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Empathetic encounters of children's augmented storying across the human and more-than-human worlds

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ABSTRACT

This study brings empathy to the centre of literacy practice by investigating children's augmented storying as it was related to empathetic encounters across the human and more-than-human worlds. The study applies sociomaterial theorising that defines empathy as relational and emergent across human–material–spatial–temporal assemblages. The empirical study was situated in a Finnish primary school in which children used an augmented story-crafting tool (*MyAR Julle*) to explore their local environment and to create and share their stories. The findings show how empathy emerged situationally across the children, other human beings, materials, technology and the natural world. The empathetic encounters of the children's narratives were more than romantic or smooth encounters, instead competing and in tension with one another, calling moral reasoning and agency. The study shows the potential of sociomaterial theorising to change the way we think about children's encounters with the world, using empathy as a framework.

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Introduction

Global disturbances, such as climate change and the COVID pandemic, are challenging the education field all over the world, and literacy education and inquiry are no exceptions. At the same time, digital transformations are changing childhoods in the Global South, with implications for children's lives, literacies and relations with each other and the world, in general (Erstad et al., 2020; Kumpulainen, Burke et al., 2020). Today, many children's lives have largely moved indoors, with less playful and imaginative exploration of the natural world and its green spaces, even as research indicates that direct experiences of nature in childhood can contribute to long-lasting appreciation and care for nature (Chawla, 2020; Kahn & Kellert, 2002; Louv, 2005). Educational systems in different parts of the globe are attempting to respond to uncertain times to serve children's contemporary

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lives, relations and needs, and to address the learning requirements of our unknown future. For instance, Finland recently introduced a new curriculum for early childhood, primary and secondary education that underscores the enhancement of learners' transversal competencies, multiliteracies and interdisciplinary, cross-curricular learning activities that take place indoors and out, inviting learners, together with their teachers and other relevant adults, to address and solve real-world problems for sustainable futures (Kumpulainen, 2018).

This study is situated in this turbulent and challenging context. At the same time, the focus of the study moves beyond current educational discourses around skills and competencies of the 21st century, and instead brings *empathy* to the centre of literacy practice and inquiry. The study underscores the importance of empathy in our precarious times as a collective and personal resource for socio-ecological justice, future-making and hope. According to the Merriam-Webster dictionary, *empathy* is other-oriented and accounts for 'the action of understanding, being aware of, being sensitive to, and vicariously experiencing the feelings, thoughts, and experience of another of either the past or present' and for 'the imaginative projection of a subjective state into an object so that the object appears to be infused with it' (<https://www.merriam-webster.com/dictionary/empathy>). Empathy is also described in the literature to be related to the concept of compassion that brings attention to actual actions, such as helping, caring, comforting and protecting others from harm and injustice (Lipponen et al., 2018). Some researchers have also brought forward the moral dimension of empathy, pointing out that empathy entails other-directed judgment towards the experiences and feelings of others. For instance, Aaltola (2013) introduces moral agency as an important component of empathy. She argues that cognitive empathy – that is, knowing another person's thoughts and feelings – is not enough to elicit moral agency, as we are incapable of understanding someone else's perspective without sensing and feeling the emotions of others. She holds that emotional and embodied dimensions of empathy are necessary for moral agency to emerge, as these resonate and respond to the emotional experiences of others. Similarly, Gruen (2009) argues that 'engaged "empathy" in humans' relations with others, including the more-than-human world, is a prerequisite for moral agency. To her, engaged empathy requires a complex and developed state of empathetic reflection, involving both affective and cognitive processes, sustained whilst entering the other's situation or emotional state.

Advocating for the importance of empathy across the human and more-than-human worlds in our turbulent times, in this study, we directed our inquiry into the emergence of empathy in young children's augmented story-crafting and storytelling – i.e. storying activities – both indoors and

outdoors in nature. In specific, our study explores the unexpected educational possibilities of children's augmented storying as it relates to empathetic encounters across children, adults, animals, plants, tools, materials and other living and non-living systems and things. Hence, our study extends a more conventional, human-centric approach to empathy, and instead, approaches empathy as relational, enacted and emergent. By *augmented storying*, we refer to children's use of an augmented reality (AR) app in their story-crafting activities, AR being technology that displays information, such as images, laid over a view of the real world to create the sensation of immersion. In this study, the app invited the children to 'capture' an AR character named Julle by taking a photo of it outdoors in nature and creating a short narrative around the character (Kumpulainen, Byman et al., 2020). Afterwards, the stories of the children were shared, discussed and elaborated on between the children and adults in conversation-like interviews.

Our earlier research showed how children's augmented storying in nature was strongly entangled with affective, embodied, sensual, scientific, cultural, symbolic and moral literacies, reflecting their knowing, valuing and becoming with nature (Kumpulainen, Burke et al., 2020). To follow up on our findings, in the present study, we wanted to focus more closely on how these literacies of the children's augmented storying addressed empathy – in specific, empathetic encounters across children, technology, other humans and more-than-human worlds. Although stories, storytelling, digital production and art have been found to be important literacy activities that have relevance for empathy (Fleer & Hammer, 2013; Friesem, 2016; Gruen, 2009; Phillips, 2003), little is known about how empathy serves as part of and emerges in children's augmented storying, or how to conceptually and methodologically investigate empathy in such a novel literacy activity. To these ends, in this study, we ask: (a) How does empathy emerge in children's augmented storying in nature? And (b) What does children's augmented storying reveal about empathetic encounters across the human and more-than-human worlds?

Conceptual grounding: researching and understanding empathetic encounters

Drawing on relational ontology and sociomaterial theorising (Bennett, 2010; Lenz Taguchi, 2010; Tanggaard, 2013), in this study, we conceptualise empathy as relational and emergent and as part of situated, ongoing and improvisational entanglements across human–material–spatial–temporal assemblages. In doing so, we emphasise the emergent relationality and complex entanglements through which empathy emerges and is performed. To underscore the relationality of empathy, we use the notion of *empathetic*

encounter to guide our inquiry into children's augmented storying with nature.

While the dominant scholarship on empathy provides helpful theories and research knowledge to define and understand it, we hold that these conceptualisations largely reflect a narrow, human-centred and static approach which limits us from investigating and understanding complex, dynamic and sociomaterially entangled dimensions of empathy across the human and more-than-human worlds. To overcome existing limitations, our inquiry moves beyond understanding empathy as the property of the individuals that emerges in subject-object relations through human intentions and goal-oriented actions. Further, our conceptualisation views empathy as a dynamic reciprocal process that is not only about movement outward, toward the other, but also about complex sociomaterial movements inward, toward one's own affective landscape (Aaltola, 2013) and movement in-between, across sociomaterial assemblages (Bennett, 2010; Lenz Taguchi, 2010; Tanggaard, 2013). Similarly, we move beyond definitions that hold that materials or tools, such as novel digital technologies, can in themselves generate empathy (Pink et al., 2017). Instead, we view technology as one element of materiality that intra-acts within a sociomaterial assemblage to create (or limit) empathy. Finally, our investigation extends research on empathy beyond the human to the more-than-human worlds, viewing empathy as an important element of not only social justice but also socio-ecological justice (Yaka, 2019).

According to our sociomaterially informed approach, both humans and non-humans act on one another as they come into relation to produce relational effects, including empathy (Burnett et al., 2020). Therefore, in our inquiry, we investigate how materiality co-participates in children's storying activities as it comes into relation with other human and non-human materialities. Our inquiry moves beyond children and materialities as distinct entities towards a focus on how empathetic encounters emerge as a complex assemblage across children, adults, materials and the natural world. Our interest in the 'unexpectedness and improvisation' in children's augmented storying and its empathetic encounters foregrounds our investigation into how digital devices and other materials can turn into different kinds of things and serve different purposes when taken up in situated activities. Hence, our conceptual and methodological approach recognises that what happens in situ is always more than what is designed or expected, with unpredictable outcomes and potentiality.

Study

Our empirical study draws on an ethnographic case study of a four-month, cross-curricular project in a Finnish primary school that integrated

literacies, arts, environmental and outdoor education to support children's holistic relating with their local environment through the crafting and sharing of their stories with an AR application *MyAR Julle* (<http://www.myar.community/julle/index-en.htm>). The app draws on Finnish mythology by introducing the children to a forest elf called Julle that they can story with in their outdoor engagement by taking photos and creating a short story around the character. Afterwards, the children shared and explained their stories back in the classroom. Instead of presenting the local environment to children as an object to learn about, the project's aim was to arouse children's wonder, imagination and multimodal and embodied relations with the natural world. The project's pedagogical design was realised as a collaborative partnership between the children, teachers and researchers. The study involved four second-grade classrooms, in a total of 62 children, 38 boys and 24 girls, aged between seven and nine years old. The children represented various language groups (71% Finnish-speaking, 8% Arabic-speaking, 6% Russian-speaking, and 15% others, including children who spoke Albanian, Chinese, Portuguese, Burman, Estonian, Italian, Bosnian and Nepali). The primary school was situated in a socioeconomically and culturally diverse neighbourhood surrounded by a rich urban green environment.

The data of this study were derived from two workshops of the augmented storying project, during which the children engaged in storying activities outdoors in nature and in the classroom. The data corpus consisted of video recordings (1,017 minutes in total) and observational field notes from the children's storying activities, their augmented story artefacts (109 Julle stories and 201 pictures) and narrations of their augmented stories in a total of 53 small-group, conversation-like interviews. The conversational interviews (Given, 2008) around the children's stories addressed five themes: (1) the children's Julle stories, (2) the children's experiences in nature, (3) the children's emotions about nature, (4) the children's perspectives on human–nature relations, and (5) the children's identity/sense of self in relation with nature (see Table 1). The conversational interviews were video-recorded and transcribed for analysis, comprising 844 minutes. These transcriptions, together with the children's digital artefacts and stories, act as the primary data for this study, amplified with video data and observational field notes.

Analysis procedure

Our analysis of the data was a recursive process of three phases informed by sensory ethnography (Pink, 2009) and visual narrative inquiry (Bach, 2008; Pink, 2007; Riessman, 2008) that guided our attempt to acknowledge the full range of senses and modalities through which the children communicated

Table 1. Conversational interviews of the children's augmented storytelling.

Themes of the conversational interviews	Exemplary questions
Children sharing their Julle stories	<i>What does Julle do in your picture/story? Why did you choose this place for Julle?</i>
Children's own experiences in nature	<i>Do you often spend time in nature? What do you like to do there? Are there any specific sounds, scents or other things in nature that you like or dislike?</i>
Children's emotions towards nature	<i>How do you feel when you go outside into nature? Do you like it? Is there something in nature that worries or scares you?</i>
Children's perspectives on human–nature relationships	<i>What does nature mean to you? Do people need nature? Does nature need people? Can humans help nature to be happy and healthy?</i>
Children's identity/sense of self in relation with nature	<i>Do you think that you are a 'natural' child?</i>

and created knowledge and meaning. The first phase of our analysis involved transcribing and familiarising ourselves with the whole data set: video data, observational field notes, the children's narrations of their augmented stories and their digital story artefacts. The second phase utilised Atlas.ti software to conduct a more systematic analysis of the data to identify manifestations of empathetic encounters in the children's augmented storytelling. Our second analysis phase was guided by Batson's (2009) taxonomy that distinguishes eight phenomena of empathy. *Cognitive empathy* is knowing another person's thoughts and feelings. However, in our study, the 'other' was extended to also concern more-than-human others; *facial empathy* means adopting the posture or matching the neural responses of an observed other. *Affective empathy* accounts for 'emotional contagion' that makes us come to feel as another person feels. *Aesthetic empathy* relates to intuiting or projecting oneself into another's situation. *Psychological empathy* directs attention to perspective-taking and imagining how the other is thinking and feeling. *Projective empathy* refers to role-taking while imagining how one would think and feel in the other's place. *Empathic distress* means feeling distress at witnessing another person's suffering. Finally, *empathic concern* is to do with feeling sympathy for another person who is suffering (Batson, 2009). In this study, we understand this taxonomy as a guiding interpretative framework rather than an exhaustive analysis framework. It helped us to identify encounters of empathetic events as they emerged in the data. At the same time, our theoretical conceptualisation differs from that of Batson as in our study we define empathy as an emergent and situational encounter across sociomaterial assemblages rather than something that people have or do not have (Bennett, 2010).

In the third phase of our analysis, we zoomed our inquiry into the identified events of empathy to investigate more closely how empathetic encounters emerged across the children, adults, technology and the more-than-human world. Following the sociomaterial analysis similar to Burnett et al. (2020), in this analysis phase, we focused on:

- how the participants – on- and off-screen, human (children, researchers, teachers) and non-human (the AR app, digital devices, Julle character, materials and objects, texts, etc.) contributed to the generation of empathetic encounters;
- how empathy unfolded in the children’s augmented storytelling between participants, whether physically co-present or on-screen, human or not; and
- the scope and diversity of empathetic encounters.

The whole analysis process involved individual and group readings of the data interspersed with reflective discussions during which the research team shared their interpretations. The data were then revisited in light of these discussions. Through this process, we identified different ways in which empathy manifested in the children’s augmented storytelling as well as how augmented storytelling enabled the children to enact empathetic inquiries into themselves, other human beings, materials, technology, animals, plants and the natural world at large.

Results

Next, we turn to our findings and discuss the scope and diversity of the empathetic encounters we identified in the children’s augmented storytelling through six illustrative vignettes selected through critical case sampling (Hays & Singh, 2012). These vignettes make visible how empathy unfolded in the children’s narrations through emergent and improvisational socio-material assemblages across the children, adults, technology and the more-than-human world.

Vignette 1: empathetic encounters with Julle

Our first vignette (see [Figure 1](#)) demonstrates how the AR character Julle intra-acted in the children’s augmented storytelling, giving rise to empathetic encounters in which nature was viewed through Julle’s perspective and feelings. Here, psychological, affective and projective empathy were distinctly present in the children’s narration, as their stories described how Julle was thinking and feeling. In our vignette, one of the children, Moosa, had created a story in which Julle is afraid of humans. She explained in her narration that humans have not been nice to Julle, who is very small and vulnerable, and for this reason, Julle runs away from them. This same storyline was also reflected in the narrative of another child, Timo, who had collaborated with Moona during augmented story-crafting activities outside in nature. In Timo’s story, Julle was afraid of Timo himself because he was photographing Julle. In Timo’s picture, Julle was hiding behind

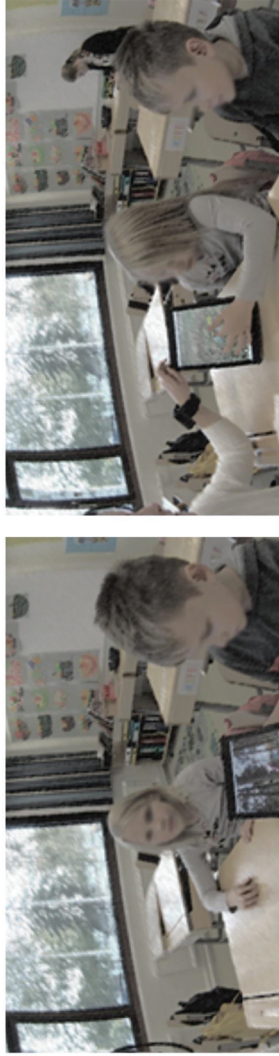


Figure 1. Left: timo is showing his picture in which Julie is hiding. He has written: 'Julle is afraid of me'. right: Moosa is pointing at Julie and saying that he is running away from humans because he is so small.

a tree. Timo explained that for his picture, he chose a tree that is thick enough for Julle to hide behind. Hence, the tree offered shelter to Julle. In sum, this vignette shows how empathy emerged and travelled across the children as they together imagined the experiences and feelings of Julle, the small elf in nature. Also, the researcher contributed to this empathetic encounter by asking clarifying questions from the children about their stories.

Researcher: Well, tell me a little bit Moosa what was the idea behind your picture?

Moosa: Well, it's like running away.

Researcher: What does it run away from? Or whom?

Moosa: People because it is so small.

Researcher: Running away from people. Have people done anything bad to it?

Moosa: Yeah.

Researcher: They have. What?

Moosa: They have . . . they are like, when it's so small and it's so light, so it has been put in that tree.

Vignette 2: empathetic encounters with plants, trees and bugs

Our second vignette (see [Figure 2](#)) derives from a conversational interview situation between the researcher and two children, Silja and Mary, who narrated about plants and bugs they had found in the local forest near the school. In their narrations, the children were empathetically encountering plants and bugs, imagining how they were experiencing and feeling. Here, similar to the previous vignette with the AR character Julle, the children's stories took the perspectives of non-human participants – in this case, plants, trees and bugs – and addressed their feelings and sufferings as if they were humans. These narrations evidenced multiple modes of empathy across cognitive, affective, aesthetic, moral, psychological and projective domains. In the vignette, Mary explained how she thought trees could become sad like humans if there was trash in the woods or if other trees were cut down around them, so that they started to feel lonely. Silja, on the other hand, explained how she realised the first time that plants were living beings: 'I noticed that it moved a little, like there was a force [inside it], and I realised that plants are alive too, and from then on, I have cared for nature.' Cognitive and aesthetic dimensions of empathy were present in the children's storytelling that considered the perspective of non-human others and



Figure 2. Silja is showing the researcher how she and her grandmother moved the bugs to save them.

their feelings. The emerging empathetic encounters were also informed by an understanding that the non-human world is alive, thus showing the vivid forms of cognitive, psychological and projective empathy. The children also narrated having found bugs that were hurt and how they had imagined their suffering. In addition, they explained how they had tried to help the bugs by taking care of them. The children's narration was very intense and filled with empathetic distress and concern, but also compassion for action in order to overcome the suffering of the bugs. The reflection shows a strong moral dimension of empathy, as the children had been taking agency to save bugs in nature. The two children continued their narrations even after a break had started and the classroom was filled with the noise of other children talking and laughing in the background. Sharing their empathetic encounters with nature was clearly meaningful and important to the children.

Mary: When I was little, I did not like bugs. But when I saw one person stepping on it, the bug started to cry. I did my best, lifting the bug up and I took it home. And after two days it recovered, so I brought it back to its own home in nature.

Researcher: Yes. In that way you can also take care of nature. You did your best in that situation, taking care of the bug.

Mary: Always when I go to school I surely see ants. I don't want to step on them, I let them first pass and then I go myself.

...

Researcher: Then I would have one last question to ask from you. Do you think that you are ‘nature kids’?

Silja: ... I sometimes feel like I’m a child of the forest. That I belong to nature or so. It feels wonderful. So then one day with my grandmother we found beetles (koppakuoriainen) on the forest path, so we moved them out of the way so that no one would step on them. Some of the beetles, we managed to save two, but quite many had been trampled on, so they could not be saved anymore, and from one bug all the internal organs were bursting out.

Researcher: Oh no, that must have been quite upsetting.

Silja: Yes, but we moved it there to the side of the road so that it would not be trampled on again and so it would not be more hurt.

Researcher: Yes, but in this situation you tried to act a bit like in Mary’s situation, so you tried to save and take care of the bugs.

Vignette 3: collective empathetic encounters with ducks and a creek

Our third vignette (see [Figure 3](#)) illustrates how the children’s narrating of their encounters with ducks and a local creek ‘travelled’ and became emotionally contagious, generating collective affective empathy over their shared experiences and appreciation of their local neighbourhood. The vignette also illuminates the aesthetic, sonic and embodied dimensions of



Figure 3. Luca is sharing his encounters with ducks and the creek.

the children's narrations of their encounters with nature as they communicated how they appreciated the rocks, ducks and the sound of the water. In the vignette, one of the children, Luca, explained how he enjoyed spending time around a creek near their school. Luca explained that this was a special place for him, and he usually visited it to build tree houses and watch ducks. Luca's narration evoked Isabella's interest, and she then shared how, together with her little sister, she often visited this same place, how her sister enjoyed the sound of the flowing water in the creek and how she herself enjoyed jumping on the rocks. Here, we can also witness Isabella's empathetic engagement with her sister's aesthetic experience by the creek. Luca empathised with Isabella's narration and explained that he had had experiences similar to Isabella's and her sister, as he also enjoyed the creek, and that he had similarly heard the sound of the flowing water. Further, both children expressed that they had had enjoyable encounters with the ducks near the creek. In addition, Isabella shared her personally relevant empathetic encounter with trees: 'Sometimes, when I go to the forest with grandad, we hug trees.' Shared experiences in nature seemed to evoke and encourage the children's joint empathetic narration of their encounters with the local nature. The children's empathetic reflection over their experiences and encounters with nature was also evoked by the researcher's sensitive encouragement during the conversation.

Researcher: Do you like to visit nature?

Luca: Yeah.

Researcher: Yeah, what do you like the most?

Luca: I like to build huts . . . at the creek.

Researcher: Where's the creek? Is it far away from here?

Luca: There.

Isabella: Near the primary school.

Luca: Near the school's yard. And then you can watch ducks.

Researcher: Yeah.

Isabella: I have been there too. My little sister likes the sound of the water.

Researcher: Oh, can you hear the sound of water there?

Isabella: Yeah, you can.

Researcher: Are there many ducks?

Isabella: Sometimes, but mostly there is feather.

Researcher: Oh, so you know that they have been there but you don't see them.

Isabella: Yeah.

Luca: There is a duck's nest beside our hut.

Researcher: Really, how do you know?

Luca: Well, because they are always there.

Researcher: Okay, yeah. What else is nice and fun in nature?

Luca: The sound of water, and then when is winter we can do sledging.

Researcher: Yeah, okay.

Isabella: And then there are those stones and I like to jump on the stones if they are not slippery.

Vignette 4: empathetic encounters with humans and bees

Our fourth vignette (see [Figure 4](#)) illustrates empathetic encounters that emerged in the narrations of two children called Theo and Liam while they reflected on relations between humans and bees. This vignette showed the moral and cognitive dimensions of empathy in the children's narration. In the vignette, Theo narrated his concern that there were many humans who did not care to protect bees or who did not treat bees with the same respect



Figure 4. Liam and theo are talking about bees, and Liam says that he would not sting anyone if he was a bee.

as they treated other humans. Theo also shared an upsetting experience, in which he witnessed some other children harming and killing bees for fun. Thus, empathetic distress and concern were present in the children's story-ing connected to how humans treat bees. Liam joined in Theo's narration and pointed out how bees were important for humans as they made honey, which he also explained to be good for human health. Theo then wondered why other children did not have the same empathetic feelings towards bees as he and Liam did. The empathetic encounters between Theo and Liam, bees and humans, was clearly a challenging and tension-laden topic for the children as well as the researcher, arousing their moral reasoning.

Theo: I am not at all afraid of bees, because you can let them be undisturbed in nature and then you don't need to do anything bad to them.

Researcher: Right.

Theo: Some people kill them but that is not nice.

Researcher: Okay, why do you think they kill them?

Theo: Because they try to sting and eat food. But I don't mind, you don't need to mind.

Liam: Because of honey, they make honey. And honey is good for humans.

Theo: And it can help your throat if you are ill.

Liam: Mmm.

Theo: And I feel a bit ill. Because my voice is a bit different now.

Researcher: Mmm, right.

Theo: And they can be left alone because they also live. Just like us humans.

Researcher: Yes.

Theo: They live, so why kill them? It is almost like killing a human.

Liam: Exactly.

Theo: It's almost like that.

Liam: Yes, it is not at all nice.

Theo: No.

Researcher: You have very interesting thoughts.

Theo: Yes, they kill almost like a human, they look just like . . . because they also live, they are also . . .

Liam: If I was a bee (puts his hand on his chest) I would not sting anyone.

Theo: Yes yes, they don't do anything bad if you don't do something bad to them. So why do people kill them?

Researcher: Yes.

Theo: Even when they don't do anything bad.

Liam: Exactly.

Vignette 5: empathetic encounters across the children, the researcher and the local environment

In the fifth vignette (see [Figure 5](#)), an empathetic encounter emerged between a child called Tuomas, the researcher, and the natural world when Tuomas narrated his fears and worries about how climate change (or 'weather change' as Tuomas called it) was affecting the local environment. This discussion illuminated aesthetic dimensions of empathy in the child's narration of how the local environment is affected by climate change. The collective narration between the children and the researcher also brought forth cognitive, facial and psychological empathy. In this vignette, the conversation was initiated by the researcher querying Tuomas and another child, Saska, about whether there was anything related to nature that scared them. During this conversation, Tuomas described that he was afraid of climate change because it would flood the whole school when the polar ice melts. The researcher tried to respond empathetically to Tuomas' worry by explaining how there were many adults and researchers trying to



Figure 5. Tuomas sharing his worries about climate change and floods.

stop climate change and that there was no need to be afraid. The other child, Saska, agreed with the researcher. Both the researcher and Saska seemed to be empathising with Tuomas' fear, and they tried to make him feel better by responding to him in a consoling and calming way. At the same time, the researcher's response did not appear to give much space for continuing collective reflection about climate change and the fears and worries it caused among the children. Rather, the researcher's assurance that adults will take care of climate change and that children do not need to worry closed the discussion. Altogether, this vignette brings forth pedagogical challenges and moral dilemmas that adults – such as researchers and educators – may face when trying to empathetically respond to children's worries in connection to the wicked problems of our times.

Researcher: Well, is there in nature something that scares or worries you?

Tuomas: What scares me is that there will be that . . . what, weather change [ilmanmuutos]?

Researcher: Mmm. That scares you. What is scary about it?

Tuomas: I've heard that, in the north pole, well, those glaciers are melting.

Researcher: Mmm. Well, is there something we could do about it, can humans somehow help nature so that that wouldn't happen?

Tuomas: Stop eating junk food.

Researcher: Mmm. What does Saska think?

Saska: Of what?

Researcher: Well, can humans somehow help nature, so that it wouldn't feel bad?

Saska: Yes they can.

Tuomas: I've heard somewhere that there are big glaciers in the school yard and all the ice would melt and the water would rise so high that it's also up on the roof of the school, that water.

Researcher: Yes.

Saska: It can . . .

Researcher: Well luckily there are a lot of scientists who really are trying to come up with ways we can help nature. There are already quite a few different ways.

Saska: Well, yes.

Researcher: There's probably no need to be so terribly worried. Well, do you think nature can help people?

Saska: Yeah.

Vignette 6: empathetic encounters with the research camera

Our sixth vignette (see [Figure 6](#)) highlights how the research camera unexpectedly became an important material in the child's narration, and how this was entangled by empathetic encounters between the child, researcher and the teacher. During the conversational interview of his augmented story, a child called Stephen showed repeated interest in the video camera that the researcher had placed on the floor. Responding empathetically to Stephen's interest in the research camera, the researcher, together with the teacher, decided to hand over the camera to him, and Stephen began eagerly to explore the camera and its functions, sensorially exploring the camera's functions with his body. Stephen wore the camera's wristband on his arm, which also included a small screen. The screen showed in real time what the camera was filming. Stephen held the camera in his hand and moved it around while watching the small screen. He filmed himself, the researcher, the teacher, the carpet on the floor and the tablet that illustrated his augmented story and photograph of Julle. He moved the camera's screen out through the window, capturing the outside places where he had just recently been story-crafting and photographing his Julle story. Stephen also expressed his interest in going outside with the camera: 'Hey,

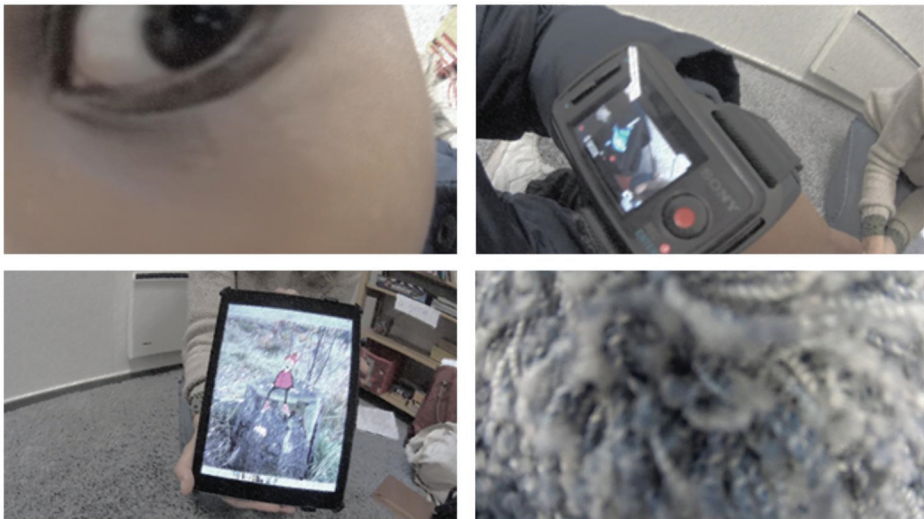


Figure 6. Stephen playing with the research camera.

I want to go outside and look [with the camera]. After that, I want to see it from here [from the camera screen].’ Here, empathetic encounters emerged at the intersection of Stephen, his augmented storying and its artefact (the camera), the researcher, the teacher and the local environment, as they all become part of the sociomaterial improvisation of unexpected possibilities. In specific, the vignette evidences cognitive empathy on the part of the researcher and teacher towards Stephen’s interest in the camera and how they created a space for him to play and explore the environment and himself with the camera. We can also witness Stephen’s own empathetic and aesthetic exploration of the possibilities of the camera in capturing him and the environment. The following extract illuminates Stephen’s exploration of the camera and its affordances.

Stephen: Why is it doing like this? (referring to the shaking world on the screen)

Researcher: Well, you are moving it when you turn the camera.

Teacher: When you move, the picture changes.

Stephen: How?

Teacher: Well, because it records from here. (Pointing to the camera lens)

Researcher: It’s that picture, It’s a bit like the camera’s eye. What the camera sees you also see from there. (Pointing to the bracelet’s screen)

At this point of the discussion Stephen turns the camera lens towards himself and stares into the lens with wide eyes, he then moves the lens close up to his left eye and glances towards the bracelet’s screen, seeing his own eye enlarged and close up through the camera’s ‘eye’.

Discussion

In this study, we have investigated the emergence of empathy in young children’s augmented storying indoors and outdoors in nature as part of their literacy activities in a Finnish primary school. We approached children’s augmented storying both as a methodology and pedagogy for researching and understanding empathetic encounters across the children, adults, animals, plants, technology and other living and non-living systems and things. Specifically, we were interested in understanding how children’s augmented storying, as a novel literacy activity, immersed and opened up and/or disclosed opportunities for empathetic encounters across the human and more-than-human worlds. Our motivation for this study was shaped by our interest in bringing empathy to the centre of literacy practice and inquiry in the present turbulent times, considering empathy as a pivotal

component of socio-ecological justice, future-making and hope. Further, we wanted to investigate how children's mobile story-crafting outdoors and communication of their stories turned into potential 'empathetic voices' *in, with, about* and *for* the environment, and how such stories could also travel and *become* that of others, hence generating dialogue as well as collective empathy and care towards our human and the more-than-human worlds. Our research interests were shaped by earlier research that has suggested how emotional connections with nature can leverage deep societal change toward respect and care for nature, recognising childhood as an important time to begin building connection (Ampuero et al., 2015; Ives et al., 2018).

Our findings show how empathy was an integral part of the children's augmented storying, enabling the children to enact empathetic and imaginative inquiries into themselves, other human beings, materials, technology and the natural world. The children's storying was entangled with multiple modes of empathy. Our findings demonstrated interrelated manifestations of empathy in the children's narrations, including cognitive, facial, affective aesthetic, psychological and projective empathy, as well as empathic distress and concern. Importantly, our study shows how empathy emerged in the improvisational relationships between the children, technologies, animals, plants and other living and nonliving systems and things, pointing to the importance of researching and understanding empathy beyond a phenomenon that rests solely in the individual. These findings also speak to the importance of recognising that young children are capable of engaging in rich modes of empathy across the human and more-than-human worlds when provided appropriate opportunities, tools and support to do so.

The empathetic encounters of the children's narratives were formed through dynamic, emergent and relational processes that were not solely showing movement outward, toward the other, or inward, toward one's own affective landscape, but also movement in-between sociomaterial assemblages (Lenz Taguchi, 2010; Tanggaard, 2013). The children's narratives revealed how they entered and weighted different empathetic orientations, including those of others, such as the imaginative AR character Julle, the research camera or living organisms that the children had identified in nature, such as plants, trees, insects or animals. The empathetic orientations of the children's narratives were at times much more than romantic and smooth encounters with the world, instead also competing and in tension with one another, calling for the children's and adults' moral reasoning and agency.

Our first vignette illustrated how the AR character Julle intra-acted in the children's augmented storying, giving rise to empathetic encounters that viewed nature through Julle's perspective and feelings. These findings evidence the power of narrative and fantasy in engaging children

empathetically with each other and the more-than-human world. In our second vignette, we could see how the children, Silja and Mary, empathetically encountered plants, trees and bugs in their narratives and how they imagined the experiences and feelings of the more-than-human world. Our third vignette illustrated how the children's narrating of their encounters with ducks and a local creek 'travelled' and became emotionally contagious, generating collective affective empathy among the children and adults about their local environment and its inhabitants. Having the possibility to share and attend to each other's stories inspired the children to both reflect on their own similar empathetic encounters and to consider different kinds of encounters with nature through each other's stories. Our fourth vignette illustrated empathetic encounters that emerged in the narration of two children, Theo and Liam, regarding relations between humans and bees. Here, our findings showed how the moral and cognitive dimensions of empathy were vividly present in the children's narration as the children wondered why not all humans respected the life of bees. The fifth vignette illuminated the children's worries and fears about our planet caused by climate change. This example pointed out pedagogical and moral challenges adults faced in responding to and empathising with children's worries about the future. Our sixth and final vignette showed how empathetic encounters between the adults (the researcher and teacher) and a child resulted in an emergent and improvisational space for the child to play and explore the environment and himself with the research camera – an important material object that entered the child's interest in the conversational interview situation, and hence created an unexpected direction for the research activity.

Methodologically, our study responds to the need to develop child-sensitive, democratic forms of inquiry that respect differences in children's ways of being, communicating and acting in the world. Here, children's imagination, mobility and multimodal exploration, communication and meaning-making of their worlds were underscored. Moreover, drawing on relational ontology and socio-material theorising (Bennett, 2010; Lenz Taguchi, 2010; Tanggaard, 2013), we moved our attention from more typical human-centric approaches to empathy that hold that empathy lies within the individual and is mediated through the individual's goal-oriented actions, and instead directed our investigation of empathy into the emergent relations between the human and more-than-human worlds. Through our sociomaterial analysis, we were able to depict how both human and non-human participants, including the AR technology, research camera and nature in general, came into relation with one another and how empathy emerged in these encounters.

Overall, our study and its findings resonate with this special issue in at least two distinctive ways. First, the study addresses the challenges of conducting literacy research in today's uncertain world, where lockdowns and restrictions not only narrow down many children's opportunities for communication and

learning both indoors and out in nature but also researchers' opportunities to generate needed research knowledge about literacy practices that can potentiate empathy in our world across sociomaterial assemblages. Second, our study and its findings show how literacy research that underscores children's mobility and multimodal communication as facilitated by their augmented storying – and in which children have an active role as partners in generating research data and knowledge – can turn into activist projects with implications for socio-ecological justice and advocacy. However, mobilising, building on and extending these valuable empathetic encounters we have identified in the children's augmented storying for socio-ecologically just futures require collective efforts. One starting point is to place empathy at the centre of literacy curriculum, practice and inquiry.

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Ethics statement

The study follows the ethical standards of scholarly research established by the Finnish Advisory Board on Research on Integrity (<https://www.tenk.fi>), Data Protection Act and the Convention on the Rights of the Child. The Education Division of the City of Helsinki reviewed and approved the study. Informed consent was obtained from all adult and youth participants and youth guardians. Pseudonyms were used for all individuals.

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