Early Childhoods in the Postdigital
Inquiry into the Literacies of Young Children's Contemporary Play with New Media Technologies

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Kenneth Pettersen
Department of Education
Faculty of Educational Sciences
University of Oslo
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Abstract

Play is a fundamental activity in young children's lives. In early childhood, literacy—understood as the social practices of meaning making—and play are closely related. Research has demonstrated how new forms of literacy emerge through young children's play as socio–technological conditions change. Today, new media technologies are posited to be entangled with young children's lives in ways that disrupt assumed digital–analog binaries. Still, there is a lack of empirical in-depth research on young children's contemporary play under these new posited conditions. Furthermore, there is a lack of empirical in-depth research on the messy, contingent, and nonsensical dimensions of young children's contemporary play with new media technologies. Rich accounts and tools to contingently capture the new dimensions and forms of play are important because they allow educators, parents, and others in close contact with young children to facilitate meaningful and pleasurable everyday experiences.

In this dissertation, ethnographic fieldwork—supported by video recordings, photography, and field notes—among young children playing with new media technologies at home and in preschool is presented. The dissertation is situated in the sociomaterial theorizing of agential realism and nonrepresentational affect theory. I aim to explore how new literacies emerge as new media technologies are brought together through and across moments of young children's contemporary play. The research objectives, corresponding to the empirical, conceptual, and methodological contributions of the dissertation, are as follows:

1. Account for the literacies of young children's contemporary play with new media technologies.
2. Identify and explore productive theorizing and concepts to study the literacies of young children's contemporary play with new media technologies.
3. Identify and explore how the literacies of young children's contemporary play with new media technologies can be studied.

In Article I, coauthored with Professor Hans Christian Arnseth (University of Oslo) and Professor Kenneth Silseth (University of Oslo), we analyze a video excerpt of three young children who are playing *Minecraft* with wooden and synthetic blocks in a preschool common room. Through playful dwelling, the children take part in messy configurations of gaming features, hands, bodies, and blocks. Even with no digital devices present, assumed digital–analog binaries are unsettled, and forms of *postdigital* play emerge.

In Article II, coauthored with Professor Christian Ehret (University of North Carolina), we analyze video excerpts of two young children's playdates at home, where they watch YouTube, play *Minecraft* on a Nintendo Switch, and play with construction playthings. The children take pleasure in moving through postdigital playscapes by taking part in the enactment of recurring *refrains*, which resonate and register as felt across diverse events. The refrains enacted in our case are characterized by the facilitation, embrace, and encouragement of intensely felt, disruptive moments of surprise. These idiosyncratic movements of flows and interruptions form felt touchpoints of the children's friendship.

In Article III, I analyze young children collecting cones, leaves, and insects in their neighborhood and preschool, and young children collecting stars, toads, and rainbows while playing *Super Mario Run* on an iPad in their bedroom. The children *answer the world* by allowing their collections to unfold in shifting, porous relationships with their surroundings, and allowing chance-like encounters to participate in the movement of their collecting. These ways of collecting resonate across diverse events, regardless of their assumed status as digital or analog. Their appreciation of the contingencies of collecting is not an abstracted sensibility

but is grounded in the material conditions of early childhood characterized by tensions with their surroundings.

Through in-depth research of a group of young children at home and in preschool, my inquiries show how contemporary early childhood play unsettles assumed digital–analog binaries. The idiosyncratic arrangements of bodies, blocks, and bytes in their play allow for a feeling of unpredictability, which the young children facilitate, embrace, and encourage. To understand this play, the concepts of the *postdigital*, the *refrain*, and *answering the world* are further developed. Through a broad ethnography in tandem with sociomaterial theorizing, I demonstrate how research can move beyond young children's discrete interactions with digital devices to broader postdigital playscapes.

The pedagogical implications of my inquiry may be that educators, parents, and others in close contact with young children to facilitate new dimensions and forms of play critically should evaluate assumptions of clean cuts between the digital and analog, and sensitively feel for the flows and interruptions of play through and across moments. The dissertation adds examples of such critical and sensitive practices.

Sammendrag

Lek er en grunnleggende aktivitet i små barns liv. I tidlig barndom henger literacy—forstått som sosiale praksiser der det skapes mening—og lek tett sammen. Forskning har vist at nye former for literacy oppstår gjennom små barns lek i følge med nye sosio–teknologiske forhold. Det påstås at nye medieteknologier i dag er viklet inn i små barns lek på måter som forstyrrer antatte skiller mellom det digitale og analoge. Likevel er det få empiriske dybdestudier om små barns lek under disse nye påståtte betingelsene. I tillegg er det få empiriske dybdestudier om små barns barokke, flyktige og nonsensiske lek med nye medieteknologier. Rike beskrivelser og verktøy som forsøksvis fanger nye dimensjoner ved og former for lek er viktige fordi det gjør pedagoger, foreldre, og andre i tett kontakt med små barn i stand til å tilrettelegge for meningsfulle og lystbetonte hverdagserfaringer.

I avhandlingen presenteres et etnografisk feltarbeid—understøttet av videoopptak, fotografier og feltnotater—blant små barn og deres lek med nye medieteknologier hjemme og i barnehage. Avhandlingen er forankret i literacy-forskning og den sosiomaterielle tenkningen i agential realisme og ikke-representasjonell affektteori. Målet for avhandlingen er å undersøke hvordan det i dag oppstår nye literacies når nye medieteknologier blir bragt sammen gjennom og på tvers av øyeblikk av lek blant små barn. Delmålene, som samsvarer med de henholdsvis empiriske, konseptuelle og metodologiske bidragene til avhandlingen, er:

1. Gjøre rede for de literacies som oppstår gjennom små barns lek med nye medieteknologier.
2. Identifisere og utforske produktive konsepter og tenkning for å undersøke de literacies som oppstår gjennom små barns lek med nye medieteknologier.
3. Identifisere og utforske hvordan de literacies som oppstår gjennom små barns lek med nye medieteknologier kan bli undersøkt.

I Artikkel I, samskrevet med Professor Hans Christian Arnseth (Universitetet i Oslo) og Professor Kenneth Silseth (Universitetet i Oslo), analyserer vi videoutdrag av tre små barn som leker *Minecraft* med treklosser og syntetiske klosser i allrommet i en barnehage. Gjennom deres dvelende, famlende og sensitive lek inngår barna i skiftende konfigurasjoner av hender, kropper og klosser, samt funksjoner og innstillinger fra gaming. Til og med uten digitale enheter tilstede, forstyrres antatte skiller mellom det digitale og analoge, og former for *postdigital* lek oppstår.

I Artikkel II, samskrevet med Professor Christian Ehret (Universitetet i North Carolina), analyserer vi videoutdrag av to små barn som er på besøk hjemme hos hverandre og ser på *YouTube*, spiller *Minecraft* på Nintendo Switch og leker med konstruksjonsleker. Barna begeistres av å bevege seg gjennom postdigitale rom for lek ved å inngå i gjentakende *refreng* som klinger kjent på tvers av uensartede hendelser. Refrengene er karakterisert av tilrettelegginger, omfavnelser og oppmuntringer til oppskakende, overraskende øyeblikk. Disse særegne øyeblikkene mellom flyt og brudd skaper følte berøringspunkter for barnas vennskap.

I Artikkel III analyserer jeg små barn som samler kongler, blader og insekter i nabolag, skog og barnehage, og små barn som samler regnbuer og stjerner i *Super Mario Run* på iPad på barnerommet. Barna *svarer verden* ved å la samlingene deres utfolde seg i stadig skiftende og porøse forhold til omgivelsene, og å la tilfeldige, slumpaktige møter delta i samlingens bevegelse. Disse måtene å samle på klinger kjent på tvers av uensartede hendelser, uavhengig av deres antatte status som digitale eller analoge. Deres verdsettelse av det flyktige ved samling er ikke bare en abstrahert livsholdning, men forankret i små barns materielle vilkår der møtet med omgivelsene er mer preget av spenninger.

Gjennom dybdestudier av en gruppe små barn i barnehage og hjemme, viser undersøkelsene hvordan små barns lek i dag kan forstyrre antatte skiller mellom det digitale og analoge. Lekens forunderlige oppstillinger av kropper, klosser og bytes bidrar til en følelse av uforutsigbarhet, som barna tilrettelegger for, omfavner og oppmuntrer til. For å forstå denne leken videreutvikles begrepene *postdigital*, *refreng*, og *å svare verden*. Gjennom en bred etnografi i kombinasjon med sosiomateriell tenkning vises hvordan forskning kan bevege seg forbi undersøkelser av små barns avgrensede bruk av digitale enheter til bredere postdigitale rom for lek.

Pedagogiske implikasjoner av mine undersøkelser kan være at pedagoger, foreldre, og andre i tett kontakt med små barn, for å tilrettelegge for nye dimensjoner ved og former for små barns lek i det postdigitale, kritisk bør vurdere antakelser om skarpe skiller mellom det digitale og analoge, og sensitivt kjenne etter lekens flyt og brudd gjennom og på tvers av øyeblikk. Avhandlingen bidrar med eksempler på slike kritiske og sensitive praksiser.

Part I: Extended abstract

Part II: Articles

Article I: Pettersen, K., Arnseth, H. C., & Silseth, K. (2022). Playing Minecraft: Young children's postdigital play. *Journal of Early Childhood Literacy*. Advance online publication. https://doi.org/10.1177/14687984221118977

Article II: Pettersen, K., & Ehret, C. (conditionally accepted). Refrains of friendship in young children's postdigital play. *Journal of Literacy Research.*

Article III: Pettersen, K. (submitted). Young children's more-than-human and more-than-digital collecting. *Children's Geographies.*

Part I: Extended abstract

1 Introduction

> After all, if a learner creates in *Minecraft* and does so by viewing YouTube walkthroughs, socially engaging with others, independently building in the game space, and designing a similar rendering on paper, then it would be difficult—if not impossible—to identify the meaning making without accounting for the range of online and offline influences and activities. (Abrams et al., 2017, p. 6)

> When Eirik and I got a tree house
> I was just happy we had shade for our screen
> —Cezinando, "Nothing stays the same, but it's all the same" (author's translation)

Play erects and transgresses assumed boundaries. Today, young children's contemporary play takes place on grassy playgrounds, through organized preschool activities, in *Minecraft* ravines, on TikTok interfaces, with Nintendo Switches, algorithmically generated YouTube content, and sticks, pencils, and mass-produced plastic playthings. The assumed boundaries transgressed, erected, and questioned through young children's contemporary engagement with new media technologies unsettle notions of what play is and what it should be. Understanding the dynamics, motivations, and feelings of young children's contemporary play is crucial because it affects how parents, teachers, and others in close contact with children respond to their play, thus serving as the basis of decisions made on behalf of young children (Dias et al., 2016; Mascheroni et al., 2016). The practical decisions regarding, for example, what platforms young children can access or how long young children should be allowed to play affect their chances to engage in activities they experience as pleasurable and meaningful.

Without a doubt, new media technologies do, on an unprecedented scale, infuse and make themselves relevant in young children's everyday lives. Around two-thirds of Norwegian 4–5-year-olds have access to computer tablets. Around two-thirds of Norwegian 4–5-year-olds watch YouTube or YouTube Kids weekly and daily, and play video games weekly or daily (The Norwegian Media Authority, 2023). Still, young children's engagement with new media technologies in relation to other activities is typically varied and balanced (Chaudron et al., 2018). In the public discourse, new media technologies are framed as threats and distractions to early childhood play (Ljung-Djärf & Tullgren, 2009), as well as representing a promising future and affording new creative ventures (Livingstone & Blum-Ross, 2021). Among researchers who aim to see what possibilities exist as new media technologies enter early childhoods, new types of digital literacies (Erstad et al., 2020; Mills, 2016), or new types of digital play (Arnott, 2016; S. Edwards & Bird, 2017; Fleer, 2017; Stephen & Plowman, 2014) are posited to emerge.

Although researchers have explored what this condition implies for literacy and play in the twenty-first century, the empirical phenomenon under study remains elusive. For example, a year into my research fellowship, preschools and schools from one day to the next heavily upgraded the digital infrastructure of education available to children because of the pandemic. TikTok users worldwide have tripled since I started my research (Statista, 2023). More recently, artificial intelligence (AI) has entered the public discourse, provoking anxiety and optimism alike. What the digital refers to—the computer room, Gameboys, .mp3 players, AirPods, and the Metaverse—does not remain the same. In fact, some scholars argue that we are now entering a postdigital condition (S. Edwards, 2022; Jandrić et al., 2018; Marsh,

2019); however, the postdigital does not mean that the digital is outmoded. On the contrary, the postdigital signifies a historical situation—experienced, felt, and reflected upon—in which a reattunement of human relationships with the computational, algorithms, and code is needed. In the postdigital, new socio–technological arrangements push researchers and non-researchers alike to rethink notions of new media technologies as representing discrete spaces or layers as opposed to the real. It is neither something easily logged onto or off, nor a tool to be used of one's own accord. For young children, as play moves from playgrounds to the screen, vice versa, or across the playground and screen, new media technologies are posited to be germane and integral. Through my inquiries, which are accounted for in this dissertation, I show how new media technologies thread through the most intimate of settings, as young children, both at home and in preschool, collect cones, build with blocks, and nurture friendships in the postdigital. These argued phenomena require new accounts, new theorizing, new conceptualizations, and new modes of inquiry.

1.1 What are new media technologies?

The terminology differs across the three articles of the present dissertation. In the first article, the coauthors and I use "digital technologies." In the second article, the coauthor and I use mostly "digital media technologies." In the third article, I use "new media technologies." Despite different terminology, they refer to the same broad phenomena. For the extended abstract, new media is understood as "those methods and social practices of communication, representation, and expression that have developed using the digital, multimedia, networked computer and the ways that this machine is held to have transformed work in other media" (Lister et al., 2009, p. 2). I include "technologies" to further allude to the materiality of those media: the device, the network, and the code. The use of the term is pragmatic and a departure point for inquiry. To avoid using generalized terminology, when appropriate, I refer to the actual media and artifact used. For example, in the present dissertation, new media technologies are most often YouTube on TVs and iPads, and the video games *Minecraft* and *Super Mario Run* on iPads and Nintendo Switch. My use of the preposition "with" ("young children's play with new media technologies") refers to their broader relationships with new media technologies rather than their isolated manipulation of digital devices, which is a point that is elaborated throughout the dissertation.

1.2 Why study young children's play with new media technologies?

I am writing this section in Spring 2023, and there is another wave of public debate in Norway concerning children's screen time. Although such debate is by no means new, they contain features that are specific for the current socio–technological milieu (Drotner, 2022). Some argue that young children's in-school and out-of-school access to and use of new media technologies is excessive and that the content is less than child-friendly. They advocate for industry regulations and stricter government guidelines on their screen time at home and in schools. In Norway, screen time features among parents' top worries (Elvestad et al., 2021).[1] However, although screen time guidelines are popular among parents, existing guidelines rely on insufficient evidence and may negatively impact parents' decision-making processes

[1] Although parents' worries typically increase as children grow older and, thus, are less salient with young children, between a third and half of all Norwegian parents of 4–5-year-olds report having screen time arguments with their children as it pertains to gaming, watching YouTube, and watching TV/streaming (The Norwegian Media Authority, 2023).

(Blum-Ross & Livingstone, 2018). Sometimes, researchers from media studies, the learning sciences, literacy research, or childhood studies enter the public debate, typically to argue for more active parental mediation and more attention to the type of use rather than time spent on digital devices. There exists a chasm between two dominant discourses of new media technologies' role in young children's everyday lives: determinist and instrumentalist. On the one hand, new media technologies are powerful actors and devices that structure interaction, acting as magnets for children's attention—therefore, it follows that their reach should be limited. On the other hand, new media technologies are tools for humans to use—it follows that users and consumers of new media technologies should collectively and individually figure out how to harness their power for the purposes of entertainment, human development, and the common good. However, this distinction—oftentimes referred to in oppositional terms of structure and agency—conceals complex dynamics more than it reveals: in the contemporary encounters between new media technologies and children, activity emerges which transcends both (Buckingham & Sefton-Green, 2003).

As advocated by Buckingham and Sefton-Green, literacy research and adjacent fields of research have for years engaged with how to account more dynamically for new ways of engaging with new media technologies. In the early 2000s, new literacy studies (NLS) developed an interest in the new digital literacies that started to emerge. NLS and new literacies are novel in respectively a paradigmatic sense and an ontological sense (Lankshear & Knobel, 2011; Mills, 2010). Paradigmatically, NLS argued for a sociocultural understanding of literacy, while, ontologically, new literacies refer to the types of literacies emerging in the wake of social media, smartphones, gaming, and apps. Sociocultural theorizing supported the recognition and legitimization of new practices of sharing, cowriting, and gaming as literacies in their own right. Attuned to literacies as socially, materially, and culturally situated, NLS allowed for accounts of "hanging out, messing around, and geeking out" (Ito et al., 2010) with new media technologies as meaningful everyday skills with educational potential. However, in the broader field of literacy research on young children and new media technologies, beyond NLS, young children's self-directed play is notably absent (Section 2).

A core belief of literacy research in the wake of NLS is that social, material, and cultural landscapes shape—and are shaped by—what are considered relevant literacies. Several researchers argue that there is something new about the contemporary condition that warrants new analyses (S. Edwards, 2022; Jandrić et al., 2018; Marsh, 2019). This condition is a historical situation in which new media technologies are oversaturated in social life, spreading into the most intimate and mundane corners of the everyday and onto the macro-phenomena of politics and culture. It follows that young children's play with new media technologies needs to be analyzed not in terms of how they constitute new discrete literacy practices that need to be recognized and legitimized, but through the configurations and assemblages they form as parts of larger play ecologies (Parry & Scott, 2020). This condition, in which we are posited to find ourselves, calls for new accounts, new theorizing, new conceptualizations, and new modes of inquiry to explore the complex contemporary relationships of new media technologies, play, and early childhoods.

1.3 Why study play as literacy?

To make such lofty explorations, my inquiry needs some firm ground—a field—on which to stand. Literacy research is a field of research in which similar and adjacent issues have been explored thoroughly, and there is an ongoing conversation about the contemporary

conditions for children's play with new media technologies and about new ways of dealing with hybridity, convergence, and, to some extent, the postdigital (e.g., Abrams et al., 2017; Apperley et al., 2016; Burnett & Merchant, 2020b; S. Edwards, 2022; Marsh, 2019). However, given the rich theoretical traditions and research literature on play, how and why does it make sense for my inquiry to treat play *as literacy*—what does this vantage point offer in terms of analysis?

Historically, literacy research has had a utilitarian relationship with play, and play has been treated as serving literacy (Roskos & Christie, 2001). For example, children's roleplaying may support the imaginative construction of written stories as the children get older. This instrumentalization of play corresponds to Sutton-Smith's (1997) theory of the rhetoric of play as progress—a normative account of play as a developmental mechanism—a rhetoric that has been thoroughly critiqued (e.g., James et al., 1998). However, following the social and multimodal turn of literacy research (Section 2.1), play took on new meanings for literacy researchers who included, for example, movement, touch, and sound as modes of meaning making (Kress, 2010). Play, roleplaying in particular, could be understood not simply as something that leads to literacy, but *as* embodied literacies in itself—the construction of narratives using your body as a meaning making device (Wohlwend, 2019).

However, studying play as literacy is not without tensions and can pose critical questions. First, studying play *as* something else—rather than studying it as it is enacted—may also devalue play. Still, for any notion of play to make sense, a mobilization of extant language and discourse is needed. Play cannot be studied as it is presented unmediated. Second, literacy is still associated with words, letters, and the encoding and decoding of signs. Acknowledging play as literacy may stretch its original meaning to the point where *anything* is (and can be) literacy, in effect rendering literacy research redundant. In one sense, this is true: a central venture of literacy research has historically been to critically review the ideologies sustaining specific conceptions of literacy (Section 2.1). Thus, literacy has emerged as a fluid concept to think with, with no set definition (Erstad & Gillen, 2020). Recently, new *sociomaterial* theorizing of literacy has stretched the conceptions of literacy even further, providing a flurry of new concepts and ideas with which to think (Kuby et al., 2019; Kuby & Rowsell, 2017). Play is famously also an ambiguous concept (Sutton-Smith, 1997), and sociomaterial theorizing has been found to attend to the ambiguity and contradictions of play (Lenz-Taguchi, 2014). Intersecting literacy and play, both with developed conceptual apparatuses from sociomateriality, may prove productive for new conceptions of literacy and play. Hackett and Rautio (2019), for example, consider young children's playful rolling down hills a "more-than-human literacy," meaning that the children do not simply use the hill instrumentally but instead engage in correspondence with the grassy knolls and rocky surface. This resonates with me as a former preschool teacher. Rolling down hills is an activity that is meaningful and simply feels right for young children, in the sense that young children derive meaning from and impress meaning on it, and in the sense that rolling down hills is experienced as worthwhile in the moment, even if it is all nonsensical and without meaning.

Sociomaterial theorizing of literacy is attuned to this dimension of young children's play—not the acquisition of skills ready to be used but emergent, in the moment, and indeterminate (Section 2.2). This is aligned with the social constructivist literacy conceptions of exploring bottom-up, emic literacy practices because the nature of the relevant literacies of tomorrow cannot be known. Tomorrow, the literacies enacted by rolling down hills may be significant. At least, they are for the young, rolling children of today. For me, this makes

literacy research and the new avenues toward which it has moved an exciting research space in which to dwell—a space of speculative propositions, probing questions, and unknown futures.

There are overlaps between different research traditions—new media research, game studies, children's geographies, literacy research, childhood studies, and the learning sciences are all research traditions between which the boundaries are blurred and unclear. In the end, "fieldwork"—working to situate your research in a field of research—is also about tying oneself to the mast and to obtain a set point of reference from which you can explore and engage with social phenomena. However, when apt, I tap into valuable insights from the sirens of adjacent research fields while cognizant of the different histories of these traditions and tensions in-between.

1.4 Research aim and objectives

The aim of the inquiry is to explore how new literacies emerge as new media technologies are brought together through and across moments of young children's contemporary play. To explore this, I perform ethnographic fieldwork—supported by video recordings, photography, and field notes—of young children's play with new media technologies across preschool and home. In Article I, the coauthors and I study two children playing *Minecraft* with wooden and synthetic blocks in a preschool common room. In Article II, the coauthor and I study two young children's playdates as they play *Minecraft*, watch YouTube, and play with construction playthings. In Article III, I study young children collecting cones, leaves, and insects in their neighborhood and preschool and collecting stars, toads, and rainbows while playing *Super Mario Run* on an iPad in their bedroom. From these inquiries, a set of empirical, methodological, and theoretical contributions are extrapolated, which are framed by the following research objectives:

1. Account for the literacies of young children's contemporary play with new media technologies
2. Identify and explore productive theorizing and concepts to study the literacies of young children's contemporary play with new media technologies
3. Identify and explore how the literacies of young children's contemporary play with new media technologies can be studied

1.5 Outline of the dissertation

The present dissertation consists of the extended abstract and three articles, one published by *Journal of Early Childhood Literacy*, a second conditionally accepted by *Journal of Literacy Research*, and a third submitted to *Children's Geographies*. In Section 2 of the extended abstract, I account for the states of relevant subfields of research to which the inquiry is situated in relation. These subfields are literacy research on early childhood play with new media technologies, as informed by NLS and sociomaterial theorizing. In Section 3, I account for the theoretical foundation and key concepts of the inquiry. The theoretical foundation is agential realist and nonrepresentational affect theorizing of literacy, and three of the key concepts are *postdigital*, *refrain*, and *answering the world*. In Section 4, I account for the modes of inquiry, namely microethnography and ethnography, as informed by postqualitative approaches, along with research quality and ethics. In Section 5, I give a summary of each article. In Section 6, I explicate the major findings of the inquiry, along with how these findings contribute empirically, methodically, and conceptually to the research

literature outlined in Section 2. In Section 7, a postscript briefly attends to issues that are less covered in the dissertation and that represent promising ventures for new inquiry.

2 States of the relevant subfields of research

Several literature reviews on the intersections of early childhood, literacy, and new media technologies—varying in scopes, settings, and underlying theoretical models—have been conducted over the past decade, and the literature is rapidly growing. However, although there is a small but growing cluster of ethnographic research on how new media technologies relate to young children's everyday play (Kumpulainen & Gillen, 2020), effect studies and case studies subscribing to logocentric transmission models of literacy still dominate the types of studies conducted. One review of empirical studies published from 2003 to 2009 on technology, literacy, and young children identifies the "predominance of small-scale studies reflecting a psychological–cognitive model of literacy" (Burnett, 2010, p. 265). In a review of empirical studies on digital literacy in early years formal educational settings published from 2000 to 2015, Kontovourki et al. (2017) confirm Burnett's findings and identify a large number of studies where digital technology is positioned as a facilitator and deliverer of literacy rather than a site of interaction or mediator in meaning making practices. A review of empirical studies published from 2012 to 2017 on the use of digital technology by and with young children identifies that the greater part of the studies emphasized healthy practices (e.g., media effects on sleep and posture) and pedagogy (Mantilla & S. Edwards, 2019). In another review of empirical studies published from 2005 to 2017 on young children's digital literacy practices in home settings, the authors find that half of the studies reviewed focus primarily on parental mediation, identifying a gap of studies on how digital literacies travel across home and formal educational settings (Kumpulainen & Gillen, 2020). Neumann and Neumann (2017) find that there is evidence from research published from 2011 to 2015 that touchscreen tablets can foster emergent writing and letter knowledge, and the quality of apps and parental mediation are found to be important factors. However, the reviews above suggest that literacy research also should attend to literacy in terms of the intrinsically motivating, creative, and transgressive dimensions of young children's play as it is enacted in situ across sites, in addition to the parental mediation, pedagogy, and media effects approaches (while valid approaches in their own right) typically adopted. Kumpulainen and Gillen write the following:

> In particular, research attention deserves to be directed to increasing our understanding of children's perspectives, agency, creativity and learning in relation to their digital literacy practices in the home. Further attention could also be paid to understanding children's digital learning lives across the settings they inhabit, so researching how knowledge and practices gained in the home are valued and leveraged for example in early years education and by cultural institutions including libraries and museums. (2020, p. 105)

Dezuanni (2022) also argues that there is a lack of research attending to the fun, passionate, and entertaining qualities of young children's engagement with new media "supersystems" in their own right. Because children typically account for their use of new media technologies in terms of leisure and a remedy for boredom (Chaudron et al., 2018), this gap is consequential. Other reviews also support Kumpulainen and Gillen's assertion that the modes of inquiry adopted should be more expansive. Burnett (2010), for example, argues that explorations across sites are scant, and Marsh posits the need to consider the "wider contexts for play, not just the digital technologies used by the child" (2019, p. 157). Parry and Scott argues that a "holistic examination of the reality of [children's] play" "must consider how

digital media encounters feed into play, in combination with broader knowledge of children's life experiences and interests" (2020, p. 450). Similarly, in a literature review on young children's on-screen reading, Kucirkova (2021a) recommends literacy researchers to consider sociomaterial assemblages across time and space.

The reviews reveal how literacy is a contested field of research. There is "considerable discussion" about how to frame literacy in the context of early childhoods and new media technologies (Kontovourki et al., 2017, p. 23), and there is a "tension" in the field between literacy as "measurable assessment" and "creative play practices" (Erstad & Gillen, 2020, pp. 40–41). A principal actor, touchstone, and sparring partner in this discussion and tension has historically been NLS, a subfield of literacy research that emerged in the 1980s and in which social dimensions of literacy are recognized and explored (Gee, 2015; Street, 1984, 2003). Considering literacies as plural, situated, and multimodal meaning making practices has broadened the field's conceptions of literacy, allowing for new avenues to be explored—for example, young children's play—as well as new theorizing, conceptualizations, and modes of inquiry. As new media technologies entered young children's traditional literacy practices, NLS developed an interest in playful "new literacies" such as posting, gaming, and browsing (Lankshear & Knobel, 2011; Mills, 2010). Thus, NLS research is heavily represented among the studies on creative play practices of the digital age compared with those studies coming from other literacy models. Recently, however, representing a break from—or extension of—NLS, sociomaterial approaches to literacy emerged as another subfield of literacy research, and, among other things, were found apt for explorations of the (new) new literacies of the 2010s and 2020s (Erstad & Gillen, 2020). Sociomaterial approaches have developed substantial critiques of the binary logic of digital and analog that have been implicit and explicit in previous research—including NLS research—and developed new theorizing, conceptualizations, and modes of inquiry (e.g., Burnett & Merchant, 2020b). However, because sociomateriality represents novel approaches in a field with a long history, this subfield of literacy research is characterized by more tension and ambiguity with regard to theorizing, conceptualizations, and modes of inquiry, as well as less empirically grounded inquiry.

In sum, although the research is growing, reviewers note a need for more studies on young children's playful literacies as they encounter new media technology in their daily lives across settings. Today, the multimodal meaning making approaches of NLS and embodiment and materiality approaches of sociomateriality represent the two dominant broad theoretical orientations within digital literacy research on young children's play (Erstad & Gillen, 2020). It follows that they represent the relevant subfields of research in which to situate my inquiry, especially given my aim to explore how new literacies emerge as new media technologies are brought together through and across moments of young children's contemporary play. In the following, I present extended introductions to NLS and sociomaterial approaches to literacy research, along with how they empirically have been applied to studies of young children, new media technologies, and play. The set of key studies is not meant to be exhaustive, and the studies are selected based on the years they were published (mostly the past 10 years), relevance (represented by number of citations), and how they represent the state of the research. The studies represent important touchstones for my own explorations of the phenomenon at hand. I return to the conclusion of this section in Section 6 to discuss how my findings contribute empirically, conceptually, and methodologically to these subfields of literacy research, as represented by the key studies.

Although the accounts of the subfields of literacy research are categorized according to theoretical approaches to the field, I want to stress that my argument is about not only changing perspectives, but also how the phenomenon at hand changes, which necessitates new accounts, theorizing, conceptualizations, and modes of inquiry. This is true as it pertains to the NLS research on new literacies, and the new sociomaterial approaches. Furthermore, any account of a research field is a reduction. I recognize that literacy research has a longer and broader history and present life than the one represented here. Many volumes account for the rearrangements, breaks, continuities, and discontinuities of different models of literacy (e.g., Erstad et al., 2020; Kucirkova et al., 2019; Mills, 2016; Rowsell & Pahl, 2015). However, for the purposes of—and considering the scope of—the extended abstract, I emphasize the mentioned models.

2.1 New literacy studies and new literacies

One model of how literacy operates in society is found in NLS (Gee, 2015; Street, 1984, 2003). Since its conception in the 1980s, NLS developed ethnographic modes of inquiry to understand how literacies are not discrete skills but thoroughly entangled with culture, ideology, and everyday interactions. To account for this social turn of NLS, two conceptual pairs are important to note (Street, 2003): "autonomous" models of literacy are contrasted with "ideological" models of literacy, and local "literacy events" are proposed in relation to broader "literacy practices."

An autonomous model of literacy considers literacy to be a skill of which some have more and others have less. Literacy is set apart from social conditions and is considered an autonomous variable, to which it is possible to attach a series of items and gain an understanding of the literacy (or illiteracy) of an individual and how their (il)literacy relates to other social variables. The ideological model of literacy, on the other hand, considers literacy a social phenomenon, and the literacies enacted in, for example, schools are but one of many "ways with words" (Heath, 1983) in the social world. Any literacy would carry certain ideological assumptions, which privilege some individuals and groups, and disadvantage others—this is central to the critical dimension of NLS (e.g., Luke, 2021). This conceptual pair allows NLS to legitimize and justify their ideological model of literacy and distance itself from the autonomous model of literacy research as it had been conducted until then.

The second conceptual pair is literacy events and literacy practices. Heath states that the literacy event is "any occasion in which a piece of writing is integral to the nature of the participants' interactions and their interpretative processes" (1983, p. 93). Thus, literacy events are local instantiations of any form of writing, for example, a girl making graffiti, a boy crafting a love letter, or a teacher writing on a blackboard. Literacy practices are theoretically extrapolated from literacy events as broader, recurrent, and more abstracted phenomena (Street, 2003). For example, there are subgenres of love letters and patterned routines to which you write in relation when making graffiti. Thus, the identification and categorization of relevant practices through ethnographic accounts of events in situ are key to the analytical modes of NLS. However, literacy events are not only the ways literacy practices make themselves known. They are also sites of hybridity and creativity; as practices intersect, participants bring their own experiences to the event, and new tools are introduced. For example, the writing on blackboards by teachers has gone through transformations as whiteboards and smartboards have been introduced, as well as new student-centered pedagogies answering to new cultural forms in broader society. Hence, the relationship between the literacy event and literacy practice is interdependent. For literacy research, the

conceptual pair of literacy event and literacy practice are important analytical tools as, one, the NLS researcher considers the enacted literacy event to be primary rather than the literacy assumed to be residing within the individual, and two, the NLS researcher locates relevant patterned and routinized practices through extended ethnographic fieldwork.

Building on NLS and its recognition of the social dimensions of literacy, some researchers argue that other modes of meaning making than that of verbal language should be considered to understand literacy. Importantly, then, verbal language is backgrounded to the benefit of a broader conceptualization of meaning making practices—a departure from Heath's proposition cited above of "writing" being "integral" to literacy events. Meaning making is multimodal and more-than-writing (Kress, 2010), including sensory, embodied dimensions of human experience. Relevant to my inquiry, Kress (1997) stresses how children's emergent literacies do not begin as they encounter letters and words; instead, from birth, they are attuned to the meanings produced through movement and sensory impression and expression. Wohlwend (2019) builds on this idea and conceptualizes children's roleplaying as an embodied literacy, in which narratives are produced, interpreted, and remixed through their bodies, rather than just being a simple pastime.

From the framework of NLS and multimodality, a group of literacy researchers—the New London Group (1996)—assembled to discuss the current state and future of literacy pedagogy. While the work of NLS is a general analytical framework of how studies of literacy can be approached, the New London Group departs from a set of historical conditions, arguing that a new set of literacies proved relevant in this new situation. They propose the concept of "multiliteracies," which refers to, one, "the increasing multiplicity and integration of significant modes of meaning-making," and, two, "increasing local diversity and global connectedness" (p. 64). These conditions shape what are relevant contemporary literacies, in which patterns and conventions of practice are inherited but also redesigned using available resources and media born of the contemporary condition. Reviewing the "digital turn" of NLS in the 2000s, Mills (2010) argues that the emergence of new digital forms of media communication, production, and consumption necessitates the reconceptualization of new literacies (see Lankshear & Knobel, 2011). Children and young people's playful, original, and oftentimes transgressive navigation and negotiation of modes, texts, and artifacts across modes and media become the modus operandi of new literacies, and imaginative, creative thinking thus emerges as an essential skill (Binkley et al., 2012).

2.1.1 Key studies of early childhood play with new media technologies

Within this subfield of literacy research, a set of studies have explored the literacies of young children's creative play as it is enacted with new media technologies. This set of studies represents a minority in the broader research field of early childhood, literacy, and new media technologies, being dominated by parental mediation, pedagogy, and media effects approaches (Section 2). Although all the studies cited are not situated explicitly within the NLS framework, they belong to the same scholarly conversation by expanding on the same sources, and central to all is the idea that the new literacies of young children in the twenty-first century—or, more precisely, the 2010s—are characterized by playful, creative ways of engaging with new, mobile, intuitive, touch-based, media technologies. Backgrounding previous research efforts to explore the developmental and educational benefits or drawbacks of new media technologies in early childhoods, this set of studies foregrounds how digital technologies are introduced and incorporated and what types of play it affords (S. Edwards,

2022; Stephen & Plowman, 2014). For the sake of simplicity, mirroring Edwards' historical account (2022), I refer to this set of studies as "digital play" research.

Importantly, this research development corresponds with new historical socio–technological conditions: the iPad was introduced in 2010, and throughout the 2010s, apps were developed that catered to an increasingly younger audience in new ways and afforded wholly new ways of engaging with screens, such as *Angry Birds*, *Pokémon Go*, and *Osmo*, thus forming new ways of enacting literacy. In the 2000s, Plowman and Stephen (2005), for example, through ethnographic case studies from seven Scottish preschool classes, find that young children allegedly "playing with the computer" did not resemble play very much at all. In later ethnographic case studies of 14 Scottish 3-year-olds at home, they note that the complexity of the interfaces makes the children need frequent support, which halts play (Plowman et al., 2012). By the 2010s, this changed, and an emerging body of work was exploring new, more playful ways of relating with new media technologies. Digital play moved from primarily being equated with screen play to a more embodied experience connected through larger ecologies (Stephen & Plowman, 2014). Illustrating the larger ecologies, Arnott (2016) proposes the digital play system, which accounts for digital play as involving a cluster of interaction patterns, social participation, technological positioning, nondigital artifacts, and so on. Through ethnographic case studies of two Scottish preschool classes over a period of nine months, she shows how technologies are not the omnipotent, sole actors determining action and how digital play is more than one child interacting with one device. Instead, children belong to larger clusters of digital play situated within larger preschool systems, through which children navigate and take on distinct roles. In subsequent ethnographic case studies of twelve 2–6-year-olds in England, Scotland, Greece, and Northern Ireland in preschool and at home, Arnott et al. (2019) consider even larger ecologies to find that there is a "digital disconnect": preschools fail to keep up with technological development and force the new media technologies into narrow educational frameworks, positioning the child in a more transmissive model of learning rather than an exploratory model of play. However, they note the following:

> For children, […] this disconnect was not problematic as they fluidly transitioned both across the entanglement of digital and non-digital play and across diverse socio–ecological contexts of home and [pre-school] settings. (Arnott et al., 2019, p. 406)

Thus, while Plowman and Stephen (2007) find that young children needed "guided participation" by teachers to interact meaningfully with computers in preschool in the 2000s, in the digital play research, children maneuver ecologies and cultural norms to engage in creative, complex play with their friends, in the sense that they draw on multiple framings and resources. However, digital play does not magically occur the moment a device ends up in a child's lap. Through video and field notes from an ethnographic case study of 27 Australian 4–5-year-olds in preschool, Bird and Edwards develop the Digital Play Framework to account for how young children come to creatively play with new media technologies in preschool: first, young children explore the device or software to learn about its affordances, and second, they use those affordances to engage in inspired creative play. The object of activity changes from digital technology as a tool to the play itself (Bird & S. Edwards, 2014; S. Edwards & Bird, 2017). Similarly, Fleer (2017, 2018), through an extensive video ethnography of 103 Australian 3–5-year-olds and 16 teachers in preschool, finds that new media technologies create new conditions for play as they are introduced, giving way to new layers of complexity

to traditional play. It follows that digital play positions the young child using the technology in a more agentive position than before. Flewitt et al., for example, performed interviews with teachers and observations in three classes across nursery, preschool, and primary school over two months in England, arguing the following:

> Digital technologies have a role to play in developing children's identity as effective learners in the classroom, through their potential to offer not only stimulating and varied pathways into literacy but also "figured worlds" (Holland et al., 1998) that are empowering for young learners in mainstream and special education. (2015, p. 305)

The historical condition of how new media technologies more suited to children's abilities, needs, and motivations are introduced is central to how children's senses of self-determinacy and independence are allowed to play out. Furthermore, Wohlwend (2015) highlights how the multitouch features of computer tablets afford young children's collaborative play.

More recently, a set of studies have further built on the digital play research literature from the mid to late 2010s. Samuelsson et al. (2022) compare play with iPads and with other artifacts through an analysis of 98 play activities among 2- and 4–5-year-olds in two Swedish preschool settings and, nuancing previous findings, find that digital play is less characterized by ludic play. Burke et al. (2023) adopt a-day-in-the-life methodology among three Canadian families with young children, finding that young children's digital play afforded resilience for families during the pandemic, despite the tensions parents experienced regarding perceived excessive screen time. Kumpulainen et al. (2020) also adopt the a-day-in-the-life methodology among two Finnish families with 2-year-olds, showing that digital play is intertwined in families' everyday activities and affords creative, transformative practices while, at times, being constrained by parents enforcing regulation.

However, although these studies largely show how young children's use of new media technologies enriches play and represents new, relevant digital literacies, the concept—digital play—remains ambiguous. In a complex research design in the UK (surveys, multimodal app analysis, ethnography from young children's homes, and video ethnography of young children's use of a selection of apps), Marsh et al. (2016) deploy and adapt an existing taxonomy of play, finding that new media technologies by and large do not change the types of play afforded to young children but instead change how those types of play are enacted. Similarly, Fleer (2017, 2018) finds that, although new media technologies do change the nature and forms of the practices, they are unmistakably still a form of play. Still, there are tensions. In the study cited above, Marsh et al., for example, state the following:

> The findings of this study provide a counterpoint to those who seek to dichotomise digital and non-digital play, suggesting that play with digital technologies is not "real play." (2016, p. 250)

Considering the title of the article—"Digital play: A new classification"—there is tension. The concept—the classification—of digital play does seem to necessitate its opposite: the real, physical, or analog. Moreover, in play, this turns even more complex because play precisely presupposes an imaginary, virtual space separate from the real: the stick is a sword, as well as an actual stick. The tension of both arguing that children move beyond digital–

analog binaries in their play while still arguing for the concept of digital play is evident, for example, in the following quote:

> The themes of children's digital play are drawn from the children's everyday lives […] but, at the same time, children play in social and material situations where they draw upon their experiences of their digital worlds. (Fleer, 2016, p. 83)

In the excerpt, "digital play" is positioned as different from, and affected by, "everyday lives," and "social and material situations" are different from, and affected by, "digital worlds." While the studies cited do note porous boundaries, they frequently end up in similar dichotomizing situations. Creating a research space for the digital to be explored while also confronting the destabilized contemporary complexity and ambiguity of the digital produce deep tensions.

Thus, there are conceptual reasons for this ambiguity—"digital play" does point toward a somewhat bounded category consisting of some characteristics. There may also be empirical reasons for this ambiguity—what the digital refers to is oftentimes elusive, covering both devices and software that facilitate more bounded activities (e.g., the computer room) and devices and software that facilitate more fluid activities (e.g., Pokémon Go). Furthermore, in a field of rapid technological developments, using even 5-year-old data may miss the mark of what the digital is today. Finally, there are reasons for the ambiguity relating to modes of inquiry. Edwards (2022, p. 7) argues that research on young children's play should move "beyond discrete engagements" with digital devices to resolve this tension, mirroring calls for action by key researchers to study young children's engagements with new media technologies in "the wider context for play" (Marsh, 2019, p. 157), as well as comprehensive reviews of the field suggesting similar moves (Burnett, 2010; Kumpulainen & Gillen, 2020). There is an analytical inconsistency in arguing that the virtual and real are blurred while methodologically singling out young children's physical manipulation of new media technologies as a unit of analysis—what Levinson (2005, in Nicolini, 2009, p. 1396) calls "interactional reductionism." However, some empirical studies situated in sociocultural theorizing show how young children engage with imaginary technologies (Bird, 2018; Vogt & Hollenstein, 2021; Wohlwend, 2009), enact computer games in the playgrounds (Burn, 2013), play on-screen/off-screen hybrids by, for example, treating games as movies or soundtracks for dancing (Huh, 2017), or incorporating new media technologies in their socio–dramatic play (Given et al., 2016). Still, although digital play research frequently notes that children behave "as if" the digital and analog are one and the same, the researchers rarely do.

In sum, while digital play research has been crucial in, through thorough empirical and widely cited empirical research, finding, recognizing, and, in effect, institutionalizing digital play as an equal form of play, there is a need for new accounts, theorizing, conceptualizations, and modes of inquiry that move "beyond discrete engagements" (S. Edwards, 2022, p. 7) with digital devices in "the wider context for play" (Marsh, 2019, p. 157). In the following, I present sociomaterial approaches to literacy research, and, specifically, key studies on early childhood play with new media technologies, which I argue are apt in dealing with these issues.

2.2 Sociomaterial approaches to literacy

Sociomaterial theorizing—broadly covering thinking premised on relational onto–epistemologies (Section 3.1)—of literacy research attunes researchers to the messy

assembling of humans and nonhumans across larger ecologies and networks and how things, devices, and software can exert emergent agency. Sociomateriality has been suggested as apt to consider how (new) new media technologies operate in the literacies of contemporary early childhood play (S. Edwards, 2022; Marsh, 2017). However, before I show how these new understandings of the relationships between early childhood, play, literacy, and new media technologies give way to a radical "undoing" of "the digital" (Burnett & Merchant, 2020b), I account for the significant challenges sociomaterial theorizing poses to the broader field of literacy research and, in particular, the NLS tradition of literacy research—along with the new avenues of research it opens up.

From an actor–network theory (ANT) perspective (e.g., Latour, 2005), the NLS approach to literacy is put under scrutiny for its focus on events and local, situated practices. In a conceptual paper, Brandt and Clinton (2002) argue that the ideological model of literacy ascribe too much power to the individual and propose an understanding of literacy as an agentive technology, and, in that sense, "autonomous": literacy is socially constructed but also has "thing status," holding practices in place. Furthermore, they critique the emphasis of NLS on the literacy event: while events are critical as instantiations of literacy, they "cannot exhaust the meaning or actions of literacy" (p. 344). It follows that, when it comes to theorizing, conceptualizations, and modes of inquiry, larger ecologies outside of what is brought into action through the event need to be considered.

From a relational materialist perspective (e.g., Barad, 2007), Lenz-Taguchi and Hultmann (2010), in a conceptual paper with empirical illustrative examples, similarly ask the reader to reconsider the things of early childhood play. Illustrated by a photograph of a young child playing with sand, they ask if the sand cannot also be said to be playing with the child. The child emerges in a relational field where no entities preexist but are continuously becoming—the flow of play produces the two fluid "relata" (Barad, 2007, pp. 136–137) of sand and child. The displacement and unsettling of the subject—the authors, for example, propose that children are verbs rather than nouns—pose challenges to a field of research in which the autonomous, sovereign child only recently was recognized (Lee, 2001; Prout, 2005).

Still, while arguing for the porousness and fragility of the child subject may present itself as a reactionary position, in a conceptual paper with empirical illustrative examples, Rautio (2013) considers this an ethical–methodological challenge to attend to and care about the minutiae, things, and everyday practicalities of the lived lives of early childhoods. Grounded in the theory of vibrant matter (Bennett, 2010), she argues, for example, that the phenomenon of carrying stones in their pockets does not need to go through language or meaning making to make sense for children. Decentering how children interpret this activity, researchers can explore the feeling of the weight of the stones, how the pretty stones appear to pull children toward them, and how affects move participants in unpredictable directions. She further considers the "aesthetic–affective openness" (Bennett, 2010, p. 11) of young children to let themselves be moved in their encounters with stones, rather than being intentional designers. Hackett and Rautio (2019), through ethnographic research in early childhood educational settings in Finland and the UK, propose the term "answering the world" to account for how young children relate to their natural surroundings while rolling down hills and running around trees. Although NLS research certainly argues that literacies do not reside in individuals, sociomaterial theorizing of literacy research makes a more radical proposition by arguing for "more-than-human" literacies (Hackett, 2021), in which even meaning making is decentered. In young children's playful literacies, they are not only constructing clear

narratives ripe for interpretation, but they are also engaging in "free-wheeling nonsense" (Wohlwend et al., 2017, p. 447).

Further exploring nonrepresentational dimensions of human experience, Leander and Boldt (2013) are critical of the notion of design from the multiliteracies framework (The New London Group, 1996)—illustrated and argued for through ethnographic accounts of two 10-year-olds engaging with Japanese graphic novels. They argue that activity, rather than moving toward a "textual end point" (Leander & Boldt, 2013, p. 22), is moving and unfolding dynamically moment by moment, and the body, rather than fixed and a system of signs, is the unreliable site of intersecting and indeterminate flows. It follows that—in an interesting contrast with Brandt and Clinton (2002), who argue against the predominance of the literacy event in NLS research—Leander and Boldt (2013) are critical toward recurrent, stabilized practices as transcendent structures, emphasizing emergent and singular literacy events in which bodies, things, ideas, texts, and so on assemble, reassemble, and disassemble contingently. There is a tendency within sociomaterial theorizing of literacy to emphasize the event and argue that literacy is enacted as the event (Burnett & Merchant, 2020a) or through the event (Ehret, 2019), without necessarily making the analytical leap to broader, recurrent, and transcendent practices. Furthermore, the felt and affective dimensions of the event are emphasized (Ehret & Leander, 2019). Ehret (2018) empirically explores the daily life of a young, hospitalized cancer patient and how traditional literacy practices of, for example, scrapbooking or the field notes of a self-conscious researcher, register as alien to the lived, felt reality he witnessed and in which he took part. Lenters (2016) empirically explores a young boy taking pleasure in overwriting textbooks with drawings from out-of-school, online influences, enacting rich, affectively charged literacy events that appear to go unnoticed in the classroom.

In sum, there is a rich tradition of sociomateriality contributing to literacy research by attuning researchers to larger networks and ecologies behind and beyond the event, as well as the immanent contingency of the event not reducible to the enactment and remixing of transcendent practices. Sociomaterial theorizing brings to the fore the things of everyday literacies and how they are emergent active agents in felt moments of literacy. Furthermore, sociomaterial theorizing radically reconfigures conceptions of literacy as a phenomenon not only socially constructed but emerging through an interplay of human and nonhuman emergent agency. Although literacy is tightly bound to the representational activities of narratives, identities, and meaning, sociomateriality attunes researchers to the broader ecologies of which literacies are one part and how flows of affect move not only via discursive patterns, but also how such patterns are inherently entangled with local, contingent emergence. Still, the subfield as a whole tends to lean toward conceptual and theoretical contributions, which are less empirically explored than illustrated through ethnographic excerpts.

2.2.1 Key studies of early childhood play with new media technologies

Considering the tensions, paradoxes, and blind spots of the digital play research—which has been accounted for in Section 2.1.1—sociomateriality can provide apt theorizing and has indeed been central to new accounts and conceptualizations of how new media technologies operate in the literacies of contemporary early childhood play (Burnett & Merchant, 2020b; S. Edwards, 2022; Marsh, 2019). There is a burgeoning conversation within sociomaterial approaches to literacy—based on theoretical propositions and empirical accounts—about how literacies are entangled with the ways new media technologies operate

today. A core claim in the extant research concerns how the contemporary condition has changed. Burnett and Merchant, for example, state that "a simple view of the digital masks some of the complexities of new technology and communication and how it operates in the current milieu" (2020b, p. 11). Based on their extensive empirical fieldwork, the authors argue for a larger reconceptualization of the digital—"undoing the digital"—in which agency and meaning making is distributed across digital technologies and humans. Leander and Burris (2020) and Robinson (2023), through conceptual papers illustrated by cases, argue that the relationship between digital technologies and humans in literacies needs to be reexamined as AI enters commonplace literacy practices in and out of educational institutions. Kumpulainen (2022), in a conceptual paper, argues that the relationship between nature and humans in the digital age is transformed but not necessarily, as many critics claim, in terms of a weakening. Robinson (2022) finds, through ethnographic research of young people's use of Discord at a video game design summer camp, that, after platform capitalism, there are significant economic dimensions of writing online, which prompts a turn to move behind and beyond platforms to study literacies enacted.

Turning to early childhood, Marsh (2017) finds, through ethnographic case studies of six young children in families supported by survey data, that, as young children use playthings connected to the internet, there is a constant flow produced between assumed analog and digital domains, and because material configurations are arranged differently, the felt agentic reach of either the toy or child plays out differently. However, although the use of state-of-the-art technologies like AI, the Internet of Toys, and Discord are certainly worthwhile topics of interest for literacy researchers, the novelty of the contemporary condition also makes itself felt and known through the mundanity of traditional playthings like Hot Wheels or the low-tech enterprise of *Subway Surfers*. Through ethnographic interviews with child participants, Marsh (2019) finds that Hot Wheels is not reducible to toy cars in the children's bedrooms but spread out across broader online–offline ecologies, enabling the children to take up this activity seemingly anytime, anywhere. In their ethnographic case studies of a young child playing *Subway Surfers* on a tablet and two young children using a tablet while roleplaying, Lundtofte et al. (2019) find that the tablet is positioned differently in relation to the child along a spectrum of absorbent and utensilent practices. This conceptual pair refers respectively to how the children yield their agency in favor of a larger system or use the tablet as a prop according to extraneous goals. A central theme emerging from this subfield of research is the increasingly complex relationship between new media technologies and humans and critically interrogating agency as it is enacted through these relationships.

Other studies explore the contemporary spatialities of the digital as they are enacted through early childhood play. However, they are often conceptual papers illustrated by empirical examples. For example, in an analytic essay, Abrams et al. (2017) argue that, although the situated instantiations of literacy should remain the focus of attention, literacy researchers should attune to global and local flows across the virtual and actual, the immaterial and material, producing young children's "playscapes," that transcend immobile and rigid understandings of space. Apperley et al. (2016), in a conceptual paper illustrated by relevant cases, argue that the mobility of new media technologies (e.g., *Pokémon Go*), and the "recruitment" of new materials while interacting with apps and screens (e.g., *Osmo*) unsettles virtual–real binaries and afford postdigital literacies that are characterized by an emergent "sensibility of risk-taking and experimenting" (p. 213). Stevenson (2020), in a conceptual paper, conceptualize young children's contemporary play as a posthuman "possibility space,"

where the digital–analog binary is interrogated. Burnett et al. (2014) similarly argue, through their empirical exploration of a group of children using Google Maps, that new analytic approaches to consider the spatial configurations, mediation, things, and embodiment of the event are needed to account for contemporary literacy practices with digital texts. Through the practical "threads and traces" that connect such events to other spaces, temporalities, layers of things, and bodies, the assumed dichotomy of virtual and actual, according to the authors, is unsettled. Focusing on adolescents on the internet, Leander and McKim, in a conceptual–methodological paper in 2003, argue that online and offline are performative spaces brought about through "sitings" rather than a priori spaces.

A set of small-scale case studies empirically explore the contemporary spatialities of the digital as they are enacted through early childhood play. Gillen and Kucirkova (2018) find that the use of specific digital technologies in a British preschool class contributed to facilitating knowledge flows and connections between home and preschool, producing "percolating" spaces. Flewitt and Clark (2020) find that two young children connect with grandparents through video calls at home in the UK, producing "porous" boundaries between spaces. Kervin et al. (2017) find that the spatial configurations of an Australian early years classroom as interactive whiteboards and computers take part affect young children's movement. In an autoethnographic study, Dezuanni (2020) argues that, in his family with a 4- and 7-year-old, Minecraft is thoroughly entangled with their everyday and proposes "worldness" to account for the porous, percolating boundaries of being online and offline; resonating with the thinking of extant sociomaterial early literacy research cited above, he concludes the following:

> For our family, Minecraft worldness has been a significance [sic] presence in our lives for several years and the boundaries between Minecraft the online game experience, and Minecraft as a presence in our "offline" lives is negligible. For us, Minecraft play is just commonplace, and entails all the ups and downs of everyday living and learning in a busy family home. (p. 375)

Similar themes are present in literacy research grounded in sociomaterial approaches on new media technology and play among older children between the ages of 8 and 12. Bailey (2016), for example, demonstrates how a group of 10–11-year-olds in a school-based Minecraft Club respond to in-game events by singing, which further affects the further trajectory of in-game and in-room events. Thus, singing can be said to occur in a hybrid virtual–actual space. Hollett and Ehret (2014) demonstrate how 12-year-olds' on-screen composing with mobile devices are embodied and felt experiences. Giddings (2014) accounts for the "gameworlds" of his two sons, in which the threads of video games weave through their everyday play. Furthermore, studies demonstrate the felt atmospheres of young people's play with new media technologies (Abrams, 2017; Hollett & Ehret, 2015) and how children engaging with new media technologies enjoy the disruptive qualities of playing "in the margins" through song (Bailey, 2016) and drawing (Lenters, 2016). However, the applicability of these findings to early childhood play is undecided because young children's access and use of new media technologies is typically more limited and parentally mediated compared with older children (Chaudron et al., 2018; Livingstone et al., 2017).

In sum, new sociomaterial approaches to literacy research on early childhood contemporary play with new media technologies consider larger ecologies and literacy as "organized less around the interface as a determined object and more around practices of

interfacing that involve increasingly undetermined and diverse sets of bodies, sensations, devices and materials" (Apperley et al., 2016, p. 215). New avenues of research emerge from this series of propositions and accounts, which are still less empirically investigated than theoretically argued and posited.

2.3 Establishing a research agenda

Following the distinction proposed by Lankshear and Knobel (2011), as the ontology of young children's relationships with new media technologies changes, new paradigms of accounts, theorizing, conceptualizations, and modes of inquiry need to attend to these changes. Today, new media technologies are thoroughly interwoven with social life, and there have been calls for action to consider how young children's play moves "beyond discrete engagements" (S. Edwards, 2022, p. 7) with digital devices in "the wider context for play" (Marsh, 2019, p. 157). As evidenced in the studies accounted for above, sociomaterial theorizing is suggested as apt for exploring the literacies of early childhood contemporary play with new media technologies (Burnett & Merchant, 2020b; S. Edwards, 2022; Marsh, 2017).

Sociomaterial theorizing of literacy is a rapidly growing subfield of research but is still emerging and has yet to develop a solid basis when it comes to theorizing, conceptualizations, and modes of inquiry. The theoretical umbrella is wide, covering, for example, agential realism (Barad, 2007), ANT (Latour, 2005), and nonrepresentational affect thinking (Deleuze, 1988; Deleuze & Guattari, 1987). The research in this tradition finds that traditional literacy metaphors, such as mediation, tools, discourse, and design, are in and of themselves insufficient to account for the contemporary relationships between literacy, new media technologies, and young children's play. The spatialities of the digital are oftentimes "porous" (Flewitt & Clark, 2020) and "percolating" (Gillen & Kucirkova, 2018), covering broader swathes and dimensions of space than the device and child, and agency is distributed unevenly depending on the specific material configurations (Lundtofte et al., 2019; Marsh, 2017). The analog–digital binary is productively interrogated (Abrams et al., 2017; Apperley et al., 2016; Burnett et al., 2014; Burnett & Merchant, 2020b; Leander & McKim, 2003; Marsh, 2019). However, empirical accounts are scattered. Furthermore, considering the new posited conditions for play, the conceptual landscape of the literacies of early childhood contemporary play with new media technologies is characterized by tensions and ambiguities. In sum, there is a need for further work in producing new accounts, theorizing, conceptualizations, and modes of inquiry regarding how new literacies emerge as new media technologies are brought together through and across moments of young children's contemporary play.

Finally, there is a relative lack of research taking place in Nordic countries.[2] The Nordic countries provide interesting conditions to explore the literacies of young children's play with new media technologies. Traditionally, parenting and educational ideals of self-directed exploration and play, as well as a strong welfare state, have been characteristic of Nordic childhoods (Kumpulainen et al., 2022). Young Norwegian children also have high access to new media technologies (The Norwegian Media Authority, 2023).

[2] However, for recent examples in and adjacent to the two subfields of literacy research, see, e.g., Aarsand and Sørensen (2021), Aronsson and Ågren (2022), Danby et al. (2018), Kumpulainen et al. (2020), Lundtofte et al. (2019), Samuelsson et al. (2022), and several contributions in the edited volume *Nordic Childhoods in the Digital Age* (Kumpulainen et al., 2022).

3 Theoretical foundation and key concepts

The theoretical foundation of my inquiry is sociomateriality. As explained above, sociomateriality is multiple. In the studies, I ground my thinking in the grand theories of agential realism (Barad, 2007) (Article I), nonrepresentational affect theorizing (Deleuze, 1988; Deleuze & Guattari, 1987) (Article II), and the middle-range theory of sociomaterial affect theorizing of early childhood play and literacy (Hackett, 2021) (Article III). The bases of sociomateriality, regardless of these suborientations, are relational onto–epistemologies, which are elaborated upon in Section 3.1. Across a common core, sociomateriality is abounded with concepts and neologisms. In Section 3.2, I account for how the theorizing and the concepts relate to my inquiry, how the concepts differ across the studies, and how each concept relates to the others. In Section 3.3, I account for the concept of the postdigital and its relation to my inquiry.

3.1 The relational onto–epistemological foundation of sociomateriality

The traditional realist metaphor of science is that of the clock (Hollis, 2012). In this metaphor, the display of the clock is read through sensory impressions, while the human mind exposes the mechanical clockwork behind it. Social constructivist—antirealist—theorizing, on the other hand, claims that inferences can only be made based on human partial access to the display of the clock (Ladyman, 2002). Still, in this take, realism and antirealism share a preoccupation with epistemological dimensions (how can knowledge be accessed) rather than ontological dimensions (what exists). The common core of epistemological realists and antirealists, it follows, tends to be dualist (knowledge is separate from reality) and anthropocentric (how can humans access knowledge). Bryant (2011) states, "The very concept of reality is transformed into reality *for-us* or the manner in which we experience and represent the world" (p. 16).[3]

Sociomateriality, on the other hand, welcomes ontological questions and strives for nondualist and nonanthropocentric accounts. Critically, sociomateriality considers knowledge as performative rather than representational, meaning that knowledge does not occupy a space outside of activity but is thoroughly entangled with it (Barad, 2007; Haraway, 1991). Thus, knowledge practices and production are parts of a material arrangement, occupying the same plane as, for example, chairs and cups. This is known as a philosophy of immanence (Deleuze & Guattari, 1987) or onto–epistemology (Barad, 2007). In contrast, consider the widely held assumption that human observation, knowing, and meaning making reside at another layer of existence than ontological materiality—what critical realists refer to as the domain of the empirical and the domain of the real, respectively (Danermark et al., 2002). Following this assumption, the world is brute and mute, awaiting representation from active and dynamic humans and language.[4] The onto–epistemology of sociomateriality, on the other hand, is relational (Barad, 2007) and becoming (Deleuze & Guattari, 1987). Relational and becoming onto–epistemology departs from relations rather than from entities. Traditionally, inquiries depart from an entity, for example, a child, to trace its relationships as it moves through the world, with an iPad, a parent, or a friend. Following a relational onto–epistemology, inquiry departs from a relation, for example, the event of a child attending preschool and playing with

[3] This paragraph mirrors a sequence of thinking I made for a paper in a Ph.D. course on the philosophy of science (UV9002, University of Oslo, Spring 2021).

[4] This is a simplified version of this position. It is often further posited that human meaning making practices also become matters of fact that feed back into human meaning making (Danermark et al., 2002; Hacking, 2000).

Legos alongside their friends, and map what entities emerge from these encounters—for example, the "Lego crew" or the "Lego-obsessed child." Furthermore, as these relations are inquired into, relations are not simply represented from the outside—material inquiry is a part of the performative action of bringing something new into existence (Barad, 2007; Deleuze & Guattari, 1987; Haraway, 1991). Thus, there is an ethical question entangled with inquiry concerning what types of assemblages are formed: we are responsible for what is brought into existence. Therefore, Barad amends ethics to onto–epistemology: an ethico–onto–epistemology (Section 4.5).

3.2 Sociomaterial conceptualizing

The two grand theories of sociomateriality tapped into for my inquiry are the nonrepresentational affect theorizing of Deleuze and Guattari (Deleuze, 1988; Deleuze & Guattari, 1987) and the agential realism of Barad (2007). There have been scholarly debates about the commensurability of these two approaches. Hein (2016), for example, claims they are incommensurable. Murris and Bozalek (2019), on the other hand, claim that they are both underpinned by relational onto–epistemologies, further positing that relational onto–epistemologies precisely precludes Hein's negative critique. Hein's critique is negative because it concerns itself with negative difference, meaning how one self-contained set of theorizing is different from another self-contained set of theorizing. Contrasted with this is a positive critique concerned with positive difference, meaning how each set of theorizing is multiple and carries the difference within. A positive critique does not construe one theory as lacking compared with another theory but puts them in contact with each other and inquires into what happens as they meet (see Latour, 2004). The stance of my inquiry is closer to the one of Murris and Bozalek—that is, Baradian and Deleuzo–Guattarian theorizing and conceptualizing are commensurable in the sense that they are underpinned by relational onto–epistemologies and in the sense that they are productive conversational partners. Still, concepts matter, and their histories, connotations, and connections should be accounted for to support the reader through scholarly arguments, which is what I aim to do in the following.

Intra-action is a central agential realist term (Barad, 2007), which figures centrally in Article I, where I claim to be doing an intra-action analysis, that is, a reworking of Jordan and Henderson's (1995) interaction analysis (see also Ehret et al., 2016). Barad explicitly discusses intra-action in relation to interaction. While interaction refers to the encounter between two entities, intra-action refers to the *performance* and becoming of entities as grounded in relations rather than entities. As explained above, performance is central to relational onto–epistemology, as opposed to representational theorizing. To signal the different traditions, I use *enactment* in Articles II and III, but enactment and performance refer to the same dynamics in my studies. Departing away from Butler's (1990) poststructural theorizing of human performance of gender, performance, in Barad's view, does not denote actions exclusive to humans—nor does enactment. Rather, performances and enactments are realized through, in the case of Barad, *configurations*, and in the case of Deleuze and Guattari, *assemblages*, which are, using posthuman terminology, more-than-human: not only do they include both the nonhuman and the human, they are relational and not settled, meaning that, for example, the categories of human and nonhuman are fluid and contingent. In Article III, *answering the world* (Hackett & Rautio, 2019), a middle-range theory of the literacies of young children's play refers to this more-than-human entanglement. Considering young children running around trees and rolling down hills, the authors argue that neither the child, nor the hill, nor the tree are ontologically prior. Instead, the activity, event, and

relationship of rolling and running are primary—and the specific sociomaterial configurations of the child, tree, and hill emerge (or not) as results of rolling and running. The children may experience rolling down a hill not as something they do to the hill but as something they do together with the hill in symbiosis. However, as the teacher plots the child's gross motor skills in charts, they assess the child as sovereign, as if, for example, the slope of the hill had little to do with the rolling.

From here, Deleuzo–Guattarian and Baradian theorizing and conceptualizing divert. Specific for Deleuze and Guattari (Deleuze, 1988; Deleuze & Guattari, 1987) and their mediary Massumi (1995) is the notion of *affect*, which refers to the production of flows through assemblages (see also Gregg & Siegworth, 2010). Affects include atmospheres, vibes, and feelings but also exceed them. Affective flows do not readily translate into language and are indeterminate—*some*thing—but as it coalesces into territories and gains meaning and stability, it becomes recognizable as some*thing* bounded and knowable (Ehret, 2018). However, there is always an overflow of affect, and if allowed to do so, it carries with it the potential to deterritorialize and introduce fissures and openings toward new becomings. In Article II, *refrain* is a key concept referring to the felt organizing forces of social life. Deleuze and Guattari (1987) use the illustration of a child singing a familiar song walking through a scary forest. Through singing, a set point is contingently fixed in chaos, providing a recognizable rhythm to follow and calm the child. Still, as part of a larger more-than-human assemblage—not merely the result of human ingenuity and playing together with the sounds of the forest or the echoes made as sound waves hit mountains—the refrain is fragile and can veer off into new avenues. Deleuze and Guattari tried to make the refrain "one of their main concepts" (Deleuze, 1997, p. 137). Today, the refrain remains lesser known than other concepts of Deleuze and Guattari. However, this effort points to how the two authors, primarily known for theories of emergence, becoming, lines of flight, and affective excess, also account for the consolidation of affect and how specific assemblages gain contingent stability—which has benefits to Deleuzo–Guattarian studies of power, identity, agency, and humanist ethics (Kleinherenbrink, 2015).

In agential realism, a central concern is the interfacing and bounding of entities—what Deleuze and Guattari would refer to as territorialization. Barad (2007) explicitly engages with the dynamics and makings of agency, claiming that it is through the *agential cuts* of intra-action that entities gain agency. Famously, Foucault, to whom Barad is intellectually indebted, states that "knowledge is not made for understanding; it is made for cutting" (1984, p. 88). It is in a similar, albeit more ontological, way that Barad deploys the metaphor of agential cuts. Through knowledge practices and production, things gain edges and borders and become substantialized (cf. the negative difference referred to above). Still, while agency is unevenly distributed, it is not per se attributable to a priori entities: agency refers to the "ongoing reconfiguring of the world" (Barad, 2007, p. 139) and coalesces in specific configurations, which then produce entities.

My intention with the two paragraphs above is not to compare and contrast Deleuzo–Guattarian ideas of affect and refrain with agential realist ideas of agency and agential cuts but rather to demonstrate how they speak and act differently in relation to phenomena.[5] The example above of children rolling down hills and running around trees (Hackett & Rautio, 2019) may be illustrative. According to the authors, rolling down hills "evolved over a series of summer months" (p. 1025) and "gained its meaning from its repetition and increasing

[5] In Article III, I employ Barad to discuss affect and highlight the resonances between the two.

popularity with the children in the daycare" (p. 1026). According to Deleuzo–Guattarian theorizing, what is happening is the formation of refrains, becoming expressive and recognizable to, even felt by, the observers and children. Still, the activity "involves an opening up to the world, which begins with an acknowledgment of difference and alterity. To open up, to reach out and touch, is to take a risk, yet at the same time, is essential to the ongoingness of living in the world" (p. 1026). There is a tension between the refrain, which is stabilizing through "repetition and increasing popularity," and the activity, which precisely is about accepting unpredictability—the children "answering" the hill. However, the potential to veer off is, according to Deleuze and Guattari, inherent to the refrain, and this potentiality is maybe the reason the children keep enjoying and drawing pleasure from the activity. The singular and contingent is not the other to the refrain but carried within. This point is developed in Article II and made relevant to the study of contemporary early childhood play with new media technologies.

Grounding my thinking in agential realism, other dimensions are brought to the fore. For example, what types of agential cuts are made as young children's gross motor skills while running around trees are assessed by teachers? What about the cameras placed on the young children's chests by the researchers? These questions may resemble familiar epistemological and methodological questions of qualitative research concerning the subjective gaze of the researcher (Clifford & Marcus, 2010) or how the knowledge derived from observation is theory laden (Hanson, 1958). However, attuned to relational onto–epistemologies, the scene does not consist of matters of fact interpreted through the lens of the solitary meaning making of the researcher. Instead, the scene is constituted by a larger apparatus of hills, charts, video cameras, field notes, books, and so on—in which a "normally developing child," a "children's perspective," and so on are brought into being, not only as ways of seeing the world, but as specific material arrangements.

In sum, sociomaterial theorizing is abounded with concepts. For this section, I have discussed intra-action, performance, enactment, configuration, assemblage, affect, refrain, and agential cuts, which are featured throughout my articles. The concepts all reflect a relational onto–epistemology. However, they are situated in different theoretical traditions, and, put to work, attune researchers to distinctive features of inquiry.

3.3 Postdigital

Although not a sociomaterial concept as such, within studies of early childhood, literacy, and learning, the postdigital has primarily been theorized as sociomaterial (S. Edwards, 2022), and theories of heterogeneity, including sociomateriality, are well aligned with postdigital thinking (Macgilchrist, 2021). Still, the history and present life of the concept are multiple, and it does not have a stable theoretical foundation, nor a precise definition:

> The postdigital is hard to define; messy; unpredictable; digital and analog; technological and non-technological; biological and informational. The postdigital is both a rupture in our existing theories and their continuation. However, such messiness seems to be inherent to the contemporary human condition. (Jandrić et al., 2018)

This eclecticism is a key characteristic of the current state of postdigital research (Jandrić et al., 2022). The postdigital has been key to my inquiry, but it has also—in and of itself—been a site of exploration. In the following prelude, I narrate my engagement with the

concept as it became salient during my fieldwork, working on the articles for the thesis, reading the literature, and engaging with scholars. This narrative also touches on my engagement with sociomaterial theorizing, which has been interwoven with my conceptual development of the postdigital. The narrative format is chosen because I aim to highlight the material arrangements of which theory is a part, rather than as a transcendental set of disembodied ideas (Section 4.5).

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When I started my ethnographic fieldwork—first in preschool, then in young children's homes (Section 4.1)—my preliminary research interests were stated in my research proposal as how children use and play with digital tools in preschool and at home. Digital devices were an important case selection criterion, and in the time preceding my fieldwork, I worried about how I would naturally observe play with digital devices without too much intervention on my part. Accordingly, I chose a preschool with a tradition of facilitating play with digital devices and with teachers displaying an interest in the topic. Complicating matters even further, my first months in the preschool were especially tinted by regulations because of the pandemic, meaning that a lot of time was spent outside where digital devices typically were absent. It was frustrating to walk around the playground and forest patch where they played, looking for the digital, however it might manifest. In an early field note, I complain, stating the following:

> Many things happening at once, hard to focus on one thing, especially when I do not really know what I am looking for. (Field notes, May 26, 2020)

This suggests a feeling of uneasiness about my object of study. At the time, I was most familiar with sociocultural approaches, which were the theorizing in which I situated my research proposal—as reflected in my use of tools as a central concept. While tools in the sociocultural tradition refer to both semiotic tools and artifacts, digital tools typically refer to digital devices or software on a digital device. There were some instances of teachers playing music from their phones, showing videos on iPads, and using digital microscopes with the children. However, digital devices and software proved hard to find in the outdoors preschool during the pandemic. Still, even with a lack of devices, the digital seeped through the children's creative play. For example, in the following excerpt from a book chapter not included in the present dissertation, the coauthors and I account for a play event I observed and in which I participated from the first few months in the preschool. Two children, Yahtzee and Captain, play a game, hidden behind a boulder in a forest:

> In the game, a person controls the children and makes them do different manoeuvres, like jump, pick up things, or walk. […] Yahtzee […] asks me to be the controller of himself and Captain […]. […] They ask me to get them to scrape moss off a boulder and put the moss down on a nearby slope of land […] by extending my index finger and swiping and touching things in their surroundings. They also ask me to get them to jump over tree branches by swiping my extended index finger upwards in a quick motion. (Pettersen et al., 2022, p. 182)

Aside from digital play, which was discussed in Section 2.1.1, this resonates with transmedia play—another strand of research that is broadly situated within a sociocultural paradigm and that refers to how children incorporate narratives, aesthetics, or other elements from popular media, across platforms, as tools to mediate their play (Alper & Herr-Stephenson, 2013). Transmedia play is grounded in the contemporary condition of cultural content being distributed across platforms, media, and artifacts (Jenkins, 2006) and considers how this condition contributes to children's play with novel resources for interaction, identity construction, and so on. For example, I noted and photographed the many hats of the children depicting elements from transmedia franchises such as *The Lego Movie*, *Ninjago*, *Super Mario*, and *Cars*. The hats were then often used in roleplay to denote the character they enacted—and appeared to give the person wearing them a certain flair. Consistent with other studies, transmedia culture influenced and provided resources for the children's play. Wohlwend (2012), for example, finds that two boys use the storylines of the Disney Princess discourse to negotiate gendered identities. Transmedia play points to a messiness of contemporary play ecologies because researchers would need in-depth knowledge about, for example, Disney Princesses to make sense of young children's seemingly local play events:

> This means that even a play interaction with an individual product cannot be analysed as an isolated act of consumption, but must be situated in its current sociocultural context and also investigated for its connections to market histories and trajectories across diverse products in a global network. (Wohlwend, 2012, p. 595)

To account for these histories and trajectories of transmedia play, play is theorized as being located in the intersections of many narratives, identities, materials, bodies, and so on, converging across multiple sites of engagements. Transmedia culture is a structural condition, providing children with many—often conflicting—discourses that are ripe for playful identity forging and narrative making. Thus, agency is enacted by creatively navigating and negotiating these discourses, sometimes subverting expectations but other times reinforcing them.

However, these accounts did not always resonate with what it felt like spending time with the children of my fieldwork. In the excerpt above, for example, two children enact a makeshift video game behind a boulder—not just narratives but including features like swiping and tapping. At a playdate I observed, two young children stand eagerly in front of the TV to decide on what videos to watch as they are fed video recommendations from the YouTube algorithm with intriguing thumbnails. While visibly annoyed with the targeted commercials on YouTube, the two children also know the words and incorporate them into playful word gymnastics. In the forest, I noted how playing with a device also includes a range of other activities in the vicinity:

> Many of the children were doing things simultaneously as the [digital] microscope activity, for example, Klara who was gathering sand, pouring it from one hand to the other, and one of the educators and Butterfly were semi-arguing over a stick with a thread attached. (Field notes, May 25, 2020)

Geertz talks of the field in fieldwork as "a powerful disciplinary force: assertive, demanding, even coercive" (1995, in Flyvbjerg, 2006, p. 235). Through these episodes, I considered and felt how the children took immense pleasure in adding gameplay laminations

to their play; how the digital intervened with a force through advertisements and recommendations; how the digital devices would move imperceptibly from foreground to background; how play dynamically would include not only commercially licensed available playthings, but also random items that would eclectically be thrown into the mix, creating unpredictable moments of joyous, cacophonic discord.

At the end of Wohlwend's (2012, p. 608) study, she considers the future directions of research and asks: "How many more layers might be at work in these playful and productive moments of negotiation around popular media?" Driven by a similar curiosity, I consulted the literature, analyzed theory, and visited the children in their homes and preschool. There (i.e., in the books, on the playground, reading .pdfs), I would explore how the materialities involved in these encounters extended beyond human utilizing of (digital) tools or discourse; how notions of culture, identity, narrative, and discourse tended to obscure the affective and nonsensical experience of engaging with new media technologies; and how the binary of digital–analog would crack and bleed upon closer inspection. In short, there was a turn from understanding young children's play with new media technologies as sociocultural to sociomaterial. Some scholars have suggested that sociocultural theorizing of young children engaging with new media technologies is aligned and complementary with sociomaterial theorizing (Kontopodis & Kumpulainen, 2020) while other studies point to deeper tensions and contradictions between, arguing that they are apt to attend to different phenomena (Wohlwend et al., 2017; Wohlwend & Thiel, 2019). The argument of the present dissertation is aligned with the latter: I argue that sociomaterial theorizing is especially apt to talk about the assumed digital as it is enacted today as young children's playscapes are radically transformed (Abrams et al., 2017; Apperley et al., 2016; Marsh, 2017). Sociomaterial theorizing has the potential to demonstrate the disruption of sedimented ways of dealing with the digital in young children's play. As a researcher fond of concepts and optimistic of their potential, I then searched for ways of conceptualizing the digital in novel ways, aligned with sociomaterial theorizing and with the ability to evoke the feeling of spending time with the children. This led to the concept of the postdigital.

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Concepts are not only representational but performative (Section 3.2). It follows that I am more interested in what the concept of the postdigital does and produces in my research project than what it is. Still, histories matter. The concept of the postdigital originated in art theory to denote aesthetics aiming to dissolve digital–analog boundaries and explore the glitches and displacements of smooth digital interfaces (Berry & Dieter, 2015). Today, art theory has moved away from the concept of the postdigital (Cramer & Jandrić, 2021), but it has been taken up in many other research fields as a provocation to unsettle previous models of human relationships with the digital. Within early literacy research, there is a brief history, and only a handful of studies and papers explicitly engage with the concept (Apperley et al., 2016; S. Edwards, 2022; Marsh, 2019; Marsh et al., 2019). However, even in the budding phase of the concept, critics argue that the distinction between digital and postdigital is artificial (Feenberg, 2019) and that the novelty of the condition is exaggerated (Levinson, 2019). Cramer is often cited for his statement that the postdigital is "a term that sucks but is useful" (Cramer, 2015, p. 13), meaning that the concept is often perceived as counter-intuitive because the trajectory of the socio–technological does not appear to move beyond the digital but instead toward even more mediatization, digitalization, and datafication.

In my inquiry, the postdigital refers to a contemporary condition that is argued to be experienced and felt qualitatively differently from periods before. Specifically, it concerns itself with the empirical phenomenon of new media technologies being thoroughly interwoven with contemporary social life. New media technologies are *ubiquitous* in the sense that they are all-pervasive. For example, AI is increasingly entangled with literacies as they imperceptibly nudge grammar, style, and spelling while writing (Leander & Burriss, 2020; Robinson, 2023), and the economic logics of platforms introduce new tensions as literacies are enacted through message boards like Discord (Robinson, 2022). The ubiquity of new media technologies implies that neither being in front of nor being away from the digital device has ontological primacy as real, prompting previously assumed fixed boundaries between the analog and digital to be read as increasingly blurred.

Furthermore, new media technologies today are *mundane* in the sense that digital technologies are already interwoven in the social fabric. It follows that human relationships with new media technologies increasingly turn, for example, from how they support or affect learning or literacies, to how complex ecologies, of which new media technologies are but one part, are navigated. When new media technologies are new, they are foregrounded and enact discrete agencies. For example, when novel AI technologies are introduced, attention typically turns to their inner mechanics and how they might affect established practices. As technologies grow older and mundane, such as the now familiar algorithms of social media, attention typically turns to how children might navigate, for example, the economics of YouTube recommendations, their father asking them to turn off the iPad after reading a sponsored Instagram post about screen time, and their older sibling annoying them by playing TikTok videos from an iPhone two feet away on the couch. New media technologies are often understood as isolated tools or considered to contain distinct features, but because they are enacted in the mundane everyday, across time and space, and increasingly familiar, they are not the only actor on the scene, backgrounded, and regarded with less reverence.

For me, encountering the concept of the postdigital did something, at that time and place, feeling aloft while trying to figure out how to discuss the eclectic mix of "bodies, blocks, and bytes" (Article II) in my fieldwork. However, the concept is also frustratingly open to interpretation, as argued in the introduction of this section. Taffel (2016) considers at least five ways "the trope of the postdigital" has been understood, arguing that the concept, or trope, of the postdigital assumes an idea of the digital—as discrete, separate, self-contained—that might be outmoded. It can be instructive to learn about its historical trajectory in art theory, where it is no longer considered a useful concept:

> [The postdigital] became obsolete in this process [of overcoming the systemic divide of digital–analog]. All the contemporary artistic tendencies that I closely follow […] mix art with other forms of work and knowledge, as well as online and offline activities […]. While it could thus be called "postdigital"—in the sense of transcending older divides between "contemporary art" and "digital art"—even the attribute "postdigital" doesn't make much sense any more since almost all art, except mainstream gallery and collector art, has become postdigital in that sense. (Cramer & Jandrić, 2021, p. 978)

Paradoxically, then, as we move further into the postdigital condition, the concept may become less useful. However, the concept of the postdigital may be valuable to unsettle prevalent modes of thinking in early childhood literacy research, which tends to depart from

versions of binary logics of the analog–digital, often failing to recognize how young children's play moves "beyond discrete engagements" (S. Edwards, 2022, p. 7) with digital devices in "the wider context for play" (Marsh, 2019, p. 157) (Section 2). Furthermore, the heated debates about screen time at home and in school are often based on crude dichotomies.

The trajectory of the concept of the postdigital throughout the three articles of my dissertation is further explicated in Section 6.2 and discussed in Section 7. Suffice to say for now, the concept of the postdigital became decreasingly foregrounded in my analytical work: theorized as emerging through the intra-actions of young children's play in Article I, as a condition for the young children's play in Article II, and not mentioned by name in Article III. In the extended abstract, the concept of the postdigital is not a theory attempting to explain a phenomenon but instead is a posited condition. Through a recognition of the ubiquity and mundanity of new media technologies in early childhoods, the questionable binaries of analog–digital are unsettled: they do not act in isolation but as emergent parts of grander relationships, networks, and ecologies. Furthermore, research should move beyond accounts of messy and entangled postdigital play practices to consider its implications for the development of pedagogies, methodologies, and conceptualizations (S. Edwards, 2022). Accordingly, through my articles, sociomaterial theorizing contributes with novel conceptualizations and modes of inquiry to account for the mundanity and ubiquity of early childhood play in the postdigital. Pedagogical implications are addressed in Section 6.4.

4 Modes of inquiry

The inquiries reported in the present dissertation are funded by the Department of Education at the University of Oslo. The present dissertation is an independent research project, with three individual studies coauthored with Professor Hans Christian Arnseth (University of Oslo), Professor Kenneth Silseth (University of Oslo), and Professor Christian Ehret (University of North Carolina), exploring how new literacies emerge as new media technologies are brought together through and across moments of young children's contemporary play. The studies, each accounted for in a separate article, depart from ethnographic fieldwork and microethnography at one preschool and three family homes, beginning May 2020 and ending November 2021. See Appendix 1 for the timeline of planning, data collection, and analysis. See Appendix 2 for a table of fieldwork overview. See Appendix 3 for a table of the research design for the inquiry.

4.1 Empirical setting and data collection

Fall 2019, I reached out to the municipality of a large Norwegian city, where a comprehensive survey mapping the use of digital technologies in its public preschools had recently been executed, following which most preschools had been visited and given presentations and workshops about the educational use of digital technologies. I asked the municipal staff responsible for these visits to recommend preschools located in diverse areas of the city where teachers were doing "something interesting" with new media technologies. They recommended one preschool, the general manager of which I contacted shortly after. I asked to come for a visit to account for my project and see if they would be interested in participating in my research project. The preschool is in a residential, family-friendly, multiethnic, and socio–economically diverse suburban area. It is close to the forest, with duplexes, townhouses, plenty of playgrounds, football fields, and small roads for bikes and walking with strollers. Norwegian preschools provide high-access (93.4% of all children between 1 and 6 years old attended preschool in 2022, Statistics Norway, 2023), affordable (around 300 USD a month, low-income families are typically additionally subsidized, The Norwegian Directorate for Education and Training, 2023) care and education with a distinct Nordic social–pedagogical tradition manifesting in self-directed outdoor play (Sandseter & Lysklett, 2017) and comparatively fewer adult-led activities. The preschool in question houses around 60 children between 1 and 6 years old, separated into five classes: two for younger children, and three for older children. While the infrastructure of the preschool is not technologically advanced, two of the teachers have a particular passion for and expertise in the intersections of pedagogy and new media technologies, and they regularly arrange activities attending to the topic. I was invited, and after the meeting, they agreed to participate. It was decided that I would mostly be staying in three classes—Apple, Banana, and Orange—attended by older children between the ages of three and six years old, and would have relatively full access to the activities in these classes. Shortly after, I presented the research project at a parents' meeting and organized information sheets and consent forms to be distributed through preschool channels.

Because of the pandemic, my fieldwork was postponed from March to May 2020 and was first to take place in Apple—other classes pending, contingent on the trajectory of the pandemic (Fall 2020 I started visiting Orange). For the time being, because of contagion control measures, Apple spent most of their time outside at an off-site makeshift playground in the forest. In the beginning, I spent most of my time becoming familiar with the children and typical activities at the preschool. Moreover, as parents would arrive with and pick up

their children, I talked to them about what I had observed during the day, specifically as they related to new media technologies, to which the parents often would tell me related stories from home settings (see Appendix 4 for interview guide).

Two children—Yahtzee Champignon (Yahtzee) and Racer—quickly piqued my interest because they were constantly together, discussing gaming and YouTube videos, and playing out themes related to these any time they had the chance. For example, outside, they pretended that pinecones were Goombas (the brown, mushroom-like antagonists of the *Super Mario* franchise) and collected them enthusiastically in plastic buckets, performing impromptu playground video games. The teachers also facilitated Yahtzee and Racer's play with new media technologies in impressively creative ways. For example, one teacher attached printouts of *Super Mario* characters to Bee-Bots (programming robots) with tape, supporting the children's imaginative play. Although initially I had an interest in the children's use of digital tools—for example, educational sessions using a digital microscope—my aims and interests shifted slightly during my fieldwork to explore what role new media technologies—primarily *Super Mario* and *Minecraft*, through videos and games—played in the broader ecologies of their lives (see Section 3.3).

After some weeks, I reached out to Yahtzee and Racer's families, who, after being asked, expressed interest in arranging for me to make visits to their family homes. Because of the pandemic, the extent, design, and frequency of the visits varied, but I stayed connected with the parents throughout 2020 and 2021. Through Yahtzee, I also became acquainted with his friend, Professor Poopy Pants (Professor), who was attending the adjacent class, Orange. According to their parents, Yahtzee and Professor had been very close before the pandemic but, because they were in different friend bubbles, had slowly lost touch. Still, I would see them talk over the red and white ribbons separating the playground, discussing *Minecraft*, *Super Mario*, *Harry Potter*, and *FlippKlipp* (a Norwegian YouTube channel for children produced by the Norwegian Broadcasting Corporation, mostly about gaming) with intensity and vigor. After the summer of 2021, they resumed their normal contact. Accordingly, I asked Professor's parents to visit him at their house, to which they agreed. These three children ended up as the focal children of my research project. Another child, Captain Sabertooth (Captain), also features prominently in Article I and in a book chapter not included in this dissertation (Pettersen et al., 2022), but I did not consider him a focal child in the sense that I primarily followed the other children while in preschool and did not make home visits to his house. It follows that I know less about his out-of-school activities. See Appendix 5 for tabled descriptions of the focal children.

At preschool, I followed Yahtzee, Professor, Racer, and other children who engaged in play or conversations related to my research interests. Initially, I talked to the preschool teachers and asked about what activities were planned, to arrange for my video camera beforehand. However, as I became more adept with the video camera, I improvised more, and if something of interest happened, I quickly recorded after gaining assent. I was mostly around for 3–4 hours during each visit to the preschool and video recorded for 30–90 minutes. I spent the rest of the time taking notes, talking to, or playing with the children. Sometimes, I arranged interview settings at the preschool, where the children and I would engage in a popular activity (e.g., drawing or making puzzles) while I asked them questions about topics of interest to my research.

In the family homes of Yahtzee and Racer, I initially aimed to arrange play tours (Marsh, 2019) from the children to gain insights into their activities, particularly while watching YouTube or gaming. However, it proved to be challenging because they were so

deeply engrossed in watching or gaming and were disinclined to engage in what was deemed irrelevant conversations (see Lundtofte et al., 2019). Consulting with their parents, I learned that they often engaged in gaming activities with their elder siblings. After video recording these activities as a more passive observer, sometimes asking a question or two, this approach yielded richer interactions, including their movements, use of playthings, and verbal communication. Notably, the children were more forthcoming with information when they were not under direct, constant questioning. Oftentimes, however, as is particularly evident in Article II, the children would frequently shift activities between socio–dramatic play, construction play, eating, gaming, watching YouTube, and so on, and I would move with the children to whatever activity they had in mind, provided they assented to me following them. These modes were copied when they had friends visiting later in the fieldwork. Additionally, the children were video recorded conducting house tours, where they demonstrated their preferred activities and gave me access to their bedrooms. Sometimes, this was also done impromptu, with me asking randomly about things that caught my eye—for example, about a Christmas wish list on the fridge. A key difference between fieldwork at home and in preschool is the level of perceived intimacy. In preschool, I felt more comfortable walking around with my notebook or playing with the children than I did at home. At home, the video camera worked as a protective layer between the family and myself—it legitimized my presence in the house as "the researcher." Thus, to make the experience more relaxed for parents, children, and myself, I cut the time not video recording in home settings down to a minimum: my visits at home typically lasted the same amount of time the video recordings did, around 1–2 hours. Furthermore, on some occasions, parents sent me short videos and photographs from home settings. Shortly after video and audio recording in both preschool and at home, I transferred the files on location to a safe university run server and deleted the content on the video recorder. When they contained personal data, the videos and photographs from parents were sent through a university-run safe web application.

Most often, I video recorded with one roaming video camera, which afforded flexibility and close-up views of screens and interactional details. Other times, I video recorded with one stationary video camera to get a wide-angle view and another roaming to get close-up views. Alternatively, I video recorded with one video camera directed at a screen and another at other relevant actions. These were synchronized and then combined with audio recordings for analysis (Mavoa et al., 2022). See Appendix 6 for anonymized list of date, activity, primary participants, place, and time of the synchronized and combined video and audio recordings (it follows that the times cited add up to less than the total time of the video recordings). Using a university-run photo app with safe data storage, I also photographed relevant things and actions to supplement field notes. Outside, because of privacy concerns, I did not video record but digital photography afforded the collecting of rich and detailed data in these settings. See Appendix 7 for an anonymized list of the date, content, and place of the photographs.

Finally, although parental mediation and the educational strategies of teachers are basic conditions for young children's access to and use of new media technologies, I have backgrounded these practices for my inquiry, emphasizing young children's autotelic, self-directed play (Section 2). Still, even this play does not occur in isolation: the parenting of young children and early childhood education exist in fields of tension with new media technologies and play. The parents of young children typically struggle to balance roles as restrictive gatekeepers and enabling scaffolders (Dias et al., 2016; Haddon & Holloway, 2018). Although parents adopt more enabling as well as restrictive mediation toward younger

children (Livingstone et al., 2017), parents also tend to perceive younger children as protected from risk because of technical restrictions and children's relative lack of skills (Dias et al., 2016; Haddon & Holloway, 2018). Furthermore, although Norwegian preschools are required to facilitate for play with new media technologies (The Norwegian Ministry of Education and Research, 2017) and the digital infrastructure of Norwegian preschools is relatively well-developed (Naper et al., 2022), tensions also historically characterize Nordic preschools' relationships with new media technologies and play (Jernes et al., 2010; Ljung-Djärf & Tullgren, 2009; Nilsen et al., 2015; Vangsnes & Økland, 2015).

Echoing traditional Nordic childcare ideals (Kragh-Müller, 2017), the parents and teachers of my fieldwork would typically adopt a hands-off approach during the children's play, allowing play to unfold uninterrupted. For example, in Article I, Yahtzee, Captain, and a younger boy are trusted to play alone in the preschool common room, and in Article II, Yahtzee and Professor play raucously on the living room couch while Professor's parents are preparing dinner. The unfolding of free play, however, is also conditioned by the arrangement of physical space, which reflects educational and parental beliefs. All families, for example, offered easy-to-access digital devices. In preschool, the children of my fieldwork rarely watched YouTube or engaged in gaming, and iPads were typically not freely available. Still, attuned to the out-of-school interests of the children, their new media experiences were often made topics of conversation by teachers. The teachers were knowledgeable of these dimensions of the children's lives and encouraged them to use their mediatized islands of expertise (Crowley & Jacobs, 2002) as resources for play. At home, all parents of focal children were positive to the children's gaming but displayed more uneasiness regarding their sedentary use of YouTube and streaming services, echoing recent surveys (The Norwegian Media Authority, 2023). For example, in Article II, the children start playing *Minecraft* because Professor's mother implores them to "stop gawking at YouTube." Still, the parents mostly underscore how new media technologies facilitate friendship, fun, and care. Article II, for example, demonstrates the role of a specific genre of YouTube videos in the friendship of Yahtzee and Professor. Racer's parents told stories of how new media technologies facilitated the tender relationship between him and his sibling. For example, after long days in preschool, Racer snuggled close to his older sibling on the living room couch while watching *Minecraft* walkthroughs on YouTube on an iPad. Still, some screen time limits are enforced with more or less rigor. However, the limits appear to be grounded in the children's histories and ad-hoc assessments rather than national guidelines.[6] Typically, after an hour of watching YouTube or playing *Minecraft*, I too felt how the atmosphere turned from spirited to stagnant. Such contingent valuations appear to be more representative of the home conditions than of the preschool conditions of my fieldwork.

4.2 Micro/ethnography

> If this is an awful mess … then would something less messy make a mess of describing it? (Law, 2004, p. 1)

[6] National guidelines from the Norwegian Directorate of Health (2022) mirror AAP and WHO guidelines by recommending that screen time be limited to one hour daily for children two and older.

Ethnography and microethnography are the primary modes of inquiry of the research project. However, ethnography and microethnography are multiple. Section 4.1 accounts for some choices I made during data collection, the cuts enacted, and what, in the end, ended up on a safe server as a data set supporting my research. In broad strokes, my participant observation, photographs, informal conversations, ethnographic interviews, play, and field notes adhere to features of doing and representing ethnography, as they, for example, are canonized by Hammersley and Atkinson (2019). Likewise, the video recordings of fine-grained interactional data, screen recordings, multimodal tables, and figures generally adhere to key features of doing and representing microethnography (Cowan, 2014; Jordan & Henderson, 1995; LeBaron, 2012). However, the combination of ethnography and microethnography is not without tensions and, considering the sociomaterial theorizing allegedly underpinning my research, there are significant issues concerning ethnography and microethnography. For Sections 4.2 and 4.3, I discuss, illustrated by examples from the analyses of my inquiry, the relationship between ethnography, microethnography, and sociomaterial theorizing: How are ethnography and microethnography weaved together in my studies (Section 4.2)? How does nonrepresentational affect theorizing and the onto–epistemology of intra-action relate to my micro/ethnographic analyses (Section 4.3)?

Ethnography and microethnography are two different modes of qualitative research that are oriented toward in situ activity, potentially supporting each other. In Articles I and II, microethnographic approaches are foregrounded, as supported by my long-term ethnographic engagement in the field. In Article III, ethnographic accounts, field notes, photographs, and video and audio recordings are relatively equally represented. According to Hammersley and Atkinson (2019), ethnography usually involves the single/few case(s) in-depth study of people and actions in everyday contexts. There is typically no fixed research design, but data are primarily collected through, among a wide array of data collection methods, participant observation and informal conversations, and analyzed inductively or abductively to interpret the meanings and functions from events and practices, aiming to produce thick descriptions (Geertz, 1973) and/or explanatory mechanisms. Microethnography, similarly, focuses on the single/few case(s) in-depth study of people and actions in everyday contexts, similarly aiming to produce explanatory mechanisms and, to a lesser extent, thick descriptions. However, the theoretical foundations differ slightly, and the modes of inquiry differ widely. Theoretically, ethnography is a mode of inquiry with anthropological roots to study exotic cultures (e.g., Malinowski, 1961) and was taken up by sociology to study the everyday practices of specific subcultures in the minority world (e.g., Willis, 1977), including childhood (Corsaro, 2011). Microethnography departs from ethnographical work in anthropology and sociology, but through new symbolic interactionist (e.g., Goffman, 1959), social interactionist (e.g., Goodwin, 1994), and ethnomethodological (e.g., Garfinkel, 1984) theorizing, and the advent of new, affordable technologies, such as photography, audio, and video recordings (Hall & Stevens, 2015), it developed a methodological tradition of its own and was taken up in the learning sciences as the more established mode of inquiry of interaction analysis (Jordan & Henderson, 1995) (LeBaron, 2012). As it pertains to data collection, ethnographers collect data primarily through participant observation and informal conversations, while microethnographers collect data through video, audio, or screen recordings. Analytically, through their immersion in a given community, ethnographers are attuned to the community's ways of doing things, that is, the typical roles participants inhabit. Typically, ethnographers aim to untangle the "webs of significance" (Geertz, 1973) of culture, locating how participants make sense of their world. Microethnography, on the other hand, departs from

small moments of interaction to explore the ordered, sequential unfolding, and fine-grained details of practice. The use of video recordings, which are central to microethnography, affords a more nuanced focus on multimodal, embodied, and artifactual dimensions (Kress, 2010; Streeck et al., 2011) through the zoom feature. Furthermore, the repeat feature affords the "progressive refinement of hypotheses" (Engle et al., 2007), and gives research communities the option to collaborate on analysis (Jordan & Henderson, 1995).

In literacy research, ethnography is a key mode of inquiry that is aligned with the theoretical premises of NLS (Heath et al., 2008). However, because ethnography is a time-intensive (and expensive) research endeavor, literacy researchers tend to opt for variants that require less time in the field, what Green and Bloome (1997, in Flewitt, 2011, p. 296) call "ethnographic approach," or "using ethnographic tools," as opposed to "doing ethnography." These variants are often supported by microethnographic approaches. For example, the a-day-in-the-life methodology involves the researcher spending and video recording the entirety of one typical day with one child, which is then repeated with a number of children (Gillen & Cameron, 2010). The benefits of this cross-sectional approach are precisely not to explore how children develop over time, but rather to be exposed to a wide variety of childhoods unfolding. Other ethnography-inspired modes of inquiry, such as focused ethnography (Knoblauch & Schnettler, 2012), are based on microethnographic approaches but, correcting for the limitations of the video camera, consider the emic knowledge researchers acquire through their presence in situ. Furthermore, multimodal approaches benefit from video recordings of activities because they allow the ethnographer to zoom in on subtle movements that may otherwise go unnoticed (Flewitt, 2011). There are specific affordances to each mode of inquiry that makes them not interchangeable but complementary. Jordan and Henderson (1995), for example, argue that ethnographic fieldwork allows the researcher to locate hot spots where microethnography may support further analysis. Flewitt (2011) further argues that ethnographic accounts combined with in-depth, multimodal analysis of the new literacies of early childhood provide a powerful amalgamation that takes into account cultural, social, embodied, and semiotic dimensions.

Back-and-forth movements between ethnography and microethnography supported my analysis. For example, I inquired with the teachers through informal conversations about when and where new media technologies were made salient during the day, following which I set up recording equipment in those spaces—be they drawing tables in the mornings when the children discussed playing video games or circle times where teachers had quizzes displayed on the walls via projectors. Furthermore, conversations with parents pointed me toward the rich and imaginative interactions the children had when they were visiting friends gaming and playing, as reported in Article II. The observations also led my further explorations, as I, for example, learned about a semisecret spot on a hill, where a group of children convened away from the teachers and to which they granted me access with my audio recorder for an exclusive interview. Vice versa, through repeated viewings of video recordings and my preliminary analysis of the *Minecraft* play reported in Article I, I developed an emerging interest in how narratives, characters, and ludic features from video games were brought into new configurations through their play, which further guided my fieldwork. Reviewing and transcribing the video recordings, through the ELAN software, I was often stopped in my tracks as I encountered novel words, idiosyncratic phrases, or strange activities: What is a "headshot"? Who is "Hacker God"? What is the "L dance"? Fan wikis and YouTube walkthroughs of video games were often of invaluable support. Being a gaming novice, I also downloaded some of the games to familiarize myself with the content. As I came back to the

children prepared, sporting, for example, my newly won knowledge of the two popular YouTubers Chris and Victor of *FlippKlipp*, I could often sense the acknowledgment from the children and could use this as a springboard into further conversations and play with them, prompting new ideas in relation with my chosen modes of inquiry.

In the studies, through processes of transduction into ethnographic accounts and shorter—illustrated and not—vignettes, I typically represent my data by, first, accounting for the broader ethnographic context and what I deem to be relevant information for the reader. For example, in Article I, I introduce Yahtzee as "a five-year-old boy […] with a keen interest in gaming and watching YouTube and movies" (p. 12). Second, I typically give a descriptive written and/or illustrated account, which is in line with my analytical purposes, of specific events illustrative of the findings of the study. For example, I recount how "Yahtzee says they are 'in creative, okay, so we can't die' before Captain joins and hands Yahtzee blocks" (Figure 2), as illustrated by a line drawing which highlights their handling of blocks. The line drawing is made by layering a screenshot from the video recording. In relation to the vignette, I draw on ethnographic fieldwork, weaving threads gathered from my fieldwork into the mesh of the micro/ethnography, by, for example, noting that "fan-made *Minecraft* tutorial videos on YouTube are frequently discussed by the children in the preschool as inspiration for *Minecraft* Creative gameplay" (p. 13). Third, I tap into the theorizing and conceptualization of the study. For example, I argue that "the absence of the health and hunger bar in *Minecraft* Creative is allowed agency to act as Yahtzee exclaims that being in creative implies that they 'can't die' (Figure 3, lines 16–18), contributing in the preschool common room to configurations of a cooperative and peaceful practice" (p. 15). In sum, ethnography and microethnography features in tandem, tightly interwoven and answering calls for action to combine the two approaches of ethnography and multimodal investigations of microethnography (Flewitt, 2011) "beyond discrete engagements" (S. Edwards, 2022, p. 7) with digital devices in "the wider context for play" (Marsh, 2019, p. 157). Accordingly, I engage with the mesh of *micro/ethnography*, recognizing that they are moved by different traditions and direct your gaze at different dimensions of social life, but also that the interplay of the two produces rich accounts of the movements and dynamics of young children's contemporary play.

4.3 Micro/ethnography and sociomateriality

Micro/ethnography, both steeped in a qualitative research paradigm, encounter critical issues as they are put into contact with sociomaterial theorizing. Recently, answering the calls to rethink qualitative modes of inquiry following posthumanist, nonrepresentational, and poststructural theories, postqualitative approaches to methodology have been proposed and established (Jackson & Mazzei, 2022; St. Pierre, 2013), gaining ground in early literacy research (Hackett, 2021; Kuby, 2019; Rautio, 2021). All three studies of my inquiry operate within the intersections of sociomateriality and micro/ethnography. Articles II and III directly engage with postqualitative approaches to micro/ethnography, and Article I discusses micro/ethnography as they relate to agential realism, suggesting an intra-action analysis of micro/ethnographic data.

Importantly, micro/ethnography, as accounted for in Section 4.2, rely on the subjective interpretation of biased data. Video recordings, field notes, and photographs are collected in the field and returned to the hard drive of the researcher for analysis. To analyze the data, the researcher employs an analytical lens—contributions from previous research, theory, systematic analytical approaches (e.g., coding), and/or analytical principles (e.g.,

sequentiality)—through which the data are read. Although it is recognized that data collection and data analysis oftentimes are blurred,[7] once collected, the data in question are treated as mute and brute, mirroring a research paradigm of clean cuts between epistemology and ontology. In Section 3.1, I established that sociomateriality instead is founded on onto–epistemology, in which theory, data analysis, data, the researcher, and so on occupy the same plane in various configurations/assemblages. The knowledge practices of analysis are not "about" a video recording or a field note but attach themselves to them, entering new configurations/assemblages: micro/ethnography are performative research practices (see Jackson & Mazzei, 2022). Furthermore, because analysis does not equate collaborative video review sessions or transcript reading, but also constitutes an integral part of fieldwork, the researcher needs to be cognizant of what types of analytical modes are made possible through their embodied presence in the field. Pink (2012) argues that ethnographers do not need to operate in the margins of the field with notebooks or recorders but should, in literal terms, follow and sense the flow of everyday life as it unfolds. In Article I, for example, my research practice is accounted for as follows:

> When studying a game of "The floor is lava" at the preschool, the fieldworker shadowed the children before participating in the game, sensing with his feet what it felt like to step on lava. Furthermore, through ethnographic interviews, the rules and loopholes of the game were explained as they became salient. Through this embodied and participatory approach to studying everyday practices, the fieldworker and the observation tools employed participate in the performance of practices. Later, as the authors, on their desktop computers, write the article you are now reading, new words are added, not as a reflection or representation of dead video recordings and field notes, but as participating in an ongoing intra-active configuration. (Article I)

Jackson and Mazzei (2022) propose the Deleuzo–Guattarian metaphor of *plugging in* as a (post)qualitative research paradigm. In this take, concepts are productive (see research objective 2, Section 1.4), not reflective. Rather than representing data, they are plugged into the researcher apparatus (Barad, 2007) to make new ways of knowing, becoming, and doing (Kuby et al., 2019) possible. Importantly, unsettling the metaphor of research design, what might happen as one theoretical proposition or a piece of data is plugged into the researcher apparatus cannot be known in advance. Because research tend to territorialize through codes (St. Pierre & Jackson, 2014) or categories (McLure, 2013), the researcher should be attuned to the boosts of what escapes labeling to explore what else is possible to know, become, or do. It follows that the researcher is encouraged to be imaginative and experimental in their approach, extending what counts as research. For example, if a poem pushes your thinking into new avenues, prompting mobilizing ideas: Is it a piece of data? Theory? Alternatively, is it simply another "thing," plugged into, and carefully attended to as it makes itself felt entering the configuration of the researcher apparatus? Importantly, what pushes the inquiry is how our relationship with data unfolds and resonates, not the data in itself.

However, considering scientific knowledge as situated and matters of fact produced does not mean anything goes (Haraway, 1991; Latour, 2004). Because research is not only

[7] Jordan and Henderson (1995), for example, note that video recordings represent reality in particular ways and the way a video camera is set up thus marks (one of) the beginning(s) of analysis. Ethnographers are also typically considered biased reporters of partial truths (Hammersley & Atkinson, 2019).

reflecting upon the state of the world, but also adding to and producing it, researchers are ethically bound and responsible for what is produced through the relationships into which we enter (Barad, 2007). For example, there are gendered cuts made through the case selection of my micro/ethnography, and the gendered coalition between me and my focal children are possibly worthy of a study in and of itself.[8] As for another example, in Article II, my focus on two children watching YouTube, rendering the fieldworker practically invisible, produces a cut that makes an exploration of the two children's activities possible but brackets off the fieldworker on the side with a video camera. What is made to matter in these configurations, and what ways of knowing, becoming, and doing would be possible with other cuts? Still, an excessive focus on the (adult) researcher might reinscribe (adult) author-ity while the two children possibly experienced him as nothing more than a sidelined nuisance. Paradoxically, sociomaterial and postqualitative approaches tend to recenter the researcher through excessive reflexivity (Gerrard et al., 2017; Petersen, 2018). In ANT, "cutting the network" (Strathern, 1996) is inherent to any (research) practice and needs to be considered as researchers perform and write up fieldwork: while everyday flows are endless, analysis "must be enacted as a stopping place" (p. 523). Writing this extended abstract, traditional cuts are made, for example, by following the format of introduction–previous research–theory–methodology– and so on. Discussing the traditional qualitative researcher "employing" sociomateriality, St. Pierre gives the following scathing critique, which may also be an apt critique of my inquiry:

> In a study claiming to be "posthuman," for example, qualitative researchers will, nonetheless, assign proper names to and, using the identity categories, describe interview participants as unique, essentialist individuals; they privilege participants' authentic voices; and they represent participants' everyday lived experiences by placing the human against a background of culture thereby maintaining human exceptionalism and the binary of human/nature—culture/nature, human/other, human/material, mind/body, objective/subjective, and so on. In the introductions and literature reviews of their papers, they may discuss, for example, DeleuzoGuattarian concepts like assemblage or rhizome or body-without-organ, but they seem not to understand, as I mentioned earlier, that the experimental ontology and transcendental empiricism that enable those concepts are incommensurable with the ontologies and empiricisms of their methodologies. Not knowing what else to "do," they fall back on the normalized methodologies they've studied and "face the threat of being stifled from the outset" (Deleuze, 1990/1995, p. 27). In short, they begin inquiry in a humanist methodology even if it does not align with the posthuman onto–epistemology they claim guides their studies. They simply cannot think or do posthuman work, whatever that might be (difference), because they are overtaken by the humanist methodology they've learned (repetition). (2016, p. 9)

However, although my research design, and the organization of my extended abstract may strike the reader as overly convenient and easy, considering my purported onto–epistemological stance, St. Pierre's critique reads to me somewhat dogmatic and reproducing

[8] Yahtzee's older brother, talking to me over his shoulder while playing video games, "I think you get it, right?" (August 24, 2020). Stevens et al., on their analysis of children playing video games: "We will not indulge in the telling of these personal stories here, but we will say that what we hold true of ourselves we have rediscovered to be true across the participants in our study" (2008, pp. 62–63).

binary oppositions of the old and new methodologies. Gerrard et al. (2017) argue that the postqualitative movement typically makes a series of gestures that are problematic. Despite insisting on analytical experimenting and creativity, postqualitative modes of inquiry are supported by specific refrains that are often no less repetitive than humanist methodologies. Moreover, positing existing methodologies as outmoded—and creative, new modes of inquiry as preferable—resonates with subjugating, colonialist discourse of progress. The idiosyncratic and innovative language of sociomateriality and postqualitative research can function as powerful boundary makers of in-groups and out-groups, which can paradoxically constrain methodological and conceptual creativity. At the same time, the experimentation encouraged to transgress the constraints of academia may be a luxury privileging a select (tenured) few. Furthermore, researcher virtues of alignment and commensurability (of theory and methodology) are problematic because they tend to emphasize negative difference rather than creative production (see Murris & Bozalek, 2019).

Rather than a critique of St. Pierre's position, this is primarily to call attention to my struggles putting onto–epistemology and postqualitative modes of inquiry to work (see Hultin, 2019). Springgay and Truman argue that exisiting modes of inquiry can be employed but "propositionally, speculatively, and experimentally, and maintain[ing] that it is the *logic of procedure and extraction* that need undoing" (2017, in Hackett, 2021, p. 29, emphasis in original). For example, in Article I, intra-action analysis is proposed as a reworking of interaction analysis. While interaction analysis typically privileges humans encountering other humans and artifacts to make meaning, intra-action analysis departs from the event to explore the cuts made through the events that make up what are experienced as bounded entities. Through this analytical work, the coauthors and I found that the assumed digital features of multiplayer and the health and hunger bar of *Minecraft* coalesce with the blocks and children, creating hybrids that unsettle digital–analog binaries. Similarly, in another study (Ehret et al., 2016), intra-action analysis is employed to attune researchers to boundaries and exclusions enacted as a group of young people make a digital book trailer, and ideas are proposed and worked into the process or disregarded. Intra-action analysis builds on—and critically interrogates—microethnography, which has long theorized the interdependent and complex relationships of the local and broader ecologies. It follows that intra-action analysis is not wholly new, nor a simple alignment of sociomateriality and micro/ethnography but is the result of what happens as agential realist theorizing and conceptualizations are plugged into micro/ethnography. Similarly, in Article II, in an adaptation of the analytical process of locating hot spots in ethnographic fieldwork to prompt microethnographic analyses (Jordan & Henderson, 1995), the coauthor and I argue the following, provocatively:

> We are not exactly sure how we came to these events. As researchers searching for new perspectives on affect and literacy, experiencing the feeling that *some*thing was happening through these events and then focusing on them was a process more apt for "data reduction" than more traditional, rationally oriented qualitative methods. (Article II, emphasis in original)

As such, postqualitative approaches of feeling for indeterminate sparks to animate thinking are plugged into the microethnography, provoking rethinking of what a hot spot can be. Still, I recognize that the broader research project could have made more adventurous

departures away from the qualitative research paradigm (e.g., Medina et al., 2022).[9] Immersive long-term ethnographies like mine run the risk of acting as authoritative inscription devices (I was *there*) rather than open vulnerably to a broad range of contradictory, inconsistent, and messy experiences as body-in-place (Hackett, 2021). Still, longer ethnographic studies in postqualitative and adjacent, research traditions are rare (Hackett, 2021). More studies in this intersection may unearth new ethnographic modes of inquiry attending to young children's lives as they unfold across times and place in situ.

4.4 Research quality

My mode of inquiry—micro/ethnography grounded in onto–epistemology and inspired by postqualitative approaches—emphasizes knowledge as being situated (Haraway, 1991), and discourages both truth claims of objectivity (epistemological naïve realism) and the subjective construction of knowledge about brute facts (epistemological antirealism). Hultin (2019) argues that key tenets of sociomateriality directly conflict with quality criteria of qualitative research informed by critical realism:

> From this perspective [of critical realism], the quality of a study is measured by the accuracy of the account in representing a certain phenomenon, and its generalizability to explain similar phenomena. Sociomaterial studies grounded in a relational or becoming ontology (e.g. agential realism) on the other hand, aim to move away from a view of materiality as something distinct, bounded, and separate from human agency and intentionality, to an understanding of it as entangled with and thus, deeply co-constitutive of, agentic action and organizational realities. (p. 92)

However, qualitative validation strategies are multiple, and a venue of tensions among qualitative researchers. Critical realism, for example, is grounded in epistemological social constructivism (Danermark et al., 2002) and does not necessarily consider accuracy, in its most narrow sense, an aim for inquiry. Still, social constructivist inquiry typically emphasize the epistemological dimensions of inquiry, which runs counter to the central premises of onto–epistemology of sociomaterial theorizing, especially when quality is assessed through pregiven categories such as validity, reliability, and generalizability (e.g., Silverman, 2014).

On the other hand, another feature of sociomaterial theorizing is attending to the effects of specific configurations and assemblages. I believe producing knowledge claims that are plausible and convincing—actionable—to the readership is fundamental to socially, politically, and ethically responsive research: writing lucidly and coherently invites a conversation where readers can tap into the propositions to think and act further.[10] However, writing plausibly, convincingly, coherently, and so on does not automatically imply applying existing validation strategies. St. Pierre (2021) makes the point that qualitative inquiry, which can be understood as the methods acting as guarantors of sound qualitative research, is historically made up and can be remade. Researchers should attend to what our modes of

[9] Still, considering the effects of the research apparatus, *too* radical departures from a common sense qualitative paradigm may render the theories and findings generated inconsequential in the broader research field (see Sandberg & Alvesson, 2011).

[10] I agree with Bailey (2017), who similarly argues that the use of niche quality criteria, while aligned theoretically, may "require a reader to have already 'bought in' to this particular paradigm," and "may appear a little too self-referential or conveniently circular. Therefore, my concern is also how validity may be asserted to a wider audience, in a way that remains methodologically coherent" (p. 197).

inquiry *do* in specific configurations and assemblages, with caution of "generalities about goodness" (St. Pierre, 2021, p. 7), while aiming to produce sound accounts and propositions in relation to the particular inquiry at hand. However, this does not preclude extant methods, theory, and validation strategies from being tapped into (Springgay & Truman, 2017, in Hackett, 2021). Importantly, though, they are not something to be applied but, rather, to be carefully noticed: how their plugging in unfolds, which needs to be accounted for in its specificity. Although validity, reliability, and generalizability—the traditional, albeit thoroughly critiqued (Denzin & Lincoln, 2018), features of research quality in qualitative research (Silverman, 2017)—far from perfectly map onto the onto–epistemological foundation of sociomateriality, I have found them to be productive concepts to think with: to contrast my modes of inquiry with strands of qualitative inquiry, but also to reflect on how my research can produce plausible and convincing—actionable—knowledge claims. In this section, grounded in the specifics of my research project, I have plugged into the concepts of validity, reliability and generalizability as starting points, rather than "generalities about goodness." I explore the soundness of my research project through discussing, one, how the events observed and accounted for relate to how they typically unfold in situ within my cases, two, how my empirical accounts are applicable beyond my cases, and, three, how the theoretical and conceptual propositions are applicable beyond my cases.

First, validity concerns how the accounts reported in a research report represent the phenomenon in which the researcher is interested (Silverman, 2017). Because sociomaterial theorizing typically considers the researcher and phenomenon (as well as adjacent assumed phenomena) as being entangled, there is a tension between considering validity as a dimension of research quality and the nonrepresentational thinking of sociomateriality. However, because I aim to produce claims that relate meaningfully with the everyday experiences of young children, reflections need to be made and measures taken to ensure that the events I observe and account for are relatively congruent with how similar events typically unfold in situ within the cases. In literacy research after the social and material turn, ecological validity (Bryman, 2012)—understood as above—is and should be a crucial question because literacy is not considered transcendental skills divorced from the social contexts or sociomaterial configurations and assemblages of which they are a part (Gee, 2015). My micro/ethnography provide accounts of contextual factors, configurations, assemblages, interactions, intra-actions, and so on in their rich complexity. My engagement in fieldwork over many months and in different settings allowed me to spend time with the children, sensing and feeling their excitement, boredom, anxiety, and tenderness. As I spent more time with the children, they grew more accustomed to my presence, and we developed trusting relationships. I wrote field notes of recurring activities and repeated phrases, and photographed popular artifacts. My fieldwork across broad spatialities and temporalities allowed me to map connections and relationships that would have been lost on me had I conducted less time- and space-extensive fieldwork. Furthermore, video recording and photography allowed me to get close to things and activities of interest, and make iterative movements between my photos, video recordings, and the fieldwork.

Second, to generalize empirically beyond the cases, readers may, through transparent descriptions of rich, ecologically valid data, consider if the empirical accounts are applicable to their conditions. For example, in Article III, I find that there are dimensions of young children's collecting that have not previously been accounted for, or at least given proper analytical attention, in the research literature. There may be unique features of their living conditions that allow for such collecting, so readers must evaluate if the phenomenon I

account for also applies to their setting of interest. This corresponds to Lincoln and Guba's (1985) notion of transferability in qualitative inquiry, where generalizability occurs as readers encounter the analysis rather than being inherent to the analysis. For readers to make judgments of transferability, data and analysis need to be accounted for transparently. For example, in Section 3.3, I extensively narrativize my engagement with the concept of the postdigital, and in Section 4.1, I extensively narrativize my fieldwork. However, rather than being claims about early childhood play made through a position of authority coming from my participation in the field or my immersion in theory, these narratives are intended to be an "invitation to join the conversation" (Hackett, 2021, p. 30). In combination with deep fieldwork, transparency allows the readers to make judgments of whether my accounts are applicable in settings with which they are more familiar. However, there are other ways to make the case that my analysis is applicable beyond my cases. For example, I cite previous empirical research on young children's collecting where the dimensions I discuss are mentioned without being properly analyzed. I also cite previous empirical research about adjacent phenomena (e.g., young children's sensorimotor play) that note similar dimensions, which can reasonably be believed to be applicable to young children's collecting. Through this discussion, I posit that the dimensions of collecting I find with the children of my fieldwork may also apply to other children.

Third, in addition to my empirical accounts hopefully being generalizable—within my cases, through immersive fieldwork, and beyond my cases, through readers' assessments of transferability via transparent accounts—I also make theoretical and conceptual propositions that are informed by my engagement with data and theory. This correlates with the distinction between, respectively, statistical and analytical generalization (Yin, 2014). Analytical generalizations are typically at a level of abstraction higher than the cases, and can take the form of a reworking of extant theory or novel concepts and theory. When aiming for analytical generalizability, Yin (2014) argues that cases are selected on their ability to "shed empirical light about some theoretical concepts or principles" (p. 40) rather than their representativeness in relation to a broader population. My selection of cases—three decidedly true gamer kids—are in no way statistically representative of the broader population of young children, nor are they randomly selected. They are strategic and extreme cases: through rich and complex situated events of gaming, playing, and hanging out, Yahtzee, Professor, and Racer made salient features of play that were surprising and thought provoking. The features were discernable with the other children of my fieldwork as well but appeared here with brighter colors. Such felt encounters with data are "assertive, demanding, even coercive" (Geertz, 1995, in Flyvbjerg, 2006), prompting us to think anew about phenomena and theory. The following rigorous engagement with relevant theorizing and the subfield of sociomaterial approaches to literacy allowed the coauthors and I to produce well-defined, empirically grounded, theoretical and conceptual propositions that revise and adapt previous theoretical and conceptual propositions in the given field of research. For example, the concept of the refrain is developed in Article II and posited to be relevant for future sociomaterial studies of the literacies of young children's play. Being with Professor and Yahtzee on playdates and later watching the video recordings on a laptop, the coauthor and I felt how certain elements repeated and resonated, and attempting to theorize this phenomenon, we found literacy research situated in sociomaterial theorizing as lacking. Leafing and scrolling through books, .pdfs, and databases, we encountered the concept of the refrain. We delved into the literature, aiming to understand the concept and its history, its alignment with sociomateriality, and its relationship with our phenomenon of interest, which is accounted for in the article. Through

this process, the utility—in other words, the analytical generalizability—of the concept of the refrain is supported.

However, in what ways are the claims above based on assumptions of a separation of ontology and epistemology? The distinction of statistical and analytical generalization, for example, seemingly rests on assumptions of the real world in contrast with human labeling. Similarly, do the dimensions of collecting cited in the fourth paragraph exist independently of my research efforts? According to sociomaterial theorizing, they are entangled. Still, my encounters with specific dimensions of young children's collecting, for example, felt intrusive, pushy, and powerful. This is, I think, precisely Barad's point when she claims that "language has been granted too much power" (2003, p. 801), and Bennett (2010) arguing for "vibrant matter." Research practices are not arbitrary filters over reality. While Barad and Bennett do not revert to a naïve realism, they call for a recognition of the limits of social constructivism. It is in this sense that I discuss ecological validity, transparency, and analytical generalizability: it is about allowing researchers and readers to be touched by rich, complex, and multiple encounters with data.

For example, in Articles II and III, attunements to vague feelings and atmospheres were crucial: the *some*things of social life (Ehret, 2018). The coauthor and I felt how intensities grew as the children were gaming in the living room and how frustrating tensions arose playing with Legos in Professor's bedroom. Although feelings are, maybe, unreliable (how do we, e.g., argue for the feeling of terror–joy while playing survival mode in *Minecraft* with friends?), there is also something anemic and one-dimensional—maybe less ecologically valid—about accounts of social life that ignores the indeterminate feelings often so evident for the participants. The use of transcription standards as strategies of reliability offers partial views: for example, affective atmospheres are difficult to capture using Jeffersonian transcription (see Ehret, 2018; Stewart, 2007). Thus, my accounts, especially in Articles 2 and 3, do not only aim to express "what happened" in a strict sense but also what it felt like to be there. Still, admittedly, writing the dissertation, many of the nuances, complexities, and tensions I felt, experienced, and reflected upon while spending time with the children are smoothed out, silenced, and/or made legible. For example, excerpts were picked for their illustrative potential of ideas, and ideas were clarified and given set boundaries. Although generalizable theories are oftentimes useful, they do not exhaust the movements of social life, and fertile knowledge production is more often than not based on thorough and sensitive engagement with cases rather than generalized theory (Flyvbjerg, 2006). On the other hand, my engagement with and development of generalized theory and specific analytical modes are not antithetical to attunement—on the contrary, they have, in a sense, proved crucial to orient me toward certain phenomena and their excesses.

Furthermore, being touched by analysis is not a solitary activity. The analysis sessions for Articles I and II, which were cowritten with seasoned researchers, were typically characterized by intuitive, imaginative, and reasoned discussion. Sometimes, ideas were proposed and questioned but fell short by going back to theory and data to, upon closer scrutiny, find little warrant and resonance for our claims. Other times, the ideas proposed were picked up, gaining speed, resonating and vibrating in relation to the data and theory. Importantly, the group work of analysis was not only directed toward a "progressive refinement of hypotheses" (Engle et al., 2007) in the sense of a intersubjective agreement, but also about facilitating for diverse and novel encounters with data in new, unpredictable assemblages. It follows that reliability, in the sense that the accounts and propositions are consistently agreed upon among observers (including readers), is not an aim of the present

dissertation. Still, I account for the inquiry transparently and adopt a well-defined theoretical stance, which are strategies typically employed to increase reliability (Moisander and Valtonen, 2006, in Silverman, 2017). I also include transcripts, field notes, and visual representations of video data in the research reports to account for data transparently (still, see the point made above about the partial view of transcription). However, transparency is not employed to reach consistency in interpretations but to facilitate multiplicity—because a transparent account of the inquiry and data, and a well-defined theoretical stance allow readers easily to enter, continue, and even reroute the conversation. Considering the situatedness of knowledge claims—which, again, does not mean that anything goes (Haraway, 1991)—researchers should attend to excess and heterogeneity rather than fidelity and finitude.

4.5 Ethics

The research reported in the present dissertation has been evaluated by the Norwegian Agency for Shared Services in Education and Research (formerly the Norwegian Center for Research Data) to be in accordance with the relevant privacy legislation (Appendix 8, in Norwegian). Parents and teachers were given all the necessary information about the project, a genuine option to decline to participate (e.g., by making sure that no children in preschool, regardless of participation in the research project, would be excluded from planned activities), and informed of their chance to withdraw at any time (Appendix 9, in Norwegian). In the end, two sets of parents opted out of the project, and one of the teachers opted out of being video recorded. All identifiable data were stored safely, and all participants have been anonymized in the articles, extended abstract, and other avenues for research dissemination. With small samples and aiming for transparent accounts, there is reason to believe the parents of the focal children might recognize their own children in the articles, despite my thoroughly anonymized figures and descriptions. I was sensitive to this while selecting illustrative excerpts for the dissertation and did not choose excerpts that I had reason to think might discomfort the children for any reason, either today or later. Still, there is no guarantee that others, including the participants, might read the excerpts differently and less favorably than I do (Flewitt, 2005).

However, ethics exceeds accordance with relevant privacy legislation. Researchers should be especially considerate, sensitive, and responsive regarding young children's involvement in research (The Norwegian National Committee for Research Ethics in the Social Sciences and the Humanities, 2022). For example, children tend to be positioned vulnerably and dependently, and their participation is often characterized by "schooled docility" (Gallacher & Gallagher, 2008, in Smith & Coady, 2020, p. 16). Being considerate, sensitive, and responsive can manifest as attunement to young children's typical and subtle nonverbal and embodied cues, as well as atmospheric conditions. Moreover, children have unconventional and often seemingly impulsive ways of acting that challenge traditional ways of doing ethics in research (Chesworth, 2018).

Although my previous work experience as a preschool teacher for 12 years was beneficial to register tensions, unorthodox signaling, and communicating in child-friendly ways, I still would fall short. For example, for my first day, I had planned a circle time with information about the research project. I did not recognize the difficulties of taking a lead with a new group of children who were more eager to get to know me and make their mark known in this new, volatile assemblage than to acquire adequate information about the fieldwork. Even if I had been given the chance to impart the information I wanted, there

would be no guarantee that this information was retained and/or later recontextualized. Information from me—and assent from the children—is not given once and for all but is given (or not) as an ongoing process (Flewitt, 2005). Information about the project became a recurring topic of conversation. For example, informed by Bird (2018), the children were given the option of choosing their own pseudonyms, which allowed me to explain the concept of anonymity. I told the children it would not be a good idea to use their real names because others would be able to read and know things about them that they might not want anyone to know. Bird notes that Harcourt and Conroy (2011) argue for children to be given the opportunity to use their real names because, among other things, children tend to want credit for their contributions in research. However, the fact that children want to use their real names does not make it morally justified. Still, their opinions should be considered. Although my framing did not allow for the option of using real names, the children did not object to the use of pseudonyms. On the contrary, choosing pseudonyms appeared to be a fun activity for the children (which, again, does not make it morally justified). It was something to do together during the first days of fieldwork and had an informal icebreaker function. Some children, for example, frequently changed their pseudonyms to reflect the type of person they felt like that day, and their choices allowed me to get a small glimpse into their interests at the moment. Yahtzee Champignon, for example, chose his name based on a fond memory from a family trip. At the beginning of the fieldwork, Racer named himself Jowst, a popular Norwegian artist from last year's Eurovision. Professor Poopy Pants is a character in a book series Professor enjoys, and Captain Sabertooth is a massively popular transmedia character in Norway.

Choosing pseudonyms also gave me an entry point to tell the children about the research project. I framed the research project as a story or book I was writing about how they were gaming, playing with iPads, listening to music from phones, and so on. With my focal children, I was more specific, which allowed them to critically engage with and register the subtleties of my project. For example, Yahtzee was unimpressed with my more humanist and social science approach, explaining that he would rather research about rocks and underground stuff. He also expressed disappointment when I explained that I had not—as he had initially thought—invented the microphones they were using. On another occasion, Professor asked me what I was writing. Absent-mindedly, I told him I was "just writing," and Professor quickly finished my sentence, smiling: "… about children." Thus, Professor displayed a sophisticated understanding of my work as generalized beyond Yahtzee, Racer, and Professor. Other times, however, their understandings were less precise. For example, Racer and Yahtzee sometimes associated my video recordings with YouTube and pleasurably and playfully took on the roles as YouTubers at times. Although there is a sense of uncertainty (Chesworth, 2018) inherent in such encounters, the feeling I registered from the events was this being a type of play, rather than them believing they were YouTubers. Still, it does suggest a point of moral complexity of doing video research with children today. Although children's familiarity with and desire of being video recorded is often cited as beneficial for ethnographies of childhood, researchers should critically consider young children's motivations and ideas about participating.[11] Moreover, these considerations are not merely rational, accountable, rights-based decision-making processes but felt in the moment

[11] Bailey (2021) notes a child in his ethnography displaying a similar sentiment, "I feel like a YouTuber" (p. 111), suggesting this may be an at-hand connection made by young children engaged in video ethnographies.

as relations unfold, which echoes my affective theoretical stance, but also the field of feminist ethics of care (Cockburn, 2005; R. Edwards & Mauthner, 2002).

Today, research *with* children—after the new sociology of childhood (Corsaro, 2011; James et al., 1998)—is not only an analytical issue privileging micro/ethnographic approaches (Section 4.2) but reads as an ethical imperative among early childhood researchers. The children were eager to join and appeared to enjoy themselves during my visits, which are important aspects of morally responsible research with vulnerable participants such as children. Furthermore, I aimed for them to identify as valuable and treasured informants. For example, at one visit, Yahtzee and Professor opened the door at my arrival by immediately informing me of their latest obsession, Lemon Craft videos, which they assumed—rightly so—that I was interested in (Article II). Similarly, at another visit, Racer was proud to display *Among Us* characters he had made using construction playthings and had them lined up in anticipation of my visit. During my interview sessions with the children in preschool, their interest in talking about gaming, YouTube, and so on, was unmistakable—lines would even form behind the interviewees. We also shared tender and joyous moments together. My final visit with Racer, for example, was bittersweet. He was unusually withdrawn, and, as I was getting ready to leave, quietly asked me if I could visit them next Christmas, too, and gave me a present: a sweet pepper he found on the kitchen counter.

Researchers, including myself, also do research *on* children *for* children, which is guided by consequentialist ethics of fairness (Bodén, 2021). Research affects—or, at least, is meant to affect—a larger group of children than the ones being studied: it feeds back to teachers, parents, and other researchers and adds knowledge, which is taken up and hopefully makes a positive impact on young children's lives. In Section 6.4, I account for what generalized prescriptive inferences can be made from my findings. However, considering ethico–onto–epistemology, researchers should be cognizant about and feel for what cuts are made through inquiry—what is made to matter, and who benefits? Within critical literacy research, there is a central tradition for these questions. For example, my focal children are members of a comfortable middle class—their parents own houses in a big city, and most have steady office jobs and/or work in the culture sector. The abundance of playthings, which is central to their ability to benefit from the postdigital, are not neutral settings. I could have followed the genealogy of the iPads, discovering the ruthless labor conditions of children not much older than Yahtzee, Professor, and Racer (Burnett et al., 2020), explored the social inequality of literacy (Hackett et al., 2020), or inquired into the economic logics of the platforms on which children and young people enact literacies (Robinson, 2022). Thus, my accounts in the articles, which emphasize the affectively intense moments of young children's contemporary play, are not politically neutral cuts; they might even be rightfully critiqued as silencing already marginalized voices, downplaying power, and offering another stage to discuss what benefits the middle class. This is a limitation of the present dissertation because it fails to consider the multiple (Burnett, 2017) dimensions that could have nuanced and complexified the analytical work performed.

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Although, after being asked nicely and gifted the sweet pepper by Racer, I did not visit the focal children the following Christmas, my relationship with them had barely started when I stopped my fieldwork. As field notes, photographs, and video recordings, they were brought into research configurations over which they had little to no control. Clifford Geertz warns

ethnographers of engaging in ventriloquism—meaning how in-depth ethnographic inquiries often lend themselves to make authenticity claims, obscuring the interpretative, affective, and nitty-gritty work of analysis (James, 2007). For example, a quote, a short segment of interaction, or a literary vignette from data can be used to illustrate already formed theoretical propositions. Resonating with this idea, an anxious feeling would often arise when thinking and writing about Yahtzee, Racer, Professor, and their peers: When is my analysis guided primarily by theory, and when do my actual real-world engagements with the children guide my analysis? Such ruminations, I think, are inevitable in any reflexive engagement with ethnography.

However, grounded in a relational onto–epistemology, clear-cut distinctions between data and theory are not useful accounts of the analytical process: instead, analysis is about "meeting the universe halfway" (Barad, 2007). Rosiek (2013) argues that the relation of research to real-world problems should be understood in terms of where the locus of felt indeterminacy is placed, which should guide decisions about where to put analytic foci. A "motivating impetus" (Rosiek, 2013, pp. 697–698) emerges from the discrepancies felt as researchers engage materially with the world and reflect on and move through these material engagements imaginatively and intuitively. These movements and thinking can be browsing bookshelves, scrolling .pdfs, locating relevant journals, attending workshops, video recording interactions, talking to participants, playing with children, following current issues, and so on. From these movements, novel ideas and doings are produced, answering the motivating impetus. If the emerging ideas and doings attend to—and are convincingly argued to attend to—the motivating impetus, what guided the analysis—theory, data, or something else—is secondary. As argued above, the resulting propositions are not authoritative truth claims but contributions to a conversation that gain legitimacy as they resonate and move with the research community.[12]

In one sense, this concerns what analytical claims can be made from research but, echoing Geertz's argument regarding ethnographic ventriloquism, there is also a strong ethical dimension because it concerns how the voices of children are represented in research. I do not refer to an exterior, authoritative ontology (the authentic voices of children as opposed to the ones emerging through a research paper), but I recognize that the analytical process emerges through material engagements with data, theory, and more. In my cases, the motivating impetus are the tensions between, one, young children's contemporary play as it resonated with me through feeling and thinking alongside them on playgrounds and in front of their screens, and, two, the accounts of researchers (e.g., digital play or transmedia play) and public discourse (e.g., screen time). Policy, education, and parenting decisions are grounded in accounts of young children's play with new media technologies, in turn affecting the conditions and constraints of young children's everyday. The movements I make in relation to this motivating impetus include going to their house, playing with them outside, talking with them on a hill, visiting the library, browsing Google Scholar, discussing the postdigital with my supervisors, and so on. These encounters are not experienced as abstracted and depersonalized but tangible and felt, which I have aimed to reflect when writing up the studies by giving space to the narratives of inquiry—the vital fleshiness of which hopefully resonating with readers (see Stewart, 2007). In Article II, for example, the coauthor and I write the following:

[12] This resonates interestingly with pragmatist philosophy (Rosiek, 2013).

> Taking children's contemporary literacies seriously requires that researchers do not only engage with them rationally but also push the boundaries of expression and analysis to attune to the feeling of literacy for young children today—gawking at YouTube, playing badly with Plus-plusses, and nurturing friendships. (Article II)

This, however, also applies to theory, which, in research papers, typically is written up transcendentally—as ideas suspended in space. In Section 3.3, I experiment by discussing the postdigital in a more narrative format. Although all theorizing is to engage materially, this was particularly evident regarding this concept because my journey with the postdigital has been fraught and tense, frustrating, and in constant dialogue with my fieldwork and my encounters with scholars through books, Zoom, ScholarOne, and in person. As research is performed, the configurations are broad, rhizomatic, and messy but somehow appear impoverished as they end up in research papers under word count constraints. Refocusing on the narratives of inquiry displaces the elements of my research into the material relationships of which they were and are a part, showing both transparently and ethically responsively how data and theory are not discrete items but thoroughly entangled.

5 Summary of articles

5.1 Article I

Pettersen, K., Arnseth, H. C., & Silseth, K. (2022). Playing Minecraft: Young children's postdigital play. *Journal of Early Childhood Literacy.* Advance online publication. https://doi.org/10.1177/14687984221118977

Article I addresses the need to account for and reconceptualize young children's contemporary play with new media technologies. The inquiry plugs into the concept of the postdigital, agential realist theorizing (Barad, 2007) and micro/ethnographic accounts of three young children "playing *Minecraft*" with wooden and synthetic blocks in a preschool common room. Postdigital refers to a set of emerging ideas about the contemporary condition in which digital and analog stop to constitute discrete spaces but become interwoven. The following research question is explored: How are young children's postdigital play practices performed? Grounded in ethnographic fieldwork, the coauthors and I were struck by the creativity and effortlessness of young children's play as they moved beyond the assumed digital–analog binary. One play episode, in which these features were made salient, was selected for microethnographic analysis. We analyzed the episode, guided by our research question, through a multimodal table and intra-action analysis to explore how and what agencies were configured and allowed to act. Finally, two excerpts were selected to illustrate our analysis.

In the episode, the children are "in creative," which refers to playing *Minecraft* Creative—a sandbox setting of *Minecraft* more appropriate for young children. When they are in creative, the children do not only plug into narratives and characters of the *Minecraft* franchise, but also, importantly, the ludic features of *Minecraft*, such as "joining," "building," and "not running out of things." We argue that, rather than maintaining and reproducing digital–analog binaries, the children engage in postdigital play practices, in which they dwell playfully in messy configurations of heterogeneous digital–analog materialities, such as gaming features, hands, bodies, and blocks.

Against a background of previous research on digital play, we argue that the concept of digital play may be reductive because it privileges the human and disregards how children dwell in contemporary, heterogeneous analog–digital configurations. Thus, the study answers calls to consider the broader ecologies, networks, and connections of young children's contemporary play with new media technologies. Building on previous work on early childhoods in the postdigital, we propose postdigital play as a heuristic to attune researchers to play "across" the digital and analog. Our case contributes to this work by considering postdigital play even when new media technologies are not tangibly present.

5.2 Article II

Pettersen, K., & Ehret, C. (conditionally accepted). Refrains of friendship in young children's postdigital play. *Journal of Literacy Research.*

Article II addresses the need to account for and conceptualize the felt consistencies emerging as new media technologies resonate across the literacies of young children's contemporary play. The inquiry plugs into the concept of the refrain (Deleuze & Guattari,

1987), nonrepresentational affect theory, and micro/ethnographic accounts of two young children watching YouTube, playing *Minecraft*, and playing with construction playthings at home. Refrains refer to the felt organizing forces of social life. The following research questions are explored: How do refrains emerge and generate felt consistency through the literacy events of two young children's play? How do refrains reemerge and generate felt consistency across the literacy events over time? How do refrains score the children's friendship through and across the literacy events? Grounded in ethnographic fieldwork, two playdates sparked our thinking around issues pertaining to our research questions. Watching the translated and transcribed recordings, and reading field notes, theory, and empirical studies, the coauthor and I registered how affects moved the children's play and zoomed in on three affectively charged events, which were narrativized and illustrated for further analysis.

We argue that felt refrains are enacted through and across the literacy events of the two children's playdates, which produce and maintain their friendship. The refrains register as felt consistencies of, for example, "the Lemon game." Playing the Lemon game, the children facilitate unpredictability and surprises by playing badly, which resonates throughout their play. In a postdigital condition, the Lemon game refrain makes itself felt as an avatar runs around a ravine recklessly among monsters, as a *Minecraft* Lego ultra zombie shoots himself, and as a Plus-plus figure jumps to his death into a pool. These felt refrains—the fluid and volatile intersecting sites of the YouTube algorithms, the *Minecraft* features, the Legos, their bodies, and so on—are integral to the production of friendship between the two children.

Literacy research drawing on sociomaterial theorizing tends to emphasize local, singular, and emergent events. Conceptually, the research in this tradition has less of a foothold to account for how certain things do not only break, rupture, or happen unexpectedly, but also remain constant and stabilize, even harden. In the postdigital condition, wider ecologies beyond interactions with discrete devices need to be taken into account. The refrain, which is aligned with sociomaterial theorizing, is apt to account for the larger ecologies of postdigital play because it attunes the researcher to how "bodies, blocks, and bytes" assemble, disassemble, and reassemble to generate the holding-together and breaking-apart of childhood play and friendships.

5.3 Article III

> Pettersen, K. (submitted). Young children's more-than-human and more-than-digital collecting. *Children's Geographies.*

Article III addresses the need to account for and conceptualize young children's collecting as it is enacted across the broader ecologies of the postdigital condition. The inquiry plugs into micro/ethnographic accounts of young children collecting, the concept of "answering the world" (Hackett & Rautio, 2019), and sociomaterial affect theorizing of early childhood play and literacy. Answering the world refers to how young children's play and literacy tends to be less designed than characterized by a sensitive correspondence between young children and their surroundings. The following research question is explored: How do young children answer the world through contemporary playful collecting? The point of departure for analysis was rereading my field notes, looking through my photographs, and encountering an excerpt and some photographs where two children collect cones and leaves on a rocky neighborhood hill while they enact a *Super Mario*-like video game. Subsequently, guided by my emerging research question, I plugged into ethnographic field notes from young

children's playful collecting on an offsite preschool forest patch and a preschool playground, as well as video recordings and field notes of young children's collecting while playing *Super Mario Run* at home.

Collecting, the children answer the world through the becoming forms of games of chance and leaky collections. First, collected items are randomly selected or appearing by chance. The children engage relationally with the world by being sensitive to the mystery and surprise of volatile encounters with possible collectible items. For example, while playing *Super Mario Run*, Yahtzee presses the screen randomly and wildly and enjoys the unpredictabilities that may emerge from this—a blindfolded throw of the dice. Second, their collections are never properly settled, bleeding in porous relationship with the surroundings of the collections. Rather than creating set collections, the children feel moved by and dwell in the act of collecting. For example, a boy carries a rock for a group of children with their collection of insects and slugs. It does not matter for them if the slugs and insects slide off or disappear in other ways. Their collecting is about moving with events as they occur, going off to find new slugs and insects, making barriers, or looking for lost slugs and insects. Extending the original metaphor of answering the world, I propose that the answering occurs in broad playscapes of both lush, green worlds of slugs and cones, and blue-screened *Super Mario* worlds of rainbows and toads. The children enjoy dwelling in these broad playscapes and facilitate for productive resonances as they, for example, enact video games on rocky neighborhood hills where leaves, Goombas, cones, and fire chains are collected. Furthermore, I discuss how young children answer the world not necessarily through a particular relational sensitivity but through the experience of material tensions with the world as rocks are too heavy or video games too difficult.

Previous research on children's collecting typically recruits children of school age, primarily emphasizing the motives and functions of collecting over affective dimensions, failing to take into account collecting on digital interfaces or across broader contemporary playscapes. The study contributes to research on children's collecting by considering the more-than-human and more-than-digital dimensions of contemporary early childhood collecting: young children sensitively attend to the affects generated in the encounters between collector and collected, on and beyond the screen.

6 Contributions and implications

The aim of my inquiry is to explore how new literacies emerge as new media technologies are brought together through and across moments of young children's contemporary play. Through the articles and extended abstract, I propose some preliminary and situated knowledge claims, which I argue contribute to the literature of the research subfields accounted for in Section 2 as points of departure or starters for new conversations. Following the tradition of extended abstracts, in the following, the contributions are categorized as empirical, conceptual, and methodological. By empirical contribution, I refer to novel accounts of empirical phenomena of interest. By conceptual contribution, I refer to how concepts on a higher level of abstraction are formed through models of relationships into novel theoretical propositions. By methodological contribution, I refer to the novel modes of inquiry I demonstrate through my studies. It should be noted that this separation is not consistent with the purported onto–epistemology of my inquiry. This inconsistency has been discussed in Sections 4.3 and 4.4. However, recognizing the artifice of these cuts and noting where the categories bleed over, the cuts may still clarify for the reader the distinct contributions of my inquiry.

6.1 Empirical contribution

The empirical contribution across the three studies of my inquiry are accounts of the literacies enacted through young children's contemporary play with new media technologies (research objective 1, Section 1.4). In the 2010s, new media technologies emerged that were more aligned with young children's interests, sensitivities, and predilections, and research demonstrated the creative, willful, and collaborative literacies of young children's play with these new media technologies (Arnott, 2016; Arnott et al., 2019; Bird & S. Edwards, 2014; S. Edwards & Bird 2017; Fleer, 2017, 2018; Flewitt et al., 2015; Marsh et al, 2016; Wohlwend, 2015). While these socio–technological developments continue their trajectory today, they take part in new configurations and assemblages, which are characterized by the increasing saturation and enmeshing of new media technologies in young children's everyday. Research attending to these issues has suggested that young children's contemporary play with new media technologies are characterized by unpredictable, messy, and expansive movements (Burnett & Merchant, 2020b), and that new postdigital literacies with a "sensibility of risk-taking and experimenting" emerge (Apperley et al., 2016, p. 213). Because new media technologies afford connection across spaces, the spaces the children inhabit are "porous" (Flewitt & Clark, 2020) and "percolating" (Gillen & Kucirkova, 2018), and, because young children's playthings are increasingly immersive and connected, the relationship between player and plaything is blurred (Lundtofte et al., 2019; Marsh, 2017). The messy playscapes of early childhood and its effects has been theorized (Abrams et a., 2017; Burnett et al., 2014; S. Edwards, 2022; Marsh, 2019; Stevenson, 2020) but has been less demonstrated empirically, prompting calls for action to empirically explore young children's playscapes "beyond discrete engagements" (S. Edwards, 2022, p. 7) with digital devices in "the wider context for play" (Marsh, 2019, p. 157). Researchers should consider how new media technologies "feed into play, in combination with broader knowledge of children's life experiences and interests" in a "holistic examination of the reality of [children's] play" (Parry & Scott 2020, p. 450). My studies provide novel in situ accounts of how early childhood play with new media technologies unfolds in the postdigital.

First, *I demonstrate how new media technologies are felt and experienced as thoroughly interwoven with young children's everyday. The literacies of early childhood play*

in the postdigital feature bodies, blocks, and bytes in novel, idiosyncratic arrangements, effectively unsettling digital–analog binaries.

In Article I, the coauthors and I demonstrate how Yahtzee and Captain are "in creative," performing ludic features of *Minecraft* while playing with blocks in the preschool common room. Rather than an out-of-school digital literacy first mastered then creatively appropriated into their traditional play at preschool, being in creative is a digital–analog text that emerged contingently through specific arrangements. For example, the abundance of blocks in the preschool common room work in tandem with the unlimited item feature of *Minecraft* Creative and emerge, through Yahtzee and Captain's postdigital play, contingently as "not running out of things." The study demonstrates young children's postdigital play in the absence of digital devices, contributing to extant research, which has mostly focused on their discrete manipulation of digital devices (Flewitt & Clark, 2020; Gillen & Kucirkova, 2018; Lundtofte et al., 2019; Marsh, 2017). While previous research certainly has demonstrated how young children, for example, feed off popular media narratives (Burn, 2013; Wohlwend, 2012) and represent absent digital playthings as resources for their play (Bird, 2018; Vogt & Hollenstein, 2021; Wohlwend, 2009), our study demonstrates how the texts of young children's literacies enacted through their contemporary play emerge dynamically as neither primarily on- nor off-screen.

Continuing this line of thinking, in Article II, the coauthor and I demonstrate how Yahtzee and Professor's play moves across diverse sets of materials—Legos, Plus-plusses, YouTube videos, *Minecraft* on a Nintendo Switch—but the feeling still resonates and is felt and registered across the events, laying the foundation of the children's friendship. For example, dying senselessly emerges as they play with *Minecraft* Legos and while playing *Minecraft* Survival, which gains felt consistency through repetition and anticipation and carries the potential of disruption, with the force such encounters entail. One apt companion piece to the study is Lenters' (2016) study of how an 11-year-old boy is fascinated by a range of online media content, and creates spaces of discord with the official curriculum by performing versions of the content in the margins of his notebooks at school. Another is Boldt and Leander's (2017) study of a father and boy playing with Legos, where the breaking-apart of the play is central to the felt life and movement of the activity. We demonstrate how similar dynamics unfold through the friendship of two young boys in new postdigital conditions, and, specifically, how the stability of resonating feelings appears to be as central to the activity and to their friendship as the surprises—feelings of resonance and feelings of surprise create conditions for the other.

Even in traditional playful activities like collecting in lush, Norwegian forests, I posit in Article III that the threads of ludic features of new media technologies weave through and are inseparable from the play—the way collecting feels resonates across diverse moments. For example, stars surprisingly appear on-screen in *Super Mario Run* and resonate with slugs mysteriously appearing in the forest, both as if gifted and contingently moving the children to collect. While previous research has primarily demonstrated the goal-oriented collecting off-screen with older children (e.g., Baker & Gentry, 1996; Beery & Lekies, 2019; Moshenska, 2008), my study demonstrates the contingent, random, and shifting collecting of young children in postdigital playscapes.

Second, *I demonstrate how the young children's play in the postdigital moves unpredictably and how the children enjoy, encourage, and facilitate the sudden bursts of affect produced as novel, idiosyncratic arrangements are formed.*

Research on the literacies of early childhood has demonstrated how affective dimensions are central to their play (e.g., Hackett; 2021; Nordström et al., 2021; Rautio, 2013). Contributing to this line of research, and aligned with research on older children and new media technologies (e.g., Abrams, 2017; Hollett & Ehret, 2015; Lenters, 2016), I show how young children also attune to felt indeterminacies in new socio–technological conditions. While the digital in the public imaginary is often associated with cold calculations, standardization, and addictive repetition, I demonstrate the pleasures, resonances, and unpredictabilities of young children's play in the postdigital.

In Article I, the coauthors and I demonstrate how Yahtzee and Captain play by dwelling: it is no simple application or insertion of a character or storyline from *Minecraft* into their play but a tentative, probing, collaborative movement, which plays being in creative into existence. For example, Yahtzee's golem constructed from blocks has disruptive potential toward Captain's house but "being in creative," a configuration that has elaborately been performed, makes such efforts less likely—in fact, Yahtzee's embodied and verbalized assertions that the golem "can" but "won't" attack restabilize "being in creative." Still, the possibility remains, to the enjoyment of Yahtzee and Captain. In Article II, the coauthor and I demonstrate how Yahtzee and Professor play the Lemon game, a game where the children play *Minecraft* deliberately badly. The Lemon game becomes recognizable as a felt consistency of their friendship through a series of rearrangements with YouTube, Nintendo Switch, Legos, and Plus-plusses. However, importantly, because playing badly moves the play to unforeseen events, the felt consistency enables its own disruption, which registers pleasurably on their bodies. For example, Yahtzee and Professor facilitate the hostile mobs to attack, and they jump, twist, and turn in the couch and chair when the mobs suddenly do. In Article III, I demonstrate how Yahtzee, Racer, and other children embrace the random and contingent qualities of doing the collecting rather than deliberately aiming to amass a set collection. For example, their collection of slugs and insects on a flat rock is characterized by randomness and permeability—an openness to what happens next. However, importantly, the sensibilities of the embrace are not divorced from the material conditions of young children's everyday. The heaviness of the rock in relation to the young child who is supporting it is as central to the unfolding as the children's predilections.

6.2 Conceptual contribution

The conceptual contribution of my inquiry is the productive theorizing and concepts I identify and explore across the three studies to study the literacies of young children's contemporary play with new media technologies (research objective 2, Section 1.4). Commenting on the state of research on early childhood education and care and the postdigital, Edwards (2022) argues that the literature is primarily descriptive of the messy and entangled qualities of postdigital play. However, she argues, the next step should, among other things, be conceptual, to move beyond purely descriptive accounts of complexity. Furthermore, broader concepts engaging meaningfully with theoretical models allow for analytical generalizability (Section 4.4).

In sociomaterial theorizing, there is a multiple conceptual landscape that can be difficult to navigate (Section 3.2). Because concepts are not reflective or representational of an inherent ontology but rather participate in the ongoing production of the world, I do not propose superior and more precise substitutes for existing concepts, which have all been generative for my own thinking. Rather, I propose concepts to keep thinking in the extension of older concepts, wary of how concepts also can territorialize and close novel thinking. Many

concepts circulate throughout my inquiry, but for this section, I highlight three concepts that are brought into movement.

The key concept of my inquiry is *postdigital*. The onto–epistemological status of postdigital is unclear and intentionally so, according to Jandrić et al. (2018). Through the conceptual development of my studies, postdigital refers to play and a felt, experienced condition. In the case of a condition, it refers to a situation when new media technologies become "mundanely invisible and ubiquitously present" (Article I) and "the digital fails to constitute a discrete space" (Article II). Importantly, because a relational onto–epistemology precludes referring to a transcendent condition, the postdigital emerges as felt and experienced in our relation to the world. In the case of play, it refers to "young children's dwelling submission to an entanglement of material agencies, heterogeneous relations, and messy practices, consequently unsettling assumed boundaries between the digital and the nondigital" (Article I). Postdigital play may more precisely be coined as play *in the* postdigital. However, because societal conditions, contexts, culture, and so on are in reciprocal relationships with everyday practices (e.g., Garfinkel, 1984; Schatzki et al., 2001), play also brings the postdigital into being through configurations enacted and connections made.

Through my engagement with fieldwork, theory, research, and writing the articles, what the postdigital represented and how it acted in the research assemblage changed (see Section 3.3). In Article I, I posit that postdigital play is enacted through the intra-actions of bodies, bytes, and blocks. Multiplayer features are recruited and recognized, not as laminating or mediating the children's play, but as actors on the same plane of the configuration of blocks and bodies. In this sense, "digitalization and the digital" is dragged "kicking and screaming—down from its discursive celestial, ethereal home and into the mud" (Ryberg in Jandrić et al., 2019, p. 166). However, attention to the intra-actional details of the local event tends to revert thinking to binaries. For example, in the discussion, the coauthors and I summarize the following:

> In our study, we show how the children, rather than adopting a privileged position of mastering or appropriating, dwell in the intra-action of *digital and non-digital agentive materialities*. (Article I, my emphasis)

The phenomenon at hand caught our eyes because it broke with our expectations of block play. However, the expectations, which were based on binary thinking and not the configurations and assemblages made in situ, still frame our analysis. Paradoxically, such (digital–analog) hybrids only make sense through the purification processes of binary thinking (Latour, 1993). To escape this bind, my thinking of the postdigital changed slightly in Articles II and III. To explain this more, the metaphor of the ecotone might be useful (see Hecht & Crowley, 2020; Ryberg et al., 2021). Ecotones are the boundary areas between two biocommunities—for example, the reeds between a forest and river. Today, as new media technologies are becoming increasingly "mundanely invisible and ubiquitously present," children inhabit—dwelling, appreciating, navigating, feeling—the expanding reeds of the postdigital. Importantly, the reeds, the forest, and the river all emerge from the same ecological system, rather than the reeds being a simple mix of the forest and river. It follows that—following the ecotone metaphor—researchers of (the reeds of) the postdigital should be advised not to explore the reeds/postdigital in terms of forest/digital and river/analog, but to

simply explore how young children live their everyday lives in the reeds/postdigital where "forest"/"digital" and "river"/"analog" may not be useful emic concepts.

The postdigital, then, is a concept that is limited in its context for use and may only be meaningful on the background of binary analog–digital thinking: it can paradoxically serve to reinstate these very dichotomies. For this reason, in Article III, while the ethnographic accounts reflect an unmistakably postdigital condition, I decided against using the concept to frame my study. In the interview excerpt cited in Section 3.3, Cramer explains how the postdigital in art theory slowly has lost its utility because most art movements "mix art with other forms of work and knowledge, as well as online and offline activities" (Cramer & Jandrić, 2021, p. 978). Similarly, because the mark of new media technologies extend into most spaces of interest for literacy researchers, the concept of the postdigital can be backgrounded. Although the concept of the postdigital has been an important scaffold, it can be dislodged. In my current thinking, recognizing the postdigital condition is not about further developing the concept, but rather, it is about a call for an attunement that mirrors the one I felt while spending time with Yahtzee, Professor, Racer, and their peers. This attunement affects my modes of inquiry (Section 6.3), what concepts are useful (this section), and what I think are relevant pedagogies (Section 6.4) (S. Edwards, 2022).

It follows from this account that positing the postdigital is only the first step of empirical inquiry. Studies of the postdigital need to be supported, among other things, by concepts and theory to generalize its findings analytically (Section 4.4). The sociomaterial theorizing of agential realism (Barad, 2007) and nonrepresentational affect theory (Deleuze, 1988; Deleuze & Guattari, 1987) provide a theoretical foundation and key concepts for my inquiry, allowing me to move beyond digital–analog binaries by attending to performance rather than representation. In Article II, *refrain* is plugged in to account for the consistencies of young children's play in the postdigital. In early literacy research, Boldt and Leander (2017) introduce the term, originally from Deleuze and Guattari (1987). However, in their study of a young child and a father playing with Legos, refrains are discussed primarily in relation to their key concept of the break, which emerges as something unpredictable and interrupting the flow of the refrain. Sociomaterial theorizing of literacy tends to emphasize singular and emergent events (Section 2.2). Refrains are, the coauthor and I argue, a fruitful avenue for future sociomaterial theorizing in literacy research to account for the consistencies of literacy. Attuning to refrains is especially important in the postdigital condition because, as we demonstrate, young children operate through novel, idiosyncratic arrangements that connect across time and space. Although the consistencies of refrains can be stagnating, unjust, and suffocating, we show how, during Yahtzee and Professor's play, refrains allow for breaks, giving friendship a felt dimension across events. For example, the Lemon game emerges from Yahtzee's and Professor's more-than-digital engagements—playing *Minecraft*, watching YouTube, and playing with Plus-plusses and Legos. A felt consistency—a refrain—emerges, which is pleasurable because the range of stuff recruited at the same time gives rise to an unpredictability that registers affectively with the children. This proposition is novel—departing away from both transmedia play and digital play—and actionable, which is elaborated in Section 6.4.

In Article III, I empirically explore and further develop the concept of *answering the world* (Hackett & Rautio, 2019) to account for the collecting of a set of young children. The concept attunes researchers to their "aesthetic–affective openness towards material surroundings" (Bennett, 2010; Rautio, 2013, p. 395) and, in my case, supported my findings of how their collections were not a set accumulation of items but leaky and unsettled, along

with how the collected items often were selected through games of chance. However, the concept may serve to romanticize young children's play. The things of their surroundings emerge as active participants or conversational partners as an effect of the tensions that tend to characterize young children's encounters with the world. For example, I show how a rock is too heavy to carry or how the mechanics of a video game might be difficult to comprehend for young children. Their answering the world follows from material tensions that are likely to occur more often for young children. Furthermore, I demonstrate how the dynamics of "answering the world" also apply to assumed virtual worlds and the expansive, connected playscapes of contemporary early childhoods. For example, being awarded stars in *Super Mario Run* registers as surprising, affective encounters in much the same ways as discovering cones on a rocky neighborhood hill.

In sum, I suggest the following propositions based on the conceptual contributions of my inquiry: *the* postdigital *refers to a felt and experienced condition when new media technologies become "mundanely invisible and ubiquitously present" (Article I) and "the digital fails to constitute a discrete space" (Article II). My inquiry shows how an attunement to the postdigital condition affects relevant modes of inquiry and conceptual development. Sociomaterial theorizing of literacy is apt to attend to the postdigital because it allows researchers to move beyond the digital–analog binary by considering the performativity of boundary making.*

The refrain *(Deleuze & Guattari, 1987) refers to the felt consistencies through and across events, which tend to be less attended to in sociomaterial theorizing of literacy. Furthermore, the refrain is apt to study early childhoods in the postdigital because it attunes the researcher to its novel, idiosyncratic arrangements that connect across time and space.*

Answering the world *(Hackett & Rautio, 2019) refers to understanding the literacies of young children's collecting as equal, material encounters, rather than goal-oriented, representational activities. Furthermore, the concept attends to early childhood play with new media technologies as it manifests in the postdigital by recognizing encounters with screens to be similarly felt as encounters with cones. However, "answering the world" may also serve to romanticize their collecting while glossing over the material conditions through which their collecting is enacted.*

6.3 Methodological contribution

The methodological contribution of my inquiry is the identification and exploration across the three studies of how literacies of young children's contemporary play with new media technologies can be studied (research objective 3, Section 1.4). The literature on early childhood play in the postdigital condition poses this as a critical issue because the digital is decreasingly equated with local engagements with digital devices (S. Edwards, 2022; Marsh, 2019). It follows that the calls for new accounts implicate calls for new modes of inquiry across broader ecologies. In principle, micro/ethnography are apt modes of inquiry. However, while sociomaterial theorizing is also apt to study the messy configurations of the postdigital, there are tensions in the intersections of the two. Typically, literacy research underpinned by sociomaterial theorizing analytically emphasizes the literacy event, without making the theoretical leap to literacy practices beyond the singular local event. In the postdigital condition, I show how felt consistencies and the productive encounters across time and space are made evident and, thus, actionable by plugging onto ethnographic accounts from immersive fieldwork and studying young children's play with new media technologies "beyond discrete engagements" (S. Edwards, 2022, p. 7) with digital devices in "the wider

context for play" (Marsh, 2019, p. 157). Plugging into postqualitative modes of inquiry, I further show how researchers inspired by these approaches can work with broader ethnographies through attuning to, not only the wonder of the unexpected and unpredictable, but also the refrains and consistencies of young children's play. Thus, my inquiry provides a demonstration of McLure's metaphor of qualitative research as a cabinet of curiosities: "one which allows for both the discernment of order and pattern and is attuned to the lively excess that always exceeds capture by structure and representation, leaving openings where something new, or something else, might issue" (2013, p. 229).

In Article I, the coauthors and I demonstrate an intra-action analysis of young children's contemporary play. This allowed us to interrogate critically the notion of digital play, which has tended to treat this play as the time- and space-bound manipulation of digital devices. The broader ethnographic accounts enable us to study in detail the complexities of how the literacy text of playing "in creative" emerges contingently through specific configurations in the preschool common room, rather than as a digital resource to be used in their analog play. In Article II, our plugging into the refrain answers Hackett's (2021) call for action to rethink how to combine postqualitative modes of inquiry and broader ethnographies. Analytical attention to the refrains, a concept situated in sociomaterial theorizing, allows researchers to feel for consistency while also feeling for interruptions and breaks. Similarly, in Article III, I demonstrate further how collecting can be approached by exploring how indoor gaming on Nintendo Switch and outdoor play resonate. Importantly, attending to this resonance is entangled with attuning to the contingent, random, and unpredictable.

In sum, I suggest the following propositions based on the methodological contributions of my inquiry: *Research on early childhood play in the postdigital can move "beyond discrete engagements" (S. Edwards, 2022, p. 7) with digital devices in "the wider context for play" (Marsh, 2019, p. 157) through the sociomaterial analyses and micro/ethnography demonstrated in my inquiry. In particular, attention to the refrains of social life is an analytical mode grounded in onto–epistemology directed toward felt consistencies across time and space, thus aligning postqualitative inquiry with broader ethnographies.*

6.4 Implications for pedagogy

I am cautious about venturing into prescriptive territory because the development of pedagogy has not been an aim of my dissertation. Still, concepts and accounts are performative and produce specific effects through the assemblages and configurations they form with other things. New concepts and accounts are apt to problematize and unsettle hardened ways of thinking and doing, as well as make (assumed) messy and entangled practices legible and meaningful, in effect making them actionable. Parents, caretakers, teachers, and policymakers produce knowledge claims of young children playing with new media technologies in terms of "protection," "agency," "digital natives," "learning," "addiction," "sleep," and so on. These claims affect how parents, teachers, and others in close contact with young children respond to young children's play and inform and align with parenting and educational practices of provision, facilitation, coplaying, restriction, and so on (Dias et al., 2016; Mascheroni et al., 2016). My accounts and propositions can also affect, inform, and align with practice by providing support for an argument about pedagogy in the postdigital.

I posit that a pedagogy that considers the digital in isolation will become increasingly anachronistic. In the postdigital, parents, caretakers, and teachers should be aware of the kinds

of novel cuts made, along with what kinds of effects they have, as "hybrid" digital–analog spaces are performed into being. In contemporary play, young children's literacies are interwoven with new media technologies, and teachers and parents should move with these novel movements—not to blindly accept and adjust but to recognize and sensitively attune. Still, sedimented ways of thinking about play among, for example, early childhood teachers may constrain the emergence of novel play pedagogies in the postdigital, and explicit measures to untrain "digital" and "analog" pedagogies might need to be made. Edwards et al. (2020) provide an example from one preschool where the teachers print images of Pokémon and hide them around the playground, effectively creatively interrogating the space between a treasure hunt and *Pokémon Go*. Although there is no guarantee that this activity will prove successful (whatever successful might look like), I encourage similar probes, experiments, and suggestive measures to play and feel with the postdigital.

Adding another dimension to pedagogy beyond meaning making, affective and posthuman approaches to literacy education emphasize the emergence of indeterminate affective intensities through novel configurations and assemblages. My analyses show how children actively search for experiences of breaks and how they feel for resonance across seemingly disparate literacy events. Thus, feeling for the flows and interruptions of young children's play may be apt modes of inquiry for parents, caretakers, and teachers in close, everyday encounters with children. This requires parents, caretakers, and teachers who do "not subscribe to territorializing refrains of [for example] *Minecraft* being either educational and good or addictive and bad. Rather, [they] should sense the vibe of the room, allow [themselves] to be affected, and allow children to move through and explore the breaks and refrains of the postdigital together with their friends" (Article II). Furthermore, when it comes to early childhood education, policymakers contribute to policy assemblages (Savage, 2020), affecting what can and cannot be produced in preschools. For example, there are ongoing debates in Norway about what happens in the wake of insufficient staffing (Bae, 2023) and the implementation of programmatic teaching and learning designs in preschools (Pettersvold & Østrem, 2018). Calls for action for slow knowledge (Clark, 2023) and vitality rights (Boldt, 2021) in young children's classrooms attend to resisting such efforts. As researchers, parents, teachers, and policymakers, we need expansive notions of literacy—where felt dimensions get due credit and new conditions for literacy are attended to—allowing for engaging thoughtfully and feelfully with young children's contemporary play with new media technologies. My thinking, feeling, and doing in relation to the everyday experiences of Yahtzee, Racer, Professor and the other children of my fieldwork may serve as rich examples of such engagements.

7 Postscript

> This fundamental tendency has been especially active since the 20th century, through the industrial diffusion of cultural means, the extension of mass culture, and the gigantic intervention of the media (press, cinema, radio, television, advertising). The ephemeral character of form and content has been accentuated, one loses count of the revolutions of style, fashion, writing, custom. In radicalizing itself thus in a change of perspective, in a continual dolly-shot, modernity changes meaning. Bit by bit, it loses all the substantial value of progress which underlay it at the beginning, in order to become an aesthetic of change for change's sake. It abstracts itself and deploys itself in a new rhetoric, it inscribes itself in the play of one or multiple systems of signs. At the limit, it merges purely and simply with fashion, which is at the same time the end/aim [la fin] of modernity. (Baudrillard, 1987, pp. 68–69)

Throughout the present dissertation, I have proposed *re*conceptualizations, *new* modes of inquiry, and discussed *post*humanist and *post*qualitative approaches to the *novel post*digital condition. These efforts resonate with the public discourse of the digital as oriented toward future and novelty (Burnett & Merchant, 2020b; Livingstone & Blum-Ross, 2021). They also resonate with the modernist impulse toward progress, as accounted by Baudrillard (1987) in the excerpt above. My key concept of the postdigital certainly lends itself to such interpretations: it evokes images of cyborg science fiction and cutting-edge Silicon Valley newspeak. It also brings to mind the world of academic fashion: a new post meant to account for a new era of social life. In the cultural milieu within which the present dissertation is meant to operate, novelty carries authority. As a doctoral research fellow, I am expected to reflect on my "contribution." In the tech industry, "disruption" is the predominant mode of action. There is an incentive for researchers to reconceptualize, argue for new ways of doing research, and posit new alleged conditions. My reflections about the concept of the postdigital, made salient in my articles and Sections 3.3 and 6.2 in the extended abstract, suggest my uneasiness about this dynamic, which is also evident in the critical reception of the concept (Feenberg, 2019; Levinson, 2019; Taffel, 2016).

What is considered *novel*, *post,* or *beyond* also carry the power of history. For example, while the media panics of today feel vital, urgent, and bearing a distinct tinge of the contemporary, they also echo earlier anxieties about the consumption of media among our youngest—be they dime novels or VHS tapes (Drotner, 1999). Posthumanist thinking also resonate interestingly with pragmatist philosophy from the turn of the nineteenth century (Rosiek, 2013). Deleuze was born shortly after World War 1, and, Spinoza, an important inspiration for Deleuzian thinking on affect, practiced in the seventeenth century. Ahmed (2008) argues that "new" materialisms often rely on gestures that misrepresent "old" theory as disregarding materiality. The discourse of novelty obscures the long lines, the refrains, attachments to the past—what makes things stick, resonate, and linger.

Rather than taken to embody the unprecedented and avant-garde, my take on the postdigital is, on the contrary, to recognize the connections across space and time that typify engagements with new media technologies today. The movements I felt and followed during my fieldwork and analysis did not only progress forward but also connected to primordial practices like collecting cones and building with blocks, echoed well-known play narratives of combat, and demonstrated how playing iPad operated in larger ecologies where everyday practices like eating an orange or finding a stick also played parts. Furthermore, although I do

posit there is something new about this condition that is embodied, materialized, and felt as the children go about their everyday, the thinking it builds upon is not new. Already in the late 1990s, Negroponte posited that "like air and drinking water, being digital will be noticed only by its absence, not its presence" (1998, para. 2). The poststructuralist impulse of collapsing binaries has an even longer history.

Although the paragraphs above suggest the need for humility and restraint, my inquiries could also have moved further. There is an emerging conversation about the platformization of education (Rivas, 2023) and, to a lesser degree, the platformization of young children's family homes (Goulden, 2021; University of Oslo, 2022). To make sense of expansive ecologies, care needs to be made to attend to how, for example, literacies are affected by YouTube recommending content and YouTube accounts connected to other platforms (Robinson, 2022). Furthermore, the multinational companies of Microsoft and Nintendo behind *Minecraft* and *Super Mario Run*, respectively, are not benevolent actors: they intentionally nudge young children into broad commercialized transmedia ecologies. Although my argument throughout the present dissertation is against a form of "interactional reductionism" (Levinson, 2005, in Nicolini, 2009), these material conditions of their play are not elaborated upon. Still, it is unmistakably present in my data: on November 25, 2020, Racer's older sibling had a paper wish list pinned to the refrigerator with a magnet:

> MARIO LEGO. ☺
> SWITCH. ☺
> SUPER MARIO-ODESI. ☺
> LUIGIS MANSION 3. ☺
> MINECRAFT. ☺
> SUPER SMASH BROS. ☺

A myopic view of their play—and the pleasures likely anticipated and then materialized on a wish list—without taking into account commercialized ecologies, is bound to be limited (S. Edwards, 2014; Wohlwend, 2020). Although the children facilitate, encourage, and embrace randomness, there is not much random about how the products appear in the young children's houses—on the contrary, a lot of work is performed to make these appear on as many wish lists as possible—benefiting a chosen few. The example of the wish list is trivial—similar mediatized and commercialized wish lists have likely appeared on refrigerators for at least the past 50 years. However, my data also contain the more novel pushes of recommendations, in-app purchases, and digital advertising. Less obvious are the amounts of data collected as the children move through the apps and games, which feed back into social life. Algorithmic cultures (Roberge & Seyfert, 2016), personalization (Kucirkova, 2021b), and surveillance capitalism (Zuboff, 2019) are all relatively new phenomena that need to be accounted for in ecologically sensitive ethnographies of early childhood play. Furthermore, thinking of the postdigital tends to privilege connection and networks, possibly playing into the hands of profit-based companies who stand to benefit from such a condition (Gourlay, 2023). In the end, the posited postdigital condition is an empirical question, and attunement to the disconnections of the contemporary condition may also be needed. For example, some news articles note a trend of young people logging off (Vadukul, 2022).

Although the gentle and not so gentle nudges of platforms are critical issues for further research—also as they relate to early childhoods—a central finding of early literacy research

has been to near consistently point out how young children transgress boundaries, are irreverent, and are unpredictable in their encounters with new media technologies. Young children attune and react to their surroundings—be they screens, forest floors, or something in-between—and "make much" rather than "make do" (Wohlwend & Thiel, 2019). The findings of my dissertation further solidify—and demonstrate the complexities of—this argument. However, tensions may arise when young children's novel ways meet the oftentimes excessively normative and dualist expectations of parents, teachers—and even researchers. Interventions might be appropriate to align early childhood pedagogy with young children's contemporary experiences (Edwards et al., 2020). Future trajectories might involve engaging young children in bottom-up research-based educational initiatives—such as social design-based experiments (Gutiérrez et al., 2017), playful methods (Medina et al., 2022), or design ethnographies (Pink et al., 2022)—to create new conditions for play that are attuned to young children's preferences and pleasures and committed to facilitating for children's participation. The Play Observatory represents one such venue, where children have been encouraged to submit videos of their play during lockdown through a website (Cannon et al., 2023; Cowan et al., 2021). By submitting, they are displaying and documenting but also being validated for their fandoms, fads, islands of expertise, pleasures, and so on. Although accounting for, theorizing, and developing new modes of inquiry are assuredly ventures that have the potential to push the research field forward, adopting new methods in which young children can express their views, propose changes, and see those changes made may be apt not only to account for and theorize but to enact hopeful, disruptive, and emancipatory ways of living and playing in the postdigital—with the postdigital.

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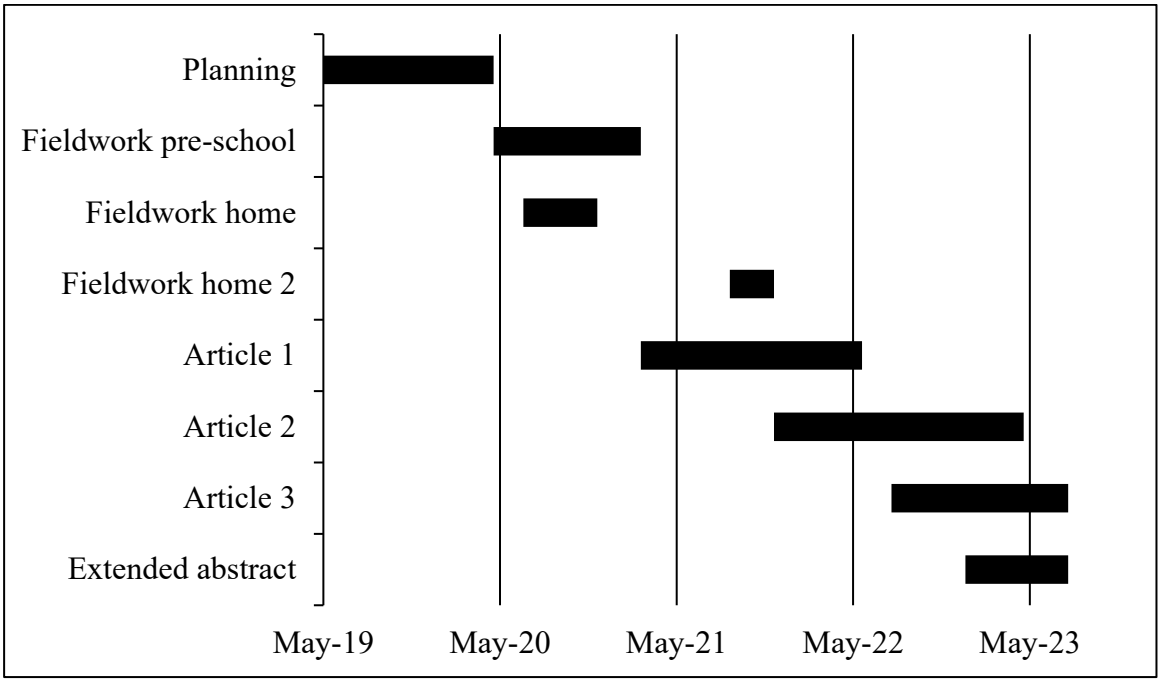
Appendix 1

Project timeline table.



Appendix 2

Fieldwork overview table.

2020								2021									
May	**June**	**July**	**August**	**September**	**October**	**November**	**December**	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**
	A					A												Y
			A			O												
					R													
	A				A													
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					O	A												
A			O															
		R																
		A																R

Apple (A)
Racer (R)
Orange (O)
Yahtzee (Y)
Professor (P)

Appendix 3

Research design table.

Research aim	Explore how new literacies emerge as new media technologies are brought together through and across moments of young children's contemporary play		
Research objectives	Account for the literacies of young children's contemporary play with new media technologies Identify and explore productive theorizing and concepts to study the literacies of young children's contemporary play with new media technologies Identify and explore how the literacies of young children's contemporary play with new media technologies can be studied		
Data collected	64 days of ethnography, including field notes 215 digital photographs 1 h 37 m 49 s digital audio recordings 55 h 8 m 15 s digital video recordings		
	Article I	**Article II**	**Article III**
Title	Playing Minecraft: Young Children's Postdigital Play	Refrains of Friendships in Young Children's Postdigital Play	Young Children's More-than-Human and More-than-Digital Collecting
Author(s)	Kenneth Pettersen Hans Christian Arnseth Kenneth Silseth	Kenneth Pettersen Christian Ehret	Kenneth Pettersen
Research question(s)	How are young children's postdigital play practices performed?	How do refrains emerge and generate felt consistency through the literacy events of two young children's play? How do refrains reemerge and generate felt consistency across the literacy events over time? How do refrains score the boys' friendship through and across the literacy events?	How do young children answer the world through contemporary playful collecting?

Primary data	12 minutes of video recordings from preschool	Three hours of video recordings from home	Field notes Ethnographic accounts Photographs Video and audio recordings
Supplementary data	Field notes Ethnographic accounts	Field notes Ethnographic accounts	
Unit of analysis	Young children's play		
Key concept	Postdigital	Refrain	Answering the world
Analysis	Intra-action analysis	Postqualitative analysis	Postqualitative analysis
Theory	Agential realism	Nonrepresentational affect theorizing	Sociomaterial affect theorizing on early childhood play and literacy

Appendix 4

Interview guide.

Descriptions of activities

- What digital tools are available at home?
- What digital tools is your child using at home?
- When is your child using digital tools at home?
- Where is your child using digital tools at home?
- How is your child using digital tools at home?
- What do you think your child is using digital tools for at preschool?

Children's perspectives on activities

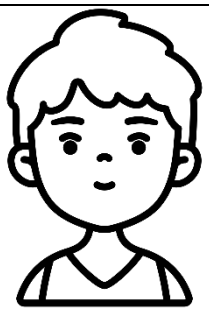
- What digital tools does your child like the most?
- How can you tell that your child likes certain digital tools?
- Why does your child like certain digital tools?
- What does your child tell you about digital tools?
- What digital tools does your child want?
- How does your child learn about new digital tools?
- What does your child tell you about use of digital tools at preschool?

Parents/legal guardians' perspectives on activities

- Tell me about an episode with your child and digital tools that has made you think.
- What digital tools do you like the most that your child is using? Why?
- What digital tools do you like the most that your child is using? Why?
- What is your opinion on your child's use of digital tools?
- What is your opinion on your child's use of digital tools at preschool?

Appendix 5

Descriptions of focal children table.

	**Yahtzee** is a 5–6-year-old boy. He lives with his older sibling, father, and mother, who were all born in Norway. Yahtzee shares a room with his sibling. They have a gaming room on the upper floor of their house, where he has friends over to play video games on an iPad or a Nintendo Switch. He is easily caught up in new projects and fads, inspiring other children to engage with him in his craze of the week.
	**Professor** is a 5–6-year-old boy. He lives with his older sibling, father, and mother, who were all born in Norway. He has his own bedroom on the top floor of their house. In his room, he has a big box of Legos, and many posters on the wall depicting characters from popular culture. He is an easy-going boy with many friends in his preschool and plays Nintendo Switch on the living room TV.
	**Racer** is a 4–5-year-old boy. He lives with his two older and younger siblings, father, and mother. Racer is bilingual and one of his parents was not born in Norway. He is a sensitive and playful boy who sometimes takes on an apprentice role when he plays with his older sibling or older friends but has a wealth of knowledge about gaming from playing *Minecraft* and other games on an iPad and Nintendo DS at home.

Appendix 6

Anonymized table of date, activity, primary participants, place, and time of the synchronized dual-video and audio recordings.

Date	**Activity**	**Primary participants**	**Place**	**Time**
June 5, 2020	Playing with digital microscope outside	Captain Pysa Yahtzee Racer	Apple	00:14:46
June 8, 2020	Interview outside (audio)	Yahtzee Racer	Apple	00:13:20
June 10, 2020	Drawing and construction play during interview (audio) Construction play during interview	Racer Yahtzee	Apple	00:37:19
June 17, 2020	Interview outside (audio)	Racer Yahtzee	Apple	00:05:38
June 19, 2020	Singing and dancing in front of iPad outside	Whole class	Apple	00:18:47
June 25, 2020	Drawing during interview outside	Racer Yahtzee	Apple	00:19:36
July 17, 2020	Gaming on Nintendo DS Gaming on phone Gaming on iPad	Morten Racer	Racer	01:17:37
July 19, 2020	Gaming on Nintendo DS	Morten Racer	Racer	00:50:51
July 29, 2020	Gaming on Nintendo DS	Morten Racer	Racer	00:45:00
August 17, 2020	Playing with Beebot	Mustafa Cat Lille Kamomilla	Apple	00:33:40
August 24, 2020	Home tour Gaming on iPad Watching YouTube on iPad	Leon Yahtzee	Yahtzee	01:02:41
August 26, 2020	Construction play (audio)	Yahtzee Captain Racer	Apple	00:44:41
August 28, 2020	Circle time with projector and iPad	Whole class	Orange	00:26:20

September 10, 2020	Drawing Gaming on iPad	Yahtzee Racer	Yahtzee	01:14:31
September 17, 2020	Interview during lunch (home recording) Drawing (home recording)	Yahtzee Racer	Racer	00:06:44
September 22, 2020	Playing with Beebot	Yahtzee Racer Captain	Apple	00:19:54
September 25, 2020	Circle time with gaming	Whole class	Orange	00:38:38
October 6, 2020	Play-Doh play Play-Doh animation play	Mustafa Racer Captain Yahtzee Karsten Nina Anthony	Apple	01:29:18
October 9, 2020	Recording podcast Lunch while listening to music	Professor Klara Charlotte Minnie Mouse Professor Farty Pants Master Soccer Wall	Orange	01:01:56
October 16, 2020	Recording podcast during lunch	Professor John Professor Pee Pants Ariel Alia	Orange	00:48:30
October 16, 2020	Gaming on iPad (home recording)	Racer	Racer	00:05:08
October 22, 2020	Home tour Gaming on iPad Watching YouTube on iPad Gaming on Nintendo DS	Racer Morten	Racer	01:31:24
October 27, 2020	Recording podcast during lunch	Professor Poopy Pants Professor Pee Pants Klara	Orange	00:35:09

November 2, 2020	Block play and play in common room	Racer Captain Leon Yahtzee	Apple	00:59:44
November 3, 2020	Drawing with Beebot	Minnie Mouse Ariel Alia Alfa Beta	Orange	00:27:07
November 24, 2020	Gaming on iPad Recording podcast during lunch	John Professor Professor Pee Pants Minnie Mouse	Orange	01:09:29
November 25, 2020	Playing with Plus-plusses Gaming on iPad	Racer Morten Iris	Racer	01:18:52
November 27, 2020	Gaming on iPad (home recording)	Racer	Racer	00:05:59
December 15, 2020	Drawing during interview	Yahtzee Soccer Wall Professor Pee Pants Mustafa Captain	Orange	00:15:40
December 17, 2020	Drawing during interview	Captain Yahtzee	Apple	00:42:11
January 14, 2021	Playing games on iPad and projector	Whole class	Orange	00:30:07
January 20, 2021	Playing *Super Mario* in common room	Anthony Racer Yahtzee	Apple	00:37:25
January 21, 2021	Playing *Super Mario* in common room	Racer Captain Yahtzee	Apple	00:40:52
February 11, 2021	Playing in common room	Anthony Yahtzee	Apple	00:46:01
February 12, 2021	Playing *Super Mario* in common room	Racer Yahtzee	Apple	00:37:38
February 19, 2021	Playing and drawing in common room	John Professor	Orange	01:00:59
February 23, 2021	Drawing Playing with Plus-plusses	John Professor	Orange	00:48:53

February 24, 2021	Interview during play in common room	Professor John	Orange	00:26:14
September 14, 2021	Gaming on iPad Gaming on Nintendo Switch	Racer	Racer	00:58:14
September 21, 2021	Gaming on Nintendo Switch (TV) Playing board games	Yahtzee	Yahtzee	00:52:42
October 19, 2021	Gaming on Nintendo Switch (TV) Drawing	Professor Yahtzee	Yahtzee	01:11:38
October 21, 2021	Gaming on Nintendo DS Playing with Duplo Robot	Anthony Racer Iris	Racer	01:13:57
October 26, 2021	Gaming on Nintendo Switch	Leon Yahtzee	Yahtzee	00:55:00
November 2, 2021	Gaming on iPad Watching YouTube on iPad	Yahtzee	Yahtzee	00:49:48
November 9, 2021	Gaming on Nintendo Switch (TV) Watching *YouTube* on TV Playing with Legos	Professor Yahtzee	Professor	01:29:20
November 16, 2021	Playing with Plus-plusses Playing with sticks Gaming on phone Watching YouTube on TV Gaming on Nintendo Switch (TV)	Professor Yahtzee	Professor	01:31:13
November 23, 2021	Gaming on Nintendo Switch (TV)	Professor Yahtzee	Yahtzee	01:03:31
November 30, 2021	Gaming on iPad Watching YouTube on iPad	Morten Racer	Racer	00:44:20

Appendix 7

Anonymized table of date, content, and place of the photographs.

Date	Content	Place
May 28, 2020	Song and dance in front of iPad outside (1) Drawings (3)	Apple
June 2, 2020	Child with microphone (1) Drawing (1)	Apple
June 5, 2020	Screenshots from digital microscope (7)	Apple
June 10, 2020	Drawing materials (11) Drawings (21)	Apple
June 17, 2020	Outside infrastructure (11) Drawings (2)	Apple
June 19, 2020	Hats (4) Chalk drawing on sidewalk (2) Outside infrastructure (2) Painting (1)	Apple
June 23, 2020	A hill (1) Children drawing (1) Pinecone spaceship (1)	Apple
June 25, 2020	Drawings (3)	Apple
July 19, 2020	Living room and kitchen (9) Bedroom (17) Office (2)	Racer
July 30, 2020	Drawers for drawings (1) Sound ear (1) Duplo construction (1) Plus-plus construction (1) Child drawing (1)	Apple
July 30, 2020	Drawing (1)	Yahtzee
August 3, 2020	Drawings (5) Duplo constructions (2) Child with toy computer (2)	Apple
August 17, 2020	Beebot equipment (3) Hug–high five–fist bump–hand shake poster (1)	Apple
August 24 2020	Outdoor play (4) Chalk drawing (1)	Apple
August 26, 2020	Children playing with Plus-plusses (2)	Apple
September 8, 2020	Activity board (1) Children in front of iPad (1) YouTube screenshot (1) Beebot equipment (3) Drawings (4)	Apple

September 10, 2020	Nature objects (5) Drawings (5)	Yahtzee
September 11, 2020	Children cutting paper (3)	Orange
September 22, 2020	Beebot equipment (3) Outdoor play (4)	Apple
October 6, 2020	Wi-fi speaker (1) YouTube screenshot (1) Child drawing (1)	Apple
October 9, 2020	Folded drawings (2) Plus-plus spinner (1) Child hand motions (1) Circle time dance with projector (4)	Orange
October 27, 2020	Plus-plus construction (1)	Orange
November 3, 2020	Beebot drawing (1)	Orange
November 25, 2020	Christmas wish list (1) Plus-plus *Among Us* (3)	Racer
November 27, 2020	Children in front of iPad (1)	Apple
December 15, 2020	Children drawing (1)	Orange
December 17, 2020	Children in front of iPad (1) Drawings (6)	Apple
January 14, 2021	Children with headphones and camera (3)	Orange
January 20, 2021	Children playing in front of camera (3)	Apple
January 21, 2021	Drawing (1)	Apple
January 21, 2021	Mario hat (1) Mario socks (1) *My Little Pony* dress (1) Drawings on walls (7) Spiderman pose (2)	Orange
February 11, 2020	Field notes (1) Drawing (1) Sticks (1) Drawer with stuff (1)	Apple
February 12, 2021	Camera (1)	Apple
September 14, 2021	Timer (1)	Racer
October 19, 2021	Drawings (5)	Yahtzee
November 23, 2021	Children gaming in front of camera (1)	Yahtzee

Appendix 8

Evaluations by the Norwegian Agency for Shared Services in Education and Research (formerly the Norwegian Center for Research Data).

1. Original
2. Revised to add fieldwork with Yahtzee and Racer at home
3. Revised to extend the time of the fieldwork and allow the parents of focal children to send videos through a safe web application
4. Revised to add fieldwork with Professor at home and allow friends visiting focal children at home to participate

Sikt

Vurdering av behandling av personopplysninger

Referansenummer	Vurderingstype	Dato
952117	Standard	27.01.2020

Tittel
Små barns bruk av digital teknologi på tvers av barnehage og hjem

Behandlingsansvarlig institusjon
Universitetet i Oslo / Det utdanningsvitenskapelige fakultet / Institutt for pedagogikk

Prosjektansvarlig
Kenneth Pettersen

Prosjektperiode
02.03.2020 - 30.04.2023

Kategorier personopplysninger
Alminnelige

Lovlig grunnlag
Samtykke (Personvernforordningen art. 6 nr. 1 bokstav a)

Behandlingen av personopplysningene er lovlig så fremt den gjennomføres som oppgitt i meldeskjemaet. Det lovlige grunnlaget gjelder til 30.04.2028.

Meldeskjema

Kommentar
Det er vår vurdering at behandlingen av personopplysninger i prosjektet vil være i samsvar med personvernlovgivningen så fremt den gjennomføres i tråd med det som er dokumentert i meldeskjema med vedlegg 27.1.2020, samt i meldingsdialogen mellom innmelder og NSD. Behandlingen kan starte.

FORSKNINGSETIKK
NSD bemerker at det er Universitetet i Oslos ansvar å sikre at forskningsetiske retningslinjer følges. Vi legger til grunn at forsker har gjort en grundig vurdering av etiske utfordringer knyttet til forskning i barnehage, især i forbindelse med videoopptak, og at slike vurderinger også gjøres fortløpende underveis i prosjektet.

MELD VESENTLIGE ENDRINGER
Dersom det skjer vesentlige endringer i behandlingen av personopplysninger, kan det være nødvendig å melde dette til NSD ved å oppdatere meldeskjemaet. Før du melder inn en endring, oppfordrer vi deg til å lese om hvilke type endringer det er nødvendig å melde:
https://nsd.no/personvernombud/meld_prosjekt/meld_endringer.html

Du må vente på svar fra NSD før endringen gjennomføres.

TYPE OPPLYSNINGER OG VARIGHET
Prosjektet vil behandle alminnelige kategorier av personopplysninger frem til 30.4.2023. Etter dette vil personopplysningene oppbevares ved institusjonen i fem år, til bruk i liknende forskningsprosjekter.

LOVLIG GRUNNLAG
Prosjektet vil innhente samtykke fra de registrerte til behandlingen av personopplysninger. Vår vurdering er at prosjektet legger opp til et samtykke i samsvar med kravene i art. 4 og 7, ved at det er en frivillig, spesifikk, informert og utvetydig bekreftelse som kan dokumenteres, og som den registrerte kan trekke tilbake. Lovlig grunnlag for behandlingen vil dermed være den registrertes samtykke, jf. personvernforordningen art. 6 nr. 1 bokstav a.

PERSONVERNPRINSIPPER
NSD vurderer at den planlagte behandlingen av personopplysninger vil følge prinsippene i personvernforordningen om:
- lovlighet, rettferdighet og åpenhet (art. 5.1 a), ved at de registrerte får tilfredsstillende informasjon om og samtykker til behandlingen
- formålsbegrensning (art. 5.1 b), ved at personopplysninger samles inn for spesifikke, uttrykkelig angitte og berettigede formål, og ikke

viderebehandles til nye uforenlige formål
- dataminimering (art. 5.1 c), ved at det kun behandles opplysninger som er adekvate, relevante og nødvendige for formålet med prosjektet
- lagringsbegrensning (art. 5.1 e), ved at personopplysningene ikke lagres lengre enn nødvendig for å oppfylle formålet

DE REGISTRERTES RETTIGHETER
Så lenge de registrerte kan identifiseres i datamaterialet vil de ha følgende rettigheter: informasjon (art. 13), innsyn (art. 15), retting (art. 16), sletting (art. 17), begrensning (art. 18), underretning (art. 19), dataportabilitet (art. 20).

NSD vurderer at informasjonen som de registrerte vil motta oppfyller lovens krav til form og innhold, jf. art. 12.1 og art. 13.

Vi minner om at hvis en registrert tar kontakt om sine rettigheter, har behandlingsansvarlig institusjon plikt til å svare innen en måned.

FØLG DIN INSTITUSJONS RETNINGSLINJER
NSD legger til grunn at behandlingen oppfyller kravene i personvernforordningen om riktighet (art. 5.1 d), integritet og konfidensialitet (art. 5.1. f) og sikkerhet (art. 32).

For å forsikre dere om at kravene oppfylles, må dere følge interne retningslinjer og eventuelt rådføre dere med behandlingsansvarlig institusjon.

OPPFØLGING AV PROSJEKTET
NSD vil følge opp underveis (hvert annet år) og ved planlagt avslutning for å avklare om behandlingen av personopplysningene er avsluttet/ pågår i tråd med den behandlingen som er dokumentert.

Lykke til med prosjektet!

Kontaktperson hos NSD: Lasse Raa
Tlf. personverntjenester: 55 58 21 17 (tast 1)

Sikt

Vurdering av behandling av personopplysninger

Referansenummer	Vurderingstype	Dato
952117	Standard	23.06.2020

Tittel
Små barns bruk av digital teknologi på tvers av barnehage og hjem

Behandlingsansvarlig institusjon
Universitetet i Oslo / Det utdanningsvitenskapelige fakultet / Institutt for pedagogikk

Prosjektansvarlig
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Prosjektperiode
02.03.2020 - 30.04.2023

Kategorier personopplysninger
Alminnelige

Lovlig grunnlag
Samtykke (Personvernforordningen art. 6 nr. 1 bokstav a)

Behandlingen av personopplysningene er lovlig så fremt den gjennomføres som oppgitt i meldeskjemaet. Det lovlige grunnlaget gjelder til 30.04.2028.

Meldeskjema

Kommentar
NSD har vurdert endringen registrert 22.6.2020.

Det er vår vurdering at behandlingen av personopplysninger i prosjektet vil være i samsvar med personvernlovgivningen så fremt den gjennomføres i tråd med det som er dokumentert i meldeskjemaet med vedlegg den 23.6.2020. Behandlingen kan fortsette.

Endringen består i to nye utvalg som skal observeres i sine hjem. Behandlingen er samtykkebasert og det gis individuell informasjon. Foreldre samtykker på vegne av sine barn, men barna får tilpasset informasjon og observasjonen stoppes dersom de uttrykker ønske om ikke å delta.

OPPFØLGING AV PROSJEKTET

NSD vil følge opp underveis (hvert annet år) og ved planlagt avslutning for å avklare om behandlingen av personopplysningene er avsluttet/pågår i tråd med den behandlingen som er dokumentert.

Lykke til med prosjektet!

Kontaktperson hos NSD: Håkon J. Tranvåg

Tlf. Personverntjenester: 55 58 21 17 (tast 1)

Sikt

Vurdering av behandling av personopplysninger

Referansenummer	Vurderingstype	Dato
952117	Standard	22.09.2020

Tittel
Små barns bruk av digital teknologi på tvers av barnehage og hjem

Behandlingsansvarlig institusjon
Universitetet i Oslo / Det utdanningsvitenskapelige fakultet / Institutt for pedagogikk

Prosjektansvarlig
Kenneth Pettersen

Prosjektperiode
02.03.2020 - 30.04.2023

Kategorier personopplysninger
Alminnelige

Lovlig grunnlag
Samtykke (Personvernforordningen art. 6 nr. 1 bokstav a)

Behandlingen av personopplysningene er lovlig så fremt den gjennomføres som oppgitt i meldeskjemaet. Det lovlige grunnlaget gjelder til 30.04.2028.

Meldeskjema

Kommentar
NSD har vurdert endringen registrert 14.9.2020.

Det er vår vurdering at behandlingen av personopplysninger i prosjektet vil være i samsvar med personvernlovgivningen så fremt den gjennomføres i tråd med det som er dokumentert i meldeskjemaet med vedlegg den 22.9.2020. Behandlingen kan fortsette.

OPPFØLGING AV PROSJEKTET

NSD vil følge opp underveis (hvert annet år) og ved planlagt avslutning for å avklare om behandlingen av personopplysningene er avsluttet/pågår i tråd med den behandlingen som er dokumentert.

Lykke til med prosjektet!

Kontaktperson hos NSD: Håkon J. Tranvåg

Tlf. Personverntjenester: 55 58 21 17 (tast 1)

Sikt

Vurdering av behandling av personopplysninger

Referansenummer	Vurderingstype	Dato
952117	Standard	11.11.2020

Tittel
Små barns bruk av digital teknologi på tvers av barnehage og hjem

Behandlingsansvarlig institusjon
Universitetet i Oslo / Det utdanningsvitenskapelige fakultet / Institutt for pedagogikk

Prosjektansvarlig
Kenneth Pettersen

Prosjektperiode
02.03.2020 - 30.04.2023

Kategorier personopplysninger
Alminnelige

Lovlig grunnlag
Samtykke (Personvernforordningen art. 6 nr. 1 bokstav a)

Behandlingen av personopplysningene er lovlig så fremt den gjennomføres som oppgitt i meldeskjemaet. Det lovlige grunnlaget gjelder til 30.04.2028.

Meldeskjema

Kommentar
NSD har vurdert endringen registrert 29.10.2020

Det er vår vurdering at behandlingen av personopplysninger i prosjektet vil være i samsvar med personvernlovgivningen så fremt den gjennomføres i tråd med det som er dokumentert i meldeskjemaet med vedlegg den 11.11.2020. Behandlingen kan fortsette.

Det er lagt til et nytt utvalg i prosjektet. Prosjektet vil innhente samtykke fra de registrerte til behandlingen av personopplysninger. De foresatte samtykker også på vegne av sine barn. Vår vurdering er at prosjektet legger opp til et samtykke i samsvar med kravene i art. 4 og 7, ved at det er en frivillig, spesifikk, informert og utvetydig bekreftelse som kan dokumenteres, og som foresatte kan trekke tilbake. Barna vil også samtykke til deltakelse.

Lovlig grunnlag for behandlingen vil dermed være foresattes samtykke, jf. personvernforordningen art. 6 nr. 1 bokstav a.

Så lenge de registrerte kan identifiseres i datamaterialet vil de ha følgende rettigheter: åpenhet (art. 12), informasjon (art. 13), innsyn (art. 15), retting (art. 16), sletting (art. 17), begrensning (art. 18), underretning (art. 19), dataportabilitet (art. 20).

NSD vurderer at informasjonen som de registrerte vil motta oppfyller lovens krav til form og innhold, jf. art. 12.1 og art. 13.

OPPFØLGING AV PROSJEKTET
NSD vil følge opp underveis (hvert annet år) og ved planlagt avslutning for å avklare om behandlingen av personopplysningene er avsluttet/pågår i tråd med den behandlingen som er dokumentert.

Lykke til videre med prosjektet!

Kontaktperson hos NSD: Håkon J. Tranvåg

Tlf. Personverntjenester: 55 58 21 17 (tast 1)

Appendix 9

Information sheets and consent forms.

1. Teachers in preschool
2. Parents in preschool
3. Parents in family homes
4. Parents in family homes (revised)
5. Parents of friend visiting family home

UiO : Universitetet i Oslo
Utdanningsvitenskapelig fakultet
Institutt for pedagogikk

Kjære ansatt

Informasjonsskriv med spørsmål om å delta i forskningsprosjektet «Små barns bruk av digitale verktøy»

Barns oppvekst, hjemme og i barnehage blir i økende grad preget av digitale verktøy som iPads, Skype og mobiltelefoner. Likevel er mange foresatte og barnehageansatte usikre, og vi vet lite om hva bruken betyr for barn. Langvarige dybdestudier av barns bruk av digitale verktøy, som denne, kan informere viktige samtaler om digital oppvekst i dag.

[redacted] er opptatt av dette, og styrer [redacted], og barnehagelærerne [redacted] og [redacted] har vist interesse og engasjement for å delta i dette forskningsprosjektet der barns bruk av digitale verktøy undersøkes gjennom et års feltarbeid. Det overordnede spørsmålet er hvordan barna bruker disse verktøyene og hva denne bruken betyr for barna.

Du vil ikke kunne identifiseres i formidlingen av forskningen (artikler, presentasjoner, undervisning).

Hva innebærer det for deg å delta?

- Vi vil gjøre observasjoner i barnehagen, inkludert feltnotater, video-/lydopptak og fotografi.
- Feltarbeidet begynner mars 2020 og avsluttes februar 2021.

Er det frivillig å delta?

- Det er frivillig å delta i prosjektet. Du har rett til å velge om du vil delta eller ikke delta i hele eller deler av prosjektet.
- Du kan når som helst trekke samtykke uten å oppgi grunn. Alle personopplysninger om deg vil da bli slettet.
- Det vil ikke ha noen negative konsekvenser for deg om du ikke deltar.

Hvordan oppbevarer og bruker vi opplysninger om deg?

- Vi vil bare bruke opplysningene til formålene vi forteller om i dette informasjonsskrivet. Vi behandler opplysningene konfidensielt og i samsvar med personvernregelverket. Personopplysninger vil oppbevares på en sikker server som tilhører Universitetet i Oslo.
- Prosjektansvarlig kan vise video-/lydopptak, fotografier og feltnotater i interne forskermøter ved Universitetet i Oslo og til medlemmer fra internasjonale forskergrupper.

Hensikten med dette er analyse innenfor prosjektets rammer, og det vil skje innenfor gjeldende personvernregelverk.

- Prosjektet vil bli dokumentert i form av forskningsartikler i vitenskapelige tidsskrifter, konferanser og undervisning der alle personopplysninger vil være anonymisert skriftlig. Ved publisering av forskningsartikler, konferanser og undervisning vil still-bilder fra datamaterialet vises omtrent slik:

- Prosjektet skal etter planen avsluttes 30. april 2023.
- Personopplysninger vil arkiveres for å kunne brukes i mulige senere tilsvarende prosjekter, der prosjektansvarlig er deltaker, frem til 30. april 2028. De vil lagres sikkert på Universitetet i Oslos servere.
- Alle personopplysninger slettes før 1. mai 2028.

Dine rettigheter

Så lenge du kan identifiseres i datamaterialet, har du rett til

- innsyn i hvilke personopplysninger som er registrert om deg
- å få rettet personopplysninger
- å få slettet personopplysninger
- få utlevert en kopi av dine personopplysninger
- å sende klage til personvernombudet eller Datatilsynet om behandlingen av dine personopplysninger.

Vær oppmerksom på at rettighetene når det gjelder innsyn og utlevering av kopier (punkt 1 og 4) kan helt eller delvis bortfalle dersom det ikke er mulig å skille dine personopplysninger fra andres, for eksempel i video-/lydopptak.

Universitetet i Oslo er ansvarlig for prosjektet. På oppdrag fra Universitet i Oslo har NSD – Norsk senter for forskningsdata AS vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket.

Hvor kan jeg finne ut mer om prosjektet?

Hvis du har spørsmål til studien, eller ønsker å benytte deg av dine rettigheter, ta kontakt med:

- Universitetet i Oslo ved Kenneth Pettersen ([redacted])
- Universitetet i Oslos personvernombud: Roger Markgraf-Bye (personvernombud@uio.no)
- NSD – Norsk senter for forskningsdata AS (personverntjenester@nsd.no eller 55 58 21 17)

Med vennlig hilsen

Kenneth Pettersen, prosjektansvarlig

Samtykkeerklæring

Jeg har blitt informert om mine rettigheter, mottatt og forstått informasjon om prosjektet «Små barns bruk av digitale verktøy», og fått anledning til å stille spørsmål. I rammen av dette prosjektet, samtykker jeg til:

- ☐ at observasjonsnotater, video-/lydopptak og fotografi innhentes om deg

Personopplysninger lagres frem til 30. april 2028 til bruk i andre prosjekter der prosjektansvarlig deltar

Ansatts navn (blokkbokstaver):

(Signert av ansatt, dato)

UiO : Universitetet i Oslo
Utdanningsvitenskapelig fakultet
Institutt for pedagogikk

Kjære foresatte

Informasjonsskriv med spørsmål om å delta i forskningsprosjektet «Små barns bruk av digitale verktøy»

Barns oppvekst, hjemme og i barnehage blir i økende grad preget av digitale verktøy som iPads, Skype og mobiltelefoner. Likevel er mange foresatte og barnehageansatte usikre, og vi vet lite om hva bruken betyr for barn. Langvarige dybdestudier av barns bruk av digitale verktøy, som denne, kan informere viktige samtaler om digital oppvekst i dag.

[redacted] er opptatt av dette, og styrer [redacted], og barnehagelærerne [redacted] og [redacted] har vist interesse og engasjement for å delta i dette forskningsprosjektet der barns bruk av digitale verktøy undersøkes gjennom et års feltarbeid. Det overordnede spørsmålet er hvordan barna bruker disse verktøyene og hva denne bruken betyr for barna.

Barna eller barnehagen vil ikke kunne identifiseres i formidlingen av forskningen (for eksempel artikler, presentasjoner, undervisning).

Hva innebærer det for dere å delta?

- Vi vil observere deres barn i barnehagen, og gjøre feltnotater, video-/lydopptak og fotografi.
- Det kan innebære uformelle samtaler med dere om barnets bruk av digitale verktøy (avkrysning 1, side 5, og se vedlegg).
- Det kan innebære at ansatte deler informasjon om barnets aktiviteter i barnehagen (avkrysning 2, side 5).
- Feltarbeidet begynner mars 2020 og avsluttes februar 2021.

Er det frivillig å delta?

- Det er frivillig å delta i forskningsprosjektet. Opplysninger om barnet behandles basert på foresattes samtykke.
- Dere kan når som helst trekke samtykke uten å oppgi grunn. Alle personopplysninger om barnet vil da bli slettet.
- Det vil ikke ha noen negative konsekvenser for barnet eller deres forhold til barnehagen om dere ikke deltar.

- Barnet har rett til å velge om han/hun ikke vil delta i hele eller deler av forskningsprosjektet, og vil bli informert om forskningsprosjektet på en barnevennlig måte gjennom samlingsstund, samt jevnlige påminnelser om at deltakelse er frivillig. Vi vil også stoppe fotografering og lyd-/videoopptak når barn ikke-verbalt uttrykker ønske om ikke å delta.

- Barnets rett til ikke å delta betyr i praksis at vi ikke fotograferer eller gjør video-/lydopptak når barnet er tilstede i et rom, og at enkelte rom i korte tidsperioder vil være lukket og tydelig merket for å unngå at barn uten samtykke er tilstede. Alternative aktiviteter vil da så langt det er mulig pågå samtidig.

Hvordan oppbevarer og bruker vi opplysninger om barnet?

- Vi vil bare bruke opplysningene til formålene vi forteller om i dette informasjonsskrivet. Vi behandler opplysningene konfidensielt og i samsvar med personvernregelverket. Personopplysninger vil oppbevares på en sikker server som tilhører Universitetet i Oslo.

- Prosjektansvarlig kan vise video-/lydopptak, fotografier og feltnotater i interne forskermøter ved Universitetet i Oslo og til medlemmer fra internasjonale forskergrupper. Hensikten med dette er analyse innenfor forskningsprosjektets rammer. Det vil skje i samsvar med personvernregelverket.

- Forskningsprosjektet vil bli dokumentert i form av forskningsartikler i vitenskapelige tidsskrifter, konferanser og undervisning der alle personopplysninger vil være anonymisert skriftlig. Ved publisering av forskningsartikler, konferanser og undervisning vil still-bilder fra datamaterialet vises omtrent slik:

- Forskningsprosjektet skal etter planen avsluttes 30. april 2023.

- Personopplysninger vil arkiveres for å kunne brukes i mulige senere tilsvarende forskningsprosjekter, der prosjektansvarlig er deltaker, frem til 30. april 2028. De vil lagres sikkert på Universitetet i Oslos servere.

- Alle personopplysninger slettes før 1. mai 2028.

Deres rettigheter

Så lenge barnet deres kan identifiseres i datamaterialet, har dere rett til

- innsyn i hvilke personopplysninger som er registrert om barnet
- å få rettet personopplysninger om barnet
- å få slettet personopplysninger om barnet
- få utlevert en kopi av barnets personopplysninger
- å sende klage til personvernombudet eller Datatilsynet om behandlingen av barnets personopplysninger

Vær oppmerksomme på at rettighetene når det gjelder innsyn og utlevering av kopier (punkt 1 og 4) kan helt eller delvis bortfalle dersom det ikke er mulig å skille deres barns personopplysninger fra andres personopplysninger, for eksempel i video-/lydopptak.

Universitetet i Oslo er ansvarlig for forskningsprosjektet. På oppdrag fra Universitet i Oslo har NSD – Norsk senter for forskningsdata AS vurdert at behandlingen av personopplysninger i dette forskningsprosjektet er i samsvar med personvernregelverket.

Hvor kan vi finne ut mer om forskningsprosjektet?

Hvis dere har spørsmål til studien, eller ønsker å benytte dere av deres rettigheter, ta kontakt med:

- Universitetet i Oslo ved Kenneth Pettersen ([redacted])
- Universitetet i Oslos personvernombud: Roger Markgraf-Bye (personvernombud@uio.no)
- NSD – Norsk senter for forskningsdata AS (personverntjenester@nsd.no eller 55 58 21 17)

Med vennlig hilsen

Kenneth Pettersen, prosjektansvarlig

Samtykkeerklæring (KRYSS AV NÅR DET ER AKTUELT)

Jeg har blitt informert om mine rettigheter, mottatt og forstått informasjon om forskningsprosjektet «Små barns bruk av digitale verktøy», og fått anledning til å stille spørsmål. I rammen av dette forskningsprosjektet, samtykker vi til:

- ☐ at observasjonsnotater, video-/lydopptak og fotografi innhentes om barnet
- ☐ at foresatte **også** kan bli invitert til å delta i uformelle samtaler om barnets bruk av digitale verktøy (se punkt 2, side 1)
- ☐ at barnehageansatte **også** kan gi opplysninger om barnet (se punkt 3, side 1)

Personopplysninger lagres frem til 30. april 2028 til bruk i andre forskningsprosjekter der prosjektansvarlig deltar

Barnets navn (blokkbokstaver):

Foresattes navn (blokkbokstaver):

(Signert av foresatt, dato)

UiO : Universitetet i Oslo
Det utdanningsvitenskapelige fakultet
Institutt for pedagogikk

Kjære foresatte

Informasjonsskriv med spørsmål om å delta i forskningsprosjektet «Små barns bruk av digital teknologi på tvers av barnehage og hjem»

Barns oppvekst blir i økende grad preget av digital teknologi som iPads, Skype og mobiltelefoner. Likevel er mange foresatte usikre, og vi vet lite om hva bruken betyr for barn. Langvarige dybdestudier av barns bruk av digitale verktøy, som denne, kan informere viktige diskusjoner om digital oppvekst i dag.

I samtaler har dere vist interesse for prosjektet, og det er med bakgrunn i disse samtalene jeg nå tar kontakt med dere med spørsmål om å delta i del to av mitt forskningsprosjekt. Jeg ønsker å gjøre deltakende observasjon hjemme hos dere og undersøke hvordan barna bruker digital teknologi hjemme og hva denne bruken betyr for barna.

Hva innebærer det for dere å delta?

- Jeg vil observere dere og deres barn i deres hjem, og gjøre feltnotater, video-/lydopptak og fotografi.
- Feltarbeidet begynner [DATO] og avsluttes [DATO].
- Vi vil ha fortløpende samtaler der vi sammen avtaler hvilke tidspunkt og arbeidsmåter som er aktuelle for dere å delta i.

Er det frivillig å delta?

- Det er frivillig å delta i forskningsprosjektet.
- Opplysninger om barna behandles basert på deres samtykke.
- Dere kan når som helst trekke samtykke uten å oppgi grunn. Alle personopplysninger vil da bli slettet.
- Det vil ikke ha noen negative konsekvenser for barna eller dere om dere ikke deltar.
- Barna og dere har rett til å velge om de/dere ikke vil delta i hele eller deler av forskningsprosjektet.

- Barna vil bli informert om forskningsprosjektet på barnevennlige måter, samt få jevnlige påminnelser om at deltakelse er frivillig. Jeg vil stoppe fotografering og lyd-/videoopptak når barna ikke-verbalt eller verbalt uttrykker ønske om ikke å delta.

Hvordan oppbevarer og bruker jeg personopplysninger?

- Jeg vil bare bruke opplysningene til formålene jeg forteller om i dette informasjonsskrivet. Jeg behandler opplysningene konfidensielt og i samsvar med personvernregelverket. Personopplysninger vil oppbevares på en sikker server som tilhører Universitetet i Oslo.

- Prosjektansvarlig kan vise video-/lydopptak, fotografier og feltnotater i interne forskermøter ved Universitetet i Oslo og til medlemmer fra internasjonale forskergrupper. Hensikten med dette er analyse innenfor forskningsprosjektets rammer. Det vil skje i samsvar med personvernregelverket.

- Forskningsprosjektet vil bli dokumentert i form av forskningsartikler i vitenskapelige tidsskrifter, konferanser og undervisning der alle personopplysninger vil være anonymisert skriftlig. Ved publisering av forskningsartikler, konferanser og undervisning vil still-bilder fra datamaterialet vises omtrent slik:

- Forskningsprosjektet skal etter planen avsluttes 30. april 2023.

- Personopplysninger vil arkiveres for å kunne brukes i mulige senere tilsvarende forskningsprosjekter, der prosjektansvarlig er deltaker, frem til 30. april 2028. De vil lagres sikkert på Universitetet i Oslos servere.

- Alle personopplysninger slettes før 1. mai 2028.

Deres rettigheter

Så lenge dere eller barnet deres kan identifiseres i datamaterialet, har dere rett til

- innsyn i hvilke personopplysninger som er registrert om dere eller barnet
- å få rettet personopplysninger om dere eller barnet
- å få slettet personopplysninger om dere eller barnet
- få utlevert en kopi av deres eller barnets personopplysninger
- å sende klage til personvernombudet eller Datatilsynet om behandlingen av dere eller barnets personopplysninger

Vær oppmerksomme på at rettighetene når det gjelder innsyn og utlevering av kopier (punkt 1 og 4) kan helt eller delvis bortfalle dersom det ikke er mulig å skille deres eller deres barns personopplysninger fra andres personopplysninger, for eksempel i video-/lydopptak.

Universitetet i Oslo er ansvarlig for forskningsprosjektet. På oppdrag fra Universitet i Oslo har NSD – Norsk senter for forskningsdata AS vurdert at behandlingen av personopplysninger i dette forskningsprosjektet er i samsvar med personvernregelverket.

Hvor kan vi finne ut mer om forskningsprosjektet?

Hvis dere har spørsmål til studien, eller ønsker å benytte dere av deres rettigheter, ta kontakt med:

- Universitetet i Oslo ved Kenneth Pettersen ([redacted])
- Universitetet i Oslos personvernombud: Roger Markgraf-Bye (personvernombud@uio.no)
- NSD – Norsk senter for forskningsdata AS (personverntjenester@nsd.no eller 55 58 21 17)

Med vennlig hilsen

Kenneth Pettersen, prosjektansvarlig

Samtykkeerklæring (KRYSS AV)

Jeg har blitt informert om mine rettigheter, mottatt og forstått informasjon om forskningsprosjektet «Små barns bruk av digital teknologi på tvers av hjem og barnehage», og fått anledning til å stille spørsmål. I rammen av dette forskningsprosjektet, samtykker vi til:

- ☐ at observasjonsnotater, video-/lydopptak og fotografi innhentes om oss og barna

Personopplysninger lagres frem til 30. april 2028 til bruk i andre forskningsprosjekter der prosjektansvarlig deltar.

Barnas fulle navn (blokkbokstaver):

Foresattes fulle navn (blokkbokstaver):

(Signert av foresatt, dato)

UiO : Universitetet i Oslo
Det utdanningsvitenskapelige fakultet
Institutt for pedagogikk

Kjære foresatte

Informasjonsskriv med spørsmål om å delta i forskningsprosjektet «Små barns bruk av digital teknologi på tvers av barnehage og hjem» *(revidert)*

Barns oppvekst blir i økende grad preget av digital teknologi som iPads, Skype og mobiltelefoner. Likevel er mange foresatte usikre, og vi vet lite om hva bruken betyr for barn. Langvarige dybdestudier av barns bruk av digitale verktøy, som denne, kan informere viktige diskusjoner om digital oppvekst i dag.

I samtaler har dere vist interesse for prosjektet, og det er med bakgrunn i disse samtalene jeg nå tar kontakt med dere med spørsmål om å delta i del to av mitt forskningsprosjekt. Jeg ønsker å gjøre deltakende observasjon hjemme hos dere og undersøke hvordan barna bruker digital teknologi hjemme og hva denne bruken betyr for barna.

Hva innebærer det for dere å delta?

- Jeg vil observere dere og deres barn i deres hjem, og gjøre feltnotater, video-/lydopptak og fotografi.
- *Dere kan selv gjøre opptak av deres barn med egne enheter og sende til meg (se punkt 4, side 2)*
- Feltarbeidet begynner [DATO] og avsluttes [DATO].
- Vi vil ha fortløpende samtaler der vi sammen avtaler hvilke tidspunkt og arbeidsmåter som er aktuelle for dere å delta i.

Er det frivillig å delta?

- Det er frivillig å delta i forskningsprosjektet.
- Opplysninger om barna behandles basert på deres samtykke.
- Dere kan når som helst trekke samtykke uten å oppgi grunn. Alle personopplysninger vil da bli slettet.
- Det vil ikke ha noen negative konsekvenser for barna eller dere om dere ikke deltar.

- Barna og dere har rett til å velge om de/dere ikke vil delta i hele eller deler av forskningsprosjektet.

- Barna vil bli informert om forskningsprosjektet på barnevennlige måter, samt få jevnlige påminnelser om at deltakelse er frivillig. Jeg vil stoppe fotografering og lyd-/videoopptak når barna ikke-verbalt eller verbalt uttrykker ønske om ikke å delta.

Hvordan oppbevarer og bruker jeg personopplysninger?

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- Prosjektansvarlig kan vise video-/lydopptak, fotografier og feltnotater i interne forskermøter ved Universitetet i Oslo og til medlemmer fra internasjonale forskergrupper. Hensikten med dette er analyse innenfor forskningsprosjektets rammer. Det vil skje i samsvar med personvernregelverket.

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Med vennlig hilsen

Kenneth Pettersen, prosjektansvarlig

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- ☐ at observasjonsnotater, video-/lydopptak og fotografi innhentes om oss og barna

Personopplysninger lagres frem til 30. april 2028 til bruk i andre forskningsprosjekter der prosjektansvarlig deltar.

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Foresattes fulle navn (blokkbokstaver):

(Signert av en eller begge foresatte, dato)

UiO : Universitetet i Oslo
Det utdanningsvitenskapelige fakultet
Institutt for pedagogikk

Kjære foresatte

Informasjonsskriv med spørsmål om å delta i forskningsprosjektet «Små barns bruk av digital teknologi på tvers av barnehage og hjem»

Barns oppvekst blir i økende grad preget av digital teknologi som iPads, Skype og mobiltelefoner. Likevel er mange foresatte usikre, og vi vet lite om hva bruken betyr for barn. Langvarige dybdestudier av barns bruk av digitale verktøy, som denne, kan informere viktige diskusjoner om digital oppvekst i dag.

I forbindelse med et forskningsprosjekt med formål å undersøke hvordan barn bruker digital teknologi og hva denne bruken betyr for barna, har jeg rekruttert tre familier for å delta i feltarbeid. I samtaler med en av de rekrutterte familiene, har jeg blitt informert om at deres barn vil besøke familiens hjem [DATO]. Det er med bakgrunn i disse samtalene jeg nå tar kontakt med dere og spør om å utføre feltarbeid hjemme hos den rekrutterte familien mens deres barn er på besøk.

Hva innebærer det for dere å delta?

- Jeg vil observere deres barn, og gjøre feltnotater, video-/lydopptak og fotografi.
- Feltarbeidet begynner [DATO] og avsluttes [DATO] og utføres mens barnet besøker den rekrutterte familiens hjem.

Er det frivillig å delta?

- Det er frivillig å delta i forskningsprosjektet.
- Opplysninger om barnet behandles basert på deres samtykke.
- Dere kan når som helst trekke samtykke uten å oppgi grunn. Alle personopplysninger vil da bli slettet.
- Det vil ikke ha noen negative konsekvenser for barnet eller dere om dere ikke deltar.
- Barnet og dere har rett til å velge om de/dere ikke vil delta i hele eller deler av forskningsprosjektet.
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Part II: Articles

I

Article I: Pettersen, K., Arnseth, H. C., & Silseth, K. (2022). Playing Minecraft: Young children's postdigital play. *Journal of Early Childhood Literacy*. Advance online publication. https://doi.org/10.1177/14687984221118977

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Playing Minecraft: Young children's postdigital play

Kenneth Pettersen*, **Hans Christian Arnseth** and **Kenneth Silseth**
Department of Education, University of Oslo, Oslo, Norway

Abstract

New sociomaterial and performative directions in literacy research on digital technologies and play in early childhoods may complicate the established concept of digital play. This study contributes to this line of research by empirically expanding on the concept of the postdigital. In the study, postdigital refers to how both "digital" and "non-digital" agentic materialities are allowed to act messily in contemporary early childhood play, unsettling the notion of the digital as a discrete category. By analyzing a case of two five-year-old children playing Minecraft with wooden and synthetic blocks in a preschool common room within an agential realist framework, we find that a postdigital play practice is performed through playful, sociomaterial configurations of "joining," "building," and "not running out of things."

Keywords

Early childhood, postdigital, digital technologies, minecraft, play, ethnography, sociomateriality, computer games

Introduction

Broadly speaking, literacies are social practices through which humans put modalities into action—writing, composing music, navigating a website—to make meaning and interact (e.g. Lankshear and Knobel, 2011; Rowsell and Pahl, 2015). Most contemporary literacy research accordingly studies ethnographically how participants' lives are unfolding in situ, locating relevant everyday social practices and how these are learned and enacted (e.g. Bloome and Green, 2015). Accordingly, young children's play practices can be

Corresponding author:
Kenneth Pettersen, Department of Education, University of Oslo, Rom 4-375, Forskningsparken C1, Gaustadalléen 21, Oslo 0359, Norway.
Email: kenneth.pettersen@iped.uio.no

understood as embodied literacies enacted by producing action texts with moving bodies (Wohlwend, 2018). In recent years, early childhood literacy researchers, prompted by the emergence of digital devices in young children's lives, have turned toward the intersections of play and digital technologies: "digital play" has emerged as a widely used conceptualization to connote how young children use digital devices in ways that afford their play to develop in new directions (e.g. Bird and Edwards, 2014; Marsh et al., 2016; Stephen and Plowman, 2014). However, new lines of research in the field of young children's literacies departing from sociomaterial and performative perspectives bring into question how we research literacies (Erstad and Gillen, 2020). Most notably, they are challenging assumptions about what agencies are involved in the performance of young children's literacies: play literacies are performed into being not only through the ingenuity of young children's social meaning-making, but through configurations of more-than-human agentic materialities (e.g. Boldt and Leander, 2017; Hackett and Somerville, 2017; Kuby and Rowsell, 2017).

We have been prompted by sociomaterial and performative perspectives on literacy to explore *what we talk about when we talk about the digital*. In educational policies, as well as the public imagination, the digital is constantly evoked: as something to be feared, embraced, anticipated, and so on (Burnett and Merchant, 2020). Practitioners and policymakers in the education field often pigeonhole the digital into designated areas or periods of time for it to be enacted or not (Erstad and Silseth, 2022). Young children's play, however, is famously boundary-crossing (Sutton-Smith, 1997), often both real and virtual at the same time (e.g. Giddings, 2014). In contemporary playgrounds, the digital is both mundanely invisible and ubiquitously present (Apperley et al., 2016; Marsh, 2019; Nansen, 2020; Nansen and Apperley, 2020; Nansen et al., 2019). Researchers, practitioners, and parents need a language for these boundary-crossing practices: an "undoing of the digital"—thinking anew about the current state of the digital—is thus warranted (Burnett and Merchant, 2020). We argue for the concept of *postdigital play* as an analytical heuristic to understand young children's contemporary play literacies, suggesting that, in young children's lived experiences, the digital does not denote discrete units but is thoroughly entangled with their everyday play literacies. It follows that what constitutes relevant literacies for young children should be reimagined. In our study, we analyze a case of young children playing Minecraft with wooden and synthetic blocks in a preschool common room. In this setting, we show how "being in creative," referring to the Creative Mode of Minecraft, is performed into being through configurations of the emergent agencies of blocks and

hands, golems and multiplayer features, constituting a postdigital play practice. Through an intra-action analysis of the young children's block play, situated in an agential realist framework (Barad, 2007), we explore the following research question: How are young children's postdigital play practices performed?

First, we discuss relevant research literature on digital technologies and play in early childhoods to situate our study in the research field. Second, we introduce our theoretical framework. Third, we describe our methodological approach. Fourth, we present our analysis. Finally, we discuss how the study contributes to previous research on literacy, digital technologies, and play in early childhoods, and point to the practical implications of our study.

Digital technologies and play in early childhoods

Ambiguities and paradoxes are at the heart of play theory, and play has materialized in very different ways throughout history and across cultural milieus (Sutton-Smith, 1997). The increasing presence of digital technologies in early childhoods is, however, often framed in opposition to what is deemed desirable play (e.g. Palmer, 2015) and has been found to challenge how we understand play (Ljung-Djärf and Tullgren, 2009). Describing and explaining distinctive characteristics of early childhood play in a digital age has thus emerged as a central practice for researchers interested in young children's contemporary literacies (e.g. Erstad et al., 2020). To situate our study, we discuss previous research from the broader field of literacy studies that has aimed to understand digital technologies and play in early childhoods.

A major line of research has been situated within a sociocultural and Vygotskian paradigm that emphasizes how digital technologies afford young children's play to develop in new, creative directions (Bird and Edwards, 2014; Edwards, 2016; Fleer, 2016, 2017, 2018; Stephen and Plowman, 2014). Bird and Edwards (2014: 1158), for example, find that "rather than limiting imaginative play, digital technologies may be seen to support children's achievement of symbolic representations and their engagement in complex acts of pretense." This unfolds through children first exploring features of digital playthings to understand them (epistemic play), followed by using the same features in playful and imaginative ways that can augment more traditional play practices (ludic play). Fleer (2016) similarly finds that digital technologies add another layer of complexity to young children's play practices as new digital tools are introduced. From a Vygotskian stance, new play practices—which emerge in the interplay of young children and the cultural–historical material and psychological tools they use—constitute zones of proximal development

that hold the potential to support learning. The zone of proximal development implies incremental progress toward higher psychological processes (Vygotsky, 1978). Accordingly, it suggests a form of teleological normativity, which is reflected in these studies as they emphasize the development of creative skills and symbolic representations. Furthermore, in these studies, digital technologies are also understood as tangible playthings (e.g. a stationary computer or an animation app) located within certain spatial boundaries (e.g. the preschool or the home) that young children manipulate in playful ways. These practices are typically understood as taking place within larger learning ecologies where young children often move across boundaries (Arnott, 2016; Arnott et al., 2019). A notable exception is the work of Bird, who finds that young children in imaginative play use non-working technologies (e.g. a smartphone with a dead battery), non-digital playthings (e.g. a rectangular block), and create their own representations (e.g. drawing a phone on a sheet of paper and cutting it out) to represent digital technologies (Bird, 2019). Following a Vygotskian framework, Bird finds that young children use imaginary artifacts to recreate, make sense of, and learn about their social worlds, where digital technologies such as smartphones are significant artifacts.

Today, new digital technologies are capable of making connections across sites, and their presence in everyday practices is ubiquitous and often subtle. Research from the broader literacy field has long attended to how everyday use of digital technologies and media often seems to contradict the commonly held belief that the digital belongs to a radically different category than the non-digital. 19 years ago, Leander and McKim (2003) argued that online and offline spaces were constructed in social processes of "siting" among adolescents. 14 years ago, Stevens et al. (2008) argued that there is a reciprocal relationship between "in-game," "in-room," and "in-world" when children are gaming. 8 years ago, Burnett et al. (2014) argued that digital media use among young children reconfigures the relationship between the real and the virtual, and the material and immaterial. Recently, empirical research on digital technologies and play in early childhoods coming from sociomaterial and performative approaches has continued this conversation to argue against a priori ontological separations between child and digital playthings, or home and preschool, preceding their potential subsequent blending. In the following, four studies within this line of research are discussed in more detail.

Marsh (2017) analyzes a three-year-old girl playing with an iPad, an internet-connected Furby, and PAW Patrol toys and describes the child's play as connected along various dimensions: for example, digital and non-digital, online and offline, and human and non-human. The connections, however,

should be understood as a "constant flow" that also co-constitutes what is connected. Accordingly, she suggests that the researcher, rather than departing from fixed binaries, should aim to locate, untangle, and describe hybrid connections as they emerge. In her study, for example, connections between the girl and the digital plaything unsettle binary notions of the active child and the passive plaything, thus allowing for a more sociomaterial and performative stance on agency—i.e. the relationship between the girl and the toy, rather than either one alone, makes things happen. In another study, Lundtofte et al. (2019) explore the use of tablet computers among 4–7-year-olds and suggest that the position of the tablet computer varies—a spectrum from absorbent to utensilent is proposed—which affects the ways agency is performed. Similarly to Marsh, agency is thus understood as belonging neither to the tablet computer nor the child but as performed in the relationship between the two.

Other researchers in this line of study demonstrate a shift in how space is understood. Whereas research situated in sociocultural or socio–ecological perspectives emphasizes situated practices and how they are nested in larger ecologies, new research situated in sociomaterial and performative perspectives understands space as performed through practices. In a study of two toddlers video-calling relatives at home, Flewitt and Clark (2020) find that digital technologies participate in the performance of the home, not as a microsystem in young children's ecologies, but as a more networked space, reaching beyond its outer walls, as, for example, grandparents are recruited into the home on small screens. Gillen and Kucirkova (2018) study practitioners and children's innovative use of digital technologies in early years classrooms and similarly find that spaces are produced through flows that leave each space bleeding into other spaces—for example, through connections made to the young children's homes, facilitated by the use of digital technologies. Boundaries between spaces are, in these studies, described as "porous" (Flewitt and Clark, 2020) and "percolating" (Gillen and Kucirkova, 2018), which relates to an important analytical point: a narrow focus on classroom and home practices as isomorphic with what happens inside the walls may fail to recognize the hybrid connections that are made after the digital.

Common to these four studies is a sociomaterial and performative perspective on space (Flewitt and Clark, 2020; Gillen and Kucirkova, 2018) and agency (Lundtofte et al., 2019; Marsh, 2017). Sociomaterial and performative perspectives afford researchers to reposition their gaze to explore how specific taken-for-granted units or entities contingently emerge—and can thus always materialize differently. As digital technologies enter our homes and classrooms, new hybridities emerge: Whatsapping grandma before bedtime reconfigures

what a home is, and young children's immersive experiences of playing Subway Surfers on a tablet computer contingently reconfigure who is really playing.

Positioning our study

While the mentioned studies situated in sociocultural or socio–ecological frameworks typically recognize the "hybrid mix of digital and non-digital" (Stephen and Plowman, 2014: 339), the "intermeshing of digital play and social pretend play" (Fleer, 2016: 84), the "blurring boundaries between children's traditional and more converged forms of play" (Edwards, 2016: 515), or how young children "fluidly [transition] between digital and non-digital play" (Arnott et al., 2019: 401), we aim to problematize a priori separations between the digital and the non-digital. Accordingly, we position our contribution as continuing the sociomaterial and performative line of literacy research on digital technologies and play in early childhoods. While these studies find that young children's movements across digital and non-digital domains reconfigure agency and space, we aim to empirically explore how the digital and non-digital are performed (or not) through young children's play practices. To achieve this, we are guided by the sociomaterial and performative perspectives of agential realism to study young children's post-digital play—a novel concept that unsettles binary notions of the digital and the non-digital.

Agential realism

Sociomaterial and agential realist analyses have gained attention in the research field of early childhood literacy (e.g. Boldt and Leander, 2017; Hackett and Somerville, 2017; Kuby and Rowsell, 2017). Moreover, as previous research suggests, such approaches are particularly apt in studies of young children's play with digital technologies. A central claim of agential realist analyses is of a *relational ontology*. According to Barad (2007), ontological reality is relational and becoming. What we normally take to be separate units or entities—e.g. a tablet or the body of a child—are performed into being through relational processes of *intra-action*. Specific intra-actions perform *agential cuts*, which make up the contingent boundaries of units or entities. Moreover, the matter in question is not mute, passive things with added significance from active, meaning-making humans. Rather, they emerge through dynamic intra-active more-than-human configurations. This is referred to as *sociomateriality*. For our study, this has important implications. Firstly, practices are primary, and units or entities

emerge through practices. This means that rather than studying how the child interacts with a tablet, we study how the child and the tablet are contingently *performed* into being. Secondly, we focus on the more-than-human configurations of practices. This means that rather than analyzing social construction—humans alone talking something into (discursive) being—we study sociomaterial performance through intra-active configurations of things, humans, words, spaces, and so on.

…And play

Lundtofte et al. (2019) claim that conceptualizations of emergence and performativity in sociomaterial theories are mirrored in theories of play as a worldful practice that decenters "our own feeble minds" to include the agentic powers of more-than-human entanglements (Bogost, 2016: 224). The conceptual pairing of *dwelling* and *building* further illuminates this notion of play (Ingold, 2011). While *building* refers to an idea originating in a human mind only to be executed on the world, *dwelling* here is more relational and less anthropocentric: working with the world to explore what emerges. For example, when playing with Lego bricks, a worldful, dwelling practice allows you to pick them up by chance, registering through touch and vision the qualities they possess. As they are placed on top of and next to each other, they start to resemble an airplane, before a tall Lego brick is placed on the nose of the plane, transforming the aircraft into a swan, or a hammer when you flip it around. Playful practices thus involve a radical openness to more-than-human forces of the world, such as the sound of a guitar string or the movement of an arm. While play is commonly identified as a state between freedom and creativity, and rules and control (Caillois, 1961), in this study, the improvisatory, processual qualities of play are highlighted and elaborated upon, in concert with the relational ontology of agential realism.

Postdigital play

Originating in art theory, the postdigital refers to the "messy state of media, arts, and design *after* their digitization" (Cramer, 2015: 19, italics in original). The *post-* in postdigital departs from understanding the digital as something that has "already happened," arguing that new configurations emerge in the wake of the digital, as it enters messy relations with the non-digital (Jandrić et al., 2018: 893). Today, the digital permeates young children's lives, as it has entered into messy relations of new playgrounds and playthings (Apperley et al., 2016;

Marsh, 2019; Nansen, 2020; Nansen and Apperley, 2020; Nansen et al., 2019). According to Nansen (2020: 130):

> These configurations comprise materialities of mobile media, young children's embodied play and everyday lives, and wider cultural contexts, discursive formations and commercial interests in shaping practices and meanings of digital childhoods.

The authors cited above find that young children are engaging with mobile digital devices designed to have interfaces that expand their reach into traditionally non-digital spaces. A feedback loop is thus generated: young children dynamically engage in hybrid, postdigital play (Giddings, 2014), and commercial interests attend to these play practices, designing postdigital playthings and playgrounds. Paradoxically, however, this ubiquity moves the digital to the background: experientially, the digital is no longer constituted through a clear break from the social, the real, or the non-digital but is a permanent condition of the world (Jandrić et al., 2018).

Illustrating the postdigital: during preschool circle time in our fieldwork, a few children carefully attend to a digital device on the wall that registers the volume of the children's voices, with green and red lights indicating an appropriate or inappropriate volume, respectively. To end the circle time, the children would touch drawings (hug, handshake, fist bump, and high five) on a poster on the wall to indicate how they would greet two designated children before they washed their hands—a practice resembling a host of 2018 viral videos from American kindergarten classrooms. Are these digital practices? Non-digital practices? Marsh (2019) argues that it makes sense to talk about postdigital practices when these assumed boundaries are transcended, and tensions are brought to the fore. As digital technologies become more widespread and imperceptible, theories of the postdigital embrace more porous boundaries between the digital and the non-digital. However, the postdigital is not merely something that emerges in the interaction of digital and non-digital domains: mirroring relational ontologies, postdigital phenomena may also co-constitute the digital and non-digital, resulting in the emergence of a contingent, fragile, and rich boundary zone that accentuates tensions between this binary (Ryberg et al., 2021).

Our theoretical contribution expands upon Marsh's assertion that as play practices increasingly emerge across and connect domains, we need new analytical and theoretical tools to describe them. Theories of the postdigital, along with a relational ontology, afford researchers the freedom to pay less myopic

attention to either the digital or the non-digital and to explore how entities that we assume belong to one of these domains (for example, Minecraft as a "digital" technology) are instead performed into being as a broader configuration of agentic materialities. Methodologically, this implies an "account of the wider context for play" and innovative and experimental methodologies (Marsh, 2019). In the next section, the methodology of our study is described.

Methodology

Our case study is a part of a larger, multi-sited naturalistic ethnographic research project. From May 2020 to November 2021, the first author regularly visited (64 times in total) and video-recorded three classrooms in one preschool (ages 3–6) and three family homes (focal children ages 4–6) as a fieldworker, guided by a general interest in the role of digital technologies in young children's daily lives. For this study, our guiding research question was the following: How are young children's postdigital play practices performed?

Traditionally, ethnographies attend to human (social) actions and accounts as units of analysis, performing analysis by interpreting said actions and accounts while attending to researcher bias (e.g. Hammersley and Atkinson, 2019). Accordingly, one could argue that ethnography is rooted in humanism, privileging human meaning-making. There are thus tensions between traditional ethnographic methodologies and agential realism. However, ethnographies may be key to access emergent more-than-human configurations. Ethnography allows the researcher to be in the moment as everyday practices unfold. In an agential realist sense, ethnography involves participating in and adding to an emergent, intra-active configuration during all phases of research: doing fieldwork is to immerse oneself in a phenomenon and recognize one's entanglement with the subject under study (Pink, 2012). When studying a game of "The floor is lava" at the preschool, the fieldworker shadowed the children before participating in the game, sensing with his feet what it felt like to step on lava. Furthermore, through ethnographic interviews, the rules and loopholes of the game were explained as they became salient. Through this embodied and participatory approach to studying everyday practices, the fieldworker and the observation tools employed participate in the performance of practices. Later, as the authors, on their desktop computers, write the article you are now reading, new words are added, not as a reflection or representation of dead video recordings and field notes, but as participating in an ongoing intra-active configuration. Ethnography is not a way to gain insight about

something pre-supposed but rather a responsive and performative exploration of the performance of emerging phenomena (Pink, 2012).

Aided by the conceptual framework of sociomateriality, we argue for a multimodal intra-action analysis in which the unit of analysis is a play practice involving three children. Through a multimodal transcription of an episode into categories of gaze, block movement, posture, and talk of each participant (Cowan, 2014), we zoom in on 12 min during which children play Minecraft with wooden and synthetic blocks in the preschool common room. As the fieldwork progressed, we grew interested in the role of gaming in their daily lives, which informed our choice of episode and subsequent attention to how the play practice involved a configuration of being in creative which unsettled our pre-supposed binary distinctions of digital and non-digital. Guided by the conceptual framework of agential realism, we explore how agential cuts are performed and materialized in the young children's play practices in the transcripts and the videos—the "specific material engagements that participate in (re)configuring the world" (Barad, 2007: 91). In other words: what agencies are allowed to act? While material engagements can be studied on different granular levels, our choice of performing a fine-grained analysis allowed us to study the performances of local material specificities that, in themselves, are complex networks that constitute and are constituted by broader ecologies: a central insight from decades of micro-ethnographic research. Our methodological and analytical framework allows us to consider how more-than-human configurations—for example, posture, wooden blocks, and the preschool common room—perform postdigital play practices.

As agential realism stresses recognition of more-than-human intra-action, we are also encouraged to further expand our researcher gaze in less anthropocentric ways (Lenz-Taguchi and Hultmann, 2010). Traditionally, micro-ethnographic analyses emphasize, for example, sequentiality (how verbal utterances build upon each other) and member relevance (how verbal utterances make things relevant for participants) (McDermott et al., 1978). From an agential realist standpoint, these analytical tools privilege human interaction while disregarding mattering phenomena traditionally thought of as "non-human." Kucirkova (2021) claims that young children's literacy practices should be studied across time and locations in "rich ethnographies" to account for sociomaterial entanglements, further noting that in effect, narrower micro-ethnographic analyses may struggle to account for this. Thus, ethnographic approaches may supplement multimodal micro-ethnographic analyses to understand the complexity of young children's digital technology practices

(Flewitt, 2011). Ethnographic insights, while in tension with some basic tenets of agential realism, are thus key to our intra-action analysis.

Ethics

In the current study, all children are anonymized, data was stored safely, and consent forms were gathered from the children's parents in accordance with Norwegian research ethics guidelines (The Norwegian National Committee for Research Ethics in the Social Sciences and the Humanities, 2022). Furthermore, all children were properly informed about the research and their right to withdraw from participation.

Research with young children is morally challenging work. On the one hand, young children should be protected from research practices that have negative impacts on their lives. Because children may be likely to assent due to power imbalances between them and adult practitioners and researchers, additional sensitivities toward how children in different ways may express dissent or assent are key (Huser et al., 2022). Furthermore, the performance of ethics is a situated practice: the fieldworker should be attentive to how official guidelines and laws relate to their research practices *and* to how moments unfold contingently in felt ways that may also be ethically problematic (cf. A rights-based approach as opposed to an ethics of care, see Cockburn, 2005; Edwards and Mauthner, 2002). The fieldworker thus makes informed decisions, not simply, for example, based on children explicitly assenting or dissenting, but also, for example, based on perceived changes in moods and atmospheres. In our case, we argue that the fieldworker's immersion in the children's lives through his fieldwork and his 10 years of experience as a preschool teacher sensitized him to these complex ethical dimensions.

On the other hand, children should not be sheltered from research. Empathetic, responsive fieldwork has the potential to enrich young children's lives. We found that the children were very eager to talk about their interests—for many of the children, these were "islands of expertise" they enthusiastically shared with anyone interested in listening (cf. Crowley and Jacobs, 2002). Inspired by Corsaro (2011), we aimed for the role of a playful, curious researcher. This materialized in long conversations about their Christmas wish lists while climbing rocks, apprenticeships in paper folding techniques the children learned from YouTube tutorials, and collaboratively setting up video equipment for recording sessions. Inspired by Bird (2018), the children were also asked to come up with pseudonyms for themselves, which we argue made our purpose in their lives more tangible for them: we were writing a book about

them. We also suggest that this may have made the concept of anonymity clearer for the children.

Finally, the dissemination of research findings is also beneficial, as it adds to understandings of the experience of being a young child today. Accordingly, our moral imperatives were inclusion and fairness (*with* and *for* children), with an emphasis both on the meaningful, assenting participation of the young children and its significance for the research community, practitioners, parents, and others who aim to improve young children's lives (cf. Bodén, 2021). However, when these aims conflicted, we acted to ensure that the participating children had a neutral or positive experience with our fieldwork.

Case description

The neighborhood where we performed our fieldwork is located in a suburban area of a large Norwegian city consisting mainly of duplexes with large green areas in between. It is a socio–economically diverse family neighborhood with many different national backgrounds represented. The preschool at the center of our study has five classrooms, around 80 1–6-year-olds, and 13 staff members. The three children in this study all belong to the same classroom and live near one another.

Yahtzee Champignon (Yahtzee) is a five-year-old boy, and one of the focal children of the broader research project, with a keen interest in gaming and watching YouTube and movies. He lives with his mother, father, and older brother in a duplex. He is an avid Minecraft player on the family tablet computer—alone and with his brother—but also just watches his brother play from time to time. Recently, some Minecraft YouTubers have piqued his interest, most notably NRK Flippklipp. In preschool, Yahtzee does not play Minecraft or watch YouTube but often wears Minecraft merchandise and initiates conversations and play activities inspired by Minecraft. Captain Sabertooth (Captain) is 5 years old and lives with his mother, father, younger and older sister. He likes some of the same games and movies as Yahtzee, but has less of an interest in Minecraft. Captain indicated that he does not have much experience playing Minecraft but watches his older male cousins play from time to time. Captain and Yahtzee are friends and play together often at preschool. They are both expressive and imaginative, constantly coming up with new ideas to fuel their play.

In Minecraft gameplay, Minecraft Creative is a mode that allows the player–avatar infinite blocks, the ability to fly, and the absence of a health and hunger bar, which together enable the player–avatars to explore the virtual

environment with few limitations. As opposed to Minecraft Survival, which is a role-playing game, Minecraft Creative is a sandbox game. The children in the preschool are generally most familiar with Minecraft Creative. This is because parents tend to restrict the children's gameplay to this mode, as they perceive it as safer (with regard to violent imagery) and more educational. After a Minecraft Creative multiplayer is created, other players can join the creator locally or online. Fan-made Minecraft tutorial videos on YouTube are frequently discussed by the children in the preschool as inspiration for Minecraft Creative gameplay.

We will now zoom in on a 12-min episode during which the boys are playing in the common room of the preschool. The first author walks around with a roaming video camera and one stationary video camera recording a wide angle shot. He is sometimes approached by the children, who ask for help or his opinions on issues they are interested in. Sitting next to the boys, the first author and his roaming camera are sometimes quite close and intimate, but at this point, they are a familiar sight around the preschool, rarely commented upon. The common room is located adjacent to the kitchen, flanked by two parts of the preschool. The common room has a large, elevated stage with curtains in one corner, several benches, a high-jump landing mat, and two large crates with synthetic and wooden blocks both in and around them (Figure 1). Anthony, a four-year-old boy, is also minimally and partially involved in the episode in

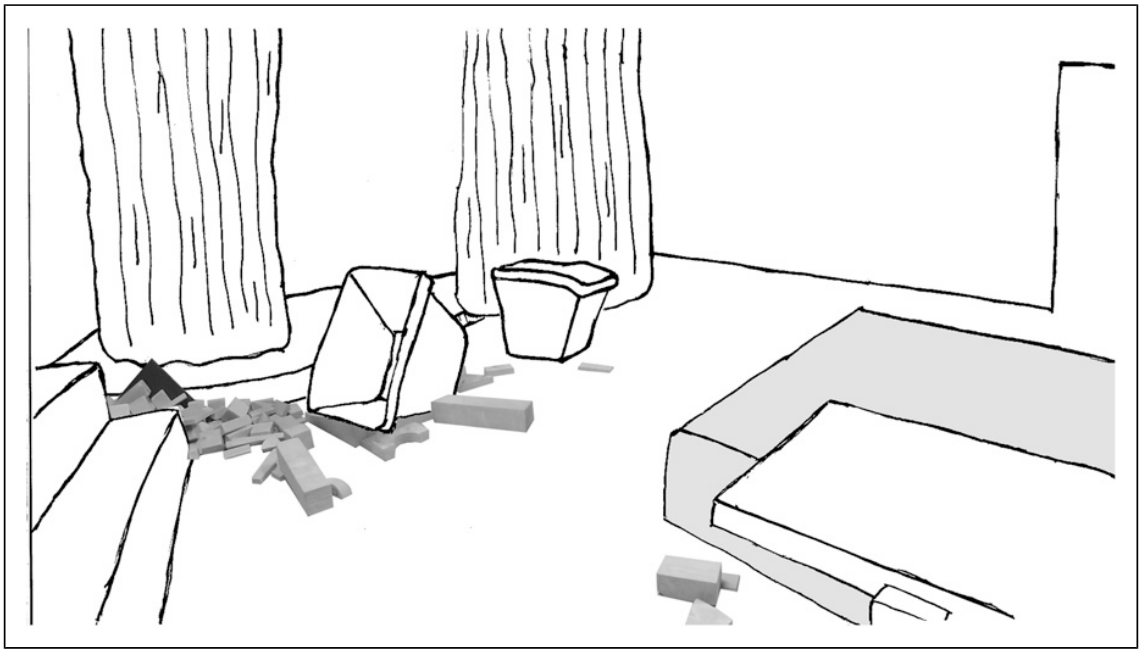

Figure 1. The common room.

question. For analytical purposes and the sake of readability, his background and contributions are less highlighted.

Though preschool staff are often seen walking through the room, the children play mostly unattended. Before the episode, the boys engage in very physically active play. First, a "play" is performed on the stage featuring "Trash Mario," "Trash Luigi," "Trash Yoshi," and "Trash Monster," who hide in "trash cans" (crates with blocks on top) to scare and catch the others. Then, "spider and flies," a form of tag, is played. Finally, the boys engage in rough-and-tumble role play as characters from the franchise The Avengers, who employ various weapons against each other. As they run around wildly, Yahtzee suddenly turns to Captain and slowly asks: "Wait up! You wanna play Minecraft?" The following visual narrative (Figure 2(a)–(j)) of anonymized video stills and descriptive captions illustrates the 12-min episode in broad strokes.

Analysis

In the episode of the visual narrative, Minecraft is constantly evoked, not just as a topic of conversation but as playing "playing Minecraft" or, more specifically, playing "being in creative" (Figure 2(b)). In the following analysis of two excerpts from the 12-min episode—bearing in mind that "practices of knowing are specific material engagements that participate in (re)configuring the world" (Barad, 2007: 91)—we explore *how* being in creative is performed. We will show that what we claim to be a *postdigital* practice of being in creative is performed in the preschool common room block play through configurations of agentic materialities in three sociomaterial specificities—joining, building, and not running out of things—chosen for their illustrative power and prevalence in our data. *Joining* is a specificity of being in creative that appears early in our case as a verbal statement by Yahtzee, but which we argue is also performed through more-than-human configurations. In the following excerpt, Yahtzee starts "playing Minecraft" before Captain eventually joins him (Figure 3).

Two players joining each other (the invitation is uttered in English, the default language of Minecraft) is different from the hierarchical practice of having or being a "boss" (Figure 3, lines 2–4). Yahtzee says repeatedly that he found blocks to build a house (Figure 3, lines 7, 11–19). It is reasonable to interpret this as an invitation to Captain to join him, who after 45 s joins Yahtzee, hands him blocks, and says in a deeper, animated voice (indicating a playful tone): "Now I found (unclear) blocks" (line 20) (*blocks* also uttered in

Figure 2. (a)–(j). Visual narrative.

English). Joining, in this configuration, is a cooperative performance, played with each other rather than one being a boss or the two of them playing against each other. Minecraft players joining in multiplayer mode is thus allowed agency to act in a new configuration. Furthermore, the absence of the health and hunger bar in Minecraft Creative is allowed agency to act as Yahtzee exclaims that being in creative implies that they "can't die" (Figure 3, lines 16–18), contributing in the preschool common room to configurations of a cooperative and peaceful practice. Other—non-digital—emergent agencies are also allowed to act. In Figure 3, third still, for example, Yahtzee–Captain–Anthony–blocks perform a specific material configuration of their bodies in a circle gazing

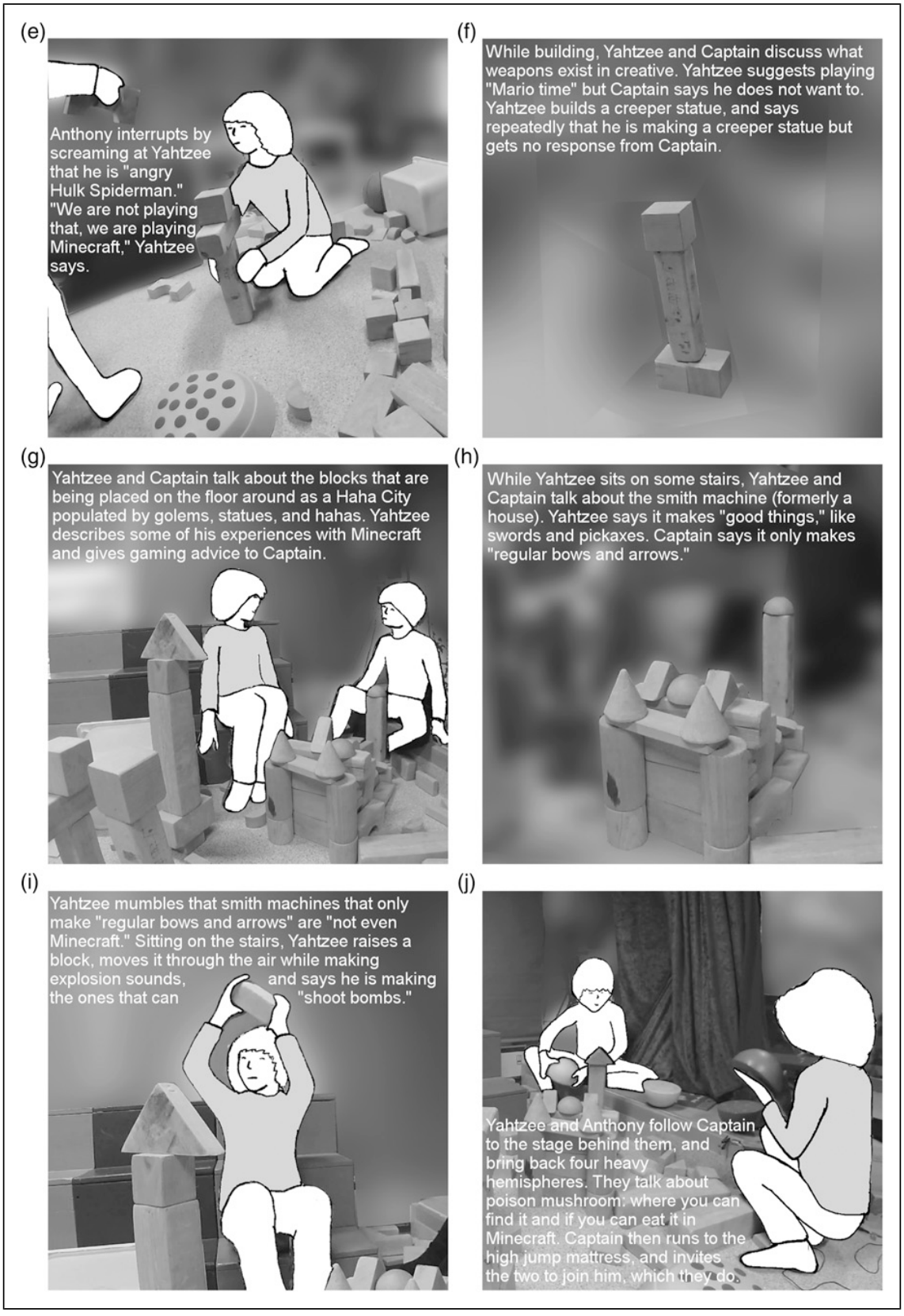

Figure 2. Continued.

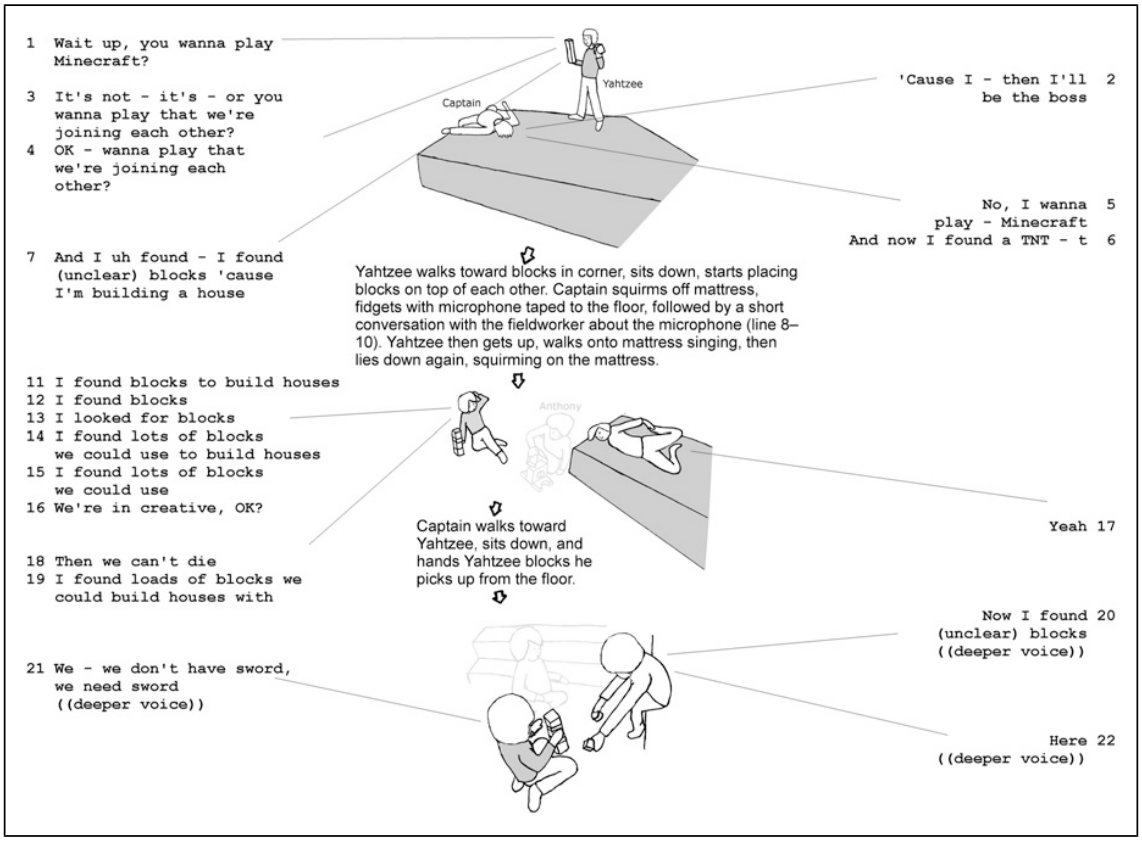

Figure 3. Yahtzee invites Captain to join him in creative.

toward the blocks in the center (cf. Ecological huddle, Goffman, 1961), which enables the children to join each other in a common project of building a house. We argue that the more-than-human configuration of joining performed in the preschool is postdigital because emerging agencies of the health and hunger bar or multiplayer mode are allowed to co-exist with the emerging agencies of the boys and the blocks. Boundaries are unsettled by the practice as not only themes and characters of Minecraft are inserted into the play (e.g. playing a creeper) but as actual gameplay practices (e.g. doing multiplayer) are allowed to be performed, and thus exert emergent agency, in a preschool common room: they are playing "playing Minecraft." However, being in creative is also performed through a larger ecology of configurations. Joining intra-actively enters configurations of specificities, such as *building* and *not running out of things*. These three specificities contingently constitute and are constituted by each other, together performing a postdigital practice of being in creative. In the next excerpt, we will see how the specificity of building and not running out of things is performed in concert with the other specificities (Figure 4).

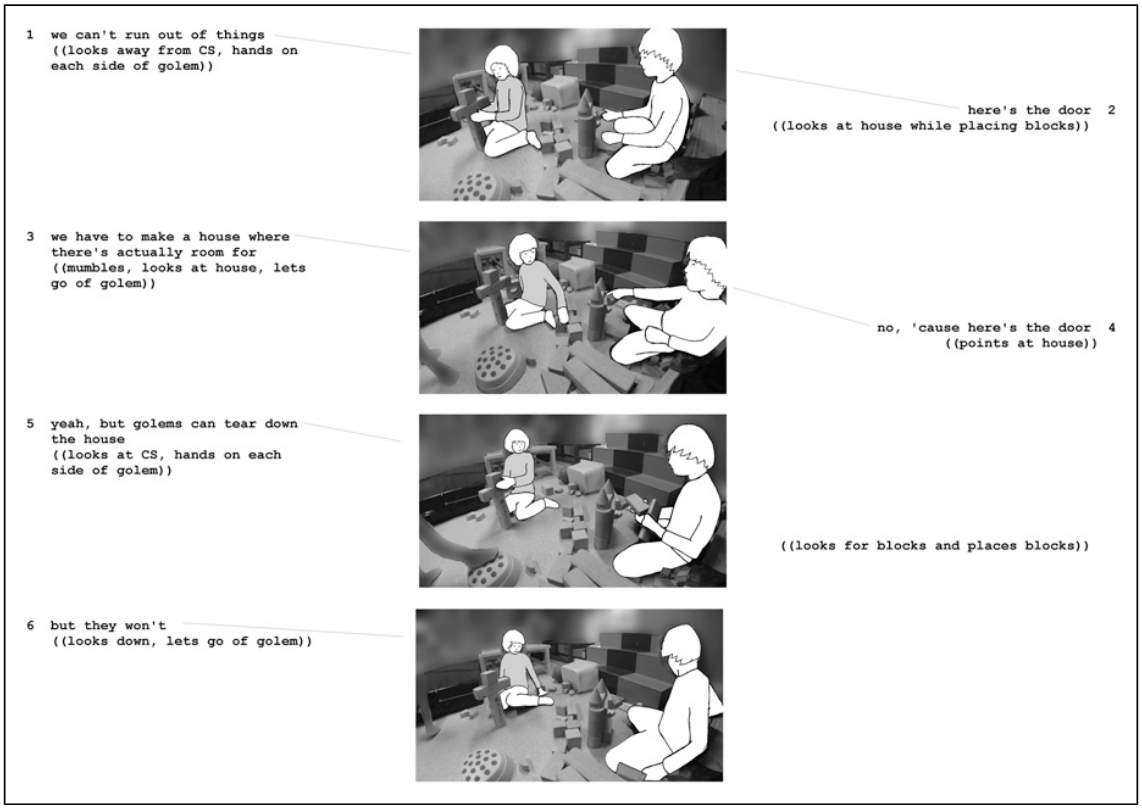

Figure 4. Yahtzee and Captain discuss golems and houses.

Placing his hands on each side of the golem, as if about to move the golem toward Captain, Yahtzee first explains that golems can tear down the house Captain builds (Figure 4, line 5). This is probably triggered by the preceding conversation in which Yahtzee wants Captain to build a bigger house (Figure 4, line 3), which Captain does not do (Figure 4, line 4). Yahtzee then adds that "it won't" (Figure, 4, line 6), stabilizing the more peaceful specificity of building. While the configuration may at any moment disintegrate into "golems [tearing] down the house," the specific configuration ensures that this does not happen here. Building—rather than tearing down—is, among other things, stabilized as it is performed in concert with joining. The golems' abilities to tear down houses in Minecraft is allowed to exert agency in a new configuration. Furthermore, comparing the body postures in the stills, we can see a configuration of Yahtzee gradually turning toward Captain. The Yahtzee–golem also alternates between a proximally nearer association (Yahtzee holding the golem with both hands) to a more proximally distant association (Yahtzee letting go of the golem). Yahtzee settling on the more inviting, proximally distant association to the golem and gradually turning toward Captain contributes to the cooperative and peaceful performance of joining and building. Dwellingly, then, the boys

allow both the features of the Minecraft golem and their own bodies to exert agency in a postdigital configuration.

The number of blocks also contributes to the cooperative and peaceful performance because Yahtzee and Captain can easily add to the building practices without competing for blocks. In Figure 4, the boys sit among an abundance of blocks and embody in a distributed way—as body–blocks—*not running out of things* in creative. Not running out of things is talked about throughout the case. Initially, Yahtzee says he found "lots of blocks we can use to build a house" and, later, "loads of blocks" (Figure 3, lines 14, 15, and 19). Later, while building the golem by placing a cube-shaped block on top of two long blocks in a T shape, Yahtzee says that "we can't run out of things" (Figure 4, line 1). Through this more-than-human intra-action of an abundance of blocks in the preschool common room, Yahtzee's verbal statements, and the unlimited items feature of Minecraft Creative, not running out of things emerges contingently. Importantly, we argue that the practices are not purely emergent but stabilized (for now) through repetition and connection. For example, Yahtzee's repetitive chanting about finding blocks to build a house (Figure 3, lines 7, 11–19) serves as a stabilizing force in their block play. Furthermore, by allowing game features to exert agency during block play, postdigital play practices gain a foothold and materialize in the preschool common room.

The three specificities add to complex configurations, emerging as more than the sum of their parts, as the recurrence of joining, building, and not running out of things are performances improvised upon as variations and counterpoints, against and with each other. For example, as both the multiplayer mode of Minecraft and specific collaborative body postures are allowed agency, joining emerges and stabilizes. The binary of the digital and the non-digital is unsettled, and a postdigital play practice of being in creative is performed.

Discussion and conclusion

In the following, we discuss how the study contributes to previous research on literacy, digital technologies, and play in early childhoods, and point to the practical implications of our study.

Being analytically informed by agential realism has sensitized us to how literacies are configurations of contingently agentive materialities, allowing us to "undo the digital" (Burnett and Merchant, 2020) as we find that the young children participate in configurations of agentive digital and non-digital materialities, unsettling the digital and non-digital binary. Furthermore, our study

provides empirical findings suggesting that the postdigital is a useful heuristic to account for what new configurations are made possible in contemporary early childhood play after the digital.

Previous research on digital play emphasizes play as a cultural–historical activity mediated by specific material (e.g. an animation app on a tablet computer) and psychological tools (e.g. role play) (Bird and Edwards, 2014; Edwards, 2016; Fleer, 2016, 2017, 2018; Stephen and Plowman, 2014). While recognizing that digital play sometimes bleeds into the non-digital, these studies are based on a priori ontological cuts between the digital and the human. For example, the conceptualization of epistemic and ludic play (Bird and Edwards, 2014) positions the human as a privileged ontological being: developing digital play literacies is a matter of humans mastering and creatively appropriating discrete digital devices. Emerging sociomaterial and performative perspectives, on the other hand, understand literacy as performed through configurations of more-than-human agentic materialities (e.g. Boldt and Leander, 2017; Hackett and Somerville, 2017; Kuby and Rowsell, 2017). In our study, we show how the children, rather than adopting a privileged position of mastering or appropriating, dwell in the intra-action of digital and non-digital agentive materialities (Ingold, 2011). Through this movement, in configurations of joining, building, and not running out of things, they are performing postdigital play practices, and a multidirectional quality of play emerges: preschool play is not simply downstream from home gaming, but unfolds in a rhizomatic structure with no easy starting point. Postdigital play can thus be understood as young children's dwelling submission to an entanglement of material agencies, heterogeneous relations, and messy practices, consequently unsettling assumed boundaries between the digital and the non-digital.

Furthermore, as opposed to the design of a series of studies on digital technologies and early childhood play adopting sociomaterial and performative stances (Flewitt and Clark, 2020; Gillen and Kucirkova, 2018; Lundtofte et al., 2019; Marsh, 2017), as well as other studies which have explored the concept of postdigital play (Apperley et al., 2016; Marsh, 2019; Nansen, 2020; Nansen and Apperley, 2020; Nansen et al., 2019), we importantly study a traditional case of block play rather than the use of more advanced digital technologies of the Internet of Toys or augmented reality. Our argument thus builds on the findings of previous studies regarding the blurred boundaries between the digital and non-digital but extends their argument by finding that the postdigital is also performed in cases where no digital playthings are present. Our study can be read in concert with Bird's (2019) research on how young children

represent digital playthings in their imaginative play through non-working digital playthings, non-digital playthings, and their own creations. However, while Bird finds that in her case, knowledge about Minecraft constitutes discursive resources that young children put into play while building a Minecraft city with non-digital playthings, thus supporting their learning of cultural and social practices in creative ways, we find that being in creative in our case of block play is much more entangled with the act of playing Minecraft on the family tablet computer. In our study, neither practice is granted primacy; instead, being in creative is a play practice that emerges through the intra-action of the two.

Following the call for action made by Burnett and Merchant (2020) to "undo the digital," we thus advocate a literacy conception that is closer to what we would argue young children's relationship with digital technologies is actually like: entangled, messy, and unpredictable. Furthermore, we encourage preschool practitioners and parents to continue exploring novel literacy practices with their children, departing from an understanding of the digital not in isolation, but in a configuration of other agentive materialities. For example, during our fieldwork, a preschool teacher brought printouts of Super Mario characters and blocks to the children, encouraging them to play Mario by making their own levels on the stage in the common room. In this novel way, we would argue, he supported their postdigital play practices. As digital technologies and play in early childhoods are increasingly participating in and emerging through complex relations, we hope to see new ways of facilitating fun and imaginative practices for young children at home and in educational institutions.

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ORCID iDs

Kenneth Pettersen https://orcid.org/0000-0003-1864-1554
Hans Christian Arnseth https://orcid.org/0000-0002-3650-5209
Kenneth Silseth https://orcid.org/0000-0002-3956-3463

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II

Abstract

Today, digital media technologies are ubiquitous and mundane, making the relationship between digital and analog messy and porous. This postdigital condition prompts new analyses of how young children's local encounters with digital media technologies unfold, and how their relationships with digital media technologies carry on after they leave their devices. Sociomaterial approaches to literacy are apt to study how such messy literacies are enacted through singular events but struggle to account for consistencies that emerge across events. Plugging into the concept of the refrain, we explore how felt consistencies are produced and score two boys' friendship through and across events as they watch YouTube, play Minecraft, and play with construction playthings. We find that felt refrains of "dwelling in novelty" are enacted, referring to the set-up of conditions where materialities act together to produce affectively intense moments of surprise. As moments accumulate, deeply felt friendships are produced over time.

Keywords: sociomateriality, affect, early literacy, digital technology, ethnography

Prologue

The first author, Kenneth, met five-year-old Yahtzee Champignon (Yahtzee) and Professor Poopy Pants (Professor)[1] during fieldwork in a Norwegian preschool in spring 2020. Yahtzee and Professor were close friends before the COVID-19 pandemic, playing together at school and at each other's homes whenever they had the chance. As the pandemic spread, classrooms were strictly separated for contagion control, which meant that the two rarely had a chance to play together. By the time pandemic restrictions loosened in Norway, the boys had turned six and found themselves attending different schools. Now able to play safely in each other's homes, they reignited their friendship through frequent playdates after gymnastics practice. When Kenneth restarted his visits to their family homes in Fall 2021, they were playing with each other at least once a week.

These playdates were a highlight of the week for Yahtzee and Professor. While hanging out, they often moved between playing video games, such as Donkey Kong, Super Mario, or Minecraft, and playing with their toy action figures, Legos, or stuff they randomly found around the house. Sometimes they both stretched out on a big couch in front of the living room TV to watch YouTube videos in relative silence. On one such day, Kenneth, carrying video equipment, audio recorders, and notebooks, was met at the door by both boys. They were excited and boisterously talked over each other as they told him what had transpired since their last meeting. "Have you ever watched Lemon?" Yahtzee asked Kenneth, referring to a recent obsession, a Minecraft YouTuber with over two million subscribers, going by the handle of Lemon Craft (n.d.).

Over the next few weeks, Kenneth would observe the boys as they "watched Lemon" on YouTube and "played Lemon" in Minecraft and with construction playthings. As the boys

moved across these sites while playing Lemon—on a streaming platform, playing a digital game, and roaming around their homes with analog playthings—Kenneth thought of how the boys themselves made no similar distinctions between "digital" and "analog." Moreover, just as he had felt the boys' excitement as they met him at the door, he felt, over time, the ways affect drove their play, leading to the sorts of surprises and novelties that sparked joy for them. These events carried histories of excitement accrued from playing the way they liked to play together: over time through a series of novel, more-than-digital movements establishing a felt dimension of their friendship characterized by a love for surprise and novelty.

Introduction

In this article, we consider the contemporary, *postdigital* conditions through which Yahtzee and Professor use their literacies to produce the surprise and novelty that energizes their play as friends. These contemporary conditions—where the digital fails to constitute a discrete space—have spawned a conversation in early childhood research around "undoing the digital" (Burnett & Merchant, 2020b) to generate more nuanced portraits of digital-analog imbrications in young children's literacies (Abrams et al., 2017; Burnett et al., 2014; Marsh, 2019). Originating in art theory (Berry & Dieter, 2015), postdigital describes the historical situation in which much of everyday life has become computational and digitally mediated, thereby blurring the distinction between digital and analog in how we come to experience social worlds.

We contribute an empirical analysis of Professor and Yahtzee's postdigital play that illuminates the consistency of literacy events across settings and over time. Our analysis of consistency refers both to the makeup of emerging literacy events, as well as to how certain literacy events evoke a sense of similarity over time—a consistency of feeling or resonance between them. We focus on consistency to address an unresolved theoretical tension in

sociomaterial studies of literacy. Although well established in literacy research, sociomaterial theories (Hackett, 2021; Kuby & Rowsell, 2017; Leander & Boldt, 2013), which are often applied to the analysis of social life as constantly unfolding and singular emergence, have struggled to account for what feels like consistencies across emergent, singular events. To address this tension, we use the Deleuzo-Guattarian (Deleuze, 1997; Deleuze & Guattari, 1987) concept of the *refrain* to illuminate the consistency of the boys' play, through the case of the "Lemon game," which is enacted across literacy events involving, among other things, YouTube algorithms, Minecraft on Nintendo Switch, and construction playthings.

Tracing the enactment of the Lemon game across time and settings also allows us to feel the way that playing the game "scores" their friendship. We illustrate how the refrain sets the conditions for the boys to dwell in novelty as they use their literacies to arrange the materials and produce the events of surprise and unpredictability animating their play. Professor and Yahtzee's play is therefore particularly apt for dealing with the problem of consistency in sociomaterial theories of literacy as their searching for, and dwelling in, novelty through their play becomes a consistent affective dimension of their childhood friendship. Our developed sociomaterial analysis provides an empirical account of how young children's contemporary postdigital play can create resonant feelings of connection between children as they use their literacies together over time.

Theory

Refrains and Feeling Consistency Through and Across Literacy Events

Literacy cannot be reduced to representation through language and other semiotic modes alone. For example, wide-ranging literacy research has described the role of feeling, vitality, and the non-verbal in living and learning with texts (e.g., Boldt, 2021). Problematizing what counts

as literacy is at the core of literacy research today, which for long has accounted for literacies enacted through other modes than the verbal. For example, young children's play is an embodied literacy, a language of movement through which children communicate (Wohlwend, 2018). Non-representational thinking attunes the researcher further to playful literacies not only used to express something. Instead, playful literacies can also be about creating nonsense (Wohlwend et al., 2017), or feeling for unpredictable affects as you move your body with the world by rolling down a hill (Hackett and Rautio, 2019). In this research tradition, affect refers to the products of the murmurations of the world coming together and breaking apart contingently, which registers through human bodies as the indeterminate vital forces and textures of social life (e.g., Gregg and Siegworth, 2010).

The literacy event, in this line of thinking, should be studied as the focal point of analysis, rather than its extrapolation to broader, recurrent practices. Literacy events are not where practices are enacted and actualized. Instead, literacies are enacted through the event (Ehret, 2019) and as the event (Burnett & Merchant, 2020a), bringing to the fore the singular and emergent. Staying in the event means asking what potentials for literacies emerge in how materialities assemble, disassemble, and reassemble in a particular place and at a particular time, to affect each other relationally.

However, it follows that this strain of literacy research typically struggles to account for apparent consistencies across literacy events over time. Concepts such as "practice," "identity," and "discourse" have supported sociocultural theorizing of literacies across contexts and events, especially in the connected ecologies of the "digital age" (e.g., Lankshear & Knobel, 2011). Yet, concepts that can account for consistencies across literacy events, theorized as singular, remain underdeveloped in sociomaterial accounts of literacy. While extant research on affective

dimensions of literacy have attended to felt consistencies as felt atmospheres (Dernikos et al., 2020; Hollett and Ehret, 2015) or how affects are produced through assemblages coming together and falling apart across larger swathes of time and space (Lenters, 2016), a general tendency toward emergence prevails. In a recent issue of the *Journal of Literacy Research*, this tendency is attended to as it presents studies from a range of theoretical traditions going "beyond emergence" to "generate more expansive literacy ecologies" (Bauer et al. 2023, p. 3). Such efforts resonate with our own. There is a need for sociomaterial, non-representationalist theorizing of literacy to develop concepts that account for how events connect, disconnect, and reconnect in postdigital conditions, and that push the field's capacity beyond analyses of the emergence of the singular event.

To address this theoretical tension, we draw on Deleuze and Guattari's (1987) concept of the refrain, which they deploy explicitly to deal with the problem of consistency (see pp. 327–328). For them, the problem of consistency is a question of "the 'holding together'" of heterogeneous elements and how a constituting element of one "holding together" becomes a constituting element of another (pp. 323–324). Consistency thus expresses a dual sense: the consistency (i.e., makeup) of a singular event and the consistency (i.e., similarities) felt across the makeup of multiple events. Deleuze and Guattari theorize the refrain as a constituting element of the holding together of an event, an organizing force that gives it a felt dimension. Furthermore, the refrain reemerges as an organizing force across multiple related yet singular events, thus generating a feeling of consistency and resonance. It is important to note that consistency does not preexist the events. Rather, consistency is "the becoming–expressive of rhythm" (Deleuze & Guattari, 1987, p. 322), the movement through this time and this space with

these bodies and materials coming together and holding together: an organizing force that expresses a sense of familiarity through a larger assemblage of materials.

Refrains of Friendship

Thus, although refrains are enacted through and are immanent to events, they bring with them a sense of familiarity ("we are doing *this*") and, as such, represent something new to the problem of consistency. Refrains are what make us experience life not as events that randomly follow each other but often as seemingly congealed—even hardened. Illustrating the contingent temporal consistency of the refrain, Berardi, in a book detailing his friendship with Félix Guattari, theorizes that friendship in essence is about shared refrains:

> Friendship means a provisional community that is not based on any common origin, on any written destiny, on any historical necessity, but instead only on provisionally assembling refrains. It means love for the same situations, pursuing the same provisional objectives, taking pleasure in following the same path together, or failing together, and falling. (Berardi, 2008, p. 87)

This conception of friendship is impersonal in the sense that it does not rely solely on human meaning making—being friends is not just a social, intersubjective construction. Rather, friendships are enacted and felt through and across refrains. The sociomaterial and affective framework provided by Deleuze and Guattari and the refrain attunes us to the familiar and unstated feeling of living and reliving refrains with friends (e.g., an in-joke about a mispronunciation from years ago that two friends just *get*). Refrains create scores that belong to friends through assemblages of stories, smells, bodies, things, places, and so on. Still, refrains, while bringing with them a feeling of consistency, emerge through events we experience as new and singular.

Like friendships, events do not hold together forever, and refrains both enable an event's holding together and its inevitable rupture toward difference. For example, Boldt and Leander (2017) analyze the literacy event of a father and child's play with Legos, describing how the movements of the play refrains produce "breaks." They use as an example the tendency for Legos to fall apart or not fit together just at the moment we want them to hold or fit together the most. This set of expectations is a refrain that expresses the sense of Lego play through and across events and which, at the same time, creates the affective conditions that enable a break in an event when the Legos do not cooperate. The refrain, as it relates to the break, is thus productive of both consistency and difference through and across events.

The Postdigital Condition

Literacy researchers have recently proposed "postdigital" as a moniker for the contemporary conditions in which digital media technologies are both ubiquitous and mundane—as mobile devices travel with us, and artificial intelligence and algorithms become ever more pervasive and technologically advanced. In this condition, the previously distinct and clear categories of analog and digital become more difficult to justify and the relationship between the two becomes messier and more porous (Edwards, 2022; Burnett and Merchant, 2020b). As digital media technologies slowly entered early childhoods in the early 2000s, sociocultural studies explored how digital cultures and technologies mediated children's play. Yet, the unprecedented pervasiveness of digital technologies in contemporary social life cannot be reduced to the mediation of digital cultures (Jarvis & Savage, 2021). Contemporary digital technologies actively collect and analyze data to affect human activity, thereby making it difficult if not sometimes impossible to disentangle the digital from the analog. For example, in Marsh (2019), a young boy's elder sister discloses to a researcher that Hot Wheels is not just a

traditional toy car activity confined to designated play spaces, as their mother initially had explained. Rather, Hot Wheels emerges via YouTube, apps and toy cars throughout all rooms of the house. This prompts questions such as what role the YouTube algorithm plays in children's choice to view Hot Wheels videos, or how their choices in improvising stories about their Hot Wheels toys is co-authored by the YouTube algorithm, trained to show them Hot Wheels stories based on their YouTube watch history. An analytical adjustment is needed to attend to the wide range of heterogeneous materialities assembled in young children's contemporary play.

Literacy researchers have found sociomaterial approaches particularly apt to study this messy assembling, disassembling, and reassembling occurring in the postdigital (Edwards, 2022). Concepts such as "sitings" (Leander and McKim, 2003), "playscapes" (Abrams et al., 2017) or "(im)materiality" (Burnett et al., 2014) are all attempts to account for relationality in the postdigital through sociomaterial frameworks, and several contributions, informed by sociomaterial theorizing, in the *Journal of Literacy Research* have explored the digital-analog imbrications of contemporary literacies (e.g., Ehret et al., 2016; Lenters, 2016; Nelson et al., 2020). Yet these studies often explore the postdigital through the singular event by emphasizing the materiality and embodiment of the digital, and the fluidity of the interfaces between screen, body, and world. They rarely explicitly explore how young children's relationships with digital media technologies resonate and reverberate across events and over time. In our analysis of Professor and Yahtzee's play we work to understand resonances across literacy events that illuminate how postdigital conditions affect how children use and experience their literacies in their everyday social worlds.

Method

Analytical Focus and Research Questions

The concept of the refrain sensitizes us to how children's contemporary play involves digital-analog assemblages across events. Rather than focusing on one "digital literacy event" understood narrowly through the digital, we focus on refrains enacted through and across literacy events, which allows us to consider how consistencies emerge that are immanently material and difficult, if not impossible, to categorize as digital *or* analog. The felt refrains hold together over time, offering insights that move our analysis beyond emergence. Throughout, we develop an impersonal theory of friendship expressed through Professor and Yahtzee's dwelling together in novelty through their literacies in play. The following research questions, driven by our development of theory to address the dilemma of consistency, guide our analysis:

RQ1: How do refrains emerge and generate felt consistency through the literacy events of two young children's play?

RQ2: How do refrains reemerge and generate felt consistency across the literacy events over time?

RQ3: How do refrains score the boys' friendship through and across the literacy events?

Fieldwork

These research questions did not precede our experiences with the boys but rather derived from our thinking and feeling together with them and, later, viewing videos of their play. The experiences and videos were collected along with audio recordings, field notes, and digital photographs from broad ethnographic fieldwork in which Kenneth immersed himself in the daily lives of young children in a large Norwegian city in 2020–2021. Beginning this fieldwork at a preschool, Kenneth focused primarily on a group of 4–5-year-old children who enacted video

game narratives on the preschool playgrounds. As his relationship with the children and their families developed, Kenneth began visiting three of the children's family homes to explore further how the children engaged in gaming-related practices across home and preschool. He made 64 visits altogether to the preschool and family homes, collecting 55 hours of video recordings.

Through this fieldwork, Kenneth learned that two children, Yahtzee and Professor, often visited each other's homes and that these visits often centered around video games—mostly Minecraft. He then visited the children over a span of two months as they had each other over for home visits or played with siblings. Some months after these visits, in anticipation of our upcoming research stays at the same university, Kenneth and the second author, Christian, met through Zoom and e-mail. Two days of the fieldwork, in which one of the boys visits the other boy's house to watch Minecraft YouTube, play Minecraft, and play with construction playthings, proved to engage our thinking around issues of the postdigital and the refrain. The video recordings from these two days amount to three hours and 33 seconds, which were transcribed and translated, with three pages of field notes. As we watched these recordings, consulted theory, and reviewed empirical studies, three events of 38 (Event 1), 71 (Event 2), and 40 (Event 3) seconds were selected for closer analysis as they seemed generative of ideas which, by then, were starting to materialize. The video recordings formed the basis of narratives accompanied by line drawings (see Figures 1–3).

Feeling for Focal Moments

We are not exactly sure how we came to these events. As researchers searching for new perspectives on affect and literacy, experiencing the feeling that *some*thing was happening through these events and then focusing on them was a process more apt for "data reduction" than

more traditional, rationally oriented qualitative methods. Feeling for feelings in data should not—and cannot—be wholly rational. Focal moments from the data, registered and felt on researcher bodies, are selected because of how they animate new thinking, rather than because they illustrate constructed patterns and themes. This analytical process, informed by post-qualitative approaches (MacLure, 2013; Jackson & Mazzei, 2022), is established in literacy research (Burnett & Merchant, 2020a; Ehret et al., 2016), and is represented in recent studies from the learning sciences (Køster and Fernandez, 2023; Leander et al., 2023). Post-qualitative research is theoretically informed by post-structuralist and posthumanist thinking, which generally resists the notion that research is a representation of a consistent, external reality. Instead, for example, ethnography can refer to the diverse, lived experiences of engaging materially, affectively, and experimentally with theory and fieldwork.

Through our feeling for focal moments in the data, we noticed how emergent and contingent sparks registered on participants' bodies as they jumped, slumped, sang, and giggled. For example, within the literacy event of Professor and Yahtzee playing Minecraft, something occurs, which is felt by us and, we argue, felt by the two boys. Waiting for a hostile mob[2]—a creeper—to appear from the bushes and kill the player's avatar, Professor tensely gets up into a crouch, both feet on the seat of the chair, and jumps rhythmically while shouting, "You have to die!" at the TV and Yahtzee. Through this event, the felt anticipation and excitement of maybe getting attacked at any moment by the hostile mobs were key to the start of new inquiries. Our interest in what happened was piqued, not because it was a repeated practice ripe for categorization or an enactment of a specific social norm, but precisely because it seemed to be not only that but something more. Following the feeling that something more was happening eventually allowed us to recognize that the boys seemed to be "designing" their gameplay to

create surprises, novelty, and intensities that were resonant across the literacy events we analyze below.

We represent the events discussed in this paper through narrativized accounts accompanied by line drawings based on video recordings. Reflecting our theoretical framework, we highlight and direct the reader's attention to the embodied, material, affective, and situated dimensions of literacies. This way of expressing our relationship with the data will, we hope, allow the reader to tune in to and feel the events as they are produced anew in this article. We cannot represent exactly what happened but only accounts of it. These narrativized analytic accounts of the boys' play are plugged into our study, producing something that we felt sparked new thinking of how early childhood literacies are enacted *in situ*. Furthermore, the drawings outlined from video stills as bottom layers in Adobe Photoshop afford transparency, adding to the trustworthiness of our interpretations.

Analysis

Professor and Yahtzee Play the Lemon Game

In this section, we consider RQ1: how do refrains emerge and generate felt consistency through the literacy events of two young children's play? In analyzing an event in which the boys play Minecraft after watching YouTube, we illustrate how a felt refrain of dwelling in novelty slowly gains felt consistency through the boys playing the Lemon game. The Lemon game first appears in their engagement with YouTube before reemerging as the boys attempt to recreate the feeling of the Lemon game on YouTube by playing Minecraft "badly."

On Lemon Craft, the Minecraft YouTube channel Yahtzee and Professor were eager to show Kenneth (as noted in the prologue), 10-minute videos of Minecraft machinima targeted toward children are posted daily to close to three million subscribers. The content most popular

with the two boys are Lemon Craft's Noob videos. Noob is short for newbie, a gaming culture term that dismissively refers to novices. In the videos, Noob is a comical, slapstick character who often ends up in dangerous situations but also sometimes crazily succeeds despite the odds stacked against him. For example, in one video—"How to USE this HUGE DIAMOND SWORD in Minecraft ? BIGGEST SWORD !" (Lemon Craft, 2021)—Lemon, the protagonist of Lemon Craft's videos, leaves his house to find Noob rambling incoherently outside his own house while putting up a sign that says "Best sword ever" and an arrangement displaying Noob's unimpressive sword. Lemon walks angrily back to his house to get a diamond sword; he then kills Noob and replaces Noob's sword with the diamond sword. Lemon turns around to walk back to his house, but Noob, now apparently respawned,[3] appears behind him with two giant diamond swords. Noob runs toward Lemon, shouting incomprehensibly. Lemon quietly exclaims "Uh-oh!" before the video freezes with the text "We'll be right back" superimposed.

One day, after the boys have watched a handful of related videos on Lemon Craft, Professor's mother—who, along with Professor's father, is in the kitchen, glancing over at the boys in the living room sometimes, commenting occasionally, but mostly letting the boys play as they like—urges the boys to "do some gaming" rather than "gawking" at YouTube. Yahtzee suggests playing what he calls a Lemon game in Minecraft. He clarifies by saying that they will play "so badly, and dumb," and later that they will "be so crazy," which echoes the content of the videos they have been watching on Lemon Craft. Professor then adds that they will "do Survival all the time," referring to selecting a mode of Minecraft where hostile mobs are running wild, accordingly a more dangerous mode of the game where "crazy" things are more likely to happen.

Now playing Minecraft, Yahtzee sits on the couch and Professor sits in a chair. They alternate holding the gaming controller. Because hostile mobs, and more prospects of dying,

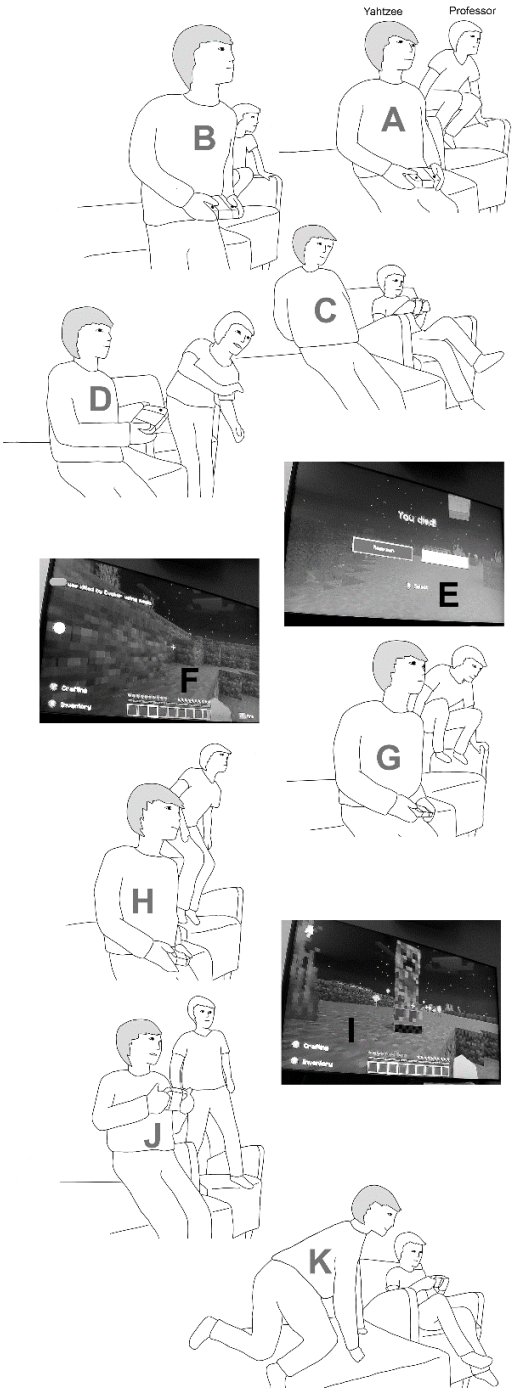
primarily surface during nighttime,[4] the boys use daytime to prepare for the Lemon game. The preparations significantly involve taking armor off, and leaving their weapons behind. Preparing to roam around during nighttime, surrounded by hostile mobs and with no armor or weapons to protect Noob is, in the boys' own words, very dumb—perfect for playing the Lemon game!

Ten minutes transpire and the sky is slowly turning darker in Minecraft. The boys have been awaiting this moment, and the hostile mobs are coming out of the woodwork. In the living room, Yahtzee is now holding the gaming controller, still on the couch; Professor still in the chair. Soon, however, the two boys' body postures and movements grow wilder and more erratic while laughing and shouting. The intensity is palpable for Kenneth, as he sits four feet away, and for Kenneth and Christian who watch the video recordings together on a shared laptop months after the fact.

Figure 1

Professor and Yahtzee Play the Lemon Game.

Professor crouches and jumps in his chair (A), chanting: "Die! You have to die! You have to die! You have to die! You have to die! You have to die! You have to die! You have to die!!! You have to die!!!" Yahtzee laughs, gets up to stand (B), eyes fixed on the screen. A creeper moves toward Noob, and Noob dies. Professor laughs and says, "Like that! My turn," leans over to get the gaming controller from Yahtzee, then sits down. "It's fun to be Noob," Professor says before shouting at Yahtzee: "Woah! Run!" The hostile mobs are barely visible, but the image jolts slightly indicating an attack from hostile mobs. Professor wiggles his legs quickly (C) and pants rhythmically. Yahtzee throws himself back on the couch, and Noob suddenly dies. Asked why they die so quickly, Professor answers that it's because Noob is crouching. Dramatically, he crouches while passing the gaming controller to Yahtzee (D). "You died," Professor says in English, copying the words currently on the screen (E). While Noob runs in a ravine, we can see a creeper in the distance (F). Also in English, Yahtzee shouts at the creeper: "Hey, boy! Hey, guy!" While sitting, Professor tensely lifts himself up into the air with his hands on the armrests (G). "Oh, that was the creeper," he says, "Run! The creeper can see you! And let it blow you up!" He is now standing in the chair running fast, in-place, then freezes, eyes fixed on the screen (H). "Oh, crap, I want you to die from the creeper," Professor says. Noob walks slowly while a creeper walks toward him (I). Professor makes a rhythmic ticking sound, then a loud boom sound as the creeper blinks white then blows up and kills Noob. Yahtzee screams and jumps high from a seating position laughing, gripping the gaming controller tightly (J). Professor gets down from the chair, takes the gaming controller from Yahtzee's hands, and sits down. "You died," he says in English. After his massive jump, Yahtzee is still bouncing slightly seated in the couch. Turning around in the couch to crawl, Yahtzee laughs exitedly: "I walked toward it! I walked toward it! That was weird, right?" (K).



First, Professor repeatedly shouts the objective of the game—"You have to die!"—while jumping in the chair. The boys consistently seek out open spaces in Minecraft where they might die, running toward the hostile mobs. It is the middle of the night and hostile mobs seem to be everywhere, killing Noob within seconds of respawning. The boys' bodies crawl, jump, and run in place, displaying feelings of excitement and anticipation. They laugh and shout interjections: "Woah!" "Run!" "Crap!" In the end, Yahtzee comments on the counterintuitive practice they are engaging in: "I walked toward it. I walked toward it. That was weird, right?"

Analysis

A refrain is emerging as Yahtzee and Professor play the Lemon game in Minecraft. Playing the Lemon game—"dumb," "badly," and "so crazy"—constitutes expressive content through which the refrain gains a felt sense: the play is going to produce something novel, something surprising. Playing dumb, badly, and so crazy, and seeing what might happen, is the metaphorical playground of the boys—in other words, what enacts the boundaries of this felt literacy event and makes it feel like the Lemon game at this moment. The boys make specific material and affectively charged moves in the game in relation to this felt sense by, for example, loading Survival mode, taking off their armor, and leaving their weapons behind.

Furthermore, the enactment of the refrain is made possible through the feature of respawning in the game. Inevitably, playing badly leads to dying, and respawning affords life after death: the boys can easily reenter the material-discursive narrative and immediately start running away from hostile mobs once again, giving their play a "calm and stable pace" (Deleuze & Guattari, 1987, p. 312) of dying, respawning, playing badly, dying, and so on. The Lemon game emerges as a felt refrain of potential surprise through their play. As the game is expressed, it gains consistency through the development of material-discursive boundaries, enabling this

potential for surprise that sparks affects. It slowly becomes recognizable as the Lemon game as the affects generated through watching Noob's dumb adventures on Lemon Craft are allowed to reemerge while playing Minecraft.

However, importantly, material breaks are also "grafted onto [the] pace" (Deleuze & Guattari, 1987, p. 312). During Event 1, the emergent agencies of the hostile mobs interfere—they break through the refrain. While Yahtzee and Professor assuredly envisions results following their actions, they are not designing something as an internal representation before enacting it on their material surroundings. On the contrary, Yahtzee and Professor facilitate for the world, in its emergent agentic materiality, to act upon them in ways that feel unpredictable: they dwell in novelty.[5] The emergent agencies of the hostile mobs attacking Yahtzee during Event 1 could not have been precisely anticipated, and both boys laugh and jump as they are moved through this break.

Any person, either present at the time, watching the video recordings, or, we hope, reading this article, will feel the zeal and intensity of the boys as the hostile mobs come for them out of nowhere. We argue that this flow is productive and significant for the boys because it allows for a movement between the break and refrain, which never disintegrates into chaos or stagnates into something too fixed and boring. The boys are dwelling in a rhythm of heterogeneous materialities because they enjoy the way it feels when something comes out of left field to surprise them. This *dwelling in novelty* is the felt refrain that we see emerge repeatedly through and across literacy events: becoming recognizable through the Lemon game in Minecraft (RQ1, this section), reemerging while playing with construction playthings (RQ2, next section), and scoring their felt friendship (RQ3, the following section).

Noob Tries All the Stuff

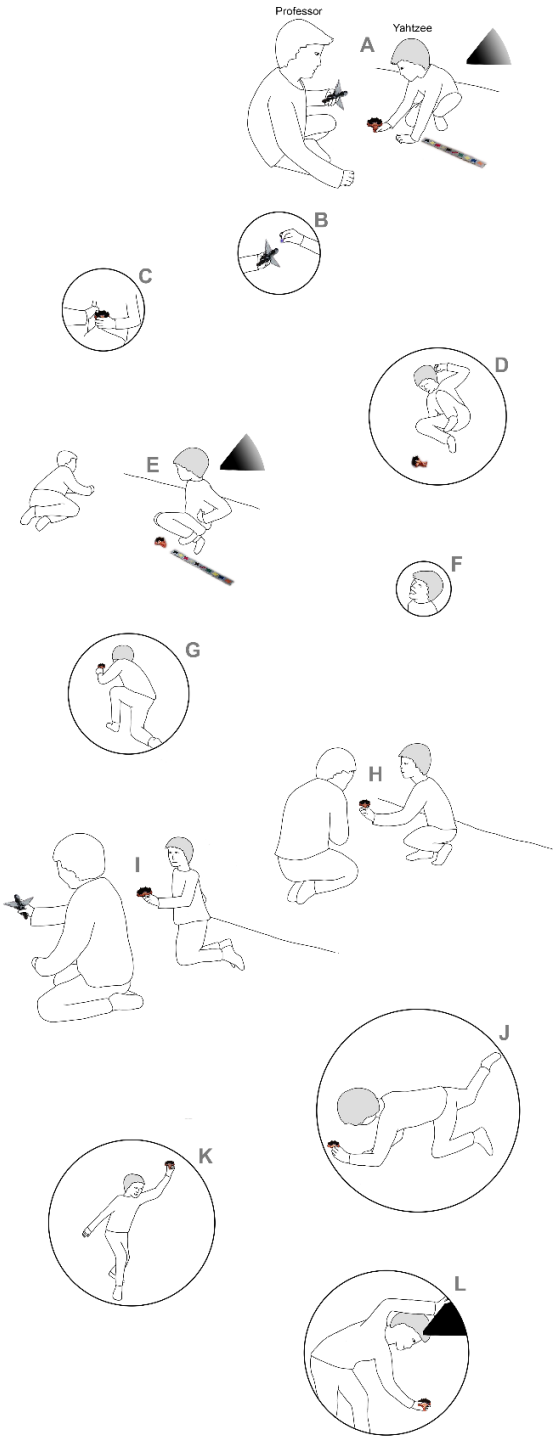
In this section, we consider RQ2: how do refrains reemerge and generate felt consistency across the literacy events over time? We analyze an event in which the boys play the Lemon game with construction playthings. The event makes us think anew about—i.e., "undo" (Burnett & Merchant, 2020b)—the digital so prevalent in Event 1. Resonating with the boys' experiences in Event 1, the Lemon game reemerges as they play with construction playthings.

One week after Event 1, the boys meet again in the same room to "play Minecraft." This time, they have moved a few feet to the left, next to a dinner table (the corners of which are represented as black triangles in Figure 2). They are sitting on the floor with Plus-plusses[6] spread out all over, and the Lemon game once again materializes. The two are close to and turned toward each other. Professor is finished making a Plus-plus ender dragon,[7] which is placed next to him. Yahtzee makes a long flat row of Plus-plusses, which are mostly grey, although uniformly placed pieces of other colors make up imagined pools within the long grey row. Furthermore, Yahtzee has built a Plus-plus Noob. Noob is jumping into pools made, according to the boys, of varying matter: e.g., wool, poop, honey, bedrock, or obsidian.[8] Yahtzee explains Noob's reasoning for jumping: "He…uh…felt like trying all the stuff they had. So he did them all." Later, Yahtzee says, "A new Noob is born! And he's pretty dumb. He wanted to try all the stuff. Even bedrock." All the while, Professor and the ender dragon roam around the living room a few feet from the floor. Next to it, Noob jumps into a pool and dies. Then, expectedly, something unexpected happens.

Figure 2

Noob Tries All the Stuff.

Professor says to Yahtzee that Noob respawned under the ender dragon. Yahtzee then moves Noob closer to the ender dragon (A), shouting "Woah!" while laughing. Yahtzee picks up a Plus-plus, moves it toward the ender dragon (B) and says Noob tried to throw a block at it. After which, Professor swiftly moves the ender dragon away, moves his other hand over Noob (C) and drops several Plus-plusses he has kept in his hand. "Dead," Professor says matter-of-factly, and makes a boom sound. "No! Woah," Yahtzee laughs and drops Noob to the floor, then falls to the floor himself (D). Yahtzee explains that Noob did not throw a block but threw water at the ender dragon. Professor affirms ("Yeah!") and elaborates: "'Cause it thought water was dangerous for it as well. It thought water was dangerous for everyone but... And you were terrified when you saw someone swimming in water." Now lying down, Professor assembles more Plus-plusses while Yahtzee watches intently (E). Dramatically, Yahtzee follows up, shouting into the ceiling: "I was like, 'No!'" (F). Still assembling Plus-plusses, Professor adds: "And you saw a zombie who wanted to go into the water to not die. And you were so... Afraid. You even tried to save it. 'Cause it was so afraid it was going to die. And you put blocks in front of the ocean. But then it just caught fire and it died." Professor laughs. Yahtzee gets up and moves Noob toward Professor and the ender dragon (G). Yahtzee laughs: "I was like, 'Wey!' 'Cause it was on fire... Instead." Yahtzee moves Noob toward the ender dragon (H) and explains: "And I was happy. I was like, 'Oh, I'll conquer the ender dragon.' I jumped on top of it." Professor moves the ender dragon away by getting up on his knees (I) and walking away saying "No, it… No, it couldn't. You hit the ground and died." Yahtzee falls down dramatically (J), screams, and laughs, then gets up quickly to run toward the pools and the dinner table (K): "I hit the pool and was like…" He moves Noob from the tabletop to the floor and the pools (L), and blows a raspberry.



In this event, Noob first respawns under the ender dragon. In a moment of apparent bewilderment, Noob attempts to throw a block at it, and later some water, which is even more futile. After the ender dragon counterattacks, he dies and respawns in the presence of a zombie. In Minecraft Survival gameplay, zombies often move toward the ocean during daylight to become underwater zombies. If they do not find shelter or become underwater zombies, they catch fire and die. However, in the boys' narrative, Noob wants to save zombies who move toward the water, mistakenly thinking they might die from drowning. He erects a wall between the zombie and the water, and, not surprisingly, the zombie catches fire and dies. Happy-go-lucky, Noob then decides to conquer the ender dragon once again and attempts to ride it by jumping on top. However, as the ender dragon flies away, Noob instead plunges into a pool and dies once again.

Analysis

Mirroring their play on the Nintendo Switch a week earlier, we once again meet Noob in this new assemblage but in a familiar refrain enacted across literacy events. We once again see Noob playing the Lemon game, finding and placing himself in dangerous situations: dying from jumping into a pool, respawning under the ender dragon, and jumping on top of the ender dragon. The boys have set the stage through the placing of materials in specific assemblages: a Noob is made of Plus-plusses, and the tabletop serves as a cliff. This allows for respawning, zombies, and pools to emerge, enacting a familiar refrain through which the features of Minecraft gameplay—most notably, respawning—are allowed to take place on the floor next to the dinner table. Furthermore, the felt refrains of dwelling in novelty are enacted as the abundant materialities they have set up—zombies, ender dragons, Noob, pools, cliffs, human bodies—make breaks possible, and openings for novelty and unpredictability enter the mix. For example,

when the zombie appears, assembled on the fly, the boys improvise, and blocks are placed along the water, igniting the zombie, which subsequently dies. This propels an overly optimistic Noob to attempt to jump on top of the ender dragon—a foray that ends in Noob's death. During the course of action, the boys laugh, blow raspberries, and gesture dramatically in ways that carry felt affective intensities due to the breaks experienced by Yahtzee's Noob as attacks by zombies, jumps into bedrock pools, and escapes of ender dragons obstruct and reroute his movement. They crawl on the floor, laugh, and scream, dwelling in these events, allowing for novelty, unpredictability, and the affective intensities produced in the encounters to move the play in new, enjoyable directions.

Importantly, the concept of the refrain allows us to study the felt consistencies across literacy events instead of focusing on singular, emergent literacy events. Furthermore, in postdigital conditions, connections are made across seemingly disparate events. Rather than study them separately—one involving "gaming literacies," the other "Lego literacies"—the refrain and the resonances across these two, which are thought-felt by the children and the researchers, are studied together. They are studied not as bounded but porous and percolating: Plus-plus Noobs are allowed the potentialities to respawn, adding novelty. Felt refrains of dwelling in novelty, first enacted through Minecraft gameplay on the Nintendo Switch and their gawking at YouTube videos, bleed over and reemerge through Plus-plus play under the kitchen table, which reflects but also enacts the postdigital conditions of their everyday. Because these conditions involve the emergent agency of a wide range of (digital-analog) materialities that introduce unpredictability and instability, the play veers off in new directions, enacting similarly felt refrains and breaks.

The Ultra Mutant Zombie Can Drop Dead by Himself

In this section, we consider RQ3: how do refrains score the boys' friendship through and across the literacy events? We analyze an event in which the boys have a disagreement while roleplaying zombies with Minecraft Legos in Professor's bedroom. We develop two arguments from our analysis of Event 3. First, the event brings to light what is more implicit in the previous events: namely, the work of attunement it requires to dwell in and let oneself be touched by the emergent agentic materialities of the world, including the ones of your friend. Second, we argue that the sensitivity toward the refrains enacted is integral to how Yahtzee and Professor's friendship grows and is nurtured.

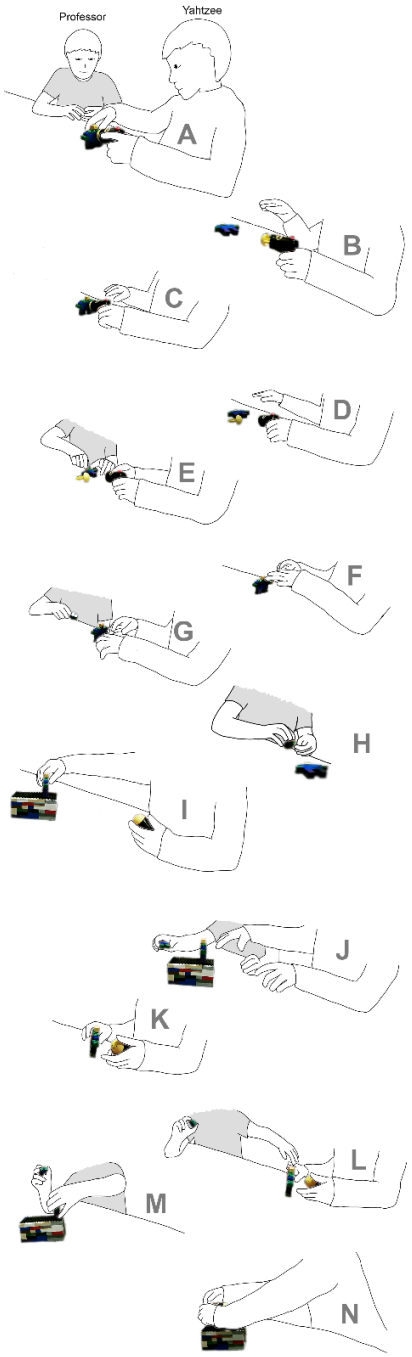
In Event 3, Yahtzee and Professor are playing with Minecraft Legos in Professor's bedroom, after having watched YouTube and played Minecraft for around an hour (Event 1). Minecraft Legos are spread out on the floor among his toys and on a chaise lounge on the floor space of his bunk bed. Kenneth arrives in the room with his video camera when they have been there for 30 seconds; the play is already taking form as they pick up two assembled Minecraft Lego zombies, one mutant and one normal. Kenneth sits down three feet away from them as they kneel and lean over the chaise lounge. A shift in perspective has occurred: the zombies are now the protagonists fighting other Minecraft characters. The adversaries are no match for the superior zombies, and the zombies soon end up attacking each other. Furthermore, to gain power, the zombies, in Professor's words, "make themselves ultra," which likely refers to a mod[9] that augments the characters' features in Minecraft. For example, Professor and Yahtzee attach blaze head Legos to the zombies and make them bigger and less vulnerable to damage. After fighting each other, Yahtzee's mutant zombie with the blaze head (i.e., the ultra mutant zombie) picks up a Batmobile Duplo cannon from the floor and, in what has become a familiar refrain, attempts to

die using it. On the same side of the chaise lounge and still on their knees, they are positioned to face each other with various Legos and a Lego house between them, each of them handling their own set of Legos.

Figure 3

The Ultra Mutant Zombie Can Drop Dead by Himself.

"I pointed at myself to die," Yahtzee says while placing the ultra mutant zombie in front of the Batmobile cannon (A). He pulls the trigger, the ultra mutant zombie falls over from the blow (B), and Yahtzee laughs. Professors smiles and says, "You didn't die 'cause you had a lot more health." Once again, Yahtzee places the ultra mutant zombie in front of the Batmobile cannon (C). "I was like," Yahtzee says and makes the droning sound characteristic of Minecraft zombies. He pulls the trigger again, and the ultra mutant zombie falls over once again from the blow (D). The ultra mutant zombie is now lying supine on the couch, and Professor raises his ultra zombie to propel it quickly twice toward the ultra mutant zombie (E): "This is how I attack, like," Professor says and makes a boom sound for each blow. Scrambling swiftly, Yahtzee picks up the ultra mutant zombie and the Batmobile cannon ball and says, while placing it on the couch standing up (F), "But I was like, I can drop dead by myself." While Yahtzee prepares the Batmobile cannon, Professor propels the ultra zombie toward the standing ultra mutant zombie (G) accompanied by a boom sound, making it fall over. "I was like I told you I am able to drop dead by myself!" Yahtzee says in a slightly more animated, rhythmic voice. Professor hits the lying ultra mutant zombie several times with the ultra zombie (H), accompanied by more boom sounds. "And you dropped dead," he says. Yahtzee moves the ultra mutant zombie away and Professor once more hits it while making the boom sound. Yahtzee echoes the sound and places the ultra mutant zombie on top of the house (I): "I respawned on top of the house," he says smiling but Professor pushes it down once more with the ultra zombie (J) and a boom sound saying, "And I pushed you down." Yahtzee picks up the ultra mutant zombie, places it standing up in front of himself (K) and replies in a loud, deep, and raspy voice: "I was like, I told you I am able to drop dead by myself!" After a moment, Professor smiles and grabs the ultra mutant zombie from Yahtzee's hands (L), placing it on top of the house (M). "So you jumped back up and shot yourself down," he says, and withdraws his hands. Yahtzee repositions the ultra mutant zombie on the house, then holds the Batmobile cannon behind it (N). "Yeah, but the cannon was behind me and I didn't know. It... I lost so much health I died," he says, pulls the trigger, and the ultra mutant zombie falls down from the house.



In this event, Yahtzee uses the Batmobile cannon to make his ultra mutant zombie shoot himself. Professor, on the other hand, attacks Yahtzee's ultra mutant zombie with his ultra zombie, which interferes with Yahtzee's plans. Speaking in the voice of the ultra mutant zombie, Yahtzee gets more and more agitated. Finally, after Yahtzee's ultra mutant zombie has been punched down for the umpteenth time by Professor's ultra zombie—this time from the roof of the house—Professor grabs the ultra mutant zombie and places it back on the roof, following instead the storyline proposed by Yahtzee: the ultra mutant zombie shoots himself. Elaborating, Yahtzee explains that the ultra mutant zombie does not even know the cannon is behind him and is shot down.

Analysis

Echoing Events 1 and 2, the recurring Lemon game refrain of dying senseless and spectacular deaths once again materializes: the ultra mutant zombie points the cannon at himself (crazy!) and fails to register that the cannon is behind him (dumb!). As we have shown, these types of refrains, characterized by dwelling in novelty, allow for breaks because a wide range of agentic materialities are assembled. Event 3 also illuminates the complex sociomaterial network that is the foundation for certain things to occur by illustrating "what if…?" Both boys—in concert with the ultra zombie, the ultra mutant zombie, the cannon, the house, the chaise lounge—bring the situation to a halt as their materialized, embodied ideas are not given the chance to resonate through the event. While there is an affective charge, this charge is characterized by an agitated, frustrated tension that does not produce "a difference that makes a difference" (Boldt & Leander, 2017, p. 409): the ultra mutant zombie gets up, gets attacked, gets up, and gets attacked again, stagnantly, boringly. Toward the end of the day, the boys begin to tire out, and Yahtzee is visibly annoyed. They have been gaming and watching YouTube for well

over an hour, and it is approaching bedtime for both. The event illustrates the intra-actional accomplishment required to enact the dwelling literacies of attuning to—feeling—the emerging agentic materialities of the world. Finally, the refrain is enacted once again as Yahtzee's ultra mutant zombie is allowed to do what it wants—to be dumb and crazy—which produces new potentialities for breaks and affective intensities to take place. In fact, after Event 3, Professor turns to look through a box of Legos to make their zombies "even more ultra bultra sultra cultra." Novelty can be introduced again, allowing for new breaks and new affective intensities.

Watching the video, being in the room, and reading our descriptions, we *feel* Yahtzee and Professor's friendship through their strong and urgent desire toward novelty alongside each other. There is a thickness and dimensionality to their play, thanks to the "provisionally assembling" refrains and breaks. They attune to each other and "follow the same path" (Berardi, 2008, p. 87), as illustrated by our three events, scored by recognizable refrains. During Event 1, they watched the same YouTube video together, gleefully reveling in Noob's unconventional approach to Minecraft gameplay, embracing the respawning feature. Anticipation builds as they turn to playing Minecraft on the Nintendo Switch. During the game's daytime period, they set things up to play the Lemon game together. The intensity is high as they jump on chairs, crawl on couches, and laugh at each other, *feeling* Noob as he keeps dying spectacularly during the nighttime. Moving to the floor in Event 2 to play with Plus-plusses, the two once again play similar refrains and dwell in similar breaks, producing familiar, intensely felt affects.

The refrains are enacted through different bodies, things, and spaces. For Yahtzee and Professor, the refrains they love—be they "digital" or "analog"—are the ones that allow for breaks, and a type of friendship, to emerge, which is about following a felt exigency toward dwelling in novelty. Through and across the events scored by these refrains, a friendship emerges

that is impersonal because the dwelling in novelty is enacted affectively and relationally: they are not friends who happen to play Minecraft. Minecraft texts and the literacies enacted throughout—in concert with the tabletops, Batmobile Duplo cannons, and Plus-plusses—are integral to, and inseparable from, the refrains, breaks, and production of affectively intense events at the center of the two boys' friendship.

Sociomaterial analyses, developed from a non-representational tradition, do not only feel for moments in data to analyze, but also work to express what literacies feel like through moments in research writing (Ehret, 2018; Stewart, 2010). As a reader coming to the end of our analysis of three literacy events, you may have a sense of what it feels like for Professor and Yahtzee to dwell in novelty together. Taking children's contemporary literacies seriously requires that researchers do not only engage with them rationally but also push the boundaries of expression and analysis to attune to the feeling of literacy for young children today—gawking at YouTube, playing badly with Plus-plusses, and nurturing friendships.

Concluding Remarks

Through our analysis and our feeling alongside Professor and Yahtzee, we show how two children watching Minecraft YouTubers, playing Minecraft on a Nintendo Switch, playing Minecraft with Minecraft Legos, and playing Minecraft with Plus-plusses in their living room and bedroom enact literacy events, through and across which refrains are enacted, producing and maintaining feelings of friendship over time. Our analysis addressed the following: how refrains emerge and generate felt consistency through the literacy events of two young children's play; how refrains reemerge and generate felt consistency across the literacy events over time; and how refrains score the boys' friendship through and across the literacy events.

Firstly, the felt refrain of dwelling in novelty emerges through a literacy event by gaining recognizability as the Lemon game. Through the refrain, discursive boundaries are erected and expressed as the Lemon game, enacting a metaphorical playground through and from which to work. Playing the Lemon game in Minecraft is to dwell in novelty because it involves, in Yahtzee's words, "[trying] all the stuff" and being open to how novelty unfolds, no matter how "dumb" it is. Dwelling in novelty allows for breaks—for example, the emergent agencies of Plus-plus zombies and Nintendo Switch zombies attacking—to insert themselves abruptly and surprisingly through the refrains of the literacy events, veering off to produce affectively intense events—jumping around, screaming, and laughing—prompting new lines of movement. Rather than rejecting or revising novelty, the boys accept and work with it, embracing unpredictability as they feel for its affects.

Secondly, the felt refrain of dwelling in novelty also reemerges and is enacted repeatedly, developing a felt consistency across the literacy events: by the kitchen table, when Plus-plus Noob jumps from a tabletop cliff into Plus-plus bedrock pools; on the Nintendo Switch, when avatar Noob takes off all his armor and weapons before nighttime when the hostile mobs appear; and in Professor's bedroom, when a Minecraft Lego ultra mutant zombie shoots himself with a Batmobile Duplo cannon. A wide range of materialities, both digital and analog—for example, Minecraft texts, Plus-plus pieces, the tabletop, the game on the TV, and the two boys' bodies—assembled, disassembled, and reassembled, enacting emergent agencies through and across literacy events.

Thirdly, the felt refrain of dwelling in novelty scores Yahtzee and Professor's friendship. The affective intensities produced through the refrains of the literacy events are key to understanding the boys' feelings of friendship. Furthermore, the feelings of friendships are an

illuminating case, through which we explore how affective intensities move over time and gain consistency. The refrains scoring the two boys' play during the two days when they dwell in novelty through the literacy events produce palpable affective intensities they feel together. Dwelling in novelty also involves dwelling in the emergent agency of each other and a sensitivity and care for the contributions of your friend. For example, when they play two zombies under attack with Minecraft Legos, Yahtzee becomes frustrated as Professor attacks his ultra mutant zombie. While it takes some work, the boys ultimately sensitively attune to each other, dwelling in novelty by allowing for the emergent agency of Yahtzee's ultra mutant zombie to play its part. Through these shared refrains, affective intensities emerge, and as literacy events like these accumulate—as old and new refrains, breaks, and affective intensities are enacted repeatedly—deeply felt sensations of being friends are being produced over time.

Our contribution with this study is twofold. First, after noting that sociomaterial analyses of literacies tend to emphasize emergent literacies unfolding through the singular event (Burnett & Merchant, 2020a; Ehret, 2019; Leander & Boldt, 2013), we contribute an empirical analysis of the felt consistencies making up two young boys' feelings of friendship, illustrating how sociomaterial literacy research can study literacies enacted and felt *across* events over time. Second, owing to our specific case in which Yahtzee and Professor attune to, feel, and enact the postdigital conditions of their everyday, we consider how young children's gaming and YouTube gawking does not spill onto the playground as tools and resources. Rather, taking into account the contemporary larger ecologies of young children's play, we show, through rich, on-site descriptions, how bodies, blocks, and bytes assemble, disassemble, and reassemble, gaining new forms of agency, across events. There is an ongoing conversation in literacy research exploring and accounting for the materiality and embodiment of the digital—the porous interface between

the screen, the body, and the world as new digital media technologies are put to use in situ. The concept of the refrain adds to sociomaterial theorizing of literacy in the postdigital by providing a new set of analytical and methodological modes. Attending to the postdigital condition, then, is not only about how bodies and things are mobilized through playing Minecraft but also about recognizing how the vibe of playing Minecraft is enacted and makes itself felt across events—even under a kitchen table, or on a bedroom bunk bed.

Leading scholars in postdigital education have described how the flexibility and ambiguity of the term "postdigital" appeals to some researchers and make others skeptical of its usefulness (Jandrić, MacKenzie, & Knox, 2022). We too have been concerned that it may further reify the digital after decades of literacy research has worked to undo the digital-analog binary, including our own work (Ehret & Hollett, 2014). In our analysis, we therefore settled on referring to the postdigital as a situation and a condition in which Yahtzee, Professor, and we find ourselves, where digital technologies increasingly act in new ways through young children's play. Consider, for example, the YouTube algorithm, which seemingly moves the play beyond digital mediation. A technology, which is not visible to the children, chooses, in part, what Lemon videos are available for the children to watch. As, among other things, the algorithm nudges the children into Lemon Craft again and again, their desire for novelty and surprise is deepened over time, and a felt dimension of their friendship is produced, attuning them to each other as they play and produce new stories and scenarios with their playthings. When digital platforms come into relation with how children feel their friendships, we see the postdigital condition at work. As Professor and Yahtzee grow up, might they also experience a fracturing of friendship—also influenced by digital platforms and the dis/information they might continue to consume? We see these questions and perspectives as part of what considering the postdigital

condition can offer early literacy researchers working to both "undo the digital" (Burnett & Merchant, 2020b) and to explore its increasing pervasiveness through even the most intimate events of children's social worlds.

We are careful not to idealize the refrain. Boldt and Leander (2017) point out that refrains tend to territorialize singular events into predefined categories; thus, they "make us dead to the social communication of others and make it seem unnecessary, undesirable or unthought of to embrace the productive powers of difference" (p. 414). We, too, recognize that refrains can harden and stagnate, not only to become "boring," as discussed above, but also to contribute to unjust power imbalances through territorializing cuts. Minecraft, for example, has been critiqued for how it portrays villagers according to antisemitic stereotypes: crooked noses, unibrows, and being expert salespersons. In fact, during the fieldwork, we observed how two children discussed the "gross" noses of the villagers. Furthermore, the gaming community has been critiqued as gendered, which became evident through the process of Gamergate in 2014, when female gamers who advocated for more progressive and gender-equal designs of video games were targeted and harassed.[10] During the preschool fieldwork, we observed mostly boys either discussing video games or playing them out on the playground, while girls did not despite some being avid gamers at home. For the age range in question, Minecraft is still mostly played among boys (Mavoa et al., 2018). Accordingly, gendered or racialized refrains from historically unequal practices can manifest through materials and bodies, producing affects Ahmed (2004) calls "sticky," causing, for example, racist or sexist feelings of disgust, anger, or schadenfreude to linger. Future studies should investigate these dimensions of the refrain in children's play and literacies.

Furthermore, while we share the enthusiasm regarding Minecraft's apparent ability to move and inspire young children in their playful endeavors, which has been documented in a range of studies (e.g., Bailey, 2016; Dezuanni & O'Mara, 2017; Hollett & Ehret, 2015), we recognize the potential peril of instrumentalizing Minecraft in ways that may not carry affective resonance for young children. Some of the appeal for Yahtzee and Professor seems to reside in the liminal space between sense and nonsense, the refrain and the break. Young children should have time and space to play around and be silly, sharing affectively intense encounters afforded by an open-ended experience of playing Minecraft, with bodies, blocks, and bytes—what Boldt (2021) refers to as "vitality rights." Parents, teachers, and policymakers tend to serve as gatekeepers of new media for young children (Livingstone & Blum-Ross, 2021). Accoordingly, we believe these groups should recognize young children's vitality rights, and not subscribe to territorializing refrains of Minecraft as inherently educational and good, or addictive and bad. Rather, we should sense the vibe of the room, allow ourselves to be affected, and allow children to move through and explore the breaks and refrains of the postdigital together with their friends.

[1] The children chose their own pseudonyms.
[2] In Minecraft, hostile mobs are unfriendly antagonists like zombies, creepers, and witches.
[3] In Minecraft, when your avatar dies, it respawns and reappears shortly thereafter near its base.
[4] In Minecraft, daytime turns to nighttime every 10 minutes.
[5] Recognizing Ingold's concept of dwelling, which "signifies that immersion of beings in the currents of the lifeworld" (Ingold, 2011, p. 10).
[6] Plus-plusses are small, uniformly shaped, colored plastic construction playthings that can be fitted onto each other. https://plus-plus.com/
[7] In Minecraft, the ender dragon is the final boss.
[8] In Minecraft, blocks are made of varying density (in addition to other variables), which affects the result of jumping onto them from heights. Bedrock is generally considered the hardest block.
[9] In Minecraft, mods, or modifications, are user-made alterations to the program code that change game aesthetics or dynamics.
[10] https://en.wikipedia.org/wiki/Gamergate_(harassment_campaign)

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We declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Article III: Pettersen, K. (submitted). Young children's more-than-human and more-than-digital collecting. *Children's Geographies.*

III

Young Children's More-than-Human and More-than-Digital Collecting

Abstract: This study aims to advance our understanding of young children's contemporary collecting. Collecting is a prevalent practice among young children. However, extant research typically highlights children of school age and emphasizes the functions and motives of collecting, but rarely considers the relevant affective dimensions. Furthermore, young children today collect on digital interfaces through gaming, and their play tends to unsettle digital–analog binaries. Still, no explicit attention has been paid to young children's collecting in these broader contemporary playscapes. In this study, I plug into ethnographic accounts of young children's collecting, sociomaterial affect theorizing of early childhood play and literacy, and the key concept of 'answering the world.' The children in this case are found to enact relational sensibilities to their surroundings and collect in ways that leave the unfolding of the activity up to chance. They put less stress on the acquisition of a set collection than on moving with and feeling the collecting. The world answered refers to broad playscapes composed of spaces of tangible, fleshy, organic forest floors, and shiny, blocky, vividly colored Super Mario Worlds. The relational sensibilities enacted are found to be entangled with the tension and discord of young children's material–discursive conditions.

Keywords: affect; collecting; early childhood; literacy; play; video games

Introduction and background

Young children collect. Simply put, collecting refers to the non-utilitarian gathering of 'objects belonging to a particular category the collector happens to fancy' (Alsop, 1982, as quoted in Pearce 1994, 157) and is a widespread feature of childhood (Lekies, Beery, and Brensinger 2017). Children are motivated to collect for the fun and joys of doing the collecting, to learn about topics of interest, to satisfy passions for what the collected items represent, to distinguish themselves from their peers, and to feel belonging to a social group (Baker and Gentry 1996). For children, the act of collecting can be deeply meaningful and provide a felt sense of agency and control over their surroundings (Danet and Katriel 1994; Loebenberg 2012; Moshenska 2008). Collecting in nature may support their emotional

connection to and knowledge of nature (Beery and Lekies 2019; Beery and Jørgensen 2018; Chipeniuk 1995; Lekies and Beery 2013). It has also been found to correlate positively with their cognitive development (McAlister, Cornwell, and Cornain 2011). Many adults have strong, sensuous memories of collecting as children (Chipeniuk 1995; Lekies and Beery 2013; Moshenska 2008).

While previous research has emphasized explicit motives and implicit functions of collecting, Baker and Gentry (1996) note an important dimension of collecting being, simply, the fun and joys of it. One of their fifth-grade informants states that the appeal of collecting is the feeling of being 'sort of happy when I'm getting hold of this stuff, just by picking something off the ground and brushing it' (Baker and Gentry 1996, 134). In her large-scale survey conducted over a century ago, Burk (1900) asked children why they collect and noted that one of the most common motivations was 'indefinite,' which prompted her to write poetically of that '"treasure" feeling' of collecting that 'twines around the heart in a more or less indefinable, unreasoning sort of way' (179). As children collect, they are touched and moved in unpredictable, indeterminate encounters with worldly treasures, whether they are pretty stones magically appearing on beaches or rare stamps in thrift stores, making their mark on collectors.

There is ambiguity in the extant research, which is itself limited, regarding this dimension of collecting, which is often, but not exclusively, present in early childhood. Typically, research on childhood collecting recruits children of school age (Baker and Gentry 1996; Danet and Katriel 1994; Loebenberg 2012) or elicits memories of childhood collecting from interviews with young people and adults (Moshenska 2008; Beery and Lekies 2019; Chipeniuk 1995; Lekies and Beery 2013). Only two articles reviewed for this study include young children of pre-school age: McAlister et al. (2011) study young children through an elaborate experiment, and Beery and Jørgensen (2018) include ethnographic observations of

outdoor pre-school play in addition to interviews with adults. For Baker and Gentry (1996), first graders' collecting raise issues, challenging traditional understandings of collecting because items are merely randomly picked up or gifted to the children. Goal-oriented collecting often tends to serve as the gold standard of collecting. In this vein, McAlister et al. (2011), for example, connect collecting to executive functioning and theory of mind. Expressing a common sentiment about young children's collections, Lekies et al. (2017) state the following:

> In the early years, the process of collecting can be somewhat unrefined and undirected until children develop a more conscious interest, both in collecting and the items being collected. Motives can differ by age, with collecting in early childhood due to instinct and in middle childhood between the ages of 9 and 12 due to genuine interest, enjoyment, imitation of others who collect, competition and interest in amassing quantity. (549)

For this study, I aim to explore early childhood collecting, which is typically discounted as instinctive and frivolous. Attending to young children's seemingly nonsensical activities of rolling down hills and running around trees, Hackett and Rautio (2019) developed the concept of *answering the world*, which is grounded in sociomaterial affect theorizing. Answering the world and its adjacent theorizing refer to how early childhood play, rather than being deliberately designed, emerges through the subtle, sensitive correspondence between young children and their surroundings. In employing answering the world as a key concept in this study, I attend to the 'indefinable, unreasoning' (Burk 1900, 179) *affective* dimensions of early childhood collecting.

Furthermore, certain types of items have consistently been collected, such as rocks or shells. Other types of collected items are ephemeral fads or emerge as collectibles with slightly longer shelf lives. Today, new media technologies, and gaming in particular, provide new ways of collecting for young children. For example, in *Pokémon*, players collect fantasy monsters, and in *Animal Crossing*, they collect fish, stones, and sticks. Video games often

facilitate the collection of items that do not have a function either in the game or outside of it (Cao 2022), and in Bartle's (1996) influential typology of approaches to gaming, 'achieving' (i.e., performing tasks to collect badges, items, and trophies) is one of only four approaches. Gamers collect not only to reach extraneous ends, but because they value collecting as an end in itself (Toups et al. 2016). However, while young children's gaming has been studied for some time (e.g., Björk-Willén and Aronsson 2014; Danby et al. 2018; Lundtofte, Odgaard, and Skovbjerg 2019), there is no explicit research on how they collect while gaming. Furthermore, recent empirical studies and theoretical developments within early childhood research suggest that new media technologies in young children's contemporary play are 'ubiquitously present and mundanely invisible' (Pettersen, Arnseth, and Silseth 2022, 2). New media technologies feed off and into young children's play in broad playscapes (Abrams, Rowsell, and Merchant 2017). This has prompted calls to perform "holistic examinations of the reality of [children's] play": rather than study play with digital devices as isolated events, researchers should explore how new media technologies participate in young children's lives "in combination with broader knowledge of children's life experiences and interests" (Parry and Scott 2020, p. 450).

To summarize, little attention has been paid to the affective dimensions of young children's collecting in broader contemporary playscapes. In the present study, ethnographic accounts of young children's everyday collecting at home and in pre-school, and sociomaterial affect theorizing of early childhood literacy and play support my inquiry into the following research question: how do young children answer the world through contemporary playful collecting?

Sociomaterial affect theorizing of literacy and play in early childhood

Young children's collecting is a form of play, in the sense that it is a spatially and temporally distinct activity outside of the mundane and ordinary through which the player's surroundings

acquire new meanings (Caillois 1961; Huizinga 1950). Collecting stamps, for example, is an activity in which stamps are bought, sold, and traded as meaningful and categorized as 'items' of a 'collection,' rather than serving solely as small paper rectangles used for postage. Children's play, however, is no simple pastime or non-committal whim. Rather, it is a complex, culturally relevant form of literacy that is not reducible to a precursor or a lesser form of reading or writing: play is an embodied literacy, as young children engage in multimodal meaning making through their bodies (Wohlwend 2018). In this sense, collecting is a form of—playful—literacy, as young children engage in representational activities by imbuing their collecting and collections with consequential narratives and meaning.

However, there is more to literacies than 'socially recognized forms of representation' (Burnett and Merchant 2021, 355). Newer approaches—proposed and developed through, for example, multiple contributions in *Children's Geographies*—have challenged anthropocentric and representational thinking of literacy. Everyday items and collectibles are not mute entities waiting to be represented through human meaning-making practices and language. Instead, they are construed as active and becoming, exerting pushes and pulls of *affect* in complex relationships with humans in social life (Hackett 2021). While Barad (2007) does not explicitly employ the concept of affect, she provides an accurate description of the dynamics through which affect is produced in the following excerpt:

> Meaning is […] an ongoing performance of the world in its differential dance of intelligibility and unintelligibility. In its causal intra-activity, part of the world becomes determinately bounded and propertied in its emergent intelligibility, while lively matterings, possibilities, and impossibilities are reconfigured. (149)

In this view, affect is a force produced through encounters or 'dances.' It moves, coalesces, and spreads—sometimes into meanings and stable, bounded properties, and other times into surpluses of affect, which point toward new potentialities and emergences. Relating affectively to research thus implies a consideration and feel for the seemingly whole,

bounded, and knowable bodies that emerge, as well as what slips away and bursts into unknown futures as intangible atmospheres and surges of indeterminate affective intensities (e.g., Gregg and Siegworth 2010; Ehret and Leander 2019; McLure 2013). Consider, for example, the stamp collector: while stamps often have specific meanings that are shared with other collectors, certain stamps may for individual collectors glow with singular qualities that are hard to explain, and certain stamp collecting events may give collectors inexplicable tingles from being there at that very moment. These elusive and intense sensations and experiences are also likely important dimensions of what it feels like to be a stamp collector.

Hackett and Rautio (2019) argue that young children, through their play—more specifically, their sensorimotor play of running around trees and rolling down hills—tend to 'answer the world,' which refers to a specific way of relating to place as they engage in equal encounters with their physical surroundings. While children rolling and running may have intentions with their actions, the outcome is not determined in advance, and the children enjoy and facilitate this unpredictability. Such activity epitomizes a literacy in its own right, in which a relational sensitivity and a porousness to the world is enacted and felt. Such literacies are 'more-than-human,' as their locus is not exclusively human, but extends beyond the skin. Young children appear prone to enact this permeable relationship with the world through their play (Wohlwend and Thiel 2019). Rautio (2013), for example, claims the following:

> Children, by virtue of their both biophysical and socially/culturally constructed existence, often seem to apply what Bennett (2010) describes as aesthetic–affective openness towards material surroundings: an attentiveness to and sensuous enchantment by non-human forces, an openness to be surprised and to grant agency to non-human entities. (395)

Rautio notes that attending to this phenomenon is not about othering young children as more 'open' but rather about recognizing what they 'find inherently rewarding and spend considerable time engaging in' (395). Young children's play typically embodies 'worldful'

(Bogost 2016) qualities—in the sense that their surroundings are experienced as enthusiastic playmates rather than empty vessels to be creatively manipulated—to which sociomaterial theorizing of affective dimensions of early childhood literacy and play attunes researchers.

For this study, I quickly felt and became cognizant of chance as a central feature of the young children's play. Games of chance typically involve a relinquishing of control to something other than the player—whether it be fate, destiny, or fortune—and can thus be said to be a strictly bounded and constraining category of play (Caillois 1961). Such accounts of games of chance—as limiting the player—are based on understandings that put the player at the center of activity. There are, however, dimensions of play that involve 'the chaotic and arbitrary play of physical forces, [transforming] men [sic] into both players and playthings' (Spariosu 1989, 16), which may be particularly evident in games of chance. Rather than the unfolding of pure, unrestrained creativity, play in this sense, resonating with sociomaterial affect theorizing, is what happens as you accept and worldfully work within the limitations of your surroundings and surrender to God, the World, or the Cosmos (Bogost 2016; Hackett and Rautio 2019). Rather than limiting play, games of chance offer new avenues through which it can unfold; precisely *because* these boundaries make themselves known and felt, trajectories veer off in unanticipated ways, and it is in these novel movements that games of chance can emerge—not only as a specific category of play but as a potential dimension of all play. Consider, for example, hopscotch: the stone with its uneven edges is thrown and moves in relation to the rigid system of the grid and play rules, creating unruly trajectories that, pleasurably, cannot be predicted.

Modes of inquiry

From May 2020 to November 2021, I carried out ethnographic fieldwork at a pre-school and in three young children's homes. I made 64 visits in all and collected field notes, approximately 250 photographs, and 36 hours of synchronized dual-video recordings. Located

in a socio-economically diverse suburban area of a large Norwegian city, the pre-school housed around 60 one- to six-year-olds (all participants of this study were three to five years old) and 15 educators in five classes. At the time of the fieldwork reported in this study—peak pandemic in the spring and summer of 2020—the children at the pre-school spent most of their time playing freely outdoors, and the playground was divided into smaller patches where each class could play while socially distanced from the others. One of the classes spent most of their time at an offsite pre-school forest patch to make space for the other classes. This patch was a dense, unfenced forest that, while only a few hundred feet from the pre-school, felt unconstrained and remote. While the extent of time spent and the way in which this was done outdoors was accentuated by the ongoing pandemic, socio-historically, Nordic early childhood education has privileged nature and the outdoors as important places for autonomous play and exploration (Sandseter and Lysklett 2017).

The family home chosen for the present study was within walking distance from the pre-school. The house was semi-detached and located among other semi-detached houses in domestic but natural outdoor surroundings. Narrow asphalt roads covered the ground, offering space for riding a bicycle or pushing a baby stroller. Smaller patches of rocky hills, grass, and trees characterized the area, as well as modest playgrounds. In the house, a five-year-old boy, Yahtzee Champignon (Yahtzee), shared a bedroom with his sibling and a roof with his two parents.[1] Yahtzee loved video games—*Minecraft* and *Super Mario* in particular—which he mostly played on a family iPad. He wanted to be a gaming YouTuber when he got older but assured me that he was not completely 'video game crazy,' a label he was prone to be assigned by other children and adults. His other interests included making comic books, *Harry Potter*, and playing outside with his friends. Racer, Yahtzee's younger friend who attended a playdate at Yahtzee's house reported in this study, was a four-year-old boy who lived with his parents and two siblings. He enjoyed playing *Sonic the Hedgehog*, *Minecraft*,

and *Super Mario* on Nintendo DS and iPad, watching video game walkthroughs on YouTube, and creating and drawing. He was an imaginative, whimsical, and popular boy with a tender relationship with his older sibling, who was also an avid gamer. Overall, the boys had high levels of access to new media technologies and passionate interests in gaming. 65% of Norwegian four- to five-year-olds have access to computer tablets, 63% watch *YouTube* or *YouTube Kids*, and 65% play video games weekly or daily (The Norwegian Media Authority 2023).

In contemporary early childhood play, new media technologies are 'mundanely invisible and ubiquitously present' (Pettersen, Arnseth, and Silseth 2022, 2), weaving the narratives, characters, items, and ludic features of digital culture into young children's play. Previous research has demonstrated, for example, how QR codes and technology augment children's playgrounds (Nansen and Apperley 2020), how gaming and outdoor play bleed into each other (Burn 2013; Pettersen, Silseth, and Arnseth 2022), how construction play and watching YouTube resonate across moments (Pettersen and Ehret, forthcoming), and how makeshift pretend 'iPads' are played into being in pre-school play (Flint and Adams 2023). It follows that researchers should explore how new media technologies "feed into play, in combination with broader knowledge of children's life experiences and interests" in a "holistic examination of the reality of [children's] play" (Parry and Scott 2020, p. 450). Accordingly, while my initial research interests were children's relationships with new media technologies, my ethnographic scope was wide and imbued with a relational sensitivity attuned to the broader contemporary playscapes of early childhood. Playscapes here refer to the expansive geographies of contemporary early childhoods that manifest locally but are composed of the global and connected mobilities afforded by contemporary socio-technological conditions (Abrams, Rowsell, and Merchant 2017). Through my fieldwork, I sensed and followed the children and registered how their play resonated and moved across

moments regardless of its status on an assumed digital–analog continuum. I followed the children outside, to their pre-school, and in their play with construction toys in their bedrooms or gaming on the family iPad, and so on, which allowed me to engage with the messy arrangements of these young children's contemporary playscapes.

Methodologically, my immersion in a community of young children and my emphasis on the situated practices of the participants resonate with the qualitative and reflexive approach to inquiry of ethnography (Pink 2012). However, following the sociomaterial affect theoretical stance of the study, post-qualitative approaches were also key to the inquiry (Jackson and Mazzei 2022; McLure 2013). Post-qualitative inquiry recognizes the heterogeneity of the research assemblage and consists of, for example, embodied fieldwork, data produced and made discrete (e.g., .txts, .jpgs, and .movs), concepts and theorizing, and extant research literature. In post-qualitative inquiry, theory and analytical strategies are not interpretative intermediaries the researcher utilizes to make sense of their fieldwork and data. Rather, they are active things to be 'plugged into' the research (Jackson and Mazzei 2022) to produce novel accounts and ideas, thus potentially contributing to the extant research. Reiterating Barad's (2007) point, the assemblage of post-qualitative inquiry enables flows of affect to move in 'an ongoing performance of the world in its differential dance of intelligibility and unintelligibility' (149). Rather than focusing only on one 'intelligible' dancer, post-qualitative inquiry—through the embodied and material conditions of fieldwork, data, analysis, and theory—attunes to the dance of the intelligible and unintelligible, feeling and sensing the constant flows and ruptures of affect, as both intelligibility and unintelligibility are performed into being. MacLure (2013) likens the process to a cabinet of curiosities, in which oddities and quirks supplement themes and categories.

While traditional ethnography may conflict with the core tenets of sociomaterial affect theorizing, relationally oriented ethnography may still be a relevant mode of inquiry in early

childhood literacy research grounded in sociomaterial affect theorizing (Hackett 2021): immersed in their community, I explored how the children's days unfolded over larger swathes of time and space in situ by tuning into the ideas, doings, feelings, and things of the community in question as they were added, layered, and resonated over time, as well as becoming sensitized to the unexpected, which enabled me to follow these lines of flight further. Importantly, the propositions developed from the inquiry do not receive their authority from my immersion in the field to reach a point of saturation, but rather from their capacity to animate further thinking.

For the present study, the point of departure was re-reading the field notes and serendipitously coming across the excerpt reproduced on page 14, which describes how two children enacted a video game-like feature while gathering cones and leaves on a rocky neighborhood hill. This resonated with the collecting I had observed on the pre-school playground, the offsite pre-school forest patch, and in their gaming at home, further advancing already emerging ideas about young children's contemporary play with new media technologies. Returning to the video recordings of the young children gaming at home and the field notes and photographs from their outdoor play at the pre-school and in their neighborhood thus enabled me to explore the young children's collecting as it was enacted across broader playscapes. My inquiry, then, echoes the ways in which the children constructed their own geographies by eclectically sifting through the conditions of their everyday realities, where new media technologies were both 'mundanely invisible and ubiquitously present' (Pettersen, Arnseth, and Silseth 2022, 2), and by exploring what resonates, what produces bursts of affect, and what remains moving and stirring. Specific moments were then selected for this article to illustrate the ideas generated. Owing to ethnography's history of thick descriptions (Geertz 1973), the descriptions of these moments

are richly textured to support the reader in evaluating the soundness of the propositions, which are, again, meant to be taken as propositions for further thinking and not full stops.

Ethics

Parents consented to their children taking part in the research project by first reading information sheets and then signing consent forms. As an ongoing process, age-appropriate information was given to the children at multiple times. They were asked to assent or dissent as it became salient, and I worked to remain sensitive to their non-verbal cues of discomfort or unease (Flewitt 2005). The other plentiful ethical considerations of the research project are elaborated on in the dissertation (Pettersen, unpublished) of which this study is part.

Analysis

Collecting cones, leaves, slugs, and insects

During the first weeks of my fieldwork at the pre-school, I spent most of my time with the children outdoors on an offsite pre-school forest patch and on the pre-school playground. The educators remarked that there was more open-ended, unsupervised play and good vibes among the children, which they attributed to their spending more time outdoors. In accordance with previous research (Beery and Lekies 2019; Lekies and Beery 2013; Lekies, Beery, and Brensinger 2017; Chipeniuk 1995; Beery and Jørgensen 2018), popular activities among the children included gathering debris from the forest floor, such as rocks, sticks, and cones. However, this gathering was typically characterized by a lack of tenacity and collection coherency. After a classic 'treasure hunt,' for example, a group of children did not keep the cones they collected, nor did they refer to them during later activities. Slowly, the pile of cones merged with its forest surroundings, which included needles, worms, and moss. On another day, a girl amassed tens of cones and proceeded to hand them out indiscriminately to

other children with a trash grabber she had come across. Similarly, on a third day, a group of children was observed to be on the prowl:

> Superman, Butterfly, Racer, and other children were looking for slugs and insects, which they put on a flat rock that Superman was carrying around. Superman kept losing slugs, but the children did not seem to mind too much. The hunt seemed more important than having more insects. But the children and I also made barriers, made of sticks and bark, and we wondered where the slugs and insects went when we could not find them. (Field notes, May 25, 2020[2])

They left Superman, a younger boy not physically equipped for the task, in charge of managing a large flat rock populated by live slugs and insects. The other children did not 'seem to mind too much' that the collection changed—insects and slugs would fly, move, or slide off the rock as it was handled haphazardly—suggesting that the items collected on the rock were not the nexus of the event. Rather, running to-and-fro, picking up slugs and insects, making barriers, and looking for lost items were what appeared to matter most to the participants.

I would also frequently find two boys, Yahtzee and Racer, on the pre-school playground, each carrying a pot or a bucket, brimful of cones, and consistently losing one or two cones from the top. The cones would be nicknamed 'potatoes' or 'Goombas' (the infamous grumpy, brown antagonists of Nintendo's Mario lore), because of the shared visual characteristics of being amorphous and brown. Later in the day, I would often find cones, still in buckets or pots, placed randomly around the playground, lost and forgotten. Pre-school staff would pour the cones out at the end of the day while cleaning up the playground, only for the boys to collect them once again the coming day.

During this time, Yahtzee and Racer were getting to know each other and often visited each other's houses. During the lockdown, children were recommended to limit their social interactions to a select bubble of people, and the two classmates quickly came together

through their mutual interest in video games. One day, I followed the two as Racer excitedly visited Yahtzee's house. The familiar cone collecting routine once again emerged, but this time in an extended edition:

> Yahtzee and Racer are running outside right after coming home from pre-school. [...] They are on top of a rocky hill encircled by semi-detached houses. They are picking up cones from the ground and placing them in a small cavity on the rocky hill. They call the cavity a 'volcano.' The cones are called 'potatoes.' They tell me that the king of the potatoes is a Goomba, one of the antagonists of *Super Mario*. The potatoes are, in fact, all Goombas. They are also gathering leaves of rowan, which they call 'fantorangs,' a deliberate mispronunciation of the *Super Mario* weapons boomerangs. The mispronunciation is an inside joke based on how Racer once misspoke, with Fantorangen being a popular character on Norwegian public television for children. Leaves of maple and some red leaves are, respectively, 'eating flowers' (piranha plants in the Mario lore) and 'fire chains' (titled the same in Mario lore), all obstacles in *Super Mario*. It all goes into the volcano. (Field notes, September 10, 2020)

Once again, the boys collected potatoes/Goombas, but this time with fantorangs, eating flowers, and fire chains, resonating with the video games they loved. Later, the boys moved from this activity to a nearby playground, where they met up with Yahtzee's father, and, as per usual, the leaves and cones were left behind on the rocky hill, most likely to be forgotten about. As fall turned to winter, the cones and leaves would have been submerged in snow, only to reappear decomposed come spring.

This field note drew my attention to the boys' gaming. As the boys drew connections while collecting cones and leaves outdoors that resonated with their experiences of playing video games, I revisited my field notes and video recordings to see how collecting was enacted while the children were playing the video games. In the next section, I provide an account from one day of my fieldwork during which Yahtzee and Racer played a video game and collected in ways that resonated with the collecting enacted on the rocky neighborhood hill, the offsite pre-school forest patch, and the pre-school playground.

Collecting rainbows, toads, and stars

Yahtzee and Racer excitedly sat on the top bunk of Yahtzee's bunk bed to play *Super Mario Run*[3] on an iPad after dinner on the balcony. Yahtzee walked upstairs to ask his mother to download the most recent update, returned, handed Racer the iPad, and told him to play Remix 10, a sub-game of *Super Mario Run*. In Remix 10, there are 30 areas, each with ten ultra-short levels, scored by a fast-paced, peppy soundtrack. The player is supposed to collect three rainbow-colored 'bonus medals' at each level and the progress is represented visually on screen as they play. Furthermore, all medals of an area are counted ceremoniously on screen after ten levels. If they got all three bonus medals from one level, it constituted a 'rainbow,' according to the boys. In such cases, they would scream and jump, 'I got all,' or 'I got a rainbow!' Yahtzee, in one instance, reminisced joyously, 'once, I got a rainbow on all [the ten levels]!' In a bonus game following the completion of an area of ten levels, the player gets new items, such as mushrooms or warp pipes. 'I wonder what we'll get now,' Yahtzee asked multiple times, suggesting the importance of the collecting, as well as the uncertainty about the awarding of items. The items are collected in a cache and can be used to decorate and customize the player's 'kingdom' in a mode called Kingdom Builder.

Later, the two switched to Toad Rally, another sub-game of *Super Mario Run*, in which the player competes against their friends or other players online on medium to short courses. When the player performs more 'stylish moves'—somersaults, fancy jumps, and so on—more toads appear at the bottom of the screen to support them. After each rally, the player's score is calculated depending on several factors, such as how many coins are amassed during the rally, and how many toads end up supporting the player. This 'toad tally' provides the basis for who wins, and the winner gets the other player's toads for their kingdom. Amassing more toads allows the player to buy more items to decorate and customize their kingdom. While most of these items are aesthetic, with no explicit function in

game play, the awarding of items elicited enthusiastic outbursts. For example, in the following exchange, Yahtzee had played the bonus game of Remix 10, which awarded him a decorative star.

Table 1

Yahtzee gets a star in Remix 10.

Yahtzee	I got a star! ((Turns around to Kenneth and smiles with an open mouth))
Kenneth	Oh… Cool!
Yahtzee	Let's check out the place where I get stuff… The star stuff. ((Turns to the screen and swipes wildly))

While they played Remix 10, Yahtzee asked Racer multiple times to 'check on [his] gifts,' (i.e., items in the cache collected from the bonus game or through purchases in Kingdom Builder). He slowly moves his fingers on the screen to look at all the items. One reviewer noted negatively about *Super Mario Run* that it sometimes 'feels like a lengthy grind in service of unlocking mostly cosmetic items' (McWerthor 2016, para. 12). Still, Yahtzee and Racer enjoyed this aspect of the game. In the following exchange, Yahtzee explained:

Table 2

Yahtzee reveals what happens when he gets one thousand toads in Toad Rally.

Yahtzee	I've got more than a hundred [toads]! I can't wait to get one thousand.
Kenneth	((Laughing)) Yeah, that'll be great.
Racer	What can you do then?
Yahtzee	Uhm… Then you can… I'll just continue. And then I can get ten thousand… Then I can get a lot.

Amassing toads, then, is not something Yahtzee did for instrumental gain—not even decorative items for their kingdom—but for the pleasure of 'get[ting] a lot.' Watching the video recordings, I thought back to Racer and Yahtzee collecting cones. This also seemed like a 'lengthy grind' with no discernible endgame other than collecting, which was, in similar ways, accompanied by joyous and pleasurable outbursts. Despite cones lacking brightly

colored visuals or the accompaniment of a fast-paced soundtrack, the abundance of the tactilely pleasant cones provided an endless supply of desirable items to be collected, which kept the pace and the boys going.

In Remix 10 and Toad Rally, the complexity was sometimes overwhelming, and too intricate to describe in its entirety here. 'Secret courses,' 'coin rushes,' and 'super stars' often emerged seemingly at random. During Toad Rally's toad tally, both boys were typically quiet, excitedly awaiting their scores, loudly cheering if they won, or visibly deflated if they lost. As they both had yet to master three-digit numbers, they waited until a toad referee pointed their flag toward the winner on screen, and the toads moved to the winner's corner. It did not appear to be clear which strategy was 'best' in Toad Rally: running fast, amassing coins, doing stylish moves, or something else? Often, Yahtzee resorted to pressing the screen fast, rhythmically, and randomly all over—increasingly intense if nothing happened. By doing so, he gave up on relying on skill or knowledge alone, instead trying his luck to see if he could get Mario to miraculously perform outrageous stunts, which might get him points, and, in effect, desirable items. Instead of honing in or expanding their skills and knowledge, the two, in similar ways, often ended up doing something random and hoping for the best when the score was calculated. For example, as they played Remix 10, Yahtzee would sing a nonsensical song to score their gameplay, which took up most of the boys' attention for a while. Mario, through the novel automatic runner feature, would keep running regardless. When Racer no longer entertained the idea of winning in Toad Rally, he enjoyed dying spectacular deaths by falling into the abyss while bursting into a series of stylish moves, reappearing only seconds later.

More-than-human collecting

In their collecting, the children constructed temporally and spatially distinct boundaries within which new play rules applied. For example, during the treasure hunt, some children reframed

cones as representing treasures to be found rather than natural objects that carried the seeds of trees. Adding to this, previous research suggests that the cones, and the collection of cones, not only represented treasures but also something deeper embedded in the children's social worlds, such as feelings of control and agency (Danet and Katriel 1994; Loebenberg 2012; Moshenska 2008). Interpreting and producing signs and making sense of relevant modes of collecting (e.g., knowing the collection discourse, being able to exercise autonomy through collecting, and so on) constitute forms of literacy, and, arguably, such literacies are most likely enacted in the illustrations I have provided. However, by plugging into sociomaterial affect theorizing, another dimension of collecting, privileging the disorganized and unruly, emerges. I argue that collecting is not all about making sense but also about making nonsense (see Wohlwend et al. 2017). In the following, I explain how the children answer the world (Hackett and Rautio 2019) in unpredictable encounters through the becoming forms of, first, *collecting as games of chance* and, second, *the leaky collection*.

First, I illustrate collecting as a game of chance. In playing Remix 10 and Toad Rally, Yahtzee and Racer did not understand how scores were calculated and often yielded their own intentional and individual contributions to allow for the dynamics of the encounter to determine the outcome (cf. Bogost 2016). For example, when Yahtzee touched the screen wildly and at random, he did not know what would come of it, but likely hoped he would be awarded an item of his liking for the effort. The tension of the silence as scores were calculated, and the outbursts of joy or deflated sighs as the scores were displayed, suggest that the children may not necessarily treat the toads awarded as badges of achievement, but instead as prizes in games of chance. This type of playful collecting unsettles how we normally think of literacy because games of chance precisely exclude individual skills, ever so contextualized, as a factor in the activity (Caillois 1961). In this type of game, the 'skill' needed is to forfeit (e.g., plunge into the digital abyss or sing a song rather than play along) by

recognizing and giving way for other forces to move the play into unknown territory. In *Super Mario Run*, the game moves on its own accord through the automatic runner feature. When the children engaged in a treasure hunt in the forest, the treasures were valued because there was an element of unpredictability in the quest—they were 'gifts' of external, possibly benevolent, forces. While some skills were awarded (e.g., knowing to look for cones under trees may be a useful skill), the cones could be anywhere, and their pursuit was not all a matter of individual ingenuity, creativity, and skill; it also depended on the direction of the wind or the age of the trees. The children left their chances of being awarded collectible items to more-than-human serendipity.

Second, I illustrate the leaky collection. According to my field notes, the children did not 'seem to mind too much' about slugs and insects escaping the flat rock, nor did Yahtzee and Racer mind too much about leaving their cones and leaves behind in the volcano. Their collections were not contained, and it did not appear as if the children intended them to be so; they were content with permeable, shifting, and leaky collections. In these cases, answering the world unfolded into new becoming forms, as the rock and the slug made their marks known and felt. However, the inclination of the young children to 'let' themselves be touched by the world through 'worldful' (Bogost 2016), 'aesthetic–affective openness' (Bennett 2010, as quoted in Rautio 2013) may have, in this case, cloaked the children in more agency than was warranted. The entanglement of self and world may have been a condition in which they irrespectively found themselves, and which was accentuated because of the relational discrepancy between, for example, the expectations articulated through the availability of the rock (or the game features of *Super Mario Run*) and their respective abilities. No matter how much Superman wanted to block the slugs from moving, he was unable to. The slugs slipped and slid, the insects took flight, the rock was too heavy, and his arms were too short. Likewise, Yahtzee's random and wild pressing of the screen could also be traced back to how

young children's fine motor skills tend to be less coordinated. Yahtzee and Racer's excitement and surprise at learning who won could be traced to how certain cognitive tasks, such as understanding three-digit numbers, tend to be more demanding for young children. It follows that young children's encounters with the world may often be imbued with a different kind of tension and discord than those of able-bodied adults. This suggests how 'sensibilities' and ways of relating are entangled with current material–discursive conditions.

This argument echoes deficiency discourses of early childhood. Sociomaterial theorizing has been instrumental in critiquing such discourses (Murris, Smalley, and Allan 2020). However, while I am wary of using language that reduces children to 'developing' or 'not yet able,' it is not a banal point, and, importantly, consistent with sociomaterial affect theorizing, that Superman struggled to keep the flat rock level, and that this, in turn, affected the movement of the moment. Because of the volatility between Superman and the rock—any minute it might have slipped out of his hands and hit his foot—a relational, moving sensitivity was necessitated, rather than the amassing of 'propertied' (Barad 2007, 149) collections. In *Super Mario Run*, chaotic visuals and a fast-paced soundtrack rendered the system behind the calculation of the scores nebulous for the children, and seemingly intentionally so, as colorful numbers, mysterious symbols, and pretty sounds rushed by on screen too fast for anyone to digest. Pleasurable affects of anticipation and suspense were produced from one moment to the next, as the toads would multiply or be decimated, or a coin rush would emerge and award the player a ton of coins. The collection slid, slithered, and spilled over, privileging not the amassment of a set collection, but a more-than-human answering the world through collecting.

More-than-digital collecting

I now return to my original point of departure for this study: my field notes from the rocky neighborhood hill on which Yahtzee and Racer collected leaves and cones. In their play on

the rocky neighborhood hill, the boys brought to the fore how affects produced and felt through collecting in the pre-school playground and the offsite pre-school forest patch resonated with the affects produced and felt when collecting in Remix 10 and Toad Rally. In the lush Norwegian forest patches, slugs would appear, moving the children to pick them up and place them on a flat stone, only for them to slither away seconds after, thereby prompting a rescue mission. Playing Remix 10, the surprising emergence of a star affected Yahtzee, who answered by smiling and attempting to check on his other gifts. The random encounters with collectibles and the unsettled collections spilling over produced felt, indeterminate qualities that the young children facilitated, enjoyed, and sensitively attended to—what Hackett and Rautio (2019) call answering the world. As a specific contribution of this study, the 'world' answered refers to the broad playscapes composed of tangible, fleshy, organic forest floors, and shiny, blocky, vividly colored Super Mario Worlds.

Other ways of telling this story are, however, possible. For example, a reader could argue that, as Yahtzee and Racer did not have 24/7 access to their iPads, they settled for a less-than-ideal outdoor substitute: with scant resources and screen time rules, they enacted inaccurate playful representations in lieu of the real thing. However, the boys never gave the impression that their activity was vicarious. The movement was not derived from a perceived lack, but from excess. The vitality and vigor increased as new elements were added to the assemblage, and their eagerness was palpable. My visits to their home were often very welcomed by the boys, because they knew this meant relatively unrestricted access to their digital devices. Still, they chose to walk around the rocky neighborhood hill and pick up cones and leaves. This was not a convenient makeshift video game, because it resonated differently with the boys. Rather than 'making do,' the children 'make much' (Wohlwend and Thiel 2019) by attuning to the affects produced through and across more-than-digital moments of collecting. Plugging into non-representational theorizing, they were not appropriating and

enacting already established practices in a new context but were instead dwelling in the production of novel affective intensities through the encounters and connections of digital networks, sensuous memories, playground discourse, and tangible things in front of them. It follows that the assumed 'digital' of playing video games and the assumed 'analog' of collecting cones are far from poor representations of each other: they are instead rich, generative, more-than-digital moments that feed off, connect to, and resonate with one another. Through the young children's collecting on the rocky neighborhood hill, broader playscapes of contemporary early childhood play were produced that were both more-than-human and more-than-digital.

Final words

In summary, this study contributes to extant research on young children's collecting by attending to its affective dimensions and the broader contemporary playscapes of early childhood. First, I consider how chance encounters play vital roles in the unfolding of activities, and how the children's collections are leaky. Both of these are qualities the children facilitate and in which they take pleasure. Taking such dimensions seriously affects how we respond to young children's playful collecting. Do we recognize accidental and random collecting coming together and breaking apart contingently as a worthwhile enterprise, or do we redirect the children toward 'proper' collecting? Do we recognize and facilitate the felt vitality of Superman carrying a flat rock with insects and slugs (cf. Boldt 2021), and give the children time to dwell in these encounters? Still, such narratives may echo romanticist discourses of young children's play as authentic and freewheeling. Accordingly, this study also suggests that young children's relational sensibilities should not be studied in isolation from the tension and discord of their material–discursive conditions, as their surroundings may put them under more stress, thereby *necessitating* encounters imbued with more work and sensitivity.

Second, this study finds that the 'the world' answered (Hackett and Rautio 2019) in this case refers to 'broad playscapes composed of both tangible, fleshy, organic forest floors and shiny, blocky, vividly colored Super Mario Worlds.' Such connections and resonances, which Yahtzee and Racer brought to the fore on the rocky neighborhood hill, are followed through this study, as I felt for the affects produced rather than for recognizable tool mediated practices ('exploring nature' and 'playing video games'). Typically, in public discourse, children's relationships with nature and outdoor play are contrasted with their use of new media technologies, which provides support for the 'displacement hypothesis' of screen time replacing time spent outdoors or playing with friends (Louv 2005). This study argues that some young children navigate and produce vibrant new spaces for play that transcend such binary oppositions and suggests, in contrast, that it may be fruitful to feel for what children 'find inherently rewarding and spend considerable time engaging in' (Rautio 2013, 395). Doing so requires that we move with the flows and interruptions of affect, irrespective of being on screen or off screen, sense or nonsense.

1. All names are self-chosen pseudonyms.
2. All field notes throughout have been edited for readability.
3. This is a popular automatic runner platform video game in Nintendo's Mario franchise. The information cited about the game was retrieved by playing the game, watching walkthroughs on *YouTube*, and via fan wikis, such as https://www.mariowiki.com/Super_Mario_Run and https://mario.fandom.com/wiki/Super_Mario_Run.

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Errata

p. 1
Original text: *YouTube*
Revised text: YouTube

Original text: the Norwegian Media Authority
Revised text: The Norwegian Media Authority

p. 15
Original text: the New London Group
Revised text: The New London Group

p. 18
Original text: the Norwegian Media Authority
Revised text: The Norwegian Media Authority

p. 28
Original text: Norwegian Directorate for Education and Training
Revised text: The Norwegian Directorate for Education and Training

Original text: comparatively less adult-led activities
Revised text: comparatively fewer adult-led activities

p. 31
Original text: the Norwegian ministry of education and research
Revised text: The Norwegian Ministry of Education and Research

Original text: the Norwegian Media authority
Revised text: The Norwegian Media Authority

p. 35
Original text: attach itself to it
Revised text: attach themselves to them

p. 42
Original text: the Norwegian National Committee for Research Ethics in the Social Sciences and Humanities
Revised text: The Norwegian National Committee for Research Ethics in the Social Sciences and Humanities

p. 46
Original text: Scholar One
Revised text: ScholarOne

p. 60

Original text: new conditions for play that is attuned to young children's preferences and pleasures

Revised text: new conditions for play that are attuned to young children's preferences and pleasures

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