongoing and takes place at a childcare centre in southwestern Ontario, is one site within a larger, SSHRC-funded collaborative research project that critically analyzes waste practices in early childhood education and is developing new theoretical and empirical directions for the ECE field that rethink the Rs (reduce, reuse, and recycle) through refiguring young children's relationships with waste (Pacini-Ketchabaw, 2017). Our site focuses specifically on plastics.

For the past two years, the classroom has created a collaboratory to rethink plastics recycling with a group of ten children ranging in age from 18 to 24 months. Kelly-Ann has participated in the collaboratory as researcher and pedagogist since 2018, working alongside Laurie and Hayley (educators), Lindsay (pedagogist), and Brenda (childcare

centre director). Our work is a collaborative effort and so this article uses the pronouns *we/our* to reflect the team's collective work.

In the first section of the article, we provide background into the common worlds framework and corresponding approaches. After briefly describing our inquiry, we reveal how it provoked a kind of governance in the classroom that troubled the very notion of early childhood education. We detail three main areas of disruption: child-centered approaches, the educator role, and the materiality of the classroom. In each of these sections we demonstrate how pedagogical interventions disrupted traditional practices—and why these disruptions matter.

3.2 Common worlds framework

The common worlds framework (Taylor, 2013, 2017; Taylor & Giugni, 2012) provides the theoretical foundation to support not only human-nonhuman relations, but also new pedagogical possibilities that emerge from within these co-constitutive relations. In decentering the human, the framework confronts the fact that humans are not alone in the world; humans and nonhumans are considered co-constituents within a shared common world. “Common worlding” is a process of attending to the actual, messy, unequal, and imperfect worlds real children inherit and co-inhabit along with other human and nonhuman beings and entities (Taylor, 2013; Taylor & Pacini-Ketchabaw, 2019). Within our common world, according to Affrica Taylor (2013), “no one stands or acts alone,” “all human lives are inextricably enmeshed with others (human and more-than-human),” and “all human actions are implicated with and have implications with others (including nonhuman others)” (p. 117).

Thinking in relations with human and nonhuman others offers the possibility to transform early childhood educators' pedagogical practice. Common worlding shifts our pedagogical focus, from child-centered approaches of learning about, for example, plastic waste management and removal, toward learning within emerging messy, lively, situated, non-innocent relations—in this case, child-plastic relations. As Taylor (2017) reminds us, the common worlds framework requires educators and children to remain open to the

presence of others, both human and nonhuman, and, more importantly, to the notion that knowledge production and world making (worlding) are co-constitutive processes.

In our specific inquiry with plastics, we are shifting our focus from thinking about plastics to thinking with plastics. The common worlds waste pedagogies we put to work in this project intentionally decenter the human as stewards of the earth or as managers of waste, making room for alternative responses to plastic waste. Inspired by the common worlds framework's generative orientation and support for emerging pedagogies that attend to complex and entangled human/nonhuman relations, we remain open to noticing how plastics invite us to respond to their presence in the classroom. Taylor and Giugni (2012) remind us "to think about ourselves as belonging to human/more-than-human common worlds . . . [and] to approach relations as generative encounters with others or shared events that have mutually transformative effects" (pp. 111–112). It is the possibility of child-plastics relations, and specifically how the "transformative effects" within these relations might inform our responses to plastic waste, that most provokes our curiosity. Recognizing child-plastic encounters as mutually reciprocal interactions allows us, not only to notice plastics' presence differently, but to inform our ongoing pedagogical choices in curriculum making.

3.3 Our plastics inquiry

Our plastics inquiry is guided by the concept of excess. At our research site—a classroom in a Reggio-Emilia-inspired early childhood centre—we intentionally inundated the classroom with hundreds of plastic bottles suspended from the ceiling, sitting on the shelves, and gathered in groupings that cover much of the classroom floor. Since then, we have invited the young children in the space to attend to and respond to plastics' presence. Using pedagogical documentation, we pay attention to and story the movements that emerge within particular encounters between bodies and plastics. The use of pedagogical documentation offers up the space for intervention: a space to revisit, question, interpret, and respond to the everyday moments we notice (see, e.g., Blaise et al., 2017; Dahlberg et al., 2007; Iorio et al., 2017; Pacini-Ketchabaw et al., 2015). While our pedagogical documentation is meant to make everyday interactions with plastics visible, our struggles to decenter the child and refocus on child-plastic relations become

apparent in the process. While in the past our pedagogical decisions were based on developmentally appropriate practices and on following the child's lead, we now refocus our attention on the unanticipated interactions that emerge between children and plastics. Keeping plastic waste in sight and in mind (Hird, 2013) rather than removing it through acts of recycling, we notice how its presence disrupts child-centered learning approaches, the role of the educator, and the materiality of the classroom.

3.3.1 Disrupting child-centered approaches to learning

Common worlds waste pedagogies disrupt child-centered approaches to learning and knowledge production. While child-centered approaches emphasize the individual child's agency within the process of receiving or constructing knowledge, the common worlds approach emphasizes the agency both humans and nonhumans have within their interactions. In fact, in her critique of child-centered approaches, Rachel Langford (2010) argues that agency is not an individual entity but rather "is networked, assembled, distributed, partial, and relative" (p. 24) to the collective. In other words, agency is a co-constituted process within a community of humans and nonhumans. Affording agency to both humans and nonhumans supports our understanding that plastics' agency is present within child-plastic co-constitutive relations, thus allowing for a shift from individual learning to learning as a collective endeavour.

Yet, decentering the child is not easy, nor is the process of remaining open to the possibilities that plastics' presence and agency effect different child-plastic encounters. Although we noticed early on that children gravitated to specific bottles and we mused over their attachment to plastic waste, we struggled to shift our focus from the child to the interactions that both children and plastics provoked. The common worlds framework emphasizes slowing down and paying attention to unanticipated moments, and in doing so, we found ourselves refocusing from the children's movements to how plastics invite children to move in multiple ways. At first we noticed how adept children were at traversing the cluttered, bottle-filled classroom, and how some children kicked the bottles aside as mere obstacles. But in shifting our thinking to a common worlds perspective, we intentionally paid attention to how bodies and bottles move and bump up against each other. Our early pedagogical documentation on what was happening during the inquiry

often focused on why/how we respond (or not) to plastics while reflecting our struggle to wonder about how plastics respond to us.

Here is an example of how we wrote our initial observations of what was happening during the plastic inquiry.

As a large group of plastic bottles convene and settle into one of the corners of the classroom, one of the children approaches them with a dustpan in hand. At first, he stands at the edges and tries to reach over the makeshift containment pool to scoop up the bottles, but he quickly realizes he cannot quite capture them. Plastic's slipperiness affects our ability to capture it. After a pause he moves to sit amongst the plastic bottles and then begins to scoop. Scooping is a two-handed process; one hand holds the handle of the dustpan while the other hand attempts to keep the slippery bottles in place. With each scoop, he lifts the pan over his head and dumps some of the bottles over the side. This process requires a chain reaction whereby the hand, arm, bottles, and dustpan must connect and react to each other. However, with each scoop several bottles slip out and fall back to the floor. With every five bottles scooped, three fall back. This is slow work! The hand-arm-bottle-dustpan movement continues until the area is clear of plastics. Once the area is emptied of bottles, the child sits back, hesitates, and seems to ponder the emptiness of the area. In one quick motion he then stands up and leaves the containment area so that the hand-arm-bottle-dustpan movements can begin pouring the bottles back to their original resting place.

Rereading the observations, we realize that we struggle to shift our attention from the child's individual experience to the interactive movements of child and bottles, particularly how the plastic bottles and the child each affect the other. The focus of our documentation is the child's movements. How might we intentionally shift our focus away from what developmental skill is emerging or why the child is clearing the bottles from the containment area? For example, how might we pay attention to how the plastic bottles push us to move in particular ways? How might we rethink plastics, not as objects to extend children's learning, but as lively participants within child-plastic encounters? This observation leaves us with a sense of discomfort, and we meet to discuss it. Shifting

away from the child-centered orientation that has dominated the early childhood field is not easy, nor is our process of speculative storying that rethinks the plastic bottles as lively provocateurs. But as Donna Haraway (2016) reminds us, this process is slow, and details matter. And so, we revisit and rewrite our documentation, this time thinking with, feeling with, and engaging with plastics' subjectivity, and how plastic-body intra-actions support a new kind of story. Here is our revised documentation.

Although the morning begins with us carefully placing the plastic bottles throughout the classroom, over the first hour dozens of bottles alongside children's tiny feet begin to move. At first children attempt to step around the bottles, but soon the feet and bottles connect and skitter away. It is as though the bodies and bottles come together briefly then push apart as each bottle bounces and shakes, taps, and dances across the classroom floor. While there is movement throughout the room, we notice a large group of bottles settling into one of the corners, and two of us decide to sit beside the pile. As three of the children notice the pile of plastic bottles, they move closer and jump in. Soon others follow. It is as though the plastic bottles gather the children rather than children gathering the plastic bottles. The role of protagonist in this encounter seems fluid, shifting from child to bottle and back again. As children and plastics lie together, their collective movements seem to mimic each other as bodies cover bottles and bottles cover bodies. This playful, companion-like dance continues throughout the morning.

The shift is subtle but meaningful, pedagogically. Rather than following the lead of the child, we follow the movements of the plastic bottles; the bottles seem to lead us. By decentering the child, we stay with the tensions of thinking with and being with plastics, and in doing so wonder what it means to befriend plastics as the children and bottles seem to frolic together as playmates. These unexpected and peculiar child-plastics encounters lead us to rethink our relations with plastics and problematize the concept of following the child's lead.

3.3.2 Disrupting the role of the educator

Within the field of early childhood education, the role of the educator in the classroom is to "listen, observe, and document children's ideas, explorations, and interests, to respond

to them and co-create meaningful, open-ended, in-depth and sustained learning experiences” (Nxumalo et al., 2018, pp. 433–434). Learning experiences are child-centered and outcome driven and are meant to prepare children to become good neoliberal citizens (Pacini-Ketchabaw, Nxumalo, & Rowan, 2014). Structure is maintained through everyday routines as educators set up classrooms into developmentally appropriate play centres (e.g., reading, blocks, art, dramatic play) to extend children’s learning. Materials as objects of manipulation are oftentimes carefully chosen by the educators to meet the needs of the developing child, pushing the learning in particular predetermined ways (e.g., social, emotional, physical, cognitive). Educators plan and document children’s activities to observe, meet, and extend learning goals.

Rethinking the role of the educator requires intervention strategies that disrupt the status quo. Using pedagogical documentation can support this shift. Mindy Blaise and colleagues write: “Within the process of documentation, the educator is not intended to be situated on the edge of children’s experiences, but rather she is always and already entangled with many layers of complexity” (Blaise et al., 2017, p. 37). While much of the literature in early childhood education texts emphasizes materials “as merely what mediates learning and developmental processes” (Pacini-Ketchabaw et al., 2017, p. 3), emerging research explores knowledge production as a more complex and contextual co-constitutive process (Pacini-Ketchabaw et al., 2017; Taylor, 2013). In understanding knowledge production as informed in relations with others, the common worlds framework invites early childhood educators to shift their practice from individualistic child-centered learning to learning in relations with human and nonhuman others (e.g., children and plastics). A common worlds perspective asks that educators remain open to unexpected possibilities that emerge within the everyday moments that child-plastic encounters reveal, and to respond to the complex and at times contentious relations that emerge within context-specific happenings.

We began the plastics inquiry by extending our pedagogical practice to thinking and being in question. As Haraway (2016) reminds us, one needs to “venture off the beaten path to meet the unexpected, non-natal kin, and to strike up conversations, to pose and respond to interesting questions, to propose together something unanticipated” (p. 130).

In other words, in researching plastics' story we become curious and active learners. To think with plastics, and beyond plastic as being an inert object, we must first get to know it. While the specifics of plastics' history are outside the scope of this article, it is important to note that by understanding the complexity of plastics' story, we notice plastics' presence differently. In the following we present a snippet of the documentation of our encounter with plastic bags and the mutually affective process of crocheting.

The children, educators, and pedagogist begin the morning scattered amongst the different stages of plastics' lively transformation. As plastics move and change from grocery bags, to strips, to conjoined links, to yarn balls, to partners in crocheting, we sit together with the lingering question of how the process of crocheting invites us to be and become with plastics. Hands push hooks through the first loop. Pulling and tugging the hook grabs onto the new piece of plastic yarn and drags it through the open loop. Each movement is like a choreographed dance in which all parts must work in unison. However, as hooks plunge through the plastic yarn, knots form and tangles slow the crocheting process to a near halt (as seen in Figure 3.1 below). Crocheting requires us to know the yarn intimately: its texture and thickness, its pliability and strength. Yet we all have little or no experience crocheting and so, while sitting with the plastic yarn balls and several crochet hooks scattered around us, we quickly notice that learning how to crochet is less about words than it is about doing and feeling. Whether tiny hands or large hands grasp the hooks, crocheting with plastic yarn requires slow, delicate, and rhythmic movements.



Figure 3.1 Tangled with plastics.

Hooks, plastic yarn, and fingers act and react to each other as delicate loops begin to transform the yarn balls. In keeping with our understanding of common worlding, our encounters with plastic yarn are “mutually transformative” (Taylor & Giugni, 2012, p. 112). Common world waste pedagogies provide space to think. Perhaps crocheting offers a metaphor for the process of being and becoming in relation with the more-than-human other. Each tug, knot, loop, and even tangle reminds us that transformation is co-constitutive.

As educators we are constantly making pedagogical decisions in our everyday practice. But in the context of our plastic inquiry, tension arises because our decisions are speculative and without set learning goals. As hands and hooks and plastic yarn tug and pull and knot, weaving together, we ask how crocheting invites us to be with and become with plastics. We wonder, as Haraway (2016) does, “what kind of caring and responsibility could unexpected collaboration [for example, with plastic yarn] evoke?” (p. 22). We sit with the questions of what it might mean to care for plastics differently and what response(abilities) emerge as hands and plastic yarn crochet together.

From a common worlds perspective, early childhood educators become curious questioners. In the plastics inquiry, we shift our practice from thinking about plastics as objects to thinking with plastics. But in understanding what it might mean to think with plastics, we sit with many questions. How do plastics have a life, a history, a story

beyond that of an object for children's use? How do plastics exist within social, cultural, political, and geographical contexts?

Keeping plastics in sight and in mind (Hird, 2013) requires a more complex response from us than removing plastics from the classroom would. We must remain open to alternative ways of thinking and being with plastics to imagine plastics beyond being objects of manipulation or objects for removal. By troubling not only waste management pedagogies and the familiar practice of predetermining particular learning goals for waste removal (e.g., identify, sort, and remove plastic recyclables) but also the binary thinking that classifies plastics as items to keep or discard, we must first begin to notice and respond to the ubiquitous presence of plastics in the classroom. In the following documentation we describe how the plastic bottles affect the spaces we occupy.

How our bodies and the bottles move changes as the plastic water bottles continue to occupy more space on the classroom floor. As the bottles continue to stockpile around one another, we (the children, educators, and pedagogist) have a difficult time navigating with and through the plastics. We stay with the discomfort of having our movements restricted by plastics and with what the overcrowding of bodies and plastics brings. Although none of us have seen firsthand the global effects of excess plastic waste, we have had the opportunity to visit the chaotic, crowded recycling facility in our community. That visit and the complex and at times contentious relations emerging within the plastic inquiry combine to trouble our understanding of the manage(ability) of plastic waste.

When all the bottles gather in the corner of the room, the educators' bodies join to create a human container. Struck by how our struggles to contain the plastic bottles seem to mimic what we witnessed in a tour of a local landfill and recycling facility, we remind ourselves that both situations illustrate how plastics' seeming uncontainability mirrors the world these children will inherit. What we noticed in the landfill and in the classroom is that in both cases human-made structures and human bodies are unable to contain excess plastic waste. While we struggle in the moment to maintain some semblance of

order, it reminds us of the uncontrollability and endless spillage within the growing plastic waste crisis.



Figure 3.2 Sleeping with plastics.

As shown in Figure 3.2 above, at certain times through this experience, the children's faces would be the only thing exposed through the body-bottle mashup. As educators, these moments of child-plastics commingling left us feeling uncomfortable. We grappled with feelings of uneasiness as we observed the emergence of plastics-child closeness. The images of the children quietly lying amid the heaps of plastic bump up against images of uncontrollable mounds of plastic waste that rise relentlessly throughout the world. While

we wonder how it feels to lie amid a sea of waste, we also wonder how the peculiar close relations within our context might invite alternative ways of being with plastics.

Seeing plastics beyond their utilitarian purposes is difficult for us, but in our research we find inspiration from other sources outside of early childhood education. For example, in thinking with articles, books (e.g., Hird, 2012, 2013; Yoldas, 2015), and documentaries (e.g., Sky News, 2017), we research body-plastics movement in other spaces and how humans and nonhumans respond to the consequences of living with excess plastics.

The artistic renderings of social justice artist Pinar Yoldas push our pedagogical work with the plastics inquiry. While her collection “Ecosystems of Excess” inspires our pedagogical work with plastics, our one-on-one conversation with her helped us to see the plastic bottles in the classroom beyond mere physical objects. Yoldas explained that her artistic work is meant to be a speculative wondering of how life in the future must evolve to survive in a plastic world. Her collection is inspired by one very simple question: “If life evolved from our current plastics-debris filled oceans, what would emerge?” (Yoldas, 2015, p. 359). She imagines how marine life might respond to excess plastics’ impact on existing food chains. The evolutionary traces of the mythical plastivore emerge from her artwork as specimens of the internal organs of marine life evolve to consume and digest plastics. In reading about and viewing her speculative wonderings of sea creatures’ evolutionary path towards becoming, we practice thinking and being in question by wondering how plastics’ shapeshifting might provoke a transformation in human-plastic relations that moves beyond plastics as objects of human inspiration.

In one of our pedagogical meetings, we discuss Pinar Yoldas’s work and the seeming disconnections between the ease of removing plastics from the classroom and the complexity of removing plastics from the ocean. We begin to think alongside her artistic renderings of plastic creatures projected on our classroom wall. In thinking and being in question, we intermingle her work with the ongoing happenings of the classroom.

Pinar Yoldas’s artistic play with futuristic plastic bodies provokes us to wonder about our own inquiry with plastics. Although context matters, the concept of excess plays a

significant role in both her work and our own. If the buildup of excess plastics in oceans influences Yoldas's artistic work, how might the excess plastics in the classroom affect our pedagogical work? While plastics and bodies are deeply entangled, we wonder how these entanglements invite particular relations with plastics and bodies. This is not easy or fast work, and so, while our interactions with plastics seem to invite closeness, we question why this closeness matters and what it might mean to become-with plastics.

3.3.3 Disrupting the materiality of classrooms

In early childhood education the materials we bring into the classroom have always played an important role in children's learning. When thinking about the aesthetics in the classroom environment, educators typically place materials as invitations or provocations to direct or support children's learning. For example, from the framework of developmentally appropriate practice, the classroom is divided into centres for learning with the materials in each centre supporting the linear development of life skills (e.g., dramatic play centre for social and emotional skills). In the Reggio Emilia approach, in contrast, the classroom environment is viewed as a third teacher. Sue Fraser (2012) asserts that "a classroom that is functioning successfully as a third teacher will be responsive to the children's interests, provide opportunities for children to make their thinking visible, and then foster further learning and engagement" (p. 67). In both cases, albeit in different ways, these descriptions indicate that the classroom environment is meant to support specific child-centered approaches, whether it be to direct or inspire children's learning. But how might we think about the idea of choreographing the materials (Pacini-Ketchabaw et al., 2017) and the space, or curating the space to engage not only the children but the educators as well? When thinking with common worlds, instead of setting up materials as invitations with ideas about what the child might do with them, we set up the space to think about what the materials might do to us.

Exaggerating plastics' presence disrupts commonly held views of what an early childhood classroom should look like. When we began our work with plastics, we first cleared the room of many of the familiar, everyday items that occupied spaces. We moved and removed many of the large and small items, from baskets of tiny toy animals, to large shelving units, to clear the area for the deluge of plastics to come. What had been

a Reggio-inspired space with purposefully chosen materials meant to respond to children's curiosities and wonderings became a vast bottle-filled space meant to provoke a response from both the children and the educators. As we continued to open up the floor space by pushing bookshelves and toy shelves up against the wall, we seemed to be physically and metaphorically deconstructing the expected image of the classroom. With only one empty shelf remaining visible and the rest facing the wall, we almost instantly felt uncomfortable as we discussed how this new space would affect our (children's and educators') daily movements. Unfamiliarity is both unsettling and informative. In this next piece of documentation, we begin the process of shifting our thinking with plastics.

Within the everyday moments with the children and plastic water bottles, we begin troubling the notion of plastics as objects for human inspiration, speculating instead on plastics as lively, unexpected provocateurs in relations with children. In thinking with the excess of bottles we begin our inquiry with an immersive process whereby the researcher/pedagogue joins the group daily to document and discuss what emerges within the first encounters with bottles (for both children and educators).

Attending to plastics' materiality requires us to be open to plastics' vitality. By engaging in the plastic inquiry, we must challenge the concept of materials as inert objects. The invitation to think with and be in relation with a material, whether natural or synthetic, is not easy. Plastics' liveliness is important in understanding the ongoing implications of plastics-body relations. Plastics as unruly, unstable shapeshifters "blur all issues of persistence and permanence" (Bensaude-Vincent, 2017, p. 24). As Zalasiewicz et al. (2016) note, "plastics are clearly long-lived on human time-scales" (p. 12), leading to unpredictable consequences of plastics' infinite earth presence (Hird, 2012). The challenge, Hawkins (2010) writes, becomes understanding how "different plastic materialities become manifest and [how] these reverberate on bodies, habits, and ecological awareness" (p. 121). As nonbiodegradable, plastics' physical composition merely transforms, from macro-plastics (e.g., recognizable remnants of water bottles or plastic bags) to smaller microplastics (e.g., microscopic plastic beads or fibers). While plastics' form and function might shift through the processes of production, consumption, and disposal, its presence remains permanent. Whether plastics are in sight or not, its

permanence, compels a (re)think of human-plastic entanglements. As part of this (re)thinking, we wonder how keeping plastics in sight in our classroom reconfigures young children's relationships with plastic waste and how learning might be affected in the process of being and becoming with plastics. The following excerpt from the documentation for the first day of the plastic inquiry demonstrates the co-constitutive relations of children and plastics.



Figure 3.3 The plastic classroom.

Day One: We begin the plastic inquiry with the question of how we invite children to attend to plastic. As we enter the newly curated plastic classroom (see Figure 3.3 above), the educators and pedagogists quickly notice the children's unusually slow pace. Normally, the day begins with the children quickly moving toward the snack table, but today, as each of the children arrive at the classroom, they hesitate at the doorway and then slowly walk up to and stare at the carefully placed bottles that sit on the floor and tables as well as hang from the ceiling greeting them. Throughout the morning we video, photograph, and write the happenings.

While each bottle contains other plastics commonly found in the classroom (plastic straws, bags, bread tags, labels, markers, CDs, diapers, balloons, beads, and more), it seems as though it is the bottles themselves, rather than their contents, that at first draw children closer. Tension arises as we notice that it is the bottles that invite children to gather, linger, and move. Plastics move us.

By allowing for the “significance, agency, and substance of materiality” (Alaimo, 2010, p. 70) and the co-constitution of being and becoming in body-matter assemblages (Iovino, 2012), we acknowledged the possibility of plastics as participating change agents in plastic-body encounters. The co-constitutive process of being and becoming in the world provides what Stacy Alaimo (2010) refers to as a “profound sense of entanglement, intra-activity, and perpetual emergence [that] fosters an ethical stance that insists that the activities and knowledge practices of the human are always part of, and accountable to, the wider world” (p. 73). To account for plastics’ agency we think with Karen Barad’s (2007) theory of agentic realism. Barad notes that “neither human practices nor material phenomena are ontologically or epistemologically prior” (p. 152) and knowledge production is an ongoing process of being and becoming in relations with both human and nonhuman others. In the plastic inquiry then, agentic realism provides the theoretical foundation that supports plastics’ agency. Rather than educators and children reacting towards inert plastic objects, educators, children, and plastics intra-act within entangled and embodied body-plastic encounters to generate new and situated knowledges (Haraway, 2016). Barad’s concept of agential intra-action captures the “reciprocally transformative” relationship with and between humans and nonhumans (Frost, 2011, p. 77) whereby neither human nor nonhuman is privileged above the other.

As the classroom filled with bodies and bottles, we began to live in a space where we were always touching or touched by plastics. Our movements were affected by plastics’ presence; bodies and plastics were in constant contact with each other. And so, we paid close attention to the intentional/unintentional movements the bottles created. Soon children’s bodies, together with the plastic water bottles, bumped, tripped, and scattered, each affecting the other.

We wanted to see what would happen if we pushed the bottles hanging on a string from the ceiling. Rhythmic wave-like movements responded to our hands as bottles moved back and forth, back and forth, inviting us to gather at each end of the curving motion. As the tiny hands caught and released the swinging bottles, we noticed that both bodies and bottles must respond to each other. We liken this to dancing, whereby each partner’s

movements matter as their response affects the other's moves. Tension arises over plastic bottles' effect/affect. Plastics move bodies and bodies move plastics.

Our pedagogical work intentionally stays with, is entangled in, and pays attention to the intra-activity of bodies and plastics. By thinking with and becoming with plastics, plastics have been reconfigured from inert objects to active participating subjects, pushing us (educators and researchers) to open up space to reimagine the possibility of plastics as lively contributors to the classroom community. Now the intersubjectivity with/between humans and nonhumans, bodies and plastics reconfigures "humans [as] always in composition with nonhuman[s], never outside of a sticky web of connections" (Bennett, 2004, p. 365). The interconnectedness emphasizes a co-constitutive subjectivity of both human and plastics. With this shift in thinking we begin to pay attention to how plastics' vitality invites us to respond to its presence.

3.4 Final thoughts

In this article we revealed some of the disruptions that have emerged in our early childhood classroom as we continue to think with common worlds waste pedagogies in our plastics inquiry. We have found in our work that common world waste pedagogies support alternative ways of being with, thinking with, and living with plastics. In the process of supporting these alternative ways, common worlds pedagogies also disrupt child-centered approaches to learning, the role of the educator, and the very materiality of classrooms.

Engaging with plastics is not easy; plastics trip us, crowd us, and disrupt our playing, eating, and sleeping habits. Although cleaning up the messiness is tempting, we are committed to staying with this inquiry.

Chapter 4

4 Restorying Young Children's Relations With Plastics Through Excess: Common Worlding Waste Pedagogies

Abstract

Earth is drowning in excess plastic waste. Plastics, knowing no boundaries, spill into oceans and rivers and across landscapes—plastic rocks, plastic water, plastic bodies, plastic worlds. Responding to the complexity of plastic's unruly presence demands careful attention. However, current responses to excess waste, plastic or otherwise, focus on ineffective management approaches that pay little attention to waste(ing). In this article we explore how common worlding waste pedagogies take up the concept of excess and speculative storying practices to restory children's relations with plastic waste. Rather than managing and removing plastic waste out of sight, the authors kept plastics (e.g., bottles and bags) in sight by exaggerating plastic's excess in one early childhood classroom. By removing all toys and books from the classroom and inundating the classroom with a deluge of plastic bottles, the researchers curated a queer synthetic classroom to create the conditions to attend to the inseparability of children and plastics. For two years the researchers, three educators, and eight children between 18 months and 2 years of age engaged with plastic's excess. The vignettes we share in this article offer snippets of the speculative stories that emerged from five particular and peculiar child-plastic encounters that created otherwise possibilities for responding to the overwhelming plastics crisis.

4.1 Being and becoming in plastic worlds

Plastics are everywhere and in everything (human and nonhuman)—plastics in oceans, plastics in rivers, plastics in rocks, plastics in bodies (Corcoran, Moore, & Jazvak, 2014; Lehner et al., 2019; Mammo et al., 2020). Waste scholars agree that current plastic waste management practices are unable to contain or control the increasing volume of plastics entering the waste stream (Hawkins, 2001, 2010; Hird, 2012, 2013; Ma & Hipel, 2016). Thus far, confronting and responding to plastic (waste) has been limited to fragmented

approaches to controlling excess plastic waste that fail to fully address waste processes and plastics' liveliness beyond mere management practices that hyper-separate humans from waste (H. Davis, 2015a, 2015b). These waste management practices fail to pay attention to the complex relations humans have with plastics and with processes of waste(ing) (Boetzkes, 2019; Gabrys et al., 2013; Hawkins, 2007). In fact, as Amanda Boetzkes (2019) states, "environmental consciousness demands a reconsideration of waste practices in intimate relation to the subject" (p. 40).

In this article we story how we work in an early childhood classroom with plastics' excess to challenge the management approach to waste and create otherwise possibilities for responding to the overwhelming plastics crisis. Throughout this article, the classroom is renamed the queer synthetic classroom⁴ and is framed as a plastics collaboratory (a hybrid concept of collaboration and laboratory as a site of learning). We worked for two years with three educators and eight children between 18 months and 2 years of age, spending one morning a week in the classroom while the rest of the week the educators continued to work with the children. The data collected in this researched included observations and field notes, as well as photographs, videos, and pedagogical documentation. Data analysis incorporated diffractive and reflexive readings⁵ of both data collected *in situ* and data from literature, films, and conversations from others outside the research site.

We have organized this article into four main sections to establish and then respond to plastics' excess. The first section provides an overview of how the queer synthetic curriculum emerges and highlights the feminist scholars that influence our work. The second section delves into plastic's banality and perseverance, while the third section

⁴ The queer synthetic classroom draws inspiration from speculative artists and their plastic art curations. By removing all toys and books from the classroom and inundating the classroom with a deluge of plastics, the authors curated the queer synthetic classroom to create the conditions necessary to attend to the inseparability of children and plastics (see blog Living with Plastics).

⁵ Diffractive and reflexive analysis involves a continual cycle of data collection, critical reflection, and interpretation (Pacini-Ketchabaw et al., 2015; Pacini-Ketchabaw, Kind, & Kocher, 2016).

brings in speculative plastic art as the inspiration for curating the synthetic classroom. The final section includes five vignettes that draw on speculative storying practices to story specific encounters between children and excess plastics to attend to particular and peculiar child-plastic relations. The first story engages with how the excesses of plastic permeate the toddler classroom and begin to participate in community gatherings, disrupting conversations, entering stories, and provoking new songs. In the second vignette, we story a young child's encounter with a plastic whale, providing a glimpse into the authors' complex reading of plastics' toxic presence. The third vignette stories how excess plastics invite particular responses from the children and educators; in it, we think with plastics' excess provocations. The fourth and fifth vignettes story plastics' shape-shifting capacity and malleability, from the excess of plastic bags to the tangled balls of plastic yarn weaving through crochet hooks, children's bodies, and classroom spaces. We conclude by reiterating how, in this pedagogical inquiry with plastics' excess, the unfolding stories between children and plastics are critical to reconfiguring children's emerging relations with plastic.

4.2 Common worlding waste pedagogies

We take up the call from environmental scholars to pay attention to humans' inseparability from plastics through the creation of common worlding waste pedagogies. Unlike most environmental sustainability practices in early childhood education that focus on waste management pedagogies (e.g., J. Davis, 2009; Inoue et al., 2016; Sauv , 2005; Somerville & Williams, 2015), common worlding waste pedagogies are responding to Myra Hird's (2012, 2013) cautions that waste management approaches, such as the Rs initiative of reduce, reuse, recycle, etc., are ineffective.

Hird (2013) emphasizes that recycling only moves waste "out of sight and out of mind" and therefore maintains capitalist and colonial desires for production and consumption that fuel our waste problem. We cannot attend to that which we cannot see or have forgotten, Hird argues. She states that "waste management . . . may actually foster our current relentless forgetting, or worse, inexperience with waste beyond feel-good practices of recycling" (p. 116). For instance, removing plastic waste out of sight allows for the unfettered perpetuation of plastic's indisposability rather than removing our

dependency on fossil fuels or responding to the unknown and unanticipated consequences of plastic's presence (Hird, 2013; Liboiron, 2018).

Conceptualizing waste-human relations through Haraway's (2008) concept of naturecultures, common worlding waste pedagogies also challenge the human-centredness of most waste management approaches and their emphasis on hyper-individualized citizenship. These human-centred practices focus on what Katz (2011) refers to as individualized "responsibilisation" (p. 42), whereby individuals are charged with fixing the external environmental sustainability issues that emphasize human exceptionalism and (mis)understand ethical response-ability in more-than-human worlds (Plumwood, 2002). These prescriptive approaches, when brought into education, rely on "effective and intentional instruction" (Blanchard & Buchanan, 2011, p. 233) and focus on teaching the skills needed to become good citizens. Whether through standardized curriculum (Eames et al., 2008), developing waste management practices (see Caiman & Lundegard, 2014; Madden & Liang, 2017; Ogelman, 2012), or teaching effective skills for managing and recycling waste (Arlemalm-Hagser & Sandberg, 2011; Cutter-Mackenzie & Edwards, 2014; Inoue et al., 2016), these approaches focus on children's behaviours and dispositions and on solving environmental sustainability issues through individual actions. For example, Eames, Cowie, and Bolstad (2008) encourage teachers to teach children to become good future citizens by learning the skills that develop stewardship through set actions. As Mackey (2012) describes, these approaches teach children how to individually care for their environment through acts such as picking up garbage or sorting recyclable materials to clean up the school—"to protect what is precious to us in *our* world" (p. 482, emphasis added).

In contrast, Peter Kraftl and his colleagues (Kraftl, 2020; Kraftl et al., 2021) note that in common worlding waste practices, children's bodies and the spaces and places they occupy are already shared with the seen and unseen presence of plastics. These scholars offer a critical glimpse into the plastic childhoods that know no boundaries—regardless of children's social or economic positions. Kraftl et al. (2021) critically analyze children's entanglements with plastics using an interdisciplinary approach that draws on

common worlds research and processes of learning in relation with the more-than-human world and considers the ethical implications a multifaceted approach provokes.

As researchers and pedagogists, we engage human-waste inseparability through our work with common worlding waste pedagogies. The creation of these pedagogies is the objective of an international research project that focuses on (1) critically analyzing the Rs (reduce, reuse, recycle, recover, remediate, repair) waste practices in early childhood education and (2) developing new theoretical and empirical directions for the field to refigure young children's relationships with waste (Pacini-Ketchabaw, 2017). Common worlding waste pedagogies intentionally push back on practices that move waste out of sight and out of mind by instead bringing waste materials in sight and in mind, exaggerating them in the classroom through artistic processes. The project is organized in collaboratories where children, educators, and researchers experiment with and articulate other worldly relations and interactions with waste. These collaboratories focus on particular waste materials: plastics, food waste, and waste water. Later in the text, we specifically story how the queer synthetic curriculum engages plastic's excess.

4.3 The queer synthetic classroom

As we have written elsewhere (Pacini-Ketchabaw & MacAlpine, accepted), the queer synthetic curriculum is emergent and responsive to what plastic's excess brings, both inside the synthetic classroom and across local and global sites. The queer synthetic curriculum emerges from our experimentations with common worlding waste pedagogies that do not separate nature from culture (Common Worlds Research Collective, see <https://commonworlds.net/>). It invites slow, situated pedagogies in which children become immersed in the tensions of plastics. More specifically, it is designed to invite children to attune to, be curious towards, and embrace the plastic futures they inherit.

In the queer synthetic curriculum, we put into conversation Heather Davis's description of plastics as multigenerational "toxic progeny" (2015b, p. 245) and Allison Cobb's (2021) autobiographical story of plastics and plastics' web of connection both in and out of bodies (human and nonhuman). In this way, we intentionally queer curriculum and attend to plastic's excess.

By exaggerating the presence of plastics in the classroom, the queer synthetic curriculum works with the inextricability of plastics from children's bodies and worlds (Kraftl, 2020) and treats plastic as queer matter that disrupts and challenges the norm (H. Davis, 2015a). Taking seriously the excess of plastic and making visible the overwhelming presence of plastics within contemporary capitalist society, the queer synthetic curriculum exaggerates the already embodied and entangled child-plastic relations as a space for otherwise (e.g., non-capitalist) relations that might emerge and "bleed out from the intensity and immediacy" of the local and situated (Pink, 2009, p. 34).

Our common worlding waste pedagogies and their curricular processes are inspired by the writings of feminist philosophers Isabelle Stengers and Donna Haraway, who emphasize the importance of speculation at a time when catastrophic events are commonplace across the globe. In coproducing a queer synthetic curriculum, we use speculation to "resist the present, and appeal to a future in the mirror of which our present and our past are strangely deformed" (Stengers, 1991, p. 151). Through speculation, a queer synthetic curriculum attempts to create a specific mode of attention to the affective/effective possibilities of an unfolding situation—including their potential dangers and opportunities (Haraway, 2016).

4.4 Plastics and their excess

Much has been written about plastics across various disciplines and theoretical frameworks. What is clear in the literature is that plastics' excesses and intemperance are characteristic of the Anthropocene, the geological and ecological era in which human activity has permanently altered Earth's systems (Crutzen & Stoermer, 2000; Malhi, 2017; Zalasiewicz et al. 2016). A poignant example of plastic excess and intemperance is "plastiglomerate." Oceanographer Charles Moore, geologist Patricia Corcoran, and artist Kelly Jazvac joined forces to study the impact of plastic waste on Kamilo Beach, Hawaii (Corcoran, Moore, & Jazvac, 2014). During visits to the site, they found not only a plethora of plastics in many shapes, sizes, and types but also small solid chunks of rock consisting of fused molten plastic and beach sediment, such as sand, wood, and coral. Referred to as plastiglomerate (Corcoran, Moore, & Jazvac, 2014; Jazvac, 2017), this newly named rock indicates the extent to which plastics have infiltrated not only

landscapes and seascapes but also the earth's geological layers, leaving a permanent mark on the earth's temporal and spatial history (Corcoran & Jazvak, 2020; Corcoran, Jazvac, & Ballent, 2017; Corcoran, Moore, & Jazvak, 2014; Zalasiewicz et al., 2016).

With over 8.5 billion tons of plastics already present on Earth (Geyer et al., 2017; Jambeck et al., 2015), plastic's presence will reverberate for generations to come. Bernadette Bensaude-Vincent (2013) writes that "the manufacture of plastics destroys the archives of life on the Earth, [and] its waste will constitute the archives of the twentieth century and beyond" (p. 24). Plastic's lifespan is beyond calculation on any current human timescales, and its unpredictable futurities make us all vulnerable to the unknown consequences of its longevity (Bensaude-Vincent, 2013; Hawkins, 2001, 2010; Hird, 2012, 2013; Ma & Hipel, 2016; Zalasiewicz et al., 2016).

Heather Davis (2015a) argues that plastic's logics contribute, in large part, to the severity of plastic's global impact. Plastic's "pervasiveness, banality, and longevity" (p. 350), shape-shifting capacity, durability and malleability, disposability and indisposability, and sterility and toxicity add to the complexity of its excessive and ubiquitous presence. Plastics contain and leak, protect and contaminate, are malleable and impermeable, can be controlled and yet are uncontrollable. It is these mixed effects, Davis notes, that allow the relentless push for and excessive production and consumption of plastics. Not only are there tons of plastics already occupying spaces on land and sea (Geyer et al., 2017), there is no foreseeable end to plastic's exponential growth.

Viewing plastics from a slightly different angle, Jody Roberts (2010) specifically names its rapid spread as subtle:

Experts of all stripes missed it slipping into unintended places, traveling near and far such that nearly every cup of water from the ocean is likely to contain some plastic in some form of degradation and nearly every human subject found anywhere on the globe will likely bear the marks of a plastic modernity. (p. 111)

Plastic's capacity to break down from identifiable macro-plastics (e.g., remnants of water bottles or plastic bags) to unidentifiable smaller microplastics (e.g., microscopic plastic beads or fibres)⁶ makes its excess almost invisible (out of sight and out of mind).

Yet, plastic's surplus goes beyond its unabated production and ceaseless spread. The excesses of plastic go side by side with its unfettered, complex toxicity. Plastics leach toxins indiscriminately in all that humans and nonhumans "eat, drink, breathe, [and] touch" (Schaag, 2020, p. 14). In fact, its inherent malleability allows it to play host to countless toxic chemicals (Lehner et al., 2019; Lithner et al., 2012; Mammo et al., 2020). Yet, due to plastic's indeterminacy, the scientific community struggles to comprehensively understand both the extent and overall effects of plastic toxicity (Lehner et al., 2019; Mitrano et al., 2021).

Feminist scholars (e.g., H. Davis, 2015b; Hawkins, 2007, 2010; Hird, 2013) urge us to stay with these struggles and recognize that because plastics are here to stay, we need to rethink our ethical response-abilities arising from our plastic addiction. Heather Davis, for instance, suggests that as a society we need to embrace plastic's toxicity and pay attention to humans' inseparability from it. Davis states:

The (heteronormative) assumption of the inviolability of the body is part of the foundational logic that allows for the bioaccumulation of toxins in the environment and in our bodies in the first place. . . [T]oxicity forces us to reveal the ways in which we are multiply composed—of plastic, of toxins, of queer morphologies. . . . Now that we are increasingly being impinged upon to acknowledge the porosity of our bodies, we need to find ways of *living with*

⁶ The processual breakdown of plastics does not indicate a compositional change as in the case of organic materials but rather a breaking apart from primary to secondary (from macro to micro) pieces (Turner et al., 2019).

toxicity, for it is certainly not going away. (2015b, p. 244, emphasis in original)

4.5 Speculative plastic art—Artists as environmental activists

While our work draws from a wide range of research on the excess of plastics, as outlined above, we are keenly interested in the emphasis that excess plays in artists' speculative engagements with plastic (see *Ecosystems of Excess* [Yoldas, 2014], the [Crochet Coral Reef Project](#) [Wertheim, n.d.], and the work of the Synthetic Collective [<https://syntheticcollective.org/>]). In Tara Donovan's 2006 installation "Untitled (Plastic Cups)," she combines thousands of single-use plastic cups to create glacial snowbanks (see <https://www.ignant.com/2017/06/26/tara-donovan-transforms-plastic-cups-into-a-geomorphic-sculpture/>). Eva Horn (2020) notes that while "one plastic cup is just a flimsy piece of plastic or polystyrene, billions of them are an ecological disaster" (p 168). Donovan's speculative offering of the seen and unseen movements of plastic cups works with the concept of excess to reimagine plastics' movements. Boetzkes (2016) states that the illusionary movement of "Untitled (Plastic Cups)" offers

a vision of anthropogenic change in which thousands of plastic cups stacked at different levels create the illusion of a glacial topography of undulating snowbanks . . . haunted by the concept of the Anthropocene: the era of human carbon history and its devastating ecological effects, including the extinction of innumerable species and the sedimentation of carbon and nuclear toxicity, all of which is measurable in geological strata. (para. 26)

Taking a slightly different approach to excess, Cobb (2021) weaves intricate plastic-body interconnectivity in, for example, the dead albatross chick whose body slowly decomposed leaving only the remnants of the excess plastics it consumed: Plastics both filled its stomach yet left it empty, leaving the full-bellied bird to starve to death. In the slow process of decomposing, the stomach sack wasted away to reveal the remnants of brightly coloured plastics it once held—pieces of toys, bottles, and grocery bags.

As researchers and pedagogists, we take inspiration from these artists to speculate with the idea of excess plastics by making large amounts of plastic the main protagonist in the child-plastic encounters that emerge in the classroom. At different times of the year, the only material in the classroom is hundreds of plastic water bottles, or hundreds of plastic grocery bags, or several rolls of plastic bubble wrap. Plastic is excessive, overabundant, and ubiquitous in the classroom. Inspired by Katie Schaag's (2020) suggestion that "performance art has the inherent capacity to activate the tension between plastic's object-ness and subject-ness" (p. 15), we attempt with the queer synthetic curriculum to activate plastic's excess and invite children to respond speculatively to living in plastic worlds. For us as educationalists, speculative work with plastic's excess is essential for rethinking plastics beyond the current binaries that narrate plastics as either good or bad, life-saving or life-taking, sterile until toxic. To show how we activate the concept of excess through speculative work, the rest of this section stories encounters between children and plastics that emerged throughout the making of the queer synthetic curriculum and provide a glimpse into how the presence of excess plastics evokes/provokes particular and, at times, peculiar responses.

4.6 Stories of excess in the queer synthetic curriculum

4.6.1 Plastic bottles join the classroom community

Gathering plastic water bottles and filling them with plastics gathered from the classroom and beyond is part of carefully curating the queer plastic curriculum. With more than 100 plastic bottles filled with thousands of tiny remnants of everyday plastic items, the plastic bottles make their excess presence known to the children.

Most mornings the educators and children gather in a circle on the floor where they engage in conversations, sing songs, read books, or tell stories. Prior to the arrival of the plastic bottles, a small, carpeted area was left open as the designated meeting place. However, since the bottles arrived, the children and educators needed to enlarge the space to find room to meet up amid the sea of plastic. Once the bottles became a part of the morning meeting, they were treated like new children joining the classroom. Images of the plastic bottles were added to the classroom photo album and the "all about me"

posters on the wall. Children's songs and stories were reimagined to incorporate the new classmates.

One morning meeting, a child is quietly tapping a plastic bottle on the floor beside them. A rhythmic tap, tap, tapping softly resonates. As one of the educators watches the child-bottle movements, she picks up the bottle sitting beside her and begins to tap. After the briefest of pauses she sings, "The bottles on the bus go tap tap tap, tap tap tap, tap tap tap." Soon after, the children chime in and the song "The Wheels on the Bus" transforms to "The Bottles on the Bus." The children and bottles join to tap together while the words to the original song quickly switch to include the bottles' sounds and movements. Once the tapping verse of the song is complete a new one is added. From tapping, to spinning, to bouncing, to crinkling, the song grows to include more things the bottles do.

The bottles on the bus go tap tap tap

Tap tap tap, tap tap tap

The bottles on the bus go tap tap tap

All through the town.

The bottles on the bus go spin spin spin . . .

The bottles on the bus go bounce bounce bounce . . .

The bottles on the bus go crinkle crinkle crinkle . . .

All through the town.

Soon other songs begin to include the bottles. "Twinkle Twinkle Little Star" becomes "Twinkle Twinkle Little Bottle" with the children now singing:

Twinkle twinkle little bottle, how I wonder what you are

up above the world so high

like a diamond in the sky . . .

As the children and bottles tap, their actions meld in rhythmic unison.



Figure 4.1. Freeing the bottles. Photograph by authors.

A child's tiny finger pokes a hole in a large clear plastic bag (see Figure 4.1) stuffed with dozens of plastic water bottles. Pulling at the bag, she makes a hole just large enough to push her hand through the opening. Her hand movements are slowed down as she pushes down into the crowded space. With some twisting and turning of the wrist she manages to grab the first bottle and tries to pull it out. Her pulling movements are met with resistance as the remaining bottles surround her hand and cause her to lose her grip. The bottle is wedged—stuck in the bottle heap.

With each movement of the bottle(s) the child responds with slight movements of her hand. It takes all morning for the back-and-forth process to remove each bottle from the bag. Once all the bottles are removed from the bag, the child turns her attention to the large, crocheted whale suspended from the ceiling. She says to Kelly-Ann, “Pick me up” as she points up at the whale while holding one of the freed bottles in her other hand.

Kelly-Ann picks up the child so that she can get closer to the whale. At first, the child continues to hold the bottle, choosing to poke her tiny finger into the bulging belly of the whale and watching as the cascade of plastic bottles spills out over the edges and the bottles land in the pile with the others. After dozens of bottles hit the floor, Kelly-Ann puts the child down and together they wade through the large mound of water bottles and begin picking bottles up one at a time to try to refill the whale's belly. Filling it is not

easy as the belly can only stretch so far to contain the excess plastic (see Figure 4.2). As one bottle is placed precariously on top of the heap another falls to the ground unable to remain contained in the whale's belly. The belly shakes as it takes and accepts the bottles. The balancing act lasts, for now.

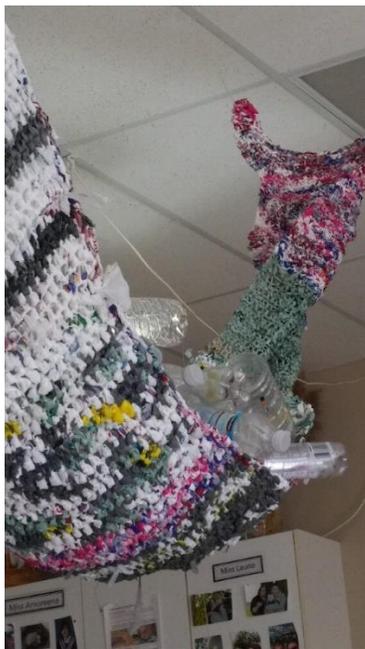


Figure 4.2. Crocheted whale. Photograph by authors.

4.6.2 Plastics invite movement

Although the morning begins with researchers slowly and carefully placing each of the hundreds of plastic bottles throughout the classroom, over the first hour dozens of bottles begin to move alongside children's tiny feet. At first children attempt to step around the bottles, but the impossibility of moving without touching any water bottles becomes very clear as the tiny feet and many bottles connect. As the feet and bottles connect the bottles skitter away. It is as though the bodies and bottles come together briefly then push apart as each bottle bounces and shakes, taps, and dances across the classroom floor. While there is movement throughout the room, the educators notice a large group of bottles settling into one of the corners. Deciding to join the pile, they move closer and sit along the edges of the mound. As three of the children notice the pile of plastic bottles, they also move closer, but rather than join the educators at the edges, they jump in, spilling several

of the bottles over the educators' legs (see Figure 4.3). With the first few children wriggling and burying themselves in the mound of bottles, other children are drawn closer and then jump in to join the mix. At first there is a great deal of noise and movement amongst children and bottles alike, but as the bottles spill out over the edges, the children respond by bringing them back in.



Figure 4.3. Bottles spilling over the edges. Photograph by authors.

The bottle-body encounter seems fluid, shifting from child to bottle and back again. Each movement of one or the other is met with a reciprocal response. As children and plastics lie together, their collective movements seem to mimic each other as bodies cover bottles and bottles cover bodies. This playful, companion-like dance continues throughout the morning.

4.6.3 Child and plastic reactivity

Living in the plastic classroom is uncomfortable. With hundreds of plastic water bottles spread out across the floor, sitting on shelves, and hanging from the ceiling, bodies and bottles are always bumping up against each other. As children and bottles respond to each other's movements, we are reminded of the affective process of touch. The dozen plastic water bottles that hang on string suspended from the ceiling command attention as educators and children alike must either weave around them or plow straight through. But in either case the bottles stir, responding to both gentle brushing of bodies or violent pushes to one side or the other. As the first pair of tiny hands pushes a bottle aside, the child stands in place and watches as bottles bump up against bottles, creating a rippling

movement that slowly stills. Another pair of tiny hands grabs hold of one of the bottles and pushes it forcefully straight ahead, and then the child runs along behind it. The bottle reaches the end of a pendulum-like arc and suspends in the air for a split second, then travels backwards with the child following close behind. Bottles and children move in and out, back and forth, each responding to the other's movements.

4.6.4 Crocheting with plastics

Outside the classroom, thousands upon thousands of empty discarded plastic bags can be found everywhere—floating in waterways, tangled in trees, weaved throughout landfills, and spewed across landscapes. Drifting like tumbleweeds, plastic bags travel the globe across land, sea, and air. Weaving through the fabric of human life and livelihood, the plastic bag leads a double life. When deemed useful it is a carrier and holder of things; when no longer needed, it is a danger to society, tangling and suffocating everything in its wake, from human bodies to water bodies. While the plastic bag is commonly found in the early childhood classroom, it remains in the background and away from the children—an object of use.

In the queer synthetic classroom, plastic bags participate in the everyday movements of the class. Bags upon bags, too many to count, have slowly been gathering alongside the children, educators, and researchers. On the floor are 22 plastic bags filled with many more crumpled plastic bags. The collective process of (plastic) yarn making requires bodies and bags and one pair of scissors. The process requires slow, careful movements from both hands and plastic bags, each responding to the other. The hands of the children, educators, and researchers must work with the plastic bags through several steps—smoothing, folding, trimming, linking, and rolling—to make the plastic yarn balls. Slowly, step by step, stitch by stitch, hands and bags must respond to the movements of the other. Transforming hundreds of bags into a dozen yarn balls takes over a week.



Figure 4.4. Becoming yarn. Photograph by authors.

From the heaping pile of plastic bags, the children, educators, and researchers pull out one bag at a time and then one by one flatten and smooth out each individual crumpled-up plastic bag (see Figure 4.4). The plastic bags make their presence known as they interact with bodies to create a static pulling and bonding, bag to body and body to bag. Tiny pieces of plastic break away during the smoothing process and stubbornly stick to the children's tiny fingers, refusing to let go even as the children vigorously shake their hands. One child says, "Look . . . it stay stuck on me," while another shakes their hand and tells the educator, "Can't get it off." The educator responds by showing them that the plastic sticks to her as well. One of the children reaches her plastic-covered finger outward, gesturing toward the educator. With slow and gentle movements, both covered fingertips touch then pull apart, but the plastic scraps remain stuck. As the child says, "Look, it stay!" she quickly moves her finger around to show the others, but the plastic piece responds to the movement of the air and falls to the ground.

Plastic yarn balls are placed across the classroom floor alongside several crochet hooks. The collective process of crocheting begins.

In a quiet corner in the classroom one educator and two children focus intently on the slow and delicate responses the yarn ball and crochet hook demand of them. While the educator places the yarn ball in her lap to allow the plastic yarn to unroll slowly, the two children watch as the ball of yarn unravels with each plunge of the crochet hook.

At first the children try to pull the yarn ball back toward their bodies by pulling on the loose thread, but with each pull the ball rolls farther and farther away. One of the children tells another, “I get it back.” With the much smaller yarn ball brought back, he turns to retrieve the loose thread and drops the now tangled mess onto the other child’s waiting foot. “Get it off.” “It stuck.” With every kick the second child makes, the more entangled the foot and yarn become (see Figure 4.5). “Help, I stuck.”



Figures 4.5. Unravelling the tangles. Photographs by authors.

4.7 Child-Plastic Futures

Grappling with the unpredictability of child-plastic futures and the perpetual trouble of living with the bodies of plastic that we (humans) have created is a common worlding waste pedagogies’ task. Rather than educating a new breed of good environmental citizens set on better managing plastic waste, common worlding waste pedagogies think with excess to reframe children’s relations with plastic. In this article, we attend to classroom stories that exaggerate plastic’s presence in the classroom: a whale stomach that holds well over 50 plastic bottles, dozens of plastic bottles suspended from the ceiling, hundreds of bottles spewed across the classroom floor and plastic yarn balls knotted on crochet hooks and children’s bodies.

Drawing inspiration from speculative artists and their plastic art curations, we invite excess into the classroom to attend to its affects. Excess plastics invite children to notice and respond to plastic's presence in ways that diverge from the petrocapiatist relations that persist (Altman, 2015). In other words, through the pedagogical interventions taking place in the synthetic curriculum, the educators create the conditions to support children in practicing the curiosity that might allow them to grow up *with*—rather than indifferent to—the plastic that surrounds us.

In this article we put common worlding pedagogies and the concept of excess to work in the queer synthetic curriculum to notice and respond to what plastic excess invites. By keeping excess plastics in sight and in mind, we challenge current waste management practices that merely move plastics out of sight and out of mind (Hird, 2013), failing to address plastic's ubiquity and liveliness (H. Davis, 2015a). In thinking with plastic's excess, the synthetic curriculum creates a specific mode of attention to the affective/effective possibilities that emerge within situated child-plastic encounters. In restorying children's relations with plastic through excess, we offer complex, creative, and context-specific gestures toward environmental scholars' call to pay attention to humans' inseparability from plastics.

Chapter 5

5 Summarizing the Research

My research questions are designed to respond to ongoing and situated problematics that surround processes of educating amid continuous ecological devastation, specifically, pedagogical and curricular approaches that fail to effectively prepare young children for an unknown future.

This article-based dissertation explored the following questions:

- What pedagogies and curricular processes might emerge when more-than-human others become visible in early childhood settings?
- How might emerging pedagogies and curricular processes reconfigure early childhood educators' relations with more-than-human others?
- How might emerging pedagogies and curricular processes reconfigure children's relations with more-than-human others?

By rethinking pedagogies and curricular processes that attend to the inseparability of children, educators, and more-than-human others, I intentionally disrupt developmental logics that hyper-separate children from the real, messy, damaged worlds they live in and will inherit. My research responds to on-the-ground work within the Common Worlds Research Collective (<https://commonworlds.net/>) that focuses on human-nonhuman relations and creating more livable worlds (e.g., Blaise et al., 2017; Hodgins, 2015; Iorio, et al., 2017; Nelson et al., 2018; Nxumalo & Pacini-Ketchabaw, 2017; Taylor et al., 2012).

There are three components to this chapter. In the first section I describe how I built on common worlds research by generating creative, complex, and context-specific common worlds pedagogies in the two research sites. In the second section I show how speculative storying is a both method for on-the-ground common worlds research and a critical pedagogical tool for educators. The final section focuses on the research questions and

how common worlds pedagogies and curricular processes open up spaces for the experimentation required to reconfigure educational approaches to early childhood education so that children and educators can learn together what ethical and responsible movements are necessary to meet ongoing environmental challenges (Taylor, 2013; 2017).

5.1 Contributions to common worlds pedagogies

Building off common worlds thinking-doing research (e.g., Duhn & Galvez, 2020; Land, 2019; Pacini-Ketchabaw et al., 2016), I put speculative storying to work as the pedagogical workspace to attend to the entangled relations that emerged within the two research sites. Ghosting pedagogies and common worlding pedagogies created the pedagogical space for educators to critically and creatively interpret everyday human-nonhuman encounters both in and outside the classroom. Developing and engaging with innovative pedagogies and curricular processes offers situated responses to the “real world challenges facing twenty-first-century children” (Taylor, 2013, p. 110). For example, in article 1, “Ghosting Pedagogies: Disrupting Developmental Narratives in Early Childhood Environmental Education” (MacAlpine, accepted), an alternative narrative allowed the educators and I to push back against developmental notions that learning is an individual human process and the forest a mute backdrop by creating the pedagogical space to attend to and story the liveliness of the forest and the critters that live there. The article draws on pedagogical documentation of children’s encounters with remnants in the forest (e.g., owl feather and coyote track), and the speculative stories of the shadowy and mythical attend to both the liveliness of seen and unseen critters (e.g., owls, and critters on-the-move) and the emerging relations between children and forest critters. In article 2, “Thinking with Plastics: Common Worlds Waste Pedagogies Disrupt the Early Childhood Classroom” (MacAlpine et al., 2020), the concept of excess exaggerated plastic’s presence in the early childhood classroom. Situating our pedagogical work as researchers, pedagogists, and educators within common worlding waste pedagogies, we engaged with pedagogical documentation to speculatively story particular and peculiar interactions between children and plastics. In doing so, educators paid attention to how plastic’s active presence affected the governance of the early

childhood classroom. In article 3, “Restorying Young Children’s Relations with Plastics Through Excess: A Common Worlding Inquiry” (MacAlpine and Pacini-Ketchabaw, submitted), common worlding waste pedagogies attended to plastic’s inseparability from children’s worlds and bodies. Each of the five vignettes in this article drew from pedagogical documentation of particular and peculiar child-plastic encounters to offer speculative stories of how plastic’s excess invited children to respond.

While each separate article stories emerging human-nonhuman relations that are made visible when alternative common worlds pedagogies and curricular processes are put in place, the three articles together offer a broad view of how shifting curricular practices within different situated contexts can address the problematics of educating amid continuous ecological devastation. Specifically, all three articles offer pedagogies and curricular processes that shift the focus from learning as an individual cognitive process to learning as an interactive relational process of being and becoming with more-than-human others (see examples within common worlds research, e.g., Taylor, 2013, 2017, 2018; Taylor & Giugni, 2012; Taylor et al., 2012).

5.2 Storying

In this dissertation, speculative practices played a critical role in my development of and engagement with ghosting pedagogies and common worlding waste pedagogies. As stated in Chapter 1, this is messy, imperfect work that requires that I learn to embrace the unexpected and experimental renderings necessary to see differently. Speculative practices offer me the creative space to “push the boundary of acceptable” (Puig de la Bellacasa, 2017, p. 73) and in turn the complex and context-specific pathways necessary to attend to the presence and agency of more-than-human others. Speculative practices are critical for noticing and responding to what emerges within interactive encounters among children, educators, researchers, and more-than-human others.

To take up speculative storying as a critical pedagogical tool, I relied heavily on close readings of feminist scholars such as Heather Davis, Donna Haraway, Gaye Hawkins, and Anna Tsing. For example, article 1, in part, draws on Haraway’s (2016) writings of speculative thinking and becoming-with others, in which Haraway writes:

Neither the critters nor the people could have existed or could endure without each other in ongoing, curious practices. Attached to ongoing pasts, they bring each other forward to thick presents and still possible futures; they stay with the trouble in speculative fabulation. (p. 133)

In article 1 I also draw on Anna Tsing's (2015) work that storied the entangled worlds of mushrooms and humans to argue for "the possibility of common life on a human-disturbed earth" (p. 163). In article 2, I bring in Hawkins' (2010) work on the lively effects of plastic materialities—of plastics "reverberating on bodies, habits, and ecological awareness" (p. 121). Finally, in article 3, I draw on Davis (2015) to support my renderings of plastics as lively provocateurs whose indeterminacy and enduring presence matter in storying their inseparability from humans in situated world making.

In all three articles I put speculative storytelling to work to make visible the active participation of more-than-human others in situated world making (e.g., wind and owl feather; plastic water bottles and plastic bags). I engage in speculative storying to creatively tell how bodies, things, and forces, seen and unseen, real and imaginary, organic and inorganic mutually interact within entangled and embodied encounters. By storying the interactive participation of children, educators, researchers, and more-than-human others within situated contexts, I collapse the binaries that hyper-separate self/other and nature/culture. In doing this work, I highlight reciprocal agency within human-nonhuman relations, thereby challenging developmental logics that hyper-separate children from a static and pre-existing world. As Taylor (2013) states, "it is relations that constitute common worlds, not sets of individual developmental trajectories—by relocating children within common worlds, the relations themselves become the locus of pedagogical attention" (p. 122). In my research, speculative storying becomes the necessary pedagogical work for making visible relational processes of thinking, doing, and being in common worlds.

By using speculative storytelling, I weaved pedagogical documentation, theory, and imagination together in an active and ongoing diffractive process for shaping and moving

the research, allowing for speculative interpretations of each encounter by enfolded the internal and external; the physical and the metaphorical; the artistic and the pedagogical (Bozalek & Zembylas, 2017; Lenz Taguchi, 2011). Employing common worlds storying methods for *thinking-doing* research (Hodgins, 2019) allows me to interpret the encounters in each of the sites as messy entanglements of both *what is* and *what else* might be. Speculative storying supports the conceptual and pedagogical “experimentation and creation” (St. Pierre, 2021) of ghosting pedagogies and common worlding waste pedagogies.

Storying as method supported both my *thinking and doing* common worlds research as well as the pedagogical work within each site. Opening up possibilities for noticing and responding to children’s encounters with more-than-human others as “embodied, situated, entangled, and noninnocent human and nonhuman relations” (Taylor, 2018, pp. 206–207) is not easy: It requires creative and complex pedagogies and curricular approaches. My use of speculative storying as a creative and complex pedagogical practice in-the-making builds on common worlds research by Fikile Nxumalo (2016) that emphasizes reconceptualizing pedagogical practices for “making visible, and ethically responding to, the entanglements of everyday practice with environmentally damaged places” (p. 40). In all three articles, I used speculative storying to help me respond to all three research questions—to make visible the active presence of more-than-human others, as a pedagogical practice to reorient educators’ curricular processes to story children’s encounters with more-than-human others as lively exchanges, and finally to creatively reconfigure children’s and educators’ relations with the more-than-human others.

5.3 Contributions to common worlds research

My research contributes to the growing body of common worlds research (see Common Worlds Research Collective, <https://commonworlds.net/>) within the field of early childhood education. Positioning my work within the common worlds framework, I offer situated responses to the question “How might we live together in heterogeneous common worlds in a way that allows difference to flourish?” (Taylor & Giugni, 2012, p. 112). The common worlding pedagogies and curricular processes that emerge in this

dissertation open up spaces for noticing and storying the complex and situated damaged worlds humans and more-than-humans share. In doing this work I flatten notions of human exceptionalism and focus instead on relational ontologies and knowledge production as an ethico-ontoepistemological process. My work is underpinned by my belief that knowledge production is an ethico-ontoepistemological process whereby learning is always woven within ongoing, collective, and interactive relational becomings with/in situated common worlds (Latour, 2004; Taylor, 2013). As such, the common worlds research I offer here is not intended to “resolve the messy, entangled, inequitable 21st-century common worlds we [humans] live in” (Hodgins, 2019, p. 13), but rather to trouble what it means to live well alongside more-than-human others—in blasted landscapes (Kirksey et al., 2013) and waste worlds. In doing so, I gesture towards ethical and response-able possibilities for living and learning responsibly and ethically in environmentally damaged spaces.

As Taylor and Pacini-Ketchabaw (2015) state, common worlds research, as an ongoing collective project, intentionally “challenges the mistaken assumption that we [humans] are exceptional and therefore separate from the rest of the world” (p. 511). In this dissertation, ghosting pedagogies and common worlding waste pedagogies intentionally focus on more-than-human agency by restorying children’s everyday encounters as entangled and embodied human-nonhuman encounters. In doing so, curricular processes such as pedagogical documentation make visible the inseparability of humans from the more-than-human worlds we live in. For example, article 1 refuses to think of the forest as a mute backdrop for children to experience, article 2 refuses to think of plastics as objects for children to manipulate, and article 3 refuses to ignore plastic’s banality and perseverance. Curricular processes and refusals are critical for educators to decentre the child and focus instead on tangled relationalities between children and more-than-human others.

5.4 Continuing common worlds research

As a pedagogist, and researcher, I take seriously the urgency to shift early childhood education to meet the needs of young children living and learning in ecologically precarious times. My research continues to engage in slow, cyclical, and emergent

processes of pedagogical documentation and curriculum-making. My work as a pedagogist supports educators' pedagogical and curricular work, provoking educators and children by introducing new ideas, theories, materials, and readings.

5.5 Conclusion

The purpose of my research is to provide situated processes for creating common worlds pedagogies that support alternative ways of thinking and doing early childhood education. Common worlds pedagogies (e.g., ghosting pedagogies and common worlding waste pedagogies) focus on thinking with rather than thinking about others—human and nonhuman (Taylor 2013, 2017). The generative and imaginative pedagogies that emerge through slow processes of noticing and responding to more-than-human others open up the possibility to create the conditions necessary for thinking and learning with the more-than-human others that children and educators engage with.

My doctoral research successfully responded to the research questions. As both individual articles and as a collective, the research offered complex, creative, and situated pathways to make visible more-than-human others, for developing generative and innovative common worlding pedagogies, and then putting to work each of the situated pedagogies along with curricular processes to reconfigure children's and educators' relations with more-than-human others. While the research emerged from two different sites and two different projects, when all three articles are integrated together, they provide clarity and importance to situated and emergent processes of curriculum-making. As stated in my introduction, early childhood education for the 21st century requires a significant shift in pedagogical and curricular approaches that are both creative enough and receptive enough to meet the unpredictable and precarious environmental future. The research I presented here provided situated approaches necessary and critical for shifting early childhood education.

More work is required for connecting speculative practices and curriculum-making processes together to allow for creative and responsive pedagogical approaches to early childhood education. Specifically, it is crucial that reconceptualizing curricular processes

remain responsive to unknown and unpredictable situated effects of living and learning in a damaged world.

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Chapter 1

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Chapter 2

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Appendix A. Letter of Information and Consent (Families)—
Climate Action Network: Exploring Climate Change
Pedagogies with Children



Letter of Information and Consent

Climate Action Network: Exploring climate change pedagogies with children Letter of Information and Consent – Families

Principal Investigator

Dr. Veronica Pacini-Ketchabaw, Faculty of Education
Western University [REDACTED]

1. Invitation to Participate

Your child is being invited to participate in this research study about developing climate change pedagogies with children because he/she is enrolled in [NAME OF CHILD CARE CENTRE] and one or more of the educators at your child's classroom have agreed to participate in this study. The child care centre is a partner in the project. The Association of Early Childhood Educators Ontario (AECEO) and Early Childhood Educators of British Columbia (ECEBC) are also partners in the Climate Action Network.

2. Why is this study being done?

The purpose of this project is to advance our understanding of children's relations with their environment in order to synthesize knowledge at local, national, and global levels regarding children's creative responses to the impacts of climate change. We are interested in how children engage creatively to address climate change related impacts on animals, trees, food, energy, and weather within their own local contexts. Your child is invited to participate in an inquiry on climate change. In addition, we are interested in the roles early childhood practitioners play in working with children to creatively and locally respond to climate-related issues. We hope that such knowledge will help us create effective and engaging new curricula, pedagogies, and policies.

3. How long will you be in this study?

It is expected that your child will be in the study for one school year, between 6 to 9 months. The collection of data will begin after [DATE (September, xxxx)] and will be ongoing during this academic year.

Your child will participate in the project during regular child care hours. Researchers will visit your child's classroom once or twice a week (approximately 3 hours per visit) during this period to work alongside classroom educators.

Please note that the educator might or might not choose to extend the activities with children (without the researchers being present) more than twice a week, during the regular programming.

4. What are the study procedures?

This is a participatory and collaborative project. If you agree to voluntarily let your child participate, her/his participation will be through his/her engagement in classroom activities and the pedagogical documentation that reflects this participation.

As outlined in the provincial pedagogical documentation is part of the regular pedagogical practices in your child's classroom. Children and educators participate in pedagogical inquiries and documentation as part of the regular activities and events of the child care program. This project is distinct from the regular pedagogical activities of the centre in that selected data will be collected from the regular documentation for analysis and dissemination beyond the centre.

The process of pedagogical documentation involves recording of the inquiry (both by educators and by project team), and individual and collective discussions with educators and children based on the recordings. The purpose of these discussions will be to:

- (a) make visible the learning that takes place in everyday practices in the program;
- (b) deepen and extend the activities observed; and
- (c) follow children's interests and curiosities.

Daily practices that relate to issues of [select one: food, weather, plants, animals, and energy] will be recorded using video, photographs, and field notes. Videos and photographs of your child will be taken only with your permission. In addition, if we have your permission, we will ask children to provide verbal assent to indicate their voluntary participation in the photos and videos.

It is anticipated that researchers will share with others the results of this project in the following ways:

- Through an art exhibit
- In publications and presentations, for example in books, chapters, articles in refereed and professional journals, academic and professional conferences, white papers.
- In masters or doctoral theses.
- In project website and professional social media (see below for more information)

Photographs and video recordings that include children's faces might be used in publications and presentations, if permission is given. However, NO images of children's faces (i.e., images where children are recognizable) will be used online. (Please see the section on Anonymity & Confidentiality below for more information.)

Some of the information collected and the ongoing analyses will also be shared through the project's website (e.g., in a blog) and professional social media accounts (e.g., Twitter). Circulating research knowledge through online platforms will increase the scope of the provincial, national and international audience that our research is shared with. Utilizing a professional research website and Twitter allows researchers to readily connect and share inquiry analyses in an accessible form with early childhood educators, students, scholars, and research institutions and units worldwide. This is vital for the sharing of learning to help build knowledge in the field of environmental early childhood education pedagogy and to improve climate change practices for children.

An example of research websites where ongoing pedagogical documentation is shared through a blog is the Common World Childhoods Research Collective at <http://commonworlds.net>. Examples of social media use (i.e., Twitter) with research inquiries can also be found on this site.

Your child's educator will act as co-researchers in the process of the research. The educator will have access to the pedagogical documentation collected in the program to use according to your Centre's guidelines. The educator might or might not choose to:

- incorporate ideas generated through the project into his/her daily practices for further observation and interpretation
- display some of the information collected and the ongoing analyses in your classroom.
- communicate the ongoing analyses through regular updates via your classroom's newsletter so you are aware of the activities in which your child is participating as well as the learning that takes place in everyday practices at the centre
- disseminate the findings in articles in professional magazines, and at conference presentations.
- contribute entries to the project website blog and professional social media accounts.

5. What are the risks and harms of participating in this study?

There are no known or anticipated risks or discomforts associated with participating in this study. However, participation in this study may cause some inconvenience to your child.

An inconvenience for children might be the interruption or intrusion of being recorded while engaged in daily activities. Since both photography and video are currently used in the centres by the educators, the intrusion will be the presence of the researcher collecting documentation. If this occurs, recording will be stopped. It is expected that the children will eventually become familiar with the presence of the researchers and this will stop being intrusive.

6. What are the benefits of participating in this study?

The potential benefits to your child include the learning that will take place during their participation in the project.

The possible benefits to educators may be to have further insights into how to engage pedagogically with issues related to climate change.

This research project may generate potential benefits to society, such as the possibility of increased understanding about how to address issues of climate change through early childhood education practices. It may also help researchers understand how young children can learn about climate issues.

7. Can participants choose to leave the study?

If you decide to withdraw your child from the study, you have the right to request withdrawal of information collected about your child. If you wish to have your information removed please let the researcher know. Choosing to withdraw from the study will not impact your relationship with the child care centre or any other institutions connected with the research study.

However, please note that it will be very difficult for us to remove what your child had said during group conversations. This is due primarily to the fact that after removing one person's dialogue in a discussion, the entire conversation might not make sense in total. We will minimize your child's data to respect your decision to withdraw him/her while ensuring that we can still gain a good understanding of other participants' experiences and insights.

When photos/videos are involved, we will crop the images and delete clips that involve your child.

8. How will participants' information be kept confidential?

Representatives of The University of Western Ontario Non-Medical Research Ethics Board may require access to your study-related records to monitor the conduct of the research.

Your child's participation in this study will not be kept confidential from their educator. The educators participating in the study will know which children are participating in the study in order to know who can and cannot be included in pedagogical documentation shared with the researchers.

While we do our best to protect your child's information there is no guarantee that we will be able to do so. The inclusion of your child's images through photographs and videos may allow someone to link the data and identify him/her.

Any photographs and/or video recordings to be shared on the project website and through professional social media accounts (e.g., Twitter) might have partial images of children (e.g.,

hands visible, feet visible) but will NOT have images of children that are recognizable (i.e., no faces will be visible).

We acknowledge the importance of your child's privacy, but are not able to assure absolute confidentiality. As with any person working with children, we are bounded by the professional and legal obligations of duty to report.

The researcher will keep any personal information about your child in a secure and confidential location for a minimum of 5 years. A list linking your child's study number with his/her name will be kept by the researcher in a secure place, separate from his/her study file. As well as making sure any identifying information is stored securely please note the following:

- If the results of the study are published, your child's name will not be used.
- Researchers might use your child's personal quotes in the dissemination of the project.
- Please be advised that although the researchers will take every precaution to maintain confidentiality of the data, the nature of group research with children prevents the researchers from guaranteeing confidentiality. The researchers would like to families to respect the privacy of other children participants in the classroom and not repeat what is said in the group meetings to others.
- In addition, your child will be able to be identified by the child care setting community (i.e., educators in your centre, other families) and potentially by other child care settings in the community (given the size the community).

9. Are participants compensated to be in this study?

You and your child will not be compensated for participation in this research.

10. What are the rights of participants?

Your child's participation in this study is voluntary. You may decide not to let your child take part in this study. Even if you consent for your child to participate he/she has the right to not answer individual questions or to withdraw from the study at any time. If your child chooses not to participate or you choose to withdraw your child from the study at any time it will have no effect on your child's care and education.

It is possible that you may feel influenced to participate because your child's educator is a participant or because [NAME OF CENTRE] is a partner in this project. It is important to stress that your child's participation in this research must be completely voluntary. If you feel influenced to be involved because of this perceived power-over relationship, you should decline participation.

We will provide you with an update if the nature of the research changes during the duration of your child's participation in the study, this will ensure that you always have current information in making decisions of whether you would like your child to remain a participant in the study.

You do not waive any legal right by signing this consent form.

11. Whom do participants contact for questions?

You are encouraged to ask any clarifying questions with regard to your child's participation in this research and I will answer your questions to the best of my knowledge and your satisfaction.

If you have questions about this research study please contact Dr. Veronica Pacini-Ketchabaw, [REDACTED]

If you have any questions about your rights as a research participant or the conduct of this study, you may contact The Office of Human Research Ethics [REDACTED]

This letter is yours to keep for future reference.

Consent

Project Title: Climate Action Network: Exploring climate change pedagogies with children
Letter of Information and Consent – Families

Principal Investigator

Dr. Veronica Pacini-Ketchabaw, Faculty of Education
Western University [REDACTED]

I have read the Letter of Information, have had the nature of the study explained to me and I agree for my child to participate. All questions have been answered to my satisfaction.

I agree for my child to be photographed in this research

YES NO

I agree for my child to be audio-recorded in this research

YES NO

I agree for my child to be video-recorded in this research

YES NO

I consent to the use of images of my child (including his/her face) obtained during the study in publications and presentations

YES NO

I consent to the use of partial images of my child (e.g., hands visible, feet visible) obtained during the study in the project website and researchers' professional social media accounts

YES NO

I consent to the use of my child's personal, identifiable quotes obtained during the study in the dissemination of this research

YES NO

I consent to the use of my child's unidentified quotes obtained during the study in the dissemination of this research

YES NO

My signature (Dr. Veronica Pacini-Ketchabaw) means that I have explained the study to the participant named above. I have answered all questions.

Print Name of Person Obtaining Consent	Signature	<i>Date (DD-MMM- YYYY)</i>
Child's Name: _____		

Parent / Legal Guardian / Substitute Decision Maker (Print): _____

Parent / Legal Guardian / Substitute Decision Maker (Sign): _____

Parent / Legal Guardian / Substitute Decision Maker (Date): _____



Appendix B. Letter of Information and Consent
(Educators)—Climate Action Network: Exploring Climate
Change Pedagogies with Children



Letter of Information and Consent

Climate Action Network: Exploring climate change pedagogies with children Letter of Information and Consent – Educators

Principal Investigator

Dr. Veronica Pacini-Ketchabaw, Faculty of Education
Western University, [REDACTED]

1. Invitation to Participate

You are being invited to participate in this research study about developing climate change pedagogies with children because you are an educator at [NAME OF CHILD CARE CENTRE]. The child care centre is a partner in the project. The Association of Early Childhood Educators Ontario (AECEO) and Early Childhood Educators of British Columbia (ECEBC) are also partners in the Climate Action Network.

2. Why is this study being done?

The purpose of this project is to advance our understanding of children's relations with their environment in order to synthesize knowledge at local, national, and global levels regarding children's creative responses to the impacts of climate change. We are interested in how children engage creatively to address climate change related impacts on animals, trees, food, energy, and weather within their own local contexts. You are invited to investigate children's responses to climate change. In addition, we are interested in what roles early childhood practitioners play in working with children to creatively and locally respond to climate-related issues. We hope that such knowledge will help us create effective and engaging new curricula, pedagogies, and policies.

3. How long will you be in this study?

It is expected that you will be in the study for one school year, between 6 to 9 months. The collection of data will begin after [DATE (September, xxxx)] and will be ongoing during this academic year. The anticipated total time commitment for this study is approximately 234 hours.

You will participate in the project during your regular working hours. Researchers will visit your classroom once or twice a week (approximately 3 hours per visit) during this period to work alongside you. You may or may not choose to extend the activities with children (without the researchers being present) more than twice a week, during your regular programming.

In addition, there will be a 2 hour evening group discussion meeting once a month during the school year to revisit and interpret the documentation collected in which other participating educators from the centre and researchers will be present. You may or may not choose to dedicate additional time to your own analysis of the pedagogical narrations. If so, you will determine the minimum/maximum amount of time beyond work hours devoted to this project.

4. What are the study procedures?

If you agree to voluntarily participate you will be asked to engage in pedagogical documentation, as described in *How does Learning Happen*, in your classroom.

Your specific responsibilities will be to facilitate and document, alongside researchers, a pedagogical inquiry related to climate change. Part of facilitation includes photographing, video/audio recording, and taking field notes of pedagogical moments, discussions and investigations to contribute to a collaborative pedagogical inquiry.

As you are aware, the process of pedagogical documentation involves recording of moments of practice (both by yourself and by the researchers), and individual and collective discussions with you (both during activity time and in scheduled meetings) based on the recordings. The purpose of these discussions will be to:

- (a) make visible the learning that takes place in everyday practices in the program;
- (b) deepen and extend the activities observed; and
- (c) follow children's interests and curiosities.

You may or may not choose to incorporate ideas generated by these analyses into your daily practices for further observation and interpretation.

Practices will be recorded using video, photographs, and field notes. Videos and photographs will be taken of you only with your permission.

You will also be responsible for attending evening discussion meetings related to the pedagogical inquiry. Researchers will also take notes during/after evening discussion meetings. Some of the scheduled meetings will be video or audio recorded for later revisiting. During these meetings, videos of you will be taken only with your permission.

You will have access to the pedagogical documentation collected from your own program to use according to your Centre's guidelines.

It is anticipated that researchers will share with others the results of this project in the following ways:

- Through an art exhibit
- In publications and presentations, for example in books, chapters, articles in refereed and professional journals, academic and professional conferences, white papers.
- In masters or doctoral theses.
- In project website and professional social media (see below for more information)

Photographs and video recordings that include educators' faces might be used when sharing results of this project, if permission is given.

Some of the information collected and the ongoing analyses will also be shared through the study website (e.g., in a blog) and professional social media accounts (e.g., Twitter). Circulating research knowledge through online platforms will increase the scope of the provincial, national and international audience that our research is shared with. Utilizing a professional research website and Twitter allows researchers to readily connect and share inquiry analyses in an accessible form with early childhood educators, students, scholars, and research institutions and units worldwide. This is vital for the sharing of learning to help build knowledge in the field of environmental early childhood education pedagogy and to improve climate change practices for children.

An example of research websites where ongoing pedagogical documentation is shared through a blog is the Common World Childhoods Research Collective at <http://commonworlds.net>. Examples of social media use (i.e., Twitter) with research inquiries can also be found on this site.

As a co-researcher, you might or might not choose to:

- display some of the information collected and the ongoing analyses in your classroom.
- communicate the ongoing analyses through regular updates via your classroom's newsletter so parents are aware of the activities in which their child is participating as well as the learning that takes place in everyday practices at the centre.
- disseminate the findings in articles in professional magazines, and at conference presentations.
- contribute entries to the project website blog and professional social media accounts.

5. What are the risks and harms of participating in this study?

There are no known or anticipated risks or discomforts associated with participating in this study. However, participation in this study may cause some inconvenience to you. Engaging in discussions related to your pedagogical narrations during staff meetings might detract you from other activities.

An inconvenience for children and for you might be the interruption or intrusion of being recorded while engaged in daily activities. If this occurs, recording will be stopped.

Another potential inconvenience to you, if you choose to be part of the project outside working hours, is that that time will be taken from other non-work related activities of your life.

6. What are the benefits of participating in this study?

The potential benefits for children include the learning that will take place during their participation in the project.

The possible benefits to you may be to have further insights into how to engage pedagogically with issues related to climate change.

This research project may generate potential benefits to society, such as the possibility of increased understanding about how to address issues of climate change through early childhood education practices. It may also help researchers understand how young children can learn about climate issues.

You will be provided with a certificate that acknowledges your participation in monthly, evening meetings.

7. Can participants choose to leave the study?

If you decide to withdraw from the study, you have the right to request withdrawal of information collected about you. If you wish to have your information removed please let the researcher know. Choosing to withdraw from the study will not impact your relationship with the child care centre or any other institutions connected with the research study.

However, please note, that it will be very difficult for us to remove what you have said during the group sessions. This is due primarily to the fact that after removing one person's dialogue in a discussion, the entire conversation might not make sense in total. We will minimize your data to respect your decision to withdraw while ensuring that we can still gain a good understanding of other participants' experiences and insights. When photos/videos are involved, we will crop the images and delete clips that involve you.

8. How will participants' information be kept confidential?

Representatives of The University of Western Ontario Non-Medical Research Ethics Board may require access to your study-related records to monitor the conduct of the research.

While we do our best to protect your information there is no guarantee that we will be able to do so. The inclusion of your images through photographs and videos may allow someone to link the data and identify you.

We acknowledge the importance of your privacy, but are not able to assure absolute confidentiality. As with any person working with children, we are bounded by the professional and legal obligations of duty to report.

The researcher will keep any personal information about you in a secure and confidential location for a minimum of 5 years. A list linking your study number with your name will be kept by the researcher in a secure place, separate from your study file. If the results of the study are published, your name will not be used. You may however want to consent for us to reveal your identity when you are co-authoring articles/chapters/presentations with us. We will ask for your consent every time an opportunity for publication arises.

In addition, given the collaborative nature of this research, you might decide to waive your confidentiality.

Researchers might use your personal quotes in the dissemination of the project.

Please be advised that although the researchers will take every precaution to maintain confidentiality of the data, the nature of group meetings prevents the researchers from guaranteeing confidentiality. The researchers would like to remind participants to respect the privacy of your fellow participants and not repeat what is said in the group meetings to others.

In addition, you will be able to be identified by your own child care setting community (i.e., colleagues in your centre, families) and potentially by other child care settings in the community (given the size of our community).

9. Are participants compensated to be in this study?

If you agree to participate in this study, we will issue a certificate of participation for the meetings that take place outside working hours which could be used towards your professional development hours. Please note that this certificate must not be coercive. It is unethical to provide undue compensation or inducements to research participants. If you would not participate if the compensation were not offered, then you should decline. If you agree to participate in this study, this form of compensation to you must not be coercive.

Letter of Information and Consent – Educators

Principal Investigator

Dr. Veronica Pacini-Ketchabaw, Faculty of Education

Western University, [REDACTED]

I have read the Letter of Information, have had the nature of the study explained to me and I agree to participate. All questions have been answered to my satisfaction.

I agree to be audio-recorded in this research

YES NO

I agree to be video-recorded in this research

YES NO

I consent to the use of images of myself obtained during the study in the project in the project website and researchers' professional social media accounts

YES NO

I consent to the use of personal, identifiable quotes obtained during the study in the dissemination of this research

YES NO

I consent to the use of unidentified quotes obtained during the study in the dissemination of this research

YES NO

I agree to have my name used in the dissemination of this research

YES NO

Print Name of Participant

Signature

*Date (DD-MMM-
YYYY)*

My signature means that I have explained the study to the participant named above. I have answered all questions.

Print Name of Person
Obtaining Consent

Signature

Date (DD-MMM-
YYYY)

Appendix C. Letter of Information and Consent
(Educators)— Rethinking the Rs Through the Arts:
Transforming Waste Practices in Early Childhood Education



Principal Investigator

Dr. Veronica Pacini-Ketchabaw, Faculty of Education
Western University [REDACTED]

1. Invitation to Participate

You are being invited to participate in this research study about developing waste pedagogies with children because you are an educator at [NAME OF CHILD CARE CENTRE]. The child care centre is a partner in the project.

2. Why is this study being done?

This 4-year international interdisciplinary project will examine for the first time how children, in different social and geographic contexts, might become active agents in creatively and critically confronting the complex waste problems that threaten their future. We are interested in how children engage creatively with waste materials within their own local contexts, and what roles early childhood practitioners play in working with children to creatively and locally respond to waste-related issues. We hope that such knowledge will help us create effective and engaging new curricula, pedagogies, and policies.

3. How long will you be in this study?

It is expected that you will be in the study for 39 weeks. The collection of data will begin after [DATE] and will be ongoing during this academic year.

4. What are the study procedures?

This is a participatory and collaborative project. If you agree to voluntarily participate, your participation will involve engagement in experimental, creative, and inventive art with waste materials. The art projects will be documented with photographs and videos that will be shared among the other five collaboratories participating in this research project.

We will also conduct three interviews with you throughout the study about your work with children in this project. The interview will be an exploratory conversation. The interview will not be evaluative of your practice. The interview is not mandatory. If you decline participation in the interview, you can continue your involvement in the project. If you agree to participate in the interview, we will be audio-recorded with your consent.

It is anticipated that researchers will share with others the results of this project in the following ways:

- Through a public and online art exhibitions and film screenings
- A website and blog
- Pre- and in-service education curricula
- In publications and presentations, for example in books, chapters, articles in refereed and professional journals, academic and professional conferences, white papers.
- In masters or doctoral theses.
- In project website and professional social media (see below for more information)

Some of the information collected and the ongoing analyses will also be shared through the project's website (e.g., in a blog) and professional social media accounts (e.g., Twitter). NO images of faces (i.e., images where people are recognizable) will be used online. (Please see the section on Anonymity & Confidentiality below for more information.)

Sharing research knowledge through online platforms will increase the scope of the provincial, national and international audience that our research is shared with. Utilizing a professional research website and Twitter allows researchers to readily connect and share inquiry analyses in an accessible form with early childhood educators, students, scholars, and research institutions and units worldwide. This is vital for the sharing of learning to help build knowledge in the field of environmental early childhood education pedagogy and to improve waste practices for children.

An example of research website where a similar study is shared through art encounters is Encounters with Materials (<http://encounterswithmaterials.com/>). Examples of social media use (i.e., Twitter) with research inquiries can be found on the Common World Childhoods Research Collective website at <http://commonworlds.net>.

You will act as co-researchers in the process of the research. You will have access to the pedagogical documentation collected in the program to use according to your Centre's guidelines. You may or may not choose to:

- incorporate ideas generated through the project into his/her daily practices for further observation and interpretation
- display some of the information collected and the ongoing analyses in your classroom.
- communicate the ongoing analyses through regular updates via your classroom's newsletter so you are aware of the activities in which your child is participating as well as the learning that takes place in everyday practices at the centre
- disseminate the findings in articles in professional magazines, and at conference presentations.
- contribute entries to the project website blog and professional social media accounts.

Practices will be recorded using video, photographs, and field notes. Videos and photographs will be taken of you only with your permission. Researchers will also take notes during/after evening discussion meetings. Some of the scheduled meetings will be video or audio recorded for later revisiting. During these meetings, videos of you will be taken only with your permission.

It is anticipated that researchers will share with others the results of this project in the following ways:

- Through an art exhibit
- In publications and presentations, for example in books, chapters, articles in refereed and professional journals, academic and professional conferences, white papers.
- In masters or doctoral theses.
- In project website and professional social media (see below for more information)

Some of the information collected and the ongoing analyses will also be shared through the study website (e.g., in a blog) and professional social media accounts (e.g., Twitter).

Circulating research knowledge through online platforms will increase the scope of the provincial, national and international audience that our research is shared with. Utilizing a professional research website and Twitter allows researchers to readily connect and share inquiry analyses in an accessible form with early childhood educators, students, scholars, and research institutions and units worldwide. This is vital for the sharing of learning to help build knowledge in the field of environmental early childhood education pedagogy and to improve waste practices for children.

An example of research websites where ongoing pedagogical documentation is shared through a blog is the Common World Childhoods Research Collective at <http://commonworlds.net>. Examples of social media use (i.e., Twitter) with research inquiries can also be found on this site.

As a co-researcher, you might or might not choose to:

- display some of the information collected and the ongoing analyses in your classroom
- communicate the ongoing analyses through regular updates via your classroom's newsletter so parents are aware of the activities in which their child is participating as well as the learning that takes place in everyday practices at the centre

- disseminate the findings in articles in professional magazines, and at conference presentations
- contribute entries to the project website blog and professional social media accounts.

5. What are the risks and harms of participating in this study?

There are no known or anticipated risks or discomforts associated with participating in this study. However, participation in this study may cause some inconvenience to you. Engaging in discussions related to the project during may detract you from other issues.

An inconvenience for children and for you might be the interruption or intrusion of being recorded while engaged in daily activities. If this occurs, recording will be stopped. Another potential inconvenience to you, if you choose to be part of the project outside working hours, is that that time will be taken from other non-work related activities of your life.

6. What are the benefits of participating in this study?

The potential benefits for children include the learning that will take place during their participation in the project.

The possible benefits to you may be to have further insights into how to engage pedagogically with issues related to waste practices.

This research project may generate potential benefits to society, such as the possibility of increased understanding about how to address issues of waste practices through early childhood education practices. It may also help researchers understand how young children can learn about waste issues.

You will be provided with a certificate that acknowledges your participation in monthly, evening meetings.

7. Can participants choose to leave the study?

If you decide to withdraw from the study, you have the right to request withdrawal of information collected about you. If you wish to have your information removed please let the researcher know.

However, please note, that it will be very difficult for us to remove what you have said during the group sessions. This is due primarily to the fact that after removing one person's dialogue in a discussion, the entire conversation might not make sense in total. We will minimize your data to respect your decision to withdraw while ensuring that we can still gain a good understanding of other participants' experiences and insights. When photos/videos are involved, we will crop the images and delete clips that involve you.

8. How will participants' information be kept confidential?

Representatives of The University of Western Ontario Non-Medical Research Ethics Board may require access to your study-related records to monitor the conduct of the research.

While we do our best to protect your information there is no guarantee that we will be able to do so. The inclusion of your images through photographs and videos may allow someone to link the data and identify you.

We acknowledge the importance of your privacy, but are not able to assure absolute confidentiality. As with any person working with children, we are bounded by the professional and legal obligations of duty to report.

The researcher will keep any personal information about you in a secure and confidential location for a minimum of 5 years. A list linking your study number with your name will be kept by the researcher in a secure place, separate from your study file.

If the results of the study are published, your name will not be used. You may, however, want to consent for us to reveal your identity when you are co-authoring articles/chapters/presentations with us. We will ask for your consent every time an opportunity for publication arises.

In addition, given the collaborative nature of this research, you might decide to waive your confidentiality. See below.

Researchers might use your personal quotes in the dissemination of the project.

Please be advised that although the researchers will take every precaution to maintain confidentiality of the data, the nature of group meetings prevents the researchers from guaranteeing confidentiality. The researchers would like to remind participants to respect the privacy of your fellow participants and not repeat what is said in the group meetings to others.

In addition, you will be able to be identified by your own child care setting community (i.e., colleagues in your centre, families) and potentially by other child care settings in the community (given the size of our community).

9. Are participants compensated to be in this study?

If you agree to participate in this study, we will issue a certificate of participation for the meetings that take place outside working hours which could be used towards your professional development hours. If project funds are available, you will receive compensation for costs incurred for attending one provincial conference. Please note that this certificate or

reimbursement of conference costs must not be coercive. It is unethical to provide undue compensation or inducements to research participants. If you would not participate if the compensation were not offered, then you should decline. If you agree to participate in this study, this form of compensation to you must not be coercive.

If you withdraw from the study, you will still receive a certificate for the professional development hours you have completed up to the withdrawal date. If you do withdraw from the study, and no other educators from your classroom are participants in this study, the children participants from your classroom will also be withdrawn from the study. Their data will only be used after their parents/legal guardians sign an authorization form.

10. What are the rights of participants?

Your participation in this study is voluntary. You may decide not to be in this study. Even if you consent to participate you have the right to not answer individual questions or to withdraw from the study at any time. If you choose not to participate or to leave the study at any time it will have no effect on your employment status.

It is possible that you may feel influenced to participate because [NAME OF CENTRE] is a partner in this project. It is important to stress that your participation in this research must be completely voluntary. If you feel influenced to be involved because of this perceived power-over relationship, you should decline participation.

We will give you new information that is learned during the study that might affect your decision to stay in the study.

You do not waive any legal right by signing this consent form.

11. Whom do participants contact for questions?

You are encouraged to ask any clarifying questions with regard to your participation in this research and I will answer your questions to the best of my knowledge and your satisfaction.

If you have questions about this research study please contact Dr. Veronica Pacini-Ketchabaw, [REDACTED].

If you have any questions about your rights as a research participant or the conduct of this study, you may contact The Office of Human Research Ethics [REDACTED].

This letter is yours to keep for future reference.

Letter of Consent—Educators

Project Title: Rethinking the Rs Through the Arts: Transforming Waste Practices in Early Childhood Education

Letter of Information and Consent – Educators

Principal Investigator

Dr. Veronica Pacini-Ketchabaw, Faculty of Education

Western University, [REDACTED]

I have read the Letter of Information, have had the nature of the study explained to me and I agree to participate. All questions have been answered to my satisfaction.

I agree to be photographed in this research

YES NO

I agree to be audio-recorded in this research

YES NO

I agree to be video-recorded in this research

YES NO

I consent to the use of images of myself obtained during the study in the project in the project website and researchers' professional social media accounts

YES NO

I agree to participate in interviews

YES NO

I agree to be audio-recorded during interviews

YES NO

I consent to the use of personal, identifiable quotes obtained during the study in the dissemination of this research

YES NO

I consent to the use of unidentified quotes obtained during the study in the dissemination of this research

YES NO

I agree to have my name used in the dissemination of this research

YES NO

Print Name of Participant

Signature

Date (DD-MM-YYYY)

My signature means that I have explained the study to the participant named above. I have answered all questions.

Print Name of Person
Obtaining Consent

Signature

Date (DD-MM-YYYY)

Appendix D. Letter of Information and Consent (Families)—
Rethinking the Rs Through the Arts: Transforming Waste
Practices in Early Childhood Education

Principal Investigator

Dr. Veronica Pacini-Ketchabaw, Faculty of Education

Western University: [REDACTED]

1. Invitation to Participate

Your child is being invited to participate in this research study about developing waste curriculum with children because he/she is enrolled in [NAME OF CHILD CARE CENTRE] and one or more of the educators at your child's classroom have agreed to participate in this study. The child care centre is a partner in the project.

2. Why is this study being done?

This 4-year international interdisciplinary project will examine for the first time how children, in different social and geographic contexts, might become active agents in confronting the complex waste problems that threaten their future. We are interested in how children engage creatively with waste materials within their own local contexts, and what roles early childhood practitioners play in working with children to respond to waste-related issues. We hope that such knowledge will help us create effective and engaging new curricula, pedagogies, and policies.

3. How long will you be in this study?

It is expected that your child will be in the study for 39 weeks. The collection of data will begin after [DATE] and will be ongoing during this academic year.

Your child will participate in the project during her/his regular child care hours.

Please note that the educator might or might not choose to extend the activities with children (without the researchers being present) more than twice a week, during the regular programming.

4. What are the study procedures?

This is a participatory and collaborative project. If you agree to voluntarily let your child participate, her/his participation will involve engagement in regular art activities in the classroom. These art activities will involve waste materials. The art projects will be documented with photographs and videos that will be shared among researchers participating in this research project.

How the Study will be Shared

It is anticipated that researchers will share with others the results of this project in the following ways:

- Through a public and online art exhibitions and film screenings
- A website and blog
- Pre- and in-service education curricula

- In publications and presentations, for example in books, chapters, articles in refereed and professional journals, academic and professional conferences, white papers.
- In masters or doctoral theses.
- In project website and professional social media (see below for more information)

Some of the information collected and the ongoing analyses will also be shared through the project's website (e.g., in a blog) and professional social media accounts (e.g., Twitter). NO images of children's faces (i.e., images where children are recognizable) will be used online. (Please see the section on Anonymity & Confidentiality below for more information.)

Sharing research knowledge through online platforms will increase the scope of the provincial, national and international audience that our research is shared with. Utilizing a professional research website and Twitter allows researchers to connect and share analyses in an accessible form with early childhood educators, students, scholars, and research institutions and units worldwide.

An example of research website where a similar study is shared through art encounters is Encounters with Materials (<http://encounterswithmaterials.com/>). Examples of social media use (i.e., Twitter) with research inquiries can be found on the Common World Childhoods Research Collective website at <http://commonworlds.net>.

Your child's educator will act as co-researchers in the process of the research. The educator will have access to the pedagogical documentation collected in the program to use according to your Centre's guidelines. The educator might or might not choose to:

- incorporate ideas generated through the project into his/her daily practices for further observation and interpretation
- display some of the information collected and the ongoing analyses in your classroom.
- communicate the ongoing analyses through regular updates via your classroom's newsletter so you are aware of the activities in which your child is participating as well as the learning that takes place in everyday practices at the centre
- disseminate the findings in articles in professional magazines, and at conference presentations.
- contribute entries to the project website blog and professional social media accounts.

5. What are the risks and harms of participating in this study?

There are no known or anticipated risks or discomforts associated with participating in this study. However, participation in this study may cause some inconvenience to your child.

An inconvenience for children might be the interruption or intrusion of being recorded while engaged in daily activities. Since both photography and video are currently used in the centres by the educators, the intrusion will be the presence of the researcher collecting documentation. If this occurs, recording will be stopped. It is expected that the children will eventually become familiar with the presence of the researchers and this will eventually not feel intrusive.

6. What are the benefits of participating in this study?

The potential benefits to your child include the learning that will take place during their participation in the project.

The possible benefits to educators may be to have further insights into how to engage pedagogically with issues related to waste practices.

This research project may generate potential benefits to society, such as the possibility of increased understanding about how to address issues of waste through early childhood education practices. It may also help researchers understand how young children can learn about waste issues.

7. Can participants choose to leave the study?

If you decide to withdraw your child from the study, you have the right to request withdrawal of information collected about your child. If you wish to have your information removed please let the researcher know.

However, please note that it will be very difficult for us to remove what your child had said during group conversations. This is due primarily to the fact that after removing one person's dialogue in a discussion, the entire conversation might not make sense in total. We will minimize your child's data to respect your decision to withdraw him/her while ensuring that we can still gain a good understanding of other participants' experiences and insights.

When photos/videos are involved, we will crop the images and delete clips that involve your child.

8. How will participants' information be kept confidential?

Representatives of The University of Western Ontario Non-Medical Research Ethics Board may require access to your study-related records to monitor the conduct of the research.

Your child's participation in this study will not be kept confidential from their educator. The educators participating in the study will know which children are participating in the study in order to know who can and cannot be included in the documentation shared with the researchers.

While we do our best to protect your child's information there is no guarantee that we will be able to do so. The inclusion of your child's images through photographs and videos may allow someone to link the data and identify him/her.

Any photographs and/or video recordings to be shared on the project website and through professional social media accounts (e.g., Twitter) might have partial images of children (e.g., hands visible, feet visible) but will NOT have images of children that are recognizable (i.e., no faces will be visible).

We acknowledge the importance of your child's privacy, but are not able to assure absolute confidentiality. As with any person working with children, we are bounded by the professional and legal obligations of duty to report.

The researcher will keep any personal information about your child in a secure and confidential location for a minimum of 5 years. A list linking your child's study number with his/her name will be kept by the researcher in a secure place, separate from his/her study file.

If the results of the study are published, your child's name will not be used.

Researchers might use your child's personal quotes in the dissemination of the project.

Please be advised that although the researchers will take every precaution to maintain confidentiality of the data, the nature of group research with children prevents the researchers from guaranteeing confidentiality. The researchers would like to families to respect the privacy of other children participants in the classroom and not repeat what is said in the group meetings to others.

In addition, your will be able to be identified by the child care setting community (i.e., educators in your centre, other families) and potentially by other child care settings in the community (given the size of our community).

9. Are participants compensated to be in this study?

Your child will not be compensated for his/her participation in this research.

10. What are the rights of participants?

Your child's participation in this study is voluntary. You may decide not to let your child be part in this study. Even if you consent for your child to participate he/she has the right to not answer individual questions or to withdraw from the study at any time. If your child chooses not to

Letter of Information and Consent – Families

Project Title: Rethinking the Rs Through the Arts: Transforming Waste Practices in Early Childhood Education

Principal Investigator

Dr. Veronica Pacini-Ketchabaw, Faculty of Education
Western University, [REDACTED]

I have read the Letter of Information, have had the nature of the study explained to me and I agree for my child to participate. All questions have been answered to my satisfaction.

YES NO

I agree for my child to be photographed in this research

YES NO

I agree for my child to be audio-recorded in this research

YES NO

I agree for my child to be video-recorded in this research

YES NO

I consent to the use of partial images of my child (e.g., hands visible, feet visible) obtained during the study in the project website and researchers' professional social media accounts

YES NO

I consent to the use of my child's personal, identifiable quotes obtained during the study in the dissemination of this research

YES NO

I consent to the use of my child's unidentified quotes obtained during the study in the dissemination of this research

YES NO

My signature means that I have explained the study to the participant named above. I have answered all questions.

Print Name of Person Obtaining Consent	Signature	<i>Date (DD-MMM-YYYY)</i>

Child's Name: _____

Parent / Legal Guardian / Substitute Decision Maker (Print): _____

Parent / Legal Guardian / Substitute Decision Maker (Sign): _____

Parent / Legal Guardian / Substitute Decision Maker (Date): _____

Appendix E. Ethics Approval—Climate Action Network: Exploring Climate Change Pedagogies With Children



Research Ethics

Western University Non-Medical Research Ethics Board NMREB Delegated Initial Approval Notice

Principal Investigator: Dr. Veronica Pacini-Ketchabaw
Department & Institution: Education/Faculty of Education, Western University

NMREB File Number: 109337
Study Title: Climate Action Network: Exploring climate change pedagogies with children

NMREB Initial Approval Date: September 06, 2017
NMREB Expiry Date: September 06, 2018

Documents Approved and/or Received for Information:

Document Name	Comments	Version Date
Western University Protocol		2017/06/27
Recruitment Items	Appendix A - Information Session	2017/05/07
Recruitment Items	Appendix B - Email reminder to be sent to Educators	2017/05/08
Recruitment Items	Appendix C: Families - Invite to Info Session	2017/06/27
Recruitment Items	Appendix D - Verbal reminder to families provided by Educators	2017/05/08
Assent	Appendix E - Children Assent	2017/05/08
Other	Appendix F - Confidentiality Agreement	2017/05/08
Letter of Information & Consent	Educators	2017/09/05
Caregiver Letter of Information & Consent	Families	2017/09/05
Instruments	Protocol to use with educators in monthly evening meetings.	2017/05/08
Instruments	Steps to conduct pedagogical documentation, including ethical considerations.	2017/05/08
Instruments	Steps of pedagogical documentation. Source: Understanding the British Columbia Early Learning Framework: From Theory to Practice (Government of British Columbia, 2015).	2017/05/08

The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the above named study, as of the NMREB Initial Approval Date noted above.

NMREB approval for this study remains valid until the NMREB Expiry Date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario.

Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB.

The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 0000941.

_____, on behalf of Dr. Randall Graham, NMREB Chair or delegated board member

EO: Erika Basile __ Grace Kelly __ Katelyn Harris __ Nicola Morphet __ Karen Gopaul __ Patricia Sargeant __ Kelly Patterson __

Western University, Research, Support Services Bldg., Rm. 5150
London, ON, Canada N6G 1G9 t. 519.661.3036 f. 519.850.2466 www.uwo.ca/research/ethics

Appendix F. Continuing Ethics Review CER Form—Climate Action Network: Exploring Climate Change Pedagogies with Children



Date: 9 September 2019

To: Dr. Veronica Pacini-Ketchabaw

Project ID: 109337

Study Title: Climate Action Network: Exploring climate change pedagogies with children

Application Type: Continuing Ethics Review (CER) Form

Review Type: Delegated

Meeting Date: 04/Oct/2019

Date Approval Issued: 09/Sep/2019

REB Approval Expiry Date: 06/Sep/2020

Lapse in Approval: September 7, 2019 to September 9, 2019

Dear Dr. Veronica Pacini-Ketchabaw,

The Western University Non-Medical Research Ethics Board has reviewed this application. This study, including all currently approved documents, has been re-approved until the expiry date noted above.

REB members involved in the research project do not participate in the review, discussion or decision.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario. Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB. The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

Please do not hesitate to contact us if you have any questions.

Sincerely,

on behalf of Prof. Randal Graham, NMREB Chair

Note: This correspondence assumes an electronic signature (validation and approval via an online system that is compliant with all regulations).

Appendix G. Ethics Approval 2—Rethinking the Rs Through the Arts: Transforming Waste Practices in Early Childhood Education



**Western
Research**

**Western University Non-Medical Research Ethics Board
NMREB Delegated Initial Approval Notice**

Principal Investigator: Dr. Veronica Pacini-Ketchabaw
Department & Institution: Education\Faculty of Education, Western University

NMREB File Number: 109353
Study Title: Rethinking the Rs Through the Arts: Transforming Waste Practices in Early Childhood Education

NMREB Initial Approval Date: July 13, 2017
NMREB Expiry Date: July 13, 2018

Documents Approved and/or Received for Information:

Document Name	Comments	Version Date
Western University Protocol	Received June 29, 2017	
Letter of Information & Consent	Appendix H - Verbal Reminder for Families	2017/06/29
Revised Assent	Appendix I	2017/06/29
Letter of Information & Consent	Appendix G - Family	2017/06/29
Letter of Information & Consent	Appendix D - Educator	2017/06/29
Other	Appendix A - Interview with educators and artists. Received May 15, 2017.	
Other	Appendix J - Confidentiality. Received May 15, 2017.	
Recruitment Items	Appendix F - Family Info Session Invite. Received May 15, 2017.	
Recruitment Items	Appendix C - Information Session Invite. Received May 15, 2017.	
Instruments	Appendix B - Protocol for Educators. Received May 15, 2017.	
Recruitment Items	Appendix E - Director Email reminder. Received May 15, 2017.	

The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the above named study, as of the NMREB Initial Approval Date noted above.

NMREB approval for this study remains valid until the NMREB Expiry Date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario.

Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB.

The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

Ethics Officer: _____ NMREB Chair or delegated board member

EO: Erika Basile ___ Grace Kelly ___ Nicola Morphet ___ Karen Gopaul ___ Patricia Sargeant ___

Appendix H. Continuing Ethics Review CER Form— Rethinking the Rs Through the Arts: Transforming Waste Practices in Early Childhood Education



Date: 25 June 2021

To: Dr. Veronica Pacini-Ketchabaw

Project ID: 109353

Study Title: Rethinking the Rs Through the Arts: Transforming Waste Practices in Early Childhood Education

Application Type: Continuing Ethics Review (CER) Form

Review Type: Delegated

Date Approval Issued: 25/Jun/2021

REB Approval Expiry Date: 13/Jul/2022

Dear Dr. Veronica Pacini-Ketchabaw,

The Western University Non-Medical Research Ethics Board has reviewed this application. This study, including all currently approved documents, has been re-approved until the expiry date noted above.

REB members involved in the research project do not participate in the review, discussion or decision.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario. Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB. The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

Please do not hesitate to contact us if you have any questions.

Sincerely,

The Office of Human Research Ethics

Note: This correspondence includes an electronic signature (validation and approval via an online system that is compliant with all regulations).

Appendix I. Confidentiality Agreement (Researchers)— Climate Action Network: Exploring Climate Change Pedagogies with Children

(To be signed by co-applicants, research assistants, and educator co-researchers)

1. Confidential Information

I understand confidential information will be made known to me for the study Climate Action Network: Exploring climate change pedagogies with children being conducted by Professor Pacini-Ketchabaw of the Faculty of Education, Western University.

Confidential information shall include all data, materials, photographs, video, and other information disclosed or submitted, orally, in writing, or by any other media, to _____ by _____.

2. Obligations of Co-Applicants/Collaborators/Research Assistants/Educators

A. _____ hereby agrees that the confidential ‘**Climate Action Network: Exploring climate change pedagogies with children**’ research study and is to be used solely for the purposes of said study. Said confidential information should only be disclosed to employees of said research study with a specific need to know.

_____ hereby agrees not to disclose, publish or otherwise reveal any of the Confidential Information received from Dr. Pacini-Ketchabaw, research assistants or other participants of the project to any other party whatsoever except with the specific prior written authorization of Dr. Pacini-Ketchabaw.

B. Materials containing confidential information must be stored in a secure online location at Western University (and then deleted from computer) so as to avoid third persons unrelated to the project to access said materials. Confidential Information shall not be duplicated by _____ except for the purposes of this Agreement.

3. Completion of the Work

Upon the completion of the work and at the request of Dr. Pacini-Ketchabaw, _____ shall return all confidential information received in written or tangible form,

including copies, or reproductions or other media containing such confidential information, within ten (10) days of such request.

At _____ option any copies of confidential documents or other media developed by _____ and remaining in her possession after the completion of her work need to be destroyed so as to protect the confidentiality of said information. _____ shall provide a written certificate to Owner regarding destruction within ten (10) days thereafter.

With his/her signature, _____ shall hereby adhere to the terms of this agreement.

Signature: _____

Date: _____

Name of Principal Investigator: _____ (please print)

Signature of Principal Investigator: _____

Date: _____

Appendix J. Confidentiality Agreement—Rethinking the Rs Through the Arts: Transforming Waste Practices in Early Childhood Education

(To be signed by co-applicants, research assistants, and educators co-researchers)

1. Confidential Information

I understand confidential information will be made known to me for the study *Rethinking the Rs Through the Arts: Transforming Waste Practices in Early Childhood Education* being conducted by Dr. Pacini-Ketchabaw of the Faculty of Education, Western University.

Confidential information shall include all data, materials, photographs, video, and other information disclosed or submitted, orally, in writing, or by any other media, to _____ by Dr. Pacini-Ketchabaw.

2. Obligations of Co-Applicants/Collaborators/Research Assistants/Educators

A) _____ hereby agrees that the confidential research study, *Rethinking the Rs Through the Arts: Transforming Waste Practices in Early Childhood Education*, and information is to be used solely for the purposes of said study. Said confidential information should only be disclosed to employees of said research study with a specific need to know.

_____ hereby agrees not to disclose, publish or otherwise reveal any of the confidential information received from Dr. Pacini-Ketchabaw, research assistants or other participants of the project to any other party whatsoever except with the specific prior written authorization of Dr. Pacini-Ketchabaw.

B) Materials containing confidential information must be stored in a safe location at Western University (and then deleted from computer) so as to avoid third persons unrelated to the project to access said materials. Confidential information shall not be duplicated by _____ except for the purposes of this Agreement.

3. Completion of the Work

Upon the completion of the work and at the request of Dr. Pacini-Ketchabaw, _____ shall return all confidential information received

in written or tangible form, including copies, or reproductions or other media containing such confidential information, within ten (10) days of such request.

At _____ option any copies of confidential documents or other media developed by _____ and remaining in her/his possession after the completion of her/his work need to be destroyed so as to protect the confidentiality of said information. _____ shall provide a written certificate to Owner regarding destruction within ten (10) days thereafter.

With his/her signature, _____ shall hereby adhere to the terms of this agreement.

Signature: _____

Date: _____

Name of Principal Investigator: _____ (please print)

Signature of Principal Investigator: _____

Date: _____

Curriculum Vitae

KELLY-ANN MACALPINE B.A., R.E.C.E., I.T.

PhD Candidate

Western University Faculty of Education, Curriculum Studies

PUBLICATIONS

- MacAlpine, K. (accepted). Ghosting Pedagogies: Disrupting Developmental Narratives in Early Childhood Environmental Education. *Contemporary Issues in Early Childhood*
- Drew, J.*, and MacAlpine, K.* (2020). Witnessing the Ruins: Speculative Stories of Caring for the Particular and the Peculiar. *Journal of Childhood Studies*, 45(2). DOI: <https://doi.org/10.18357/jcs452202019737>
- MacAlpine, K.*, (with Johnstone, H., Minten, L., Sparkes, L., and Grigg, B). (2020). Inviting plastic waste into the early childhood classroom: A response to the plastic waste crisis. *eceLINK*, 4(1), 35-44.
- Jobb, C., MacAlpine, K., and Pacini-Ketchabaw, V. (2019). Educators Experimenting with Common World Pedagogies (ch. 3). In L. Gibbs & M. Gasper (Eds), *Challenging the Intersection of policy with pedagogy; Thinking about Pedagogy in Early Education (Volume 6)* (pp.35-48). New York, NY: Routledge, 2019.
- MacAlpine, K.*, and Pacini-Ketchabaw, V. (2018). Overview of Early Childhood Education (Canada). *Bloomsbury Education and Child Studies. Bloomsbury Digital Resources*. DOI: 10.5040/9781474209441.0047
- Ott, M., MacAlpine, K. A., & Hibbert, K. (2018). Seeing double: Design and enactment in a lesson on perspective-taking. *European Journal of Curriculum Studies*, 29(2), 277-294. <https://doi.org/10.1080/09585176.2018.1445578>
- MacAlpine, K. (2017). Through the Looking Glass: Interpreting ‘Growing Success, the Kindergarten Addendum’, Ontario’s assessment, evaluation, and reporting policy document. *Journal of Childhood Studies*. 42(2), 34-41. <https://doi.org/10.18357/jcs.v42i2.17840>
- MacAlpine, K. (Jan. 2018). Creating Contextual Spaces for Equity. *Canadian Society for the Study of Education (CSSE)*. Retrieved: <https://csse-scee.ca/blog/creating-contextual-spaces-for-equity/>

PROFESSIONAL WRITING

- MacAlpine, K. (2021). Common Worlding Waste Pedagogies [Blog Post]. *Early Childhood Pedagogies Collaboratory*. Retrieved: <https://www.earlychildhoodcollaboratory.net/common-worlding-waste-pedagogies>
- MacAlpine, K. (2020). Ghosting Pedagogies [Blog Post]. *Early Childhood Pedagogies Collaboratory*. Retrieved: <https://www.earlychildhoodcollaboratory.net/>
- MacAlpine, K. (January 13, 2020). How might close encounters with bubble-wrap in an early childhood classroom trouble governing binaries of safe/unsafe and care/careless? [Blog post]. *Common Worlds Research Collective*. Retrieved:

<https://commonworlds.net/how-might-close-encounters-with-bubble-wrap-in-an-early-childhood-classroom-trouble-governing-binaries-of-safe-unsafe-and-care-careless/>

- MacAlpine, K. (April 28, 2019). Does exaggerating plastic's presence in the classroom transform children's relations with plastics? [Blog post]. Common Worlds Research Collective. Retrieved: <http://commonworlds.net/does-exaggerating-plastics-presence-in-the-classroom-transform-childrens-relations-with-plastics/>
- MacAlpine, K. (2017). A Pedagogy of Thinking With. Early Childhood Pedagogies Collaboratory. Retrieved: <https://www.earlychildhoodcollaboratory.net/a-pedagogy-of-thinking-with>
- MacAlpine, K. (2017). Pedagogies of Interpretative Dance; Scenes from 'dancing in the rain'. Early Childhood Pedagogies Collaboratory. Retrieved: <https://www.earlychildhoodcollaboratory.net/pedagogy-of-interpretive-dance>

CONFERENCE PRESENTATIONS

- MacAlpine, K. (2020, March). Ghosting Pedagogies in Early Childhood Environmental Education: Restorying peculiarities in ecological precarity [Paper Presentation]. Comparative and International Education Society [CIES]. Miami, United States [Conference cancelled]
- MacAlpine, K. (2020, May 31-June 5). Ghosting Pedagogies: An alternative pedagogical narrative [Paper Presentation]. Canadian Society for the Study of Education [CSSE], Western University, London, Canada [Conference cancelled]
- MacAlpine, K. (2019, September). Ghosting Pedagogies: Restorying Peculiarities in times of Ecological Precarity [Paper presentation]. Young people, well-being, resilience and enterprise: critical perspectives for the Anthropocene. Bilbao, Spain
- Jobb, C., and MacAlpine, K. (2019, May). A Deluge of Plastics: Transforming Waste Pedagogies in Early Childhood Education [Paper presentation]. 15th Annual International Congress of Qualitative Inquiry. Chicago, United States
- MacAlpine, K., and Jobb, C. (2019, April). Troubling Place in everyday encounters in Early Childhood Education [Poster presentation]. American Education Research Association [AERA]. Toronto, Canada
- MacAlpine, K. and Drew, J. (2019, January). Troubling the stories of place through everyday encounters in early childhood education [Paper presentation]. Vaxjo, Sweden
- MacAlpine, K. (2018, June). Challenging the Great Nature/Culture Divide [Paper presentation]. Canadian Society for the Study of Education [CSSE]. Regina, Canada
- MacAlpine, K. (2018, May). (Re)thinking Waste Practices: Storying a serious game of hide and seek with crows [Paper presentation]. Childhood and Materiality VIII; Conference on Childhood Studies. Jyväskylä, Finland [unable to attend]
- Ott, M., Hibbert, K., MacAlpine, K. A. (2017, June). Seeing it my way: Design and enactments of a writing curriculum [Paper presentation]. European Conference on Curriculum Studies. University of Stirling, Scotland. Canadian Society for the Study of Education (CSSE)

- MacAlpine, K. (June, 2017). Purpose and Perspective Affect Assessment and Evaluation: Tension with the Merging of ECE and Formal Education [Round Table Discussion]. Canadian Society for the Study of Education. Ryerson University, Canada
- MacAlpine, K. (2017, April). Tensions at the crossroads in Ontario: ECE meets Growing Success [Round table]. Robert MacMillan Graduate Research in Education Symposium (GRiES). London, Canada
- MacAlpine, K. (August, 2016). Emerging alliance between ECE and formal education highlights reconceptualization for the 21st century [Poster Presentation]. Western Education 21st Century Curriculum Symposium. London, Ontario

TEACHING EXPERIENCE

- Instructor, EDUC 5461: Curriculum, Pedagogy, and Learning in Early Childhood II [online]
Bed Program, Western University Faculty of Education – September 2020 – February 2021
- Instructor, EDUC 5461: Curriculum, Pedagogy, and Learning in Early Childhood II Bed Program, Western University Faculty of Education – September 2019 – February 2020
- Early Childhood Educator – Infant/Toddler and Preschool – 1989 – 2002
STEM Outreach and Mentor – Youth – 2007 - 2021

RESEARCH EXPERIENCE

- Ethics Consultation | York University Faculty of Education | 2021
Graduate Research Assistant | Faculty of Education | 2017 - 2021
Research Assistant | Western University, Faculty of Education [Provincial Centre of Excellence for Child Care] | February 2019 | April 2019
Research Assistant | Faculty of Education, Western University [21st Century Literacies: Research and development of a ‘cloud curriculum’] | September 2017 – July 2018

AWARDS

- Distinguished Service Award 2020 | Youth Science Canada
Ontario Graduate Student (OGS) Award Recipient, 2019-2020
Western University Travel Grant 2020
Western University Travel Grant 2019

ACADEMIC COMMITTEES

- Education Graduate Students Association | 2017 – 2021
Faculty Council/PhD Rep 2020-2021
Research Committee/PhD Rep 2019-2020
Secretary 2018-2019
Faculty Council/PhD Rep 2017-2018
Graduate Research in Education Studies (GRiES) Steering Committee

SPEAKING ENGAGEMENTS

- Western University, Faculty of Education, PhD Seminar Course | January 2020

Western University, Faculty of Education, PhD Seminar Course | March 2020
Western University, Faculty of Education, BEd Professional Development Week
[Workshop] | February 2019
Western University, Faculty of Education, PhD Seminar Course | November 2018

PROFESSIONAL SERVICE

Reviewer | Journal of Environmental Education Research
Reviewer | Journal of Childhood Studies
Reviewer | Canadian Society for the Study of Education [ECE SIG] 2017 – On Going

COMMUNITY SERVICE

Youth Science Canada | Member | 2008
Youth Science Ontario | Member | 2016
Youth Science London | Board Member and Regional Coordinator | 2010