

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

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Abstract

This article reveals how inundating a 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-centred approaches to learning by decentering the human and attending instead to complex, entangled human–nonhuman relations that emerge in everyday encounters with nonhuman others, 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 waste inquiry, alongside other common worlds waste pedagogies, disrupts dominant discourses of early childhood education, the role of the educator, and the very materiality of the classroom.

Key words

common worlds, waste pedagogies, plastics, early childhood education, materiality, nonhuman

Author Biographies

Kelly-Ann MacAlpine is a PhD candidate in Curriculum Studies at the University of Western Ontario. Her area of study in early childhood environmental education promotes children's sensitivities to, and relations with, nonhumans in environmentally precarious times. Her current research focuses on exploring how common worlds pedagogies and concepts of excess, noticing, and lingering invite new ways of thinking with plastics. As she stories the peculiar child–plastic relations that emerge in everyday encounters, she wonders how children might live ethically alongside nonhuman others in a plastic world.

Hayley Johnstone is a registered early childhood educator. Hayley has been in the toddler room for several years and is open and excited to learn with and alongside her team, visiting researchers, and now plastics. Beyond the toddler room, she is an avid reader with a well-worn library card.

Laurie Minten is a registered early childhood educator. Laurie's curious and imaginative nature keeps her

open to the unknown and unpredictable possibilities that emerge in the everyday happenings in her current position in the toddler room.

Lindsay Sparkes a registered early childhood educator working with an early learning childcare services group for the past 12 years. Over this time, she has filled several roles in many classrooms. Currently, she is working as pedagogist, thinking alongside educators about practice, specifically around the relationship a classroom of toddlers has with plastic.

Brenda Grigg a registered early childhood educator working at an early learning childcare services group for most of her career in various positions at the individual centres. She joined the team in January of this year as Co-Director. She loves spending time in the various classrooms, researching and learning alongside the children and educators.

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

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, Jambeck, & Law, 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, O’Gorman, & Davis, 2016; Sauv , 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 (ECE) is the common worlds framework. Common worlds pedagogies (e.g., Blyth & Meiring, 2018; Iorio, Coustley, & Grayland, 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 nonhuman others. In other words, common worlds theorists argue that the world is not just a human world but rather a co-constitutive common world.

Child-centred approaches currently dominate the early childhood education field. The common worlds framework questions these approaches. Decentering the child opens up space to pay attention to the interrelationships that emerge within everyday encounters between humans and nonhuman others, such as waste materials (Taylor, 2013). Challenging child-centred 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-centred 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, Social Sciences and Humanities Research Council-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 reconfiguring 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 collaboratory¹ 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 a 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-centred 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.

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

¹ For further information on Common Worlds collaboratories, see <https://www.earlychildhoodcollaboratory.net/>.

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 (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 pedagogical focus, from child-centred approaches to learning about, for example, plastic waste management and removal, toward learning within emerging messy, lively, situated, non-innocent relations—in this case, child-plastics 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 de-centre 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 responses to plastic waste, that most provokes curiosity. Recognizing child-plastics encounters as mutually reciprocal interactions allows us not only to notice plastics’ presence differently but to inform our ongoing pedagogical choices in curriculum making.

Our Plastic Waste Inquiry

Our plastic waste 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, each bottle filled with plastic pieces (e.g. diapers, straws, bags, ribbons, beads, blocks, and glitter). The bottles were suspended from the ceiling, sitting on the shelves, and gathered in groupings that covered much of the classroom floor. We then invited the young children into the space to attend to and respond to plastics’ presence. Using pedagogical documentation, we paid attention to and storied the movements that emerged within encounters between bodies and plastics. The use of pedagogical documentation offered up the space for intervention: a space to revisit, question, interpret, and respond to the everyday moments we noticed (see, e.g., Blaise, Hamm, & Iorio, 2017; Dahlberg, Moss, & Pence, 2007; Iorio et al., 2017; Pacini-Ketchabaw, Nxumalo, Kocher, Elliot, & Sanchez, 2015). While our pedagogical documentation is meant to make everyday interactions with plastics visible, our struggles to de-centre the child and refocus on child-plastics 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 refocused our attention on the unanticipated interactions that emerged between children and plastics. Keeping plastic waste in sight and in mind (Hird, 2013) rather than removing it through acts of recycling, we noticed how its presence disrupted child-centred learning approaches, the role of the educator, and the materiality of the classroom.

Disrupting Child-centred Approaches to Learning

Common worlds waste pedagogies disrupt child-centred approaches to learning and knowledge production. While child-centred 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-centred 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-plastics co-constitutive relations, thus allowing for a shift from individual learning to learning as a collective endeavour.

Yet, de-centring the child is not easy, nor is the process of remaining open to the possibilities of the effect of plastics' presence and agency on different child-plastics 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 shifting focus from the children's movements to how plastics invited 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 responded (or not) to plastics while reflecting our struggle to wonder about how plastics responded to us.

Here is an example of how we wrote our initial observations of what was happening during the plastic waste 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. Plastics' slipperiness affects his 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 containment 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 struggled 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 provoke 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-plastics encounters? This observation leaves us with a sense of discomfort, and we meet to discuss it. Shifting away from the child-centred 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, as we move forward in the plastic inquiry our documentation focuses on thinking with, feeling with, and engaging with plastics' subjectivity, and how plastic-body intra-actions support a new kind of story. The documentation below provides a sample of this shift.

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.

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, Vintimilla, & Nelson, 2018, pp. 433–434). Learning experiences are child-centred 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 classrooms up 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 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, Kind, & Kocher, 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-centred 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–plastics encounters reveal and to respond to the complex and at times contentious relations that emerge within context-specific happenings.

We began the plastic waste 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 plastics as being inert objects, we must first get to know the material. 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 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 1. Tangled with plastics.
(Image by Kelly-Ann MacAlpine)

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 nonhuman 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 waste 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 response-ability 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 plastic waste 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 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.

As shown in Figure 2, 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 child-plastics closeness. The images of the children quietly lying amid the heaps of plastics bump up against images of uncontainable 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.

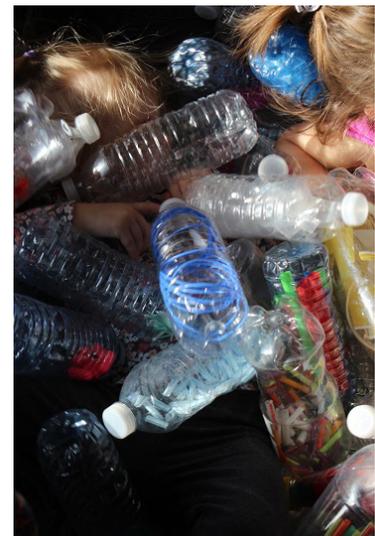


Figure 2. Sleeping with plastics. (Image by Kelly-Ann MacAlpine)

Seeing plastics beyond their utilitarian purposes is difficult for us, but in our research, we find inspiration from other sources outside 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 nonhuman others respond to the consequences of living with excess plastics.

The artistic renderings of social justice artist Pinar Yoldas push our pedagogical work with the plastic waste 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 world full of plastic. Her collection is inspired by one very simple question: “If life evolved from our current plastic-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 toward becoming, we practice thinking and being in question by wondering how plastics’ shapeshifting might provoke a transformation in human-plastics 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 disconnect 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 plastic waste. 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 how it affects our response(abilities) to plastics. .

Disrupting the Materiality of Classrooms

In early childhood education the materials educators 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-centred approaches, whether it be to direct or inspire children’s learning. But what 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, educators could set up the space to think about what the materials might do to them.

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 walls, 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, the team 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 other words, how might we shift out thinking from plastics as objects to plastics as participant? 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 waste 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 entities, 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 fibres). 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, their permanence compels a (re)think of human-plastics 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 waste inquiry demonstrates the co-constitutive relations of children and plastics.

Day One: We begin the plastic waste inquiry with the question of how we invite children to attend to plastics. As we enter the newly curated plastic waste classroom (see Figure 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.



Figure 3. The plastic waste classroom.
(Image by Kelly-Ann MacAlpine)

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 acknowledge the possibility of plastics as participating change agents in plastics-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 waste inquiry then, agentic realism provides the theoretical foundation that supports plastics' agency. Rather than educators and children reacting toward inert plastic objects, educators, children, and plastics intra-act within entangled and embodied body-plastics 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 nonhuman others (Frost, 2011, p. 77) whereby neither the human nor the nonhuman other is privileged.

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.

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 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-centred 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.

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