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Posthuman Object Pedagogies:
Thinking with Things to Think with Theory for Innovative Educational Research

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Abstract

Educational practices and learning processes are entangled with multitudes of objects but these objects are so often disregarded as mundane background and *thingified* – positioned as dull, inert matter, unnoticed, and made subserviently serviceable in order that the proper business of educating the human can go on. Such an education, with its orientation to reason, logical argument and the mind, silences objects and produces humans as docile bodies. This article develops posthuman object pedagogies to contest the ontological positioning of objects as inert and dead and, instead, attend to the quiet but powerful work they do (Taylor, 2013, 2017). Using Barad's (2007) and Haraway's (2016) posthumanist materialist ontology of what Bennett's (2010) calls thing-power the article proposes a practice of thinking with things as a means of thinking with theory. We illuminate this practice through four object encounters. The insights from these encounters provide the basis for developing posthuman object pedagogies which re-evaluate understanding of the work objects do as intra-active agencies and in recasting educational research. As four educators at different career stages, we develop posthuman object pedagogies to enable us to do educational research otherwise.

Keywords: Posthuman object pedagogies, education research, theory-praxis

Introduction

This article is motivated by the question: what can attending to the particular and significant effects and affects of objects produce and enable for educational research? Working with objects' thing-power means attending to objects as vital materialities which often do unnoticed but powerful work in educational contexts and research (Bennett, 2010). In pursuing our curiosity about how to do research with (not on or about) objects, and in considering what objects quietly do in the mobile and shifting human/non-human assemblages that constitute educational research, the article works as a theory-praxis account of how to think with objects as a means to think with theory (Jackson & Mazzei, 2012). The first sections lay out the feminist materialist and

posthumanist theoretical terrain which situate our arguments. Following this, drawing on empirical materials and utilising a methodology of noticing (Tsing, 2015). We include four object encounters addressing a question of: What does a book do? What does a stone do? What does a lanyard do? And what does a plastic wrapper do? These objects are mundane, ordinary, familiar and everyday things enmeshed in our respective educational research projects. Each encounter thinks with theory to bring to the fore the agentic role objects have as powerful producers of affects, attachments, relations, and the work they do as materializers of power and differentiations.

The object encounters illuminate the complex choreographies objects, bodies, spaces, and times produce (Taylor, 2013). They emphasize the profound questions objects can provoke – about Whiteness, about colonialist legacies and post-colonial possibilities, about life in the Anthropocene, and children's learning. The encounters provide a foundation for the elaboration of the theory-praxis of posthuman object pedagogies. Informed by Deleuze's (1994) view that pedagogy is or ought to be a "problem-posing" move against "heterogeneity", we propose posthuman object pedagogies as a novel approach to education research (Buchanan, 2015, p. 9). Working against the normative, enables us to wonder about things and theory otherwise, and shift notions of what comes to matter in research. The article is written as a collaborative piece by four educator-researchers at different career stages, occupying different positions within the academy. Hannah and Eliane are doctoral students; Carol and Elisabeth are senior academics. We each have different intellectual lineages and particular post-/multi-/inter-disciplinary affiliations which shape our orientations to objects and their matterings. The next section outlines the theoretical confluences which locate our discussions.

Contexts: Theoretical, Methodological, Empirical

In this section we explore the theoretical, methodological, and empirical contexts and illuminate this with our four object encounters.

Thing-Power

In *Vibrant Matter: A Political Ecology of Things* Jane Bennett (2010) outlines a theory of the vitality of things. Bennett's posthuman philosophy of thing-power figures non-human and human things in a flatter, more distributed ontology which regards objects as having material force and agency. This ontological move sees objects not as commodities and artefacts but as agentially tangled with, and acting in intra-active concert with, humans. Working with a conception of thing-power is a valuable posthuman move. It is not to say that objects' agency is like human agency in degree or kind. Rather, it is to shift towards a more "congregational" or "confederate" ontological understanding of agency (Bennett 2010, p. 20). Agency is not a matter of individual human will but an emergent process of co-constitutive acts arising from objects-bodies-spaces-temporal relations. Thing-power unleashes potential for new insights in educational research. For example, Gravett, Taylor and Fairchild (2021) explore signs, masks, hand sanitizer bottles, and hand wipes in COVID-19 higher education spaces; Dernikos (2019) analyses the transcorporeal affects of things which help construct Whiteness as norm in early childhood classrooms; and Lincoln (2014) considers objects' role in identity formation in the material assemblages of teenagers' bedroom spaces. These educational examples are part of a broader social science shift to recognize objects' agentic properties in enabling connections, memories, affectivities, attachments, belongings (Bissell, 2009; Hurdley, 2007; Shortt & Izak, 2020). In educational research, thinking with objects is about moving past the thingification of

objects. Considering objects as ontological actors means un-fixing them from their humanist positioning as disregarded background – as dead, dull, inert matter. It means shifting from an education shaped in terms of human exceptionalism to an education of material-discursive inclusion. It means getting rid of the notion that education is about sitting still and listening to the teacher/lecturer as voice of authority in which reason, logic, argument, and the mind are centred. Developing a more capacious ontology of/for education research means attending to objects' thing-power (Bennett, 2010), their intra-active agency, and their co-relational productivities (Taylor & Fairchild, 2020).

Posthumanism and New Materialism

Wallin (2017) suggests the need to grasp "the speculative inhuman vantage of the Anthropocene and post-Anthropocene that we might begin to discern the limitations of educational research" (p. 1106). Thus, we abandon the habitual centering of humans, focusing instead on what objects offer in terms of different ontological, epistemological, and ethical starting points for posthuman educational research. Posthumanism is a heterogeneous terrain of ideas, concepts, theories, frameworks, and practices (Taylor, 2016). Nevertheless, Taylor & Fairchild (2020) identify five shared features of posthuman thinking: (1) to unsettle the category of the human as a site of political privilege and displace claims of human exceptionalism; (2) to include a broader range of ontologically diverse actors in considerations of what/who matters; (3) to shift from a hierarchical epistemology which places Western human reason at the top towards a multi-logical epistemology which recognizes that other accounts, such as Indigenous, post-colonial, eco-feminist, and Non-Western Science explanations have equal value; (4) to displace binaries and boundaries which police and demarcate human/nature, human/culture, natural/unnatural, human/non-human; and (5) to dispute notions of man as sovereign and egoistic individual separated from others by his boundaried body and cultured mind in favour of a view of humans as constituted in-relation with nature. Educationalists working with posthumanism, envisage it as a political and ethical endeavour to centre our relational worldly entanglements (Snaza & Weaver, 2014). This is not about thinking after humanity (posthuman). It is about seeking to displace the legacy of Humanism and its anthropocentric, colonialist, patriarchal imperatives which have positioned white, Euro-American Man as the only one who matters. The posthuman shift entails a focus on materiality and practices of mattering which has been widely taken up in feminist new materialist scholarship (Barad, 2007).

Thinking with Theory

Jackson & Mazzei (2012) use the phrase *thinking with theory* to explain interpretation as a practice which is both a thinking and a doing of analysis. Thinking with theory is an engaged, active practice of putting theory to work in relation to a particular problem. It is both a methodology-in-process, and an empirical and analytic stance. Its focus is how meaning-making occurs in the relations of theory-concepts-data-world. Thinking with theory is underpinned by a posthumanist materialist epistemology and ontology in which "knowing does not come from standing at a distance and representing but rather from a direct material engagement with the world" (Barad, 2007, p. 49). Thinking with theory works against presumptions of objective mastery. Instead, it figures knowledge as an emergent and embodied "practice of knowing in being" (Jackson & Mazzei, 2012, p. 116) which casts researcher positionality as an ontological, epistemological, and ethically entangled accountability. Thinking with theory contests traditional

research methods which presume the possibility of obtaining the essence or truth of what participants' words mean or of what something is. It is also not a method for applying or using theory because, again, such an approach presumes human mastery and separation. As used in this article, thinking with things and theory attends to what comes to matter in object entanglements. We follow our curiosity to ask: what is this object doing, producing, enabling, and making possible? We experiment with objects' productivities via Jackson & Mazzei's (2012) analytic practice of "plugging one text into another" (p. 1) to enable connectivities to emerge. We pursue the practice of "thinking with objects as a means to think with theory" uncertain about where this would lead!

Attending to Objects as Empirical Practice

As indicated in the previous section, a posthumanist materialist approach refuses human mastery and distance – but how can we avoid the god trick (Haraway, 1988) of thinking about and of rather than with our objects? How can we enable a more "direct material engagement with the world" (Barad, 2007, p. 49)? How can we engage our empirical materials to support us in co-constructing research insights? Bennett (2010) suggests the need to "suspend suspicion and adopt a more open-ended comportment" (p. xv) when attending to objects. Inspired by this, we framed a posthumanist materialist empirical approach of "following the scent of a non-human, thingly power" (p. xiii). We aimed at a research stance of "cultivated, patient, sensory attentiveness" which enabled our curiosity to get "caught up in" (p. xv) the effects and affects our object encounters entangled us in. This curious practice resists certainty. Instead, it proffers an empirical invitation and response, requiring a slower and more hesitant approach. It urges us to enact knowledge as emergent, response-able and care-full. It is a research process reliant on arts of noticing (Tsing, 2015).

Four Object Encounters

In the object encounters below, we follow the scent of our things, and enfold object with theory as an embodied praxis for thinking educational research otherwise.

A Book: *Carol*

Christina Sharpe's (2016) book *In The Wake: On Blackness and Being* (**Figure 1**), sits on my worktable. Paperback. Spine broken in places from reading closely, slowly, avidly. Edges curling from contact with warm hands. Pencil marks and notes texture its pages. Its smooth front cover displays an art-work by Cornelia Parker, my finger-marks visible on it. This book, and the shocking suffering, overwhelmingly pain, and potential for doing otherwise it tells of, has been my companion for months. This book has thing-power, it provokes affects and bodily sensations (Bennett, 2010); it materially entangles itself with me, with other books on my shelves, with memories of being a student and studying, and with histories and practices of how knowledge is produced in/through academic disciplines. This book acts in concert with these affective assemblages, insistently questioning the structural and silent, intimate and deadly work that power and, more particularly, white power does.
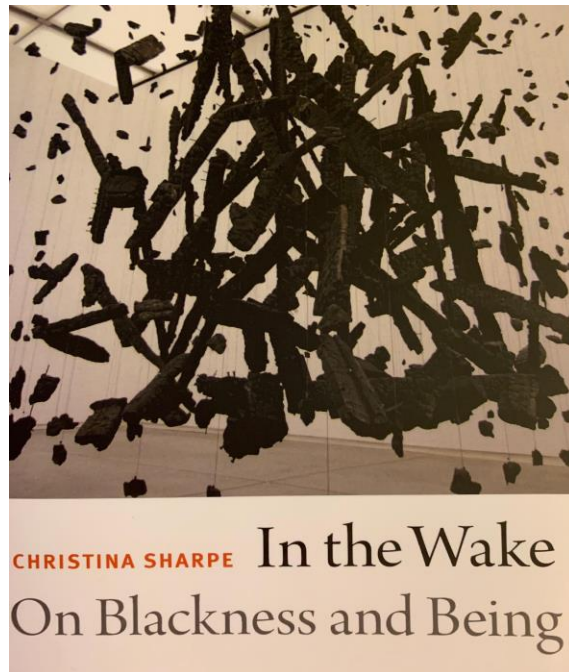
Figure 1. *A Book*

The book's back cover designates it as a Black Studies book. I encounter this book as a white feminist in a prestigious university in a neo-colonialist nation. Abel (1993) urges us to see, name and resist the unacknowledged privilege that Whiteness enables, and Ahmed (2007) specifies a need to maintain a critical focus on power so that the racism Whiteness propels is made visible. How does a book help materialize White privilege? How can a book's thing-power help undo White privilege?

Academic books are expensive. Books require space on bookshelves; they need a quiet place and time to read them. These particular space-time-matterings of academic books are embedded within economic, spatial, and temporal patterns tied into capitalist ownership, accumulation, and possession (Barad, 2007). Academic books are linked, at the level of the home, to privacy and exclusivity. Library books, we tend to think, are free to the user. But University libraries are institutional enclosures. Without the privilege of the swipe card, you cannot get in, and many public libraries in UK towns and cities have closed. Access to books is a matter of White privilege.

This book introduced me to the notion of the *wake* as the real-imagined-metaphorical-symbolic "contemporary conditions of Black life as it is lived near death, as deathliness, in the wake of slavery" (Sharpe, 2016, pp. 7-8). Sharpe demonstrates how slavery's wake operated, and continues to operate, juridically, socially, constitutionally, culturally, psychologically in contexts of global (post-)colonialism. In the USA, UK (and elsewhere), the wake is entangled with, and diffracted through, particular colonialist practices to ensure the ongoingness of a destructive antiblackness. These practices enact a rancid polity which requires that Black Death, exclusion, and injustice are normative. Opposing this pervasive antiblackness, Christina Sharpe (2016)

situates wake work as a theory and praxis to attend to the "largeness that is Black life", as an insistent "visualsonic resistance to that imposition of non-being" (p. 21). Holding this book in my hand, my eye-brain-hand-heart are affectively touched. The racial injustices it relays choreograph my body's attentiveness. This book's velocity moves me.

Academic books materialize an epistemic terrain. They come to matter within architectures of knowledge that are also architectures of power. Books are situated within disciplines; books are then made to do work to discipline our thinking. For example, at university, my undergraduate degree required reading a lineage of canonical texts: Chaucer, Shakespeare, Pope, Wordsworth, Joyce, etc.—A Parade of Great White Men and Their Works (capitals important). These authors defined and delimited the terrain and significance of English Literature (capitals important). Their Whiteness and maleness colonized epistemic space. The few women, and even fewer Black writers, who made it into the curriculum space were add-ons to the Great White Men at the centre. Through buying, holding in my hand, reading, and arranging books on my shelves as an undergraduate I learned how Whiteness shapes, organizes and produces fields of study. This was never articulated; the work that Whiteness did was silent and successful. Devastatingly so. Now, decolonising the curriculum has become central to many universities, but many Black and Indigenous academics remain sceptical about these efforts, seeing them as tick-box exercises in institutional inclusion which leave Whiteness more-or-less intact to continue its dirty work elsewhere (Bhopal, 2018; Tuck & Yang, 2012).

St. Pierre (2011) reiterates the thingly vitality of books, her urgent plea to junior scholars is to "read, read, read" and this is good advice for all of us! But it matters who and how you read, as well as who you cite, because books can play a part in assembling and potentially dis-assembling and undoing disciplinary Whiteness. Christina Sharpe's (2016) book will leave my desk at some future time to nestle alongside other books on my shelves: Audre Lorde, bell hooks, Angela Davies, Dionne Brand, Kathryn Yusoff, Katherine McKittrick, Robin Wall Kimmerer. Reading, citing, and teaching Black women authors can push against colonialist knowledge practices. White scholars need to refuse to re-produce Whiteness in their/our academic acknowledgements.

A Stone: *Hannah*

A stone sitting in the soil in a small woodland area used by an outdoor nursery in Southeast England is the vibrant object I am thinking-with (Bennett, 2010). This stone, a fragment broken away from a larger rock, with its chalky, orange peel-like skin, and shiny yet indented interior, is a marbled mix of pale greys, creamy beiges, and earthy browns. This solid mass of minerals and matter has lumps that have smoothed, over time, to form a point. I first encountered the stone mingling and intra-acting with a child's hands and piles of soil, whilst researching children's play. The vibrancy of the stone/child encounter ensured it was recorded in research notes and re-told in my Masters dissertation. I was captivated by the way in which the child sat with the stone, moving it from hand to hand, writing in my research diary I noted: wanted to ask what he was doing but he said, "I am busy!" when I approached. Then twisted the stone into the soil. Made lots of little piles of soil. About 45 mins!

Figure 2. *A Stone*

Initially, I analysed this encounter alongside Piaget's developmental stages of cognition, leading me to posit that the child was using the stone to explore the world around him. However, I was revisited by the stone/child encounter during my doctoral research. Here posthuman and feminist new materialist theories made me question my previous analyses, so heavily based on "causality, linearity and *neatness*" (Rautio, 2013, p. 96). The anthropocentric thinking rendered the stone inert with all attention on the human child, specifically on the child's mind, severing body from mind and child from environment. Viewing the stone primarily in terms of what it affords the human risks grossly underestimating all that the stone is contributing to these pedagogical happenings. It feeds into a human exceptionalism that is shaped by extractive and reductive research understandings. Rather than using theories to extract meaning and claim findings, what if we used theories to open the stone/child encounter to questions, uncertainties, and possibilities?

Thinking-with-stone/child and Barad's methodology (2007) sends ripples across thoughts and memories, troubling certainties and linear ways of knowing. Barad's agential realism (2007) suggests that agency does not belong to one (usually human) individual but is shared across assemblages. Agency is enacted in the "space *in between* children and their environments, arising in complex encounters rather than located only in the human subject" (Rautio, 2013, p. 396). Child/stone/researcher are not separate entities but emerge through their intra-actions and continue emerging in ongoing diffractive readings. Hultman and Lenz-Taguchi (2010) challenge a reductively anthropocentric analysis of object/child encounters which provoke me to suggest that the stone is inviting the child to play as much as the child chooses to play with stone. The stone's agency is relationally and materially embodied. When squeezed the stone brings blood to the hand, and when twisted displaces soil leaving marks on the ground. Knowledge is an entangled stone/child/soil phenomena, not an intellectual transference from one human to another, nor

something cognitively generated within the individual child. This challenges ageist pedagogies making room for "children as knowledge producers, rather than knowledge consumers" (Giorza & Murris, 2021, p. 4). Rautio (2013) describes the "carrying of stones" as an autotelic every day practice (meaning the activity is the reward itself) and suggests these practices are "worth cultivating instead of being considered trivial or even harmful" (p. 395).

Early years settings, including outdoor spaces, gardens, playgrounds, have materials and objects that, like the stone, are actants. Attending to the stone enables us to see that children are not individually-bodied entities to be studied, researched, taught, given a *voice*. They, like everything else in the world, are relational becomings emerging through encounters with other bodies, spaces, times and matter (Barratt Hacking & Taylor, 2020). Thinking with the stone to think with theory is vital in ensuring that the details of human/non-human relationships are not overlooked in practice and research.

A Lanyard: *Elisabeth*

My object is a batik lanyard. I first encountered it during a research visit to a primary school for unschooled children in Jakarta, Indonesia in 2015. The school, Sekolah Aman (a pseudonym) evolved in a partnership between students and staff in a nearby international school, local community members, and a business. These partners wanted to effect change together, by building a school which provided safety, nourishment, health, and education to marginalized children, and brought wildlife back to a despoiled urban environment.

Figure 3. *A Lost Lanyard*

During the visit I purchased the lanyard, afterwards I wore it proudly for months, then lost it. The loss is still lamented (**Figure 3**). In many settings, the lanyard has become a familiar object on which hangs our professional and corporate identity and, for some, evokes a sense of

belonging. This lanyard, however, was an object of beauty, white background with delicate multi-coloured batik floral design. The lanyard symbolized more than my professional identity. It was imbued with my love of nature, with memories of my own batik making at school of Sekolah Aman, and its students wearing batik uniforms, of Arwan (a pseudonym) whose story is entangled with the lanyard, and of the lush vegetation, and tropical flowers growing in and around the school.

Surprisingly Sekolah Aman was also a place of work. Arwan, a former student, had a small workshop where he was making batik lanyards, with a sewing machine and row of beautiful fabrics. After leaving Sekolah Aman, Arwan had passed the secondary school examinations and was paying his school fees by making lanyards after school. Sekolah Aman provided a safe space, and equipment. Without this support and his own efforts, creativity and enterprise, Arwan would not be in school. His home is the kampung, an impoverished city neighbourhood, where begging or scavenging on the rubbish tips, toxic from burning plastic, provides a typical livelihood. Arwan's future is brighter, due to his education.

The lanyard's power carries Arwan's story forward far beyond my initial encounter with a remarkable boy in Jakarta. The lanyard imbues the kampung, the geography and history of colonization, environment, nature, place, culture, art, craft, learning, education, childhood, endeavour, work, and much more. Its vitality reverberates in spacetimematterings across thousands of years to the early Javanese artisans, inspired by the tropical rainforest, using natural dyes to create beautiful fabrics (Barad, 2007). The lanyard is a material trace of the Dutch East Indies (now Indonesia) where colonizers appropriated batik for fashion and furnishings, trading it globally, amassing huge wealth (der Meer, 2021). The lanyard's rainforest flowers echo colonial destruction. The interdiction of shifting cultivation—an indigenous, ecologically sensitive practice—replaced lush rainforest with monoculture plantations to provide teak for shipbuilding to power this global trade.

What work does this object do? The lanyard hails the destructive impact of colonization on people, land and ecology, "settler societies are built on a dual war – a war against nature and a war against the natives" (Rose, 2002, p. 2). In doing so, it demonstrates how the ruptures colonialism creates in people and place are perpetuated through bodies, spaces, and objects. Arendt's (1961) theorising of decolonization shows how coloniality appears in the present, the exploitative past continues to impact on Arwan, his home, the kampung, and beyond. The lanyard also materializes how objects act within local-global circuits of capital. Locally, its production was a source of finance for Arwan, enabling access to school, thus altering his and his family's situation. Globally, the lanyard speaks to efforts to build peace and reconciliation; it materializes who matters and what counts in working for educational, social, and environmental justice (Rose, 2002). The lanyard urges us to protest past-present exploitation as rainforest burns and impoverishment destroys lives across Indonesia and elsewhere.

On return to the UK, I wore the lanyard proudly; it became a talking point, its object vitality summoning others. In research meetings, conferences and teaching, the lanyard became a material expression, an agentic materialization of my research in Indonesia. I pointed to it, touched it, held it, thought with it, participants asked questions about it. Thinking-with the lanyard now, via posthumanist new materialist notions of response-ability and care, I continue to query my own part—as a white European researcher from the minority world—in the encounter. How, I continue

to ask, can I not perpetuate colonialism? How do I disrupt inequalities? How should I enact ethical relations in research with majority world schools?

A Plastic Chocolate Wrapper: *Eliane*

A walk on the beach. Brightly coloured chocolate wrappers swirl gold and blue in the wind, faded by the sun and sea. Wrinkled wrappers transiently peak through the pebbles, ever reconfiguring, turning, and returning with the tide. The wrapper offers a faint configuration of its past intended as an attractive protective coat to a deliciously sweet cocoa, milk, and sugar concoction. A walk on the beach will never be the same.

Figure 4. *A Plastic Chocolate Wrapper*

Plastic pollution has been accumulating in the marine environment for decades (Ostle et al., 2019). For long hiding in plain sight, the Blue Planet Effect changed our relationship with plastic litter. Following the broadcast of the seventh episode of the *Blue Planet II* in the UK in 2017, millions of viewers witnessed the impact of plastic pollution on the once pristine marine environment (Hunt, 2017). No longer can you not see. The programme captured viewers' attention and prompted a sustained conversation on plastic pollution, achieving more in one hour of televised visual storytelling than a whole community of educators could in years. As an educator concerned with promoting meaningful engagements with marine environments, litter's mattering matters deeply to me. How did it do this? Was it the stunning imagery welcoming viewers, many for the first time, into the beautiful hidden world beneath the waves only then to see the horror of marine animals entangled in plastic nets? Was it the individual stories, sad tales of whale, fish and bird, whose innocent lives were straying off normality, becoming aberrant through no fault of their own? Or were they affected by the images of a seabird's stomach contents of many indigestible

coloured plastic pieces? Did these cruel images become significant through our own subsequent repeated daily encounters with plastic culprits? Plastic is ubiquitous—as is our responsibility for this human-made stuff intended to reside in our cupboards, bags, and supermarkets, that is now swirling on our streets, travelling through our drains and rivers, and trapped on our beaches.

Blue Planet II revealed litter as *actant*. According to Bruno Latour (1999), an actant is "a source of action that can be either human or non-human; it is that which has efficacy, can *do* things, […] make a difference, produce effects, alter the course of events" (in Bennett, 2010, p. viii, emphasis in original). According to Actor-Network-Theory, natural and social worlds are composed of constantly shifting relationship networks, where the role of the non-human is emphasized as strengthening and extending the network (Latour, 2005). Litter is everywhere in everyday life. Estimates indicate by 2050 there will be more plastic in the ocean than fish. In the aftermath of *Blue Planet II*, plastic wrappers encountered as litter work as actants to maintain a conversation on plastic pollution, in the same way a knife cuts cheese, or a bottle holds water. Each and every piece of litter acts as a connector transmitting power across the networked human. After *Blue Planet II*, my encounter with a plastic wrapper materializes this broader social awareness of the impact of plastic pollution. The wrapper as object is not reduced or dead, it is disclosing its vibrancy with lessons to be learnt, exposing the entangled, relational nature of everyday material life. Litter is no longer just litter. Litter can make a difference. Litter can change the course of events. Litter can prompt at least some reflexive thought and, potentially, action.

Repeat litter encounters confront us conspicuously the way it fills our homes and streets. The intra-relations of living-human-planet-plastic relationship become increasingly blurred and complex, calling for new forms of learning. However, the pedagogical potential of these momentary encounters may easily be missed because the vitality of matter is hard to discern, and once discerned, hard to keep focused on (Bennett, 2010). Nevertheless, there is hope for orienting humans towards more sustainable ways of living. Thinking of what plastic waste—of wrappers as litter—do, afford, and enable challenges long-held, positive, romantic notions associated with outdoor education settings. Kraftl's (2018) studies of pollution encourage engagement with these sad and intractable realities. Four years on from *Blue Planet II*, I continue to hear litter calling. I listen to it. I wonder how widely it might be heard. I also wonder how it is so easy not to hear or see its devastating effects. I cannot ignore the plastic wrapper. Can you?

What are Posthuman Object Pedagogies and What Do They Enable for Educational Research?

This section coalesces the insights emerging from our four object encounters. Working with the practice of thinking with objects to think with theory we outline what is meant by posthuman object pedagogies and how this produces new directions for educational research.

Posthuman object pedagogies are not about "what can we learn from objects" in the normative sense. This would presume: a humanist ontological separation of object from human; that the object's meaning is already settled; and a transmission model of knowledge. This is how many objects are currently used as teachable content in classrooms and museums. Humanist object pedagogies are also widely adopted by Reggio Emilia preschool methodologies, where objects are used as learning provocations. Such approaches are based on humanist notions of objects as things which exist as vehicles, to provoke the educative power of human interpretation.

This anthropocentric gaze blinds us to objects' agency. Posthuman object pedagogies begin ontologically, epistemologically, and ethically with non-human/human/object relationalities. The pedagogy of posthuman object pedagogies is to be understood in Deleuze's (1994) sense as anything which poses a problem and resists reproduction. In Deleuze's view, pedagogy is a problem-posing move towards the generation of difference, of the production of the new, of a resistance of heterogeneity. For Deleuze, pedagogy is about "ignit[ing] a revolutionary attitude" (Buchanan, 2015, p. 13). This notion of pedagogy pushes us to re-think educational research as an experimental practice. Research should not be a production of the same via methods of the same (interview, case study, focus group). It should be both an experimentation with thought, the unthought and unlearning, and an experiment in empirical practice to activate new relations between thought, matter, and action. It is in this sense of pedagogy, that posthuman object pedagogies suggest the need for a renewed attention to what objects make possible in human/non-human matterings to support the development of more creative, curious, care-full, and kind research approaches. Our experimental approach of thinking with objects to think with theory is exemplified in the object encounters above. Other feminist materialist posthuman research examples of object experiments include a consideration of objects as mundane as a T-shirt to produce new insights into gender and power in a classroom, and a table to explore classroom space and ableism (Taylor, 2013, 2017).

Posthuman object pedagogies aim to be nomadic. Following the thingly scent resists pre-formed research questions instead attending to objects to enable the research questions. They pose to emerge time and time again, not only once at the beginning of the research process. In following objects' questions nomadic research is likely, then, to push off in many directions, following rhizomic pathways which multiply and proliferate. Posthuman object pedagogies don't see research questions as framing devices for projects, neither do questions have to be slavishly answered. They refute the existence of the "right question". Instead, research questions are devised as experimentation techniques, as invitations, as problems, as response-ability for welcoming, enabling, and opening the unforeseen. As each of us relive and recount our object encounter above, we show how following the thingly scent led to unanticipated space-time moves, unaware where the object would take us, what it would reveal. An interesting example of how objects release potential for doing and thinking otherwise can be found in Benozzo et al. (2019). Objects such as a toy gorilla, an action man doll, and children's pacifiers (dummies) travelled around and disturbed the regulated conference space, causing disconcertion and questioning.

Posthuman object pedagogies encourage educational research as an embodied and embedded doing, suggesting research activities such as heeding, discovering, speculating and a research stance of sensory attentiveness and mindbody immersion. In casting educational research as knowing-becoming-doing, they refuse off the peg methods. Instead, they provoke us to create and hybridize methods, to unfix methods from their humanist framings. An example of this is Renold's (2018) development of creative arts-based methods when working with 15-year-old girls at a school in the Welsh Valleys (UK) to address problems of sexual harassment and violence. The "ruler skirt" the girls made became an agentic material object which visited the Welsh Assembly, the United Nations, schools and activist meetings, and influenced understandings, policy and practice regarding how gendered oppression matters and materializes. In attending to objects' thing-power and their intra-active agency in non-human/human assemblages, educational research might then realize the potential for ushering in the unseen, unknown and heterogeneous,

for inviting in that which is normally considered out of bounds. Attending to the thing-power of objects in Deleuze's (1994) pedagogical sense enables processes of thinking, doing and being outside humanist intentionality, wants and needs.

Posthuman object pedagogies aim to place vitality, life and potentiality at the heart of research – to re-animate research practice in line with Bennett's (2010) invitation to consider "the curious ability of inanimate things to animate, to act, to produce effects dramatic and subtle" (p. 6). Each object encounter shows viscerally how objects, as material and matter, have potency, are in flow, a vital part of the entangled web of space and time. The book leads us back-and-forth with colonialism, slavery and plantations; the lanyard produces spacetimemattings with non-human and human nature, impoverishment, and reparation for ongoing colonization; the stone invites the child to play-and-learn with geologic pasts, inspiring a reframing of early childhood research-and-practice; the plastic wrapper challenges the linearity of production, consumption and waste, and comes to matter as a globally-mobile actant in the planetary emergency. Post-human object pedagogies are indebted to the relationality and animacy of Indigenous ontologies, and to the care-full work of feminist ecological activists (Jones & Hoskins, 2016). Each object encounter provokes thinking and unthinking in response to our object's intra-activity within "a wider distribution of agency" than that afforded by the idea of the sovereign human (p. 122). Research that is attentive to worldly vitalism—in ways that most dominant research practices are currently not—may gather the power of things to make us think, do, be, and become differently. Objects may provoke "in a way that worries common sense, stumps the imagination, and solicits wonder" (Jagodzinski, 2015, p. 20). Attending to an object's vibrancy and to think with theory helps discern unseen connectivities. In this respect, the methods development work of Anna Hickey-Moody (2018) and the object-data litterings and other object experimentations in Fairchild et al. (2022), for example, are interesting and vital research practices.

An object's vibrancy is often fugitive, ephemeral, momentary and yet an object can unleash forceful, affective, and powerful effects. Posthuman object pedagogies invite risk and discomfort, in their challenge to do research against the grain in the cracks, interstices, middles and muddles. We may worry about the academic recognition for such work. Posthuman object pedagogies encourage undisciplined educational research. Our object encounters entangled us with memory studies, feminism, Black Studies, post-colonialism, posthumanism, human geography, ocean literacy, childhood studies, and more. If educational research has to be undisciplined (and it must—the problems are too big, the answers uncontainable by the reductivity of single disciplines), then we may worry about where we fit in the academy, which discourse communities we are addressing, who wants to listen to us. Posthuman object pedagogies encourage us to be braver in forging a less anthropocentric research practice, where the force and reach of objects, and the human/non-human flows they forge is acknowledged. Barad (2007) reminds us that even the smallest intra-actions matter and urges us to attend to matter's mattering in its uniqueness, relationalities, and differences. Each object encounter enfolds micro/macro and prompts the need for developing a research capacity for "becoming little" so we can attend to the unnoticed connections that are so central to our becoming-in-the-world (Giorza & Murris, 2021, p. 4).

Concluding

Deleuze said a concept is a brick, you can throw it through a window. Perhaps a book, a lanyard, a plastic wrapper, a stone is a brick too, helping to unsettle the plantation mentality and the colonial spaces of the canon, the disciplines, and extractive practices of educational research-as-usual. Object encounters prompt an engaged practice of thinking with objects to think with theory to produce new questions and interrogate problems differently. Posthuman object pedagogies offer a methodology-in-process, empirical experimentation, and a materialist analytic stance to enable meaning to emerge in the relations between theory, concepts, data, history, memory, geography, the world. Such research aims to rupture the known. It is undisciplined, uncertain, collaborative, event-ful, unfinished, and unfinishable. Objects are generous. They keep on doing their quiet work. They keep on inviting connections, relations, new possibilities.

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