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Weather worlding: learning with the elements in early childhood

Tonya Rooney

Faculty of Education and Arts, Australian Catholic University, Canberra, Australia

ABSTRACT

In the context of challenges posed by climate change, this paper draws attention to the significance of children's relationship with weather. The paper contends that it is time to engage more closely with children's weather relations when developing and experimenting with new environmental pedagogies. Furthermore, it is argued that there is a need look beyond the ways children learn 'about' the weather (where this is presented as something separate to our human selves), to more situated and entangled ways of learning in and 'with' weather. Notions such as the 'weather world' and 'weathering' are discussed here as valuable starting points for re-thinking child/weather relations. These offer a way forward where the lively curiosity of children, combined with the educational practice of being with the weather, may open up alternative, less human-centric ways of coming to know and respond to the environmental challenges ahead.

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Introduction

A young child rushes outside into the cold. All of a sudden she stops, noticing the little clouds of air left drifting in her wake. She draws in a big breath and then breathes out, more deliberately and forcefully this time. Fascinated, the child delights in the visible condensation that forms as her warm breath moves through the cold air. Another child comes to join her and they stand together 'making' little clouds, exclaiming in wonder at what the simple act of breathing can do in the chilly weather.

Historically, there has never been a greater need to focus attention on our relationship with the weather. As climate change brings with it more extreme weather events and wreaks damage on rich bio-diverse environments, we can no longer ignore the effects of our human presence. These changes require us to re-think our actions, relations and priorities in the world. Working our way through possible responses is not straightforward if we (as humans) are to individually and collectively respond to climate change without perpetuating a human-centric view of the world that, many argue, has led to the very problems we now face. Creative and open ways of thinking are required that do not simply reinforce a dominant human-progress narrative at the centre of the solution/s (Gibson, Rose, and Fincher 2015); but rather, allow us to take up the opportunity to 'reconfigure our place and agency in the world' where we understand ourselves as part of the world rather than somehow separate from it (Instone and Taylor 2015, 139). Environmental pedagogies can play an important role in providing children with opportunities to attend to the mutual (even if entirely different) climate-induced vulnerabilities that are faced by all worldly inhabitants, thus extending children's concern beyond human interests to encompass the more-than-human. In this paper, I explore the interconnection between the weather, children's weather

experiences and the wider entanglements these are part of, to show how we might bring meaning to the intricacies of human/weather relations as a form of pedagogical practice with young children.

In thinking about how we might develop pedagogies for children in ways that do not side-step the reality of environmental challenges, and yet which offer something more than a directive or a 'telling about' the types of actions that we as humans can/should take, I take inspiration from the notion of 'common worlding' as a pedagogical opportunity (see e.g. Pacini-Ketchabaw, Taylor, and Blaise 2016; Taylor and Giugni 2012; Taylor and Pacini-Ketchabaw 2015; Taylor, Pacinini-Katchabaw, and Blaise 2012). Through this we are invited to explore the possibilities in learning to be affected by the 'unruly materialities' (Taylor and Blaise 2014, 380) and the messy relations that abound in the worlds we share with others, human and non-human. These complex and entangled relations can be understood as generative of the worlds we make and remake together (Taylor and Blaise 2014); a collective world-making that Haraway refers to as 'worlding' (2011). As our experience of the world does not occur in isolation from the weather, and as our presence is clearly implicated in climatic fluctuations (Neimanis and Walker 2014), there is important work the weather is doing and that we are doing with the weather in shaping the 'weather world' (Ingold 2007). To bring out more fully the complexities in human/weather relations, I draw these notions together to explore children's relations with the world through their day-to-day weather encounters where these are understood as both generative and mutually implicated; a form of 'weather worlding' where human, non-human and elemental conditions are entangled in a collective world-making.

My central aim in this theoretical paper is to argue that it is time for early childhood environmental education to directly attend to the pedagogical significance of child/weather relations. The framework I present here forms the conceptual groundwork upon which empirical research and pedagogical practice might explore the possibilities for young children in 'learning with weather'. I open this paper by situating the discussion in the current environmental education context and highlight some of the challenges of embedding climate change education in an early years' curriculum. I then turn more specifically to the matter of 'weathering' (Neimanis and Walker 2014) to highlight how we might conceptualise child-weather relations through better understanding human interconnections with the 'weather world' (Ingold 2010, 2015). Finally, I briefly consider how these notions might lend support to educational practices that allow children to be out in the elements and to learn *with* the weather; where for example the affect of weather may bring new insights into our (human) entanglements with place, other co-habitants and wider climate conditions.

In thinking about the distinction between weather and climate, the weather is generally understood as the day-to-day conditions in the atmosphere at a particular place and time, and climate as the longer-term average of these conditions (Climate Council 2015). In this paper, I consider both as part of our weather experience, as there are many ways we can attune to and are connected with both short and long term fluctuations in the atmosphere. The nature of this discussion therefore lends itself to a more fluid understanding of the relationship between weather and climate, supporting the suggestion by Neimanis and Walker that a loosening of this distinction becomes necessary if we are to 'reduce the distance between the enormity of climate change and the immediacy of our own flesh' (2014, 562). The hope here is that if we can find alternate ways of articulating how the elements (such as wind, sun and rain) bring meaning to the interconnectedness between place, objects and multi-species inhabitants in children's worlds, then we also open new pedagogical possibilities for developing responses to the climatic challenges ahead.

Climate change and early years environmental education

Environmental education in early childhood settings has grown rapidly with support from global initiatives such as UNESCO's *Education for Sustainability* vision and national curriculum frameworks such as the Australian Government's *Early Years Learning Framework* (EYLF). In Australia, the *National Quality Standard* for early childhood education also requires of services that 'children are supported to become environmentally responsible and show respect for the environment' (ACECQA 2013, 78). Although

'education for sustainability' has been widely promoted through both global and local learning frameworks in recent years, sustainability discourses have not been without controversy, and there remains ongoing debate as to the theoretical underpinnings that might best inform environmental and/or ecological-focused pedagogies in the early years (see e.g. Somerville and Williams 2015). While not entering directly into this debate, this paper suggests that, at the very least, the significance of our (human) relationship with the weather is something that warrants closer attention in emerging pedagogies.

Learning about the weather occurs in many ways in early childhood education settings. This can be indirectly, such as when decisions about outdoor play or what to clothes to wear are influenced by the weather. Or it might be a more deliberate focus of a learning experience, for example observing the daily weather as part of a morning routine or recording the weather on a chart. As I argue here, if we are to encourage children to engage with the challenges of climate change, it is important to ensure that such learning opportunities do more than portray the weather as an external condition to be observed and recorded. Rather, we need to find ways to draw attention to the relationship between humans and weather. Some have pointed out that, with the rise of technologies, information about the weather is often presented as an abstraction, where:

to interpret or forecast the weather we are more likely to look at a television screen or tap a weather app on a smart phone rather than go outside and look at the sky (Gough and Gough 2016, 33).

While new meteorological tools and a proliferation of weather apps may provide us with unprecedented access to certain types of data about the weather, they can never represent all there is to know about the work of weathering, its affects and the complexities of human-weather relations.

In research to date, children's relationship with the weather has been explored from several different angles. For example, studies in education and health disciplines have focused on the impact of weather conditions on children's outdoor play (Ergler, Kearns, and Witten 2013), levels of physical activity (Harrison et al. 2011), preschool routines such as dressing for the outdoors (Hatcher and Squibb 2010), social and asocial behaviours (Lagacé-Séguin and D'Entremont 2005) and well-being (Ergler, Kearns, and Witten 2013). In environmental education, a number of studies on learning in the outdoors mention the weather as one of many dimensions of the experience. This is particularly the case in a number of Scandinavian studies, where educational policy supports children participating in outdoor play no matter what the weather experience (Sandseter and Hagen 2016). It is in some of these studies that the affective and sensory aspect of children's weather experience comes to the fore (see e.g. MacQuarrie, Nugent, and Warden 2015); a theme I pick up later in this paper. Another area where the weather features in environmental education literature is in the ways that children come to learn about climate change (e.g. Porter, Weaver, and Raptis 2012; Shepardson et al. 2014), with projects such as 'Climate Change and Me' (Cutter-Mackenzie and Rousell 2014) extending this research to the development of a climate change curriculum drawing on the input of young people. Each of these studies touches in part on the impact of weather on a certain aspect of children's lives and/or highlights the weather as one part of children's wider environmental learning experience.

Within this diverse coverage of child/weather relations in the literature, one area that has been little explored is the often under-stated complexities in the mutual and co-implicated happenings between weather and children. It is this dimension I take up here, looking to the potential this offers in re-orienting the way we think about human/weather relations in responding to climate change. Drawing on the 'common worlds' approach mentioned earlier, I aim to challenge and extend how we think about the weather dimension in children's worldly encounters, by setting out a framework that positions the weather as part of children's complex and entangled relations with the environment. This highlights ways of knowing that challenge rigid binaries such as the nature-culture divide, and offers a way of re-thinking human and non-human relations as more intertwined and mutually interdependent (Braidotti 2013; Taylor 2013). It also looks to the potential in less goal-oriented practices that value (rather than close off) open-ended learning outcomes in acknowledgement of the uncertain and risky times in which we live (Instone 2015; Pacini-Ketchabaw, Taylor, and Blaise 2016). I use these ideas to challenge the perception that humans and the weather can be neatly distinguished from each other, and show

instead how humans are part of the 'weather world' (Ingold 2007). We may be situated and grounded (in a material sense) as 'human' within this world (Braidotti 2013), but are nonetheless intricately connected to the worldly goings on; a scenario no more evident than in anthropogenic climate change itself.

Challenges of engaging with climate change in early years education

It can be difficult to know where to start with climate change in early years education. Educators often encounter the view that children are too young to be confronted by such global issues, as the concepts are considered complex and burdensome (Davis 2015; Elliott and Davis 2009; Ernst and Tornabene 2012). In response, one of the aims of education for sustainability programs has been to show that children are situated in and affected by the world, and hence deserve access to (rather than shielding from) ways of learning that may help them better navigate and respond to the world (Davis 2015). There are other challenges that educators face in introducing climate change into an early years curriculum. The two I highlight here are: the potential limitations arising from the child-centred theories that tend to dominate early childhood education; and, the overwhelming sense of scale, urgency and distance often associated with how we might respond to climate change in our daily lives. I briefly expand on these points here, returning to them in the concluding section to show how this paper provides a way forward that is cognisant of such challenges.

The limitations of child-centred pedagogies in a climate change era

Cutter-Mackenzie and Edwards (2013) suggest that it is important for early childhood education to draw on multiple perspectives if we are to imagine the possibilities for sustainable futures. This openness is crucial, as one of the potential obstacles to introducing new theoretical perspectives into early childhood education can be the long-standing commitment to child-centred pedagogies and the developmental needs of the child as understood 'within the child's (exclusively human) sociocultural context' (Pacini-Ketchabaw, Taylor, and Blaise 2016, 150). Such approaches tend to emphasise human-centric perspectives and practices in children's learning. However, if we are to respond to the climate challenges of our time in a way that takes us beyond human-centrism, we may need to re-think the child-centred focus that dominates early childhood learning. Pacini-Ketchabaw, Taylor and Blaise (2016) provide insight in this regard, as they call for an approach that includes the more-than-human constituents of the worlds in which children grow up. They refer to these worlds as 'common worlds' (Taylor and Giugni 2012; Taylor, 2013) in recognition that these are shared with other species and that it is the multi-species relations and interactions that collectively shape these worlds and 'bring them into being' (Pacini-Ketchabaw, Taylor, and Blaise 2016, 151).

In contradistinction to pedagogical approaches that place the child at the centre, a common worlds theoretical approach therefore draws our attention to the complex, entangled and mutually productive relations that children have with others (human and non-human) in their immediate worlds (Pacini-Ketchabaw, Taylor, and Blaise 2016). A shift in focus from human-centric to more-than-human relations in children's learning does not necessarily require a whole re-working of existing curriculum frameworks; but rather suggests a creative way of working within frameworks such as the Australian EYLF that have been constructed to allow multiple perspectives, debates and avenues for reflection on children's learning (Millei and Sumsion referred to in Cutter-Mackenzie and Edwards 2013). As an example, the EYLF acknowledges children's sense of belonging as entailing 'interdependence with others' and encourages children to 'explore relationships with other living and non-living things and observe, notice and respond to change' (Department of Education, Employment and Workplace Relations 2009, 29). Such objectives are open-ended and draw attention to the significance of the multiple relations in children's lives, thus providing opportunities for educators to bring a range of viewpoints into environmental pedagogy and practice. Thinking in terms of the 'weather world' (as discussed further below) provides one way of extending such learning frameworks.

Challenges of scale, urgency and distance

Another challenge for educators in addressing the reality of climate change is that it is easy to feel our actions may be ineffective or insignificant in the face of the sheer scale of the problem and the sense of urgency that surrounds the need for a response. Added to this is the perception that climate change is in many ways an abstract or seemingly distant phenomena, making it difficult at times to grasp the implications for our day-to-day lived experience. If this sense of scale, urgency and distance is not to overwhelm us, then we need to find ways of making the wider climatic challenges more tangible and localised (Neimanis and Walker 2014) and bring this to our everyday teaching practices with young children. In addressing this challenge, this paper looks to the potential in the embodied, immediate and place-based dimensions of human relations with the weather. Given the connection between the day-to-day weather and wider climatic conditions, such an approach provides a fertile starting point for what Neimanis and Walker describe as:

cultivating an imaginary where our bodies are makers, transfer points, and sensors of the 'climate change' from which we might otherwise feel too distant, or which may seem to us too abstract to get a bodily grip on (2014, 559).

Focusing on the bodily affect of elemental conditions such as rain, wind and sunshine in environmental pedagogies is therefore one way in which we might open opportunities for children to become alert to the flux of climatic activity (Neimanis 2015). In addition, we might also bring the challenges closer to home by re-thinking the temporal and place-based dimensions of our relations with climate change. In the next section, I therefore look to how local, immediate and less-rushed activity can constitute a meaningful 'here and now' response to the challenges ahead, despite the dominance of the urgent and distant discourses that would belie this.

The challenges relating to the sometimes abstract nature of climate change are further exacerbated by the fact that we are faced with having to develop climate 'adaptions' (not just solutions) to enable humans to live with and survive the increasing incidence of erratic and extreme weather events. One feature of this shift is that many such adaptions bring with them the potential for greater detachment, segregation and disassociation from the immediate weather experience; for example, through the building of stronger and more enclosed spaces for home, work, leisure and transit where the air temperature is continually regulated and the elements 'locked out' (Vannini et al. 2012). While such adaptions may bring relief from harsh climate conditions, a shift to increased segregation from the elements also risks deepening the perception that humans can somehow be separated from the weather; a somewhat ironic scenario given that the necessity for such living arrangements can be directly attributed to the ongoing, intertwined and co-implicated relationship between humans and the weather. Such attempts at separation are also ultimately futile, as we can never fully dissociate ourselves from the weather and the way it moves through our bodies (Neimanis and Walker 2014). This adaptive shift therefore only adds to the imperative to develop pedagogies that allow children to build and maintain close connections with everyday elemental conditions.

In light of all these challenges, the theoretical concepts discussed below propose an approach to early years environmental education that focuses on human entanglement with, rather than an artificial separation from, what Ingold refers to as the 'weather world' (2007).

Weather worlding

We know what it is like to be in the open on a windy day (Ingold 2007). We also know how the rain feels as it trickles down our face and the smell in the air as a storm approaches. The heat of the midday sun can warm the skin and if we trudge too long through the winter snow our toes may go numb or ache with pain. These, and many such other experiences, are familiar weather encounters. Yet, as we try to conceptualise these experiences, the notion of 'weather' remains somewhat elusive (Ingold 2007). As Ingold (2007) suggests, we still tend to be drawn to concepts and words that situate the weather as something external to ourselves, that we make contact with or that impacts on our body. Yet such formulations do not capture in full the ways that we mingle with the elements – absorbing, releasing,

inhaling or exhaling the wind, sun and moisture from both sky and earth (Ingold 2007, 2010). As the opening narrative indicates, children often experiment with their own part in the weather world. On cold days the simple act of breathing out can become visible through condensation forming in the air that is exhaled, and it is not uncommon to witness an excited exclamation from children keen to share the connection between their own breathing, the elemental conditions and their own 'becoming weather'.

Understood in this way, there is no clear boundary between the human body and the elements. We are porous and even our skin is still but a 'partially permeable membrane' (Neimanis 2012, 91), as shown in the way we might draw in heat from the sun or perspire to cool down on a hot day. We cannot therefore know the weather from the outside, because to extract ourselves from air, sunlight, wind and water would be to remove ourselves from the elements that sustain us. As Ingold observes:

to draw the limits of materiality around the surfaces of the landscape and artefacts would be to leave the inhabitants of the landscape and the users of artefacts in a vacuum. They would be unable to breath. Nor could anything be grown. (2015, 69)

Ingold (2015) also points out that the ground itself is also more than simply a discrete surface upon which weather conditions occur. The land is transforming, shifting, (re)generating and layering in a way that makes it difficult to say where the earth as substance ends and the weathering begins. If we think of the wind constantly moving leaves, dust or seeds across the land, and the way these move through both earth/air, then we can think of the wind not so much as something that simply blows things, but rather as Ingold (2007, 30) suggests that 'the wind is its blowing' as witnessed in the movement and swirl of matter and water across the earth. We cannot therefore dissociate our relations and interactions with the world around us from the weather; and as we move through places where air, water and earth intermingle we can be said to be moving with and part of the ever-changing elements of the 'weather world' (Ingold 2015). As children delight in jumping in a puddle or squelching through a patch of mud, even these seemingly small encounters become a reminder of the way the earth is constantly being 'weathered' and how our own presence and movement is inevitably caught up with the weathering process.

Neimanis and Walker offer, as a provocation to 'think otherwise', the notion that we too are 'weathering' (2014). The aim, as with the work of Ingold, is to help counter the artificiality of the weather/human divide. To this end, Neimanis and Walker propose that we think of ourselves as 'weather bodies':

the ebb and flow of meteorological life transits through us, just as the actions, matters and meanings of our own bodies return to the climate in a myriad of ways (2014, 560).

Such a view can help us create connections with the wider, sometimes intangible, process of climate change. Drawing on Barad's notion of 'intra-action', Neimanis and Walker conceive weathering as a form of mutual becoming where 'humans and climate change come to matter' (2014, 560). To bring about change, we not only need to immerse ourselves in the weather world, we also need to understand ourselves as part of that world, for:

[w]hen we hold on to the belief that we can separate our human bodies from climate (close our doors, resist the winds) we maintain a worldview of relating *to* the earth, rather than worlding *with* it (Neimanis and Walker 2014, 567). (*italics in original*)

The notion that we too are 'weathering' therefore helps to disrupt our human-centric tendency to view the earth as something available for us to 'do things to' and the weather as something that 'happens to us'. According to Neimanis and Walker (2014), understanding the entwinement of human/weather relations is not only something that involves thinking about our relation with the weather in the 'now', but to consider what this means over and for the passage of time. To understand 'weathering' as 'worlding' is to highlight how climate and elemental conditions are not simply tied to a particular point in time that we 'pass through' in a linear way, but rather are conditions that are generated over time through a co-creative form of world-making, where time itself is understood as 'a time we weather together' (Neimanis and Walker 2014, 570).

What we can take from the work of Neimanis and Walker (2014) is a way of thinking of our bodies as entangled in the process of weathering and also the possibility that there are alternative temporal narratives for thinking about climate change. This opens up new avenues for learning and action that are more open-ended and less goal-directed, and yet which nonetheless offer possibilities that are responsive to future needs. Recall the earlier point that climate change challenges are often presented with a sense of urgency and the need to work towards (human progress-oriented) solutions. One limitation of this approach is that these anticipatory and urgent discourses can make it difficult to find spaces for alternative ways of thinking about how we might respond to climate change. The dominant views of what is considered 'urgent', while important, can at times work to obscure other urgencies that also require our ethical attention (Olson 2015). It has been suggested that if we shift the focus away from a dominant, linear and progress-driven trajectory, we can uncover and perhaps make space for some of the more 'hidden' matters that require our attention (Instone 2015; Olson 2015; Tsing 2015). In a similar vein, Neimanis and Walker (2014, 561) suggest that the 'stop climate change' narrative may obscure other ways of attuning to how we are affected and what we are affecting through our situated 'weather bodies', and that a more responsive ethics may come from 'ongoing engagement with a weather-world in flux' rather than a singular focus on solution-directed action.

It is not just the temporal dimension of urgency that can obscure alternative responses to climate change. There is a risk that, in heeding the urgent call for action, the solutions may be formulated in ways that are rushed and unnecessarily controlling, perhaps inadvertently reaffirming a view of humans at the centre and making it difficult to see other possibilities for action (Instone and Taylor 2015). To counter this, Instone and Taylor (2015) draw on the work of Stengers to suggest that thinking from 'where we are' and in the presence of (multi-species) others is a positioning that reveals the way that human and more-than-human entanglements have collectively shaped the histories of a particular place. Thinking from 'where we are' may be local, but it cannot be separated from the wider global concerns of climate change (Instone and Taylor 2015; Somerville, Power, and De Carteret 2009). In applying this to how we might come to understand ourselves as part of the weather world, attention can be drawn to the 'place' of our weather experience, where attending to what is happening 'with the weather' and 'where we are' can provide a meaningful positioning through which we can come to understand our entangled relations with the wider flux of climatic change.

The weather is always part of how we encounter place; even if at times its presence is not directly acknowledged or seems a mere backdrop (Ingold 2007; Vannini et al. 2012). Encountering place through the way it is transformed by weather conditions can provide a valuable method for understanding the interconnectedness between place, objects, other species and the weather experience. Violent weather events in particular bring this effect to the fore, such as when places (and plants or animal species) are razed by a tsunami or bushfire. At the same time, weather is not simply to be understood as an outside force impacting on a place, but is produced and emergent in ways that are ultimately inseparable from the inhabitants and landforms in the places through which it is experienced (Vannini et al. 2012). Even without such stark examples, there are many everyday ways of coming to know the connections between place and weather. The work of weathering may at times take days or weeks to unfold (as with seasonal changes or extended periods of dry/wet weather), or it could happen within seconds or minutes, such as with the blowing wind, a crack of lightning, a brief rain shower or the shadow from a passing cloud. Positioning ourselves with the weather world in a particular time and place also opens up a way to notice the affect of weathering on other inhabitants and their habitats. For example, a hot day may bring snakes and other reptiles out into the open seeking warmth from the sun, or a rain shower may wash creatures out of their usual homes, leaving them exposed in ways that are unexpected. In this sense, our experience of place and its inhabitants is never 'weather-neutral' (Vannini et al. 2012), and being in or returning to familiar places over time can allow us to witness the ever-changing place/weather relations that emerge over the short and longer term.

Thinking through places that are local and familiar is not to deny the enormity and urgency of climate change, but rather to suggest that there is merit in attuning to the immediate, local and embodied dimensions of the 'weather world', where the dimension of time can be understood as an entangled

past, present and future (Neimanis and Walker 2014) and where we can come to understand the place we are in as an opportunity to 'slow down, to be present enough to notice the multiple presence of others' (Instone and Taylor 2015, 137) and what this reveals about the more-than-human worlds and concerns we are entwined within. Our human/weather relations are not simply our own concern; they are common world happenings where we are 'weathering' together in a making and re-making of our shared world. In this world we remain implicated as participants and co-makers (Ingold 2015; Neimanis and Walker 2014), regardless of whether we contain ourselves in a shelter or expose ourselves to the elements. Either way, the presence of the weather still persists in our lives as something we have to contend with (Ingold 2015) – to 'weather' if you like (Vannini et al. 2012). These are complex and co-implicated entanglements with more-than-human relations and concerns.

Notions such as the 'weather world' and 'weathering' help us to envision the possibilities in attending to human/weather relations as part of environmental learning. As young children explore or respond to fleeting lines of feeling, thought or action within their day-to-day weather encounters, they generate new ways of relating to and becoming with the world; an ongoing process of co-shaping and intermingling that we can understand as a form of 'weather worlding'. The pedagogical practice of learning *with* the weather (explored briefly in the next section) is in part about recognising the value in attending to the more immediate, relational and place-based ways of making meaning in the world. It aims to do so in a way that is still future oriented, in that it seeks a continuing with others (Ingold 2015) and the responsibilities this entails, and yet is not limited to actions which are focused on pre-determined, progress-based or human-centric goals.

Learning *with* the weather

The theoretical concepts above lend support to pedagogies and practices that move beyond thinking about the weather as context to a particular experience (e.g. 'it is raining today'), to those that attend to the ways the weather moves in, with or through us and where we move in, with or through a flux of elemental forces. The notion of 'weather worlding' is not only a theoretical positioning, it is deeply pedagogical in that it suggests a way of learning 'with' weather through the multiple and entangled affects of the weather world. Within this, there lies the potential for understanding not only how we are affected, but also how our actions affect others (Pacini-Ketchabaw, Taylor, and Blaise 2016; Taylor and Pacini-Ketchabaw 2015), thus opening up possible ways of responding to climate change that shift the focus beyond human-centric concerns.

There are many possibilities for extending environmental education to attend more directly to the significance of child/weather relations. While these are by no means exhaustive, three types of practices that may lend themselves to this endeavour include: walking in the weather, and the sensory and affective engagement this affords; building connections with and returning to places, to bring meaning to the ongoing and collective work of weathering; and, nurturing modes of attention to more-than-human encounters and concerns so as to bring alternative perspectives to bear on complex and mutual climate change vulnerabilities. I briefly expand on the potential in each of these.

Walking in the weather

Embodied and sensory encounters with the weather allow us to come to know the weather differently (Neimanis 2015) through the ways we respond, feel and engage with the weather world. In exposing ourselves to the elements, we may also become more immediately aware of our bodies as porous (Neimanis and Walker 2014) and open to the weather (as the young children did in the opening narrative). Explorations with children that highlight this intermingling with the 'weather world' may help to bring affective attention to human bodies as 'weather bodies' (Neimanis and Walker 2014). The everyday act of walking as a practice or method for learning with the weather takes up Ingold's suggestion that walking in the 'weather world' allows us to open ourselves to the 'intimate relation between becoming knowledgeable, walking along and the experience of weather' (2010, 121). It also draws on ways that

walking has been recently used as an experimental proposition for how we might attune ourselves to the challenges of our changing world (see e.g. Instone 2015; Springgay 2016) and reflects the growing interest in the practice of ‘walking’ in the lives of children and young people (Horton et al. 2014). As Instone suggests, while the slow pace of walking may appear at odds with the urgency of climate change, it may be just what we need to ‘help to enhance our connectedness with the world in embodied and creative ways’ (2015, 137). Walking along can also help us to see ‘there is no singular right way’ (Instone 2015, 138) and therefore lends itself to more open-ended ways of attending to the world.

To be in the weather is not always easy or comfortable, and can just as readily invite messy, unexpected, and even at times precarious, conditions and encounters. Having to stray off the path to avoid a puddle or tread more gingerly across a frosty surface to avoid slipping can illustrate how the co-mingling of human/weather relations is evident in even the briefest moments of mobility. Getting to know these relations and affects through walking with the weather may offer a starting point for understanding our inter-connectedness with the weather world.

Returning to places

The practice of engaging with, and returning to, particular places over time may also offer a positioning from which children might attune to the short and longer term changes in broader climatic activity. Returning to places makes them familiar and builds connection with both place and its inhabitants (see e.g. MacQuarrie, Nugent, and Warden 2015). As Solnit observes, the more one comes to know places, ‘the more one seeds them with the invisible crop of memories and associations that will be waiting for you when you come back’ (2001, 13). Others have noted how our memories of a particular time and place are in part shaped by the sensory dimensions of our weather experience, as for example in the way that certain ‘summer smells’ can evoke a memory drawing our ‘pasts into a weathered future’ (Berland 1994, 99). Becoming familiar with places therefore provides an opportunity to notice the work of weathering over time. Given that we cannot contrive or control the weather conditions, affording experiences in the weather simply ‘as it is’ each day can provide a perspective from which to notice fluxes in the weather and reveal the intricate connections between weather and place; a counter to the view that the weather can somehow be isolated from the places we inhabit.

Attending to more-than-human encounters and concerns

As noted earlier, the implications of human/weather relations extend beyond human concerns. Attending to children’s relations within a common worlds framework helps re-orient attention to the collective (human and more-than-human) shaping of our shared world. Even smaller, hidden or seemingly insignificant activity may offer insights into the constantly shifting and inter-mingling of earth, creatures and weather; as shown for example in Taylor and Pacini-Ketchabaw’s study on children’s encounters with ants and worms (2015). Tsing, in her travels with mushrooms, also shows how following more-than-human relations can open the senses to the unexpected possibilities of life and hope; from this suggesting:

Our first step is to bring back curiosity. Unencumbered by the simplifications of progress narratives, the knots and pulses of patchiness are there to explore (Tsing 2015, 6).

For young children, curiosity is an important way of engaging with the micro-worlds in their immediate surrounds. When children are given the time and space to attend to the happenings in these worlds, possibilities for new and unexpected relations can emerge.

The three types of practices for ‘learning with the weather’, as discussed above, are relatively broad. It is acknowledged that translating these approaches into concrete, daily activities with children in education settings is no easy task. Further experimentation and reflection is required on how we (as both educators and researchers) might draw on these ideas to promote ways of learning ‘with’ the weather; noting that they offer many possible pathways forward. In order to re-orient environmental

pedagogies to engage more directly with child/weather relations, the suggestion here is that we focus on practices that avoid reaffirming any type of artificial separation between humans and weather, but rather highlight the intermingling of these. Further, if we are to acknowledge human implication in climate change and seek responsive ways forward, then such pedagogies and practices need also to acknowledge our entanglement with more-than-human relations and our collective 'weather worlding'.

Conclusion

In facing the challenges posed by climate change, we can no longer over-look our (human) part in the shaping of the weather world. In this context, pedagogies and practices that foster an appreciation of the inter-mingling of humans and the weather can act as a strategy to counter our often habitual belief in some form of human/weather divide. This can be achieved by placing an emphasis on ways of learning *with* the weather and developing environmental education practices that attend to the sensory and affective intricacies of human/weather relations. Understanding these relations as entangled within a shared or common world, offers a basis for pedagogical engagement with the more-than-human curiosities and concerns in children's daily encounters. This in turn offers a shift in emphasis from human-centric modes of thinking and an opportunity to draw attention to the climate-induced vulnerabilities of all worldly inhabitants. By attending to the collective work of weathering in local surrounds, we can open up new possibilities for environmental education that might bring the future, and seemingly distant, challenges of climate change closer to home.

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Notes on contributor

Tonya Rooney is a lecturer in the Faculty of Education and Arts at the Australian Catholic University and a member of the Common World Childhoods Research Collective.

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