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Renlund, Jenny

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Chapter 13

'I could smell the sound of winter'

Children's aesthetic experiences in their local forest through digital storying

Jenny Renlund, Kristiina Kumpulainen, Jenny Byman and Chin-Chin Wong

Introduction

A growing body of literature suggests that relating aesthetically with outdoor landscapes and wildlife promotes wellbeing (Gelter, 2007; Sandell & Öhman, 2010) and increases environmental care (Bartos, 2013; Kellert, 2013; Tooth & Renshaw, 2020). The Nordic countries have an abundance of landscapes with rich wildlife for people to enjoy and spending time outdoors in nature lies at the heart of the Nordic cultural tradition, with aesthetic immersion regarded as an important part of the Nordic outdoor experience (Gelter, 2007). Although children's opportunities for playing and roaming outdoors are emphasised in Nordic early childhood education (Sandseter & Lysklett, 2017), urbanisation and changing lifestyles are affecting children's outdoor activities and experiences. These changes interact with the ways children perceive and relate with their living environments (Payne, 2018). Because aesthetic experiences have the power to create paths for wonder and curiosity about the world, along with forming meaningful connections with surrounding matter and space (Rousell and Williams, 2020; Rousell & Cutter-Mackenzie-Knowles, 2020; Kellert, 2013), it becomes important to devote more attention to understanding children's aesthetic experiences in their local environments.

In this chapter, we discuss a case study about children's digital storying of their aesthetic experiences in a forest of their neighbourhood. With digital storying we refer to children's digital storycrafting and storytelling processes, which include embodied and multimodal experiences and expressions (Facer, 2019). Considering that digital technology plays an increasing role in children's lives, there is a need to investigate how digital practices interlace with children's aesthetic experiences outdoors in nature (Scott-Stevenson, 2020). As Kim (2013) writes, 'the screen is not always an opaque barrier, but can be a media enhanced window onto our surroundings' (p. 2). Drawing on a relational materialist approach (Hultman & Lenz Taguchi, 2010), this study aims to increase understanding of the aesthetic and relational dynamics at play in digital storying events.

Our investigation draws on empirical data from two digital storying workshops using a novel augmented reality (AR) application, MyAR Julle, held in a Finnish primary school. Our previous research showed how children's sensuous literacies,

among other entangled literacy dimensions, emerged as a significant way for children to relate to their surroundings with and through the AR storytelling application (Kumpulainen et al., 2020; see also Kumpulainen, this edition). In this study, we build on our earlier findings and further investigate the aesthetic dimensions of children's experiences with the local forest in their digital storying. We approach children's aesthetic experiences through a relational perspective, which understands them as emerging in intra-actions between digital devices, augmented reality characters, children, and the environment (e.g. Hultman & Lenz Taguchi, 2010; Lenz Taguchi, 2009).

In our study, we ask the following: (a) How does digital material interlace with the aesthetic experiences of children in the forest and (b) How does digital material create movements within these aesthetic experiences?

Children's aesthetic experiences as relational phenomena

Through combining phenomenologically grounded aesthetic theories (Berleant, 2010; Rodaway, 2002) with relational ontologies (e.g. Hultman & Lenz Taguchi, 2010; Lenz Taguchi, 2009), we conceptualise aesthetic experiences as socially, culturally, and materially entangled phenomena. We recognise humans as an inseparable part of nature and understand children as simultaneously experiencing, expressing, and creating in relation with their lived environments (Berleant, 2010; Rousell & Cutter-Mackenzie-Knowles, 2020; Rousell & Williams, 2020). Children's aesthetic experiences are therefore born in communicative flows between children and matter (Rautio, 2013). This idea relates to Lenz Taguchi's intra-active pedagogy, which views children, materiality, and discourses as mutually affected and transforming within pedagogical practices (Lenz Taguchi, 2009; see also Barad, 2007). Following this line of thinking, we understand children's aesthetic experiences as transformative intra-actions with human and non-human matter that draw children's attention and invite them into embodied relational play, where both children and matter are becoming together (Hultman & Lenz Taguchi, 2010; Lenz Taguchi, 2009; Rautio, 2013).

We further elaborate our perspective on children's aesthetic experiences by following the etymological roots of the ancient Greek aisthēsis: perception through the senses, viewing aesthetic experience as an entangled phenomenon, consisting of both physical sensation and aesthetic sense-making (Berleant, 2010; Rodaway, 2002). In this entangled phenomenon, sensory impressions assemble through interconnected dimensions. Although Rodaway (2002) acknowledges the inseparability of sensory impressions, he suggests that multisensory aesthetic experiences can be explored through entangled modalities of haptic, olfactory, visual, and auditory dimensions. The haptic dimension is associated with the skin, expanding through the mobile body and involves sensations of touch and movement. The olfactory dimension involves smells and flavours associated with the nose and tongue. The visual dimension involves seeing and is associated with the eyes. The auditory dimension involves hearing sounds and is associated with the ears. While

these sensory dimensions can be identified as having unique qualities, their boundaries are diffuse and dynamic in children's aesthetic sense-making of events and environments, forming intricate blends of multiple sensory dimensions (Rodaway, 2002). Furthermore, children's sensory impressions are not only bound by their physical bodies but can also be extended through non-human materialities (Rodaway, 2002; Swanstrom, 2016). For example, sensory impressions can be experienced through technological and digital devices, which means that the boundaries between children's sensing bodies and contextual materialities are not clear or fixed; they are porous and changing within events.

Digital storying workshops

This chapter draws on empirical data collected from two digital storying workshops in a city-run Finnish primary school in eastern Helsinki. The school is located in a socioeconomically and culturally diverse neighbourhood composed of residential areas interlaced with urban woods, hills and rocks and the school buildings are surrounded by forested areas incorporating the school yard. Sixty-two children from four second-grade classrooms participated in the workshops (38 boys, 24 girls, aged 7–9 years old). The children hailed from diverse linguistic backgrounds: 70 per cent Finnish-speaking, 8 per cent Arabic-speaking, 6 per cent Russian-speaking, and 15 per cent speaking other languages, such as Albanian, Chinese, and Portuguese. The workshops were conducted as part of a four-month-long cross-curricular project that combined environmental, literacy, and arts education in exploring the local neighbourhood. The project was carried out in collaboration with the children, four teachers from the school and five researchers from the university. In the workshops, the children engaged in a storytelling activity using a purposefully-designed AR application, MyAR Julle (www.myar.community/julle/info-en.html) on tablet devices. Through the cameras in the mobile devices, the use of AR technology allowed children to project an immersive rendering of a forest elf, Julle, in their physical environment. The application also provided a set of pre-designed appearances for Julle; the children could choose from these designs and with the cameras create a composition of the character situated in the surroundings.

The workshops were conducted in three stages: listening to an orienting story about forest elves, photographing and storying outdoors with the AR application, and semi-structured interviews (Figure 13.1). During the interviews, the researchers asked open-ended questions focusing on themes, which included the Julle stories and pictures created by the children (e.g. 'What does Julle do in your picture/story?'), the children's sensory experiences (e.g. 'Are there any specific scents or sounds in nature that you like or dislike?'), and the children's emotions (e.g., 'How do you feel when you go outside into nature?').

The data corpus of this study comprised 53 video-recorded and transcribed interviews, 201 pictures created by the children, along with the researchers' videos and observational notes, documenting the children's use of the application to construct their stories in the forest. In total, 1,017 minutes of video data were processed.

1. First, the children gathered in their classrooms and were introduced to the AR application. Then they were presented with an orienting story about forest elves.

2. After the orienting story, the children were divided into groups and received tablets. The children then moved outdoors to 'capture' Julle and create their own stories.

3. When a group of children had finished 'capturing' Julle, they were invited indoors by a researcher to a semi-structured interview.

Figure 13.1 Implementation of the digital storying workshops.

In accordance with the ethical guidelines put forth by the Finnish National Board on Research Integrity (TENK) (2019), research permission was acquired from the municipality and written consent was obtained from the legal guardians of the participating children. Guardians, teachers, children, and school administrators were informed about our research plans and data collection methods. During the workshop activities, the researchers also informed the children that their participation was voluntary. At times, children would verbally or with their body language express that they did not want to be video recorded; the researcher would then turn off the camera or turn it away from those specific children. Furthermore, following ethical guidelines, pseudonyms are used for all participants. Photographs of the participants are only published as edited versions, and the participants are not recognisable.

Reading the data with a relational materialist approach

Our analysis of the children's digital storying was conducted in two phases; phase one was informed by sensory ethnography (Pink, 2015) and phase two by a relational materialist methodology (Hultman & Lenz Taguchi, 2010). This approach helped us to investigate how the children's sensory aesthetic experiences with their local forest were born in entanglements across digitality and other non-human materialities, bodies and spaces. Our reading and analysing included looking at the children's verbal narration, as well as their multimodal expressions during the digital storying events. These events encompassed the children's sense-making of their aesthetic experiences, their stories about Julle, as well as their embodied engagement with the environment as they took photographs with the application.

With the sensory ethnographic approach, we began the analysis by exploring the data as a whole, identifying moments in the data that illuminated various sensory dimensions in the children's digital storying (Pink, 2015). These included haptic, olfactory, visual, and auditory dimensions (see also Rodaway, 2002). Our

motivation was to explore the sensory complexities and to investigate if certain sensory dimensions entangled in distinct ways with digitality and different contexts during the workshops.

During the second phase of our analysis, we explored the material entanglements of children's aesthetic experiences and recognised the agencies of non-human materialities in the digital storying events. For this, we directed our analytic focus towards a range of substances and bodies and their intra-actions (Barad, 2007; Hultman & Lenz Taguchi, 2010). This meant exploring the children, the researchers, the digital dimensions, and other non-human materialities as entangled agents who all contributed to the dynamics of the workshops. Furthermore, this included becoming attentive to how digital dimensions created aesthetic movements in the children's digital storying events (Hultman & Lenz Taguchi, 2010).

Children's aesthetic experiences in the local forest through digital storying

Next, we turn to illuminating and discussing our results. First, we will discuss how digital dimensions interlaced with children's aesthetic experiences in the forest, by highlighting various sensory dimensions of the digital storying events. Second, we will explain how digital material participated in creating movements within the children's aesthetic experiences in the forest.

Digital material interlacing with the sensory dimensions of children's aesthetic experiences

Our analysis shows how digital storying allowed the children to explore, express and share a broad array of sensory aesthetic experiences in their local forest. During the workshops, the children's aesthetic experiences evidenced haptic dimensions of mobility, textures, and temperatures; visual dimensions of light, shadows, colours, and shapes; olfactory dimensions of smells and flavours; as well as auditory dimensions of sounds and silences. Our findings echo previous research, which have found that digital and visual methods can promote children's multisensory perceptiveness of environmental details (Bartos, 2013; van Hoven & Trell, 2010; Kullman, 2012; Kumpulainen et al., 2020).

The children's engagement with the environment through the AR application seemed to create shifting visual and haptic experiences as the children looked through, moved with, and touched the tablets. When photographing outdoors with the digital devices and the AR application, the children often considered how, for example, light, darkness, colours, patterns, and shapes affected the image. The children seemed to be mindful of how to place Julle and frame the image, which made them aware of aesthetic details in their surroundings and allowed them to express aesthetic preferences. Many children were also inspired to share detailed descriptions of their visual and haptic everyday experiences while moving in the forest or on the playground and at times the children's stories about Julle resonated strongly with their narration of their everyday aesthetic experiences.

The children storied about beautiful landscapes and details, for instance about colourful autumn leaves, flowers, and glitter. They shared stories of climbing trees and hills, moving in difficult terrain, or running on asphalt. Furthermore, they described enjoyable sensations of touch related to materialities and atmospheres in various terrains, such as sensations of moisture, stickiness, and softness. In many of the children's stories, they also imagined Julle's bodily movements or touch sensations in the forest. A few children imagined Julle floating in the air or jumping into space, extending their imaginative experiences with Julle beyond their own material boundaries.

Additionally, the temperature was part of the children's digital storying. Our workshop took place during the cold autumn and winter seasons in Finland, and the chilly weather became intertwined with the children's aesthetic experiences. Computers worked more slowly than usual or froze, the children and researchers handled the digital devices with stiff fingers, and Julle experienced contrasting sensations of warmth and cold in the children's stories. For instance, Laura and Iris described how Julle in their photograph was sleeping on the ground and that he enjoyed being cool during his nap. Laura later explained about a sensory experience she once had in cold weather:

LAURA: Well once from my balcony I could smell the sound of winter when I was brushing my teeth.
RESEARCHER: The sound of winter? What kind of sound is that?
LAURA: Well, a fragrant one.

During our workshop discussions, smells, flavours, and sounds were also a part of several children's stories. The children shared their experiences of enjoyable smells, such as freshly cut grass, resin, or flowers and of picking and eating berries or mushrooms in the forest, naming tastes they preferred. The olfactory dimension was not as common in the children's stories about Julle. However, a few children included sensations of flavours in their stories, with Julle described as eating marshmallows or enjoying the taste of mushrooms. Auditory dimensions entangled in the storying events through the various mixtures of sounds made by children, digital devices, the AR application, researchers, nearby traffic, and construction work. The children also mentioned their experiences with sounds and silences from playing in the local forest, such as the pleasure in hearing rustling leaves or birdsong. A few children also included experiences of sounds into their stories about Julle. For instance, Nellie who described in her image how Julle had found a peaceful place where no one would disturb him and was enjoying some quiet time in the nice landscape (see Figure 13.2). Nellie explained that she enjoyed similar experiences of quietness and that she often goes to the forest to be by herself.

In summary, digital storying encompassed various sensory aesthetic dimensions, which contributed to the atmosphere and quality of the events. The way the children in our study talked about their everyday relating with the local forest indicates that they found haptic, visual, auditory, and olfactory dimensions important in
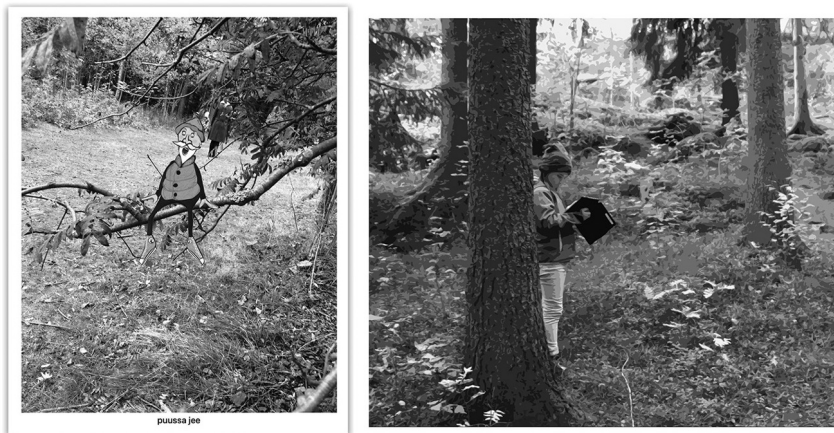
Figure 13.2 Left: Nellie's Julle photograph, about which she wrote, 'in the tree, yay'. Right: Nellie standing by a tree after taking her second Julle picture.

their aesthetic experiences. However, the olfactory and auditory dimensions were not as present in the children's stories about the forest elf Julle. This indicates that the *MyAR Julle* application may not have supported the children's auditory and olfactory engagement to the same degree as their visual and haptic engagement. These results reflect Bartos's study (2013), which found that many children emphasised visual experiences when talking about their photographs of meaningful environments.

Digital material creating movements in children's aesthetic experiences

Next, we will discuss an example from our data, which shows how digital dimensions and different materialities participated in creating movements within children's aesthetic experiences in the forest. The event below illuminates Vera's and Ida's explorations of the forest around their school yard, revealing various visual, haptic, and olfactory aesthetic dimensions. There are multiple things shifting and transforming in our example. A tree, resin, digital dimensions, the children, and a lamp post all play agential parts and co-shape the transformations within this event, illuminating how aesthetic experiences are formed in and through dynamic intra-actions (Hultman & Lenz Taguchi, 2010).

Vera and Ida started their explorations together with Julle by a pine tree near to the school building. Vera was standing in front of the tree holding the tablet computer and immersed in creating a picture of the elf peeking from behind the tree (Figure 13.3, middle). While Vera engaged in photographing with the

Figure 13.3 Left: Vera's photograph of Julle peeking from behind the tree. Middle: Vera engaged in photographing with the application and Ida touching the bark on the tree trunk. Right: Vera sniffing and looking at the resin on her hand.

application, Ida stood close to the tree and touched the bark on the tree trunk. She noticed some resin on the trunk and called out 'There is resin here, Vera'. In Vera's photograph, Julle has his fingers positioned at the same place where the resin seeped out from the bark (Figure 13.3, left).

After finishing her image Vera handed the tablet computer to Ida and walked closer to the pine tree to pick some bark from its trunk. Through mutual engagement between the resin and Vera, some resin became attached to Vera's hand. Vera looked at her hand and, wrinkling her nose, turned to a nearby researcher, saying, 'Yuck, I got resin on my hands'. She tried to remove some of the stickiness from her skin by rubbing her hand against a lamp post. 'But it smells quite nice', she then said, bringing her fingers to her nose and sniffing the resin (Figure 13.3 right). After this Vera ran across the schoolyard to catch up with Ida who was calling for her and already heading with the tablet computer raised in front of her towards a small forest clearing at the back end of the schoolyard.

Later that day during the interview, Vera sniffed her hand again, saying, 'My fingers might still smell', recalling the resin that was still clinging to her skin from when she captured Julle behind the tree trunk. Inspired by this both Vera and Ida started talking about how they enjoy the smell of resin.

In our example, through the tablet computer, Julle engages with the tree and the resin, becoming a co-creator and co-experiencer in the event. This encounter illustrates how the agencies of the tablet and Julle affect the ways Vera moves with, touches, inhales, and views her surroundings. At the same time, the tablet, the AR application, Julle, and Vera are dynamically participating in aesthetically framing the environment. Within this digital storying event Vera and the syrupy resin become physically attached and Vera seems to be both repelled by its clinginess and attracted by the smell. Also, the lamp post with its hard and flat surface becomes involved as a merging of Vera, resin and lamp post takes place, when Vera's resin smudged hand rubs against the metal. Furthermore, the picture of Julle peeking

from behind the tree and the resin on Vera's hand resonate throughout the workshop, reminding the children and the researcher of the fluid that persistently clings to their hands and the surfaces they touch, emitting a lingering scent.

Through our theoretical lens we understand these intra-actions as aesthetically dynamic (Lenz Taguchi, 2009; Rautio, 2013). In our example, Vera, Ida, the tablet, Julle, the tree, the resin, and the lamp post are part of constant transformations, leaving aesthetically infused traces upon each other. This means that when children are experiencing aesthetic sensations through digital storying their sensory impressions are born in environmental and material relations, of which both the children and the digital dimensions are part (Berleant, 2010; Rodaway, 2002). In this way digital storying emerges as embodied events where the children's sensory relating with space, matter, digitality, and each other creates meaning and makes a difference in multimodal and material ways (Swanstrom, 2016). Digital storying can thus be understood as events of differentiation (Rautio, 2013), in which both children, digital dimensions and the environment are changed through aesthetic dynamics.

Conclusions

The results of our study challenge notions that digital technology makes children removed or inattentive of their embodied presence in the world (Ergler et al., 2016; Lentini & Decortis, 2010). Instead, our study echoes previous research, which suggests that multimodal, embodied, and aesthetic experiences through digital practices can invite children to encounter local environments with new perspectives (Kervin & Mantei, 2017; Kumpulainen, 2016; Sintonen, 2020). Our results suggest that using digital storying with augmented reality can offer pedagogical potentials for promoting children's sensory experiences and aesthetic awareness of their surroundings (Scott-Stevenson, 2020). However, there is a need to be mindful of how pedagogical discourse and practices create possibilities and boundaries for various embodied and sensuous experiences (Lenz Taguchi, 2009). Hence, we suggest that more research attention be directed towards understanding how sensory dimensions entangle with different digital practices.

In addition, this study provides insights into the material significance of digital practices with children. Our findings show how the digital dimensions, rather than being immaterial, entangled with and participated within the material dynamics of the digital storying workshops (Munster; 2006; Swanstrom, 2016), generating material-discursive shifts and transformations (Lenz Taguchi, 2009). Through relational play with the AR application and Julle, the children performed diverse roles as both perceivers and co-creators of the aesthetic conditions born in their material encounters during the workshops. These results illuminate the potential of digital matter to intertwine with children's aesthetic experiences, expressions and agencies over time and space (Munster, 2006).

Overall, our work contributes to empirical knowledge about the potentials of using digital storying as a pedagogical method of promoting children's aesthetic experiences and sense-making outdoors in nature. The way digital storying

allowed the children to have direct encounters with the forest through various aesthetic experiences offers an important complement to Nordic early childhood education, in which outdoor activities are valued and promoted (Sandseter & Lysklett, 2017; Sintonen, 2020). Although our study is situated within a specific context, it implies that aesthetic experiences through digital storying can potentially promote children's social, cultural and material awareness of their local forests (Lentini & Decortis, 2010; Scott-Stevenson, 2020) and pedagogically support children to participate actively in exploring and discussing the aesthetics of their living environments.

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Conflicts of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships, which could be construed as a potential conflict of interest.

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