

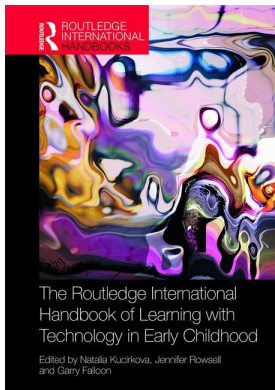
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11

RESEARCHING YOUNG CHILDREN'S PLAY IN THE POST-DIGITAL AGE

Questions of method

Jackie Marsh

Post-digital play

Play in the digital world is complex due to the way in which technologies shape, and are in turn are shaped by, the contexts in which play occurs. Over a number of years, a range of studies have recognised that play moves seamlessly across both digital and non-digital texts, artefacts and practices, which would suggest that a study of digital play needs to take account of the wider context for play, not just the digital technologies used by the child (e.g. Burke & Marsh, 2013; Giddings, 2014; Marsh, 2014).

The concept of 'connected play' characterises activities that take place across sites and domains in this way. Kafai and Fields (2013, p. 2) suggest that 'Connections are at the core of play in the digital playgrounds of the twenty-first century'. In a detailed study of one child's play, Marsh (2017) outlined the range of connections that might be made as children play with a range of technologies and media, which included: physical/virtual; non-digital/digital; online/offline; material/immaterial; public/private; local/global. These continua may be applied to particular play episodes in specific contexts, and some aspects will resonate more strongly than others at those times. For example, a child may be involved in a game of hide-and-seek on Skype with grandparents (see Kelly, 2015), thus drawing on the online and offline and local and global connections in dynamic ways; or a child may play synchronously in a virtual world with others in ways that distinguish the nexus between private and public worlds (see Marsh, 2014).

The key point to be made here is that, given these connections and dynamics that occur in contemporary play, there are significant challenges when considering how to undertake research on young children's play in the home. What is required is a post-digital approach to the development of methods that might inform an understanding of play in the home. Following Cramer (2015), the term 'post-digital' is used here to indicate not a historical juncture – there will always be digital developments and changes in society – but a move to characterise a world in which the dynamic flows between analogue and digital make a myopic attention to any one of these outmoded. Sometimes, the characterisation of the post-digital condition is one that suggests an actual complete merging of worlds:

the post-digital stands for a change that is subtle, and yet also powerful enough to mark the difference between the original war cry and the chillier lament that comes once the

energy of that first provocation starts to dissipate, and once the agents of that provocation begin to regroup and reconsider. According to this view, the emergence of the notion of the postdigital epitomises the sense in which the disjunction between what is digital and what is not has blurred, as has any conceptual distinction between the two.
(Fazi, 2016, np)

Whilst this is useful as a means of challenging the false dichotomy that is sometimes posed between the analogue and the digital, it is also the case that indeed there are some very important distinctions to be made between the digital and non-digital in relation to children's play experiences. There are issues relating to cognition and embodiment, which mean that the distinction between the physical (and analogue) and the virtual (and digital) is paramount in some contexts, and, thus, the domains need to be considered both separately and in synchrony. There is also the fact that in some cases, it is possible to say clearly what the digital element of the experience is, and what is the non-digital, and how one influences the other. Nevertheless, Jayemanne, Nansen, and Apperley (2015, p. 4) argue that presuppositions about the nature of entities and devices that are used in connected play episodes cannot be made and suggest that the concept of 'postdigital play' accounts for when a 'set of playful actors, objects and spaces exceed discrete, pre-defined units'. The term is used in this chapter to characterise a context in which the non-digital and the digital are sometimes separate and sometimes merged in children's play, but always in states of flux, tension and flow with each other when children are using technologies in their play. However, there are certain methodological challenges to be faced when considering a study of play in a post-digital world. What is needed is the development of research tools that enable an understanding to be developed of 'the moments of intersection that take shape across asymmetrical powers of bodies, devices and objects for sensing, feeling and doing, which are hybridized in postdigital situations' (Apperley et al., 2017). Traditional approaches to the study of children's play in the home, which are located within ethnographic traditions, may not give rise to a full understanding of the 'becomings' (Deleuze & Guattari, 1987) taking place across and within assemblages of the digital and non-digital.

In the next section of this chapter, an overview is given of the Technology and Play (TAP) study, before an analysis is undertaken of some of the methods used to address these issues.

The technology and play study

This was a co-produced study, developed in collaboration between academics in the Universities of Sheffield and Edinburgh, the BBC (CBeebies), Montenev Primary School, and the children's media companies Dubit and Foundling Bird. The project was co-produced in that all project partners contributed to the development of the project aims and objectives and were involved in data collection, analysis and dissemination. The project aimed to address a gap in knowledge with regard to pre-school children's (aged from birth to 5) use of tablet apps. The aims of the study were to examine pre-school children's use of apps, and identify how far tablet apps for pre-school children promote play and creativity.

The study had four phases. In Phase One, an online survey of 2000 parents of 0–5 year-olds who had access to tablets was conducted. In Phase Two, observations and interviews were undertaken with children and parents in six families. In Phase Three, 12 children aged 3–5 were filmed using the apps that had been identified in Phase One as the top 10 favourite apps, in order to examine how far they promoted play and creativity. In Phase Four, an analysis of the apps was undertaken in order to identify what features supported play and creativity, and which limited them. This chapter is concerned with the methods used in the case studies.

A pool of households interested in taking part in Phase Two was populated in order to recruit six families for Phase Two of the study. The pool was populated with families from the north of England in order to facilitate case study visits. It included a varied sample in terms of: (i) socio-economic class; (ii) age and gender of child; and (iii) ethnicity (at least one of the six families from a BME group) in order that the six families' profiles could be broadly in line with the main user groups identified in the survey. Only four of the families were eventually recruited from this panel. Other families that agreed to participate dropped out at an early stage for various reasons. The team therefore recruited two additional families, one through the contacts of a local nursery, and one through contacts from a member of the team. Both of these families completed the survey after joining the project. Demographic profiles of the case study children can be found in Table 11.1.

The key findings of the study as a whole indicated that under 5s have extensive access to tablets in the home and at the homes of grandparents, other family members and friends. Thirty-one percent of the children owned their own tablet. Children use tablets on a typical day for 1 hour 19 minutes, and on a typical weekend day, for 1 hour 23 minutes. Their use differs across the day, with the peak period of use being 4pm–6pm. Parents report that for more than half of this time they support their child's use of the tablet, while 35% of use is independent. Children develop a wide range of competences in their use of the tablet from their earliest years, with over half of under 3s (54%) and 76% of 3–5 year-olds being able to swipe the screen to change 'pages'/sites unassisted by others, 60% of 3–5 year-olds able to use a tablet independently to take photographs, and 44% of 3–5 year-olds able to create videos on their own.

Young children enjoy using apps across a range of genres, and their favourite apps allow them to watch videos, listen to music, play games, draw and paint, play games, create virtual worlds, look after pets, dress up avatars and engage in role play. The most popular apps were YouTube, CBeebies (general apps), Angry Birds, Peppa's Paintbox, Talking Tom (and similar), Temple Run, Minecraft, Disney (general apps), Candy Crush Saga and Toca Boca (general apps). Children like apps that relate to their popular cultural interests across television, films and iconic characters.

The majority of apps promoted creativity and play, although the extent to which they did that differed according to the design of the app. The apps that were most successful at promoting play and creativity were apps designed specifically for this age group. The majority of play types that have been identified in children's non-digital play (Hughes, 2002) were also evident in

Table 11.1 Demographic profiles of the case study children

Family no.	Name (pseudonym)	Gender	Age on first visit	Social class (using NSR social grades)	Ethnicity	Siblings
F1	Arjun	Boy	3.1	B (Middle class)	Indian	Sister, aged 10
F2	Jade	Girl	4.11	D (Working class)	White	–
F3	Amy	Girl	2.11	C1 (Lower middle class)	White	–
F4	David	Boy	2.8	A (Upper class)	Iranian	–
F5	Tommy	Boy	6 months	E (Not working)	White	Brother, aged 6
F6	Angela	Girl	2.3	C2 (Skilled working class)	White	Brother, aged 7

children's digital play. Children's play with apps and toys and artefacts related to those apps took place fluidly across digital and non-digital domains, and involved a range of media. Augmented reality apps offer open-ended opportunities for creative play and foster imaginative play that crosses virtual and physical domains, as do toys that might be characterised as belonging to the Internet of Toys – that is, toys that have some online element (Chaudron et al., 2017).

The study identified 12 features of apps that limit play and creativity, and 41 features that foster play and creativity. These have been produced as guidance for app designers. The study also identified ways in which apps can be designed to provide optimal experiences for children aged under 5, by considering the needs of children at different ages. The project website (www.techandplay.org) provides reports on the study for the children's media industry, parents, early years' practitioners and researchers.

Whilst the study provided a wealth of data about young children's play through the use of traditional ethnographic approaches such as observations and interviews, it was felt important to utilise methods that could enable children's own perspectives and experiences to be shared. In the next section, two of the methods used are discussed, and the ways in which they informed and understanding of post-digital play are considered.

Participatory methods in a post-digital age

In exploring children's digital play in the home, it is useful to reflect on the way in which participatory methods might be used in order to ensure children's own views and experiences are recorded. This is not to suggest that such a task is unproblematic; as Bitou and Waller (2017) argue, there are questions to be raised about how far adults really listen to children when using such approaches, how they respond to silences, consider how power and agency are exercised and so on. A number of research studies with under 6s on aspects of their social worlds have utilised participatory methods, such as the use of photographs (Clark, 2010), collections of material objects (Winter, 2010), Lego (Pimlott-Wilson, 2012) and drawings (Angelides & Michaelidou, 2009). However, to date, most studies of pre-school children's digital play in the home draw on surveys, observations and interviews with parents (e.g. Slutsky & DeShetler, 2017).

In the TAP project, participatory methods were important to use, not just because they facilitated access to children's own viewpoints and experiences, but also because they aligned with the conceptual framing of play in the study. In this sense, the use of play tours to examine the home playscapes of young children in a post-digital age was a useful tool.

Play tours

A number of studies of children's media use have drawn upon the use of media tours, or techno-tours of the child's home, in which a child takes the researcher around a home and discusses his or her media use (e.g. Yelland, 2007). Whilst a valuable approach, it does raise some challenges when considering research studies undertaken with children aged under five, for a number of reasons. First, parents are more likely to feel uncomfortable about a young child, unaccompanied by parent, being taken around the home by an adult who is not a family member. Second, older children may be able to make judgements about which spaces parents might be less comfortable about researchers having access to, and take this into account when directing the tour, whereas this cannot be expected of younger children. Instead, it was decided that in the TAP study, the family would be asked to draw a map of the home, or guide the

researcher's drawing of it, which then could be used as a stimulus for discussion with both the child and family members. In some families, the map was then used in an actual physical tour of the home, and for other families, it appeared that a more comfortable approach was discussion around the map. In both cases, young children were encouraged to take photographs of their favourite toys either as part of the tour (either actual or virtual tour), or prior to going on it, to inform the discussion.

This approach enabled a focus on the central passions of young children, which were brought to the fore in the images. Three-year-old Arjun was in the relatively early stages of learning English as an additional language, and seldom participated in dialogue with the researcher beyond the use of one or two word utterances. However, his use of a camera enabled him to convey that the 'Hot Wheels' brand was important to him. His mum commented on a photograph Arjun had taken of his cars in the bedroom he shared with his parents (Figure 11.1):

*Ah, see. He has taken only the photos of his Hot Wheels, he loves Hot Wheels very much. . . .
He has kept all his Hot Wheels here and he has taken the picture of the Hot Wheels car.
(Arjun's mum)*

From discussions with his 8-year-old sister, using the map of the home as a prompt, it became clear that the Hot Wheels play, with both cars and apps and YouTube videos on the tablet, took place in most rooms, including her bedroom, although this was not without its tensions:

*Aasha: . . . I go in the bedroom and then he comes with me.
Interviewer: Oh really? And what happens then?
Aasha: Then we have to share.
Interviewer: OK.
Aasha: And then he fights with me because he wants the tablet.
Interviewer: So what sort of things happen when you share the tablet in your bedroom, what sort of . . .
Aasha: Erm . . . I watch things on the YouTube, and then he wants to watch Hot Wheels.*



Figure 11.1 Arjun's picture of his Hot Wheels cars in his bedroom

The map prompted Aasha to share that the Hot Wheels tablet play also took place in the corridor, where Aasha would place her young brother to play with the tablet in his pram, and also in dens that they created in the living room:

We . . . like last night, what I thought was, we had chairs, so we put the chairs together and then I made a den so that he could sit inside and watch the tablet. So then I made it and then he sat inside and he was watching the Hot Wheels and he was playing games, and then when my mum needed to feed him my mum just came in and then fed him.

In this way, the play tour, commented upon by his mother and sister, indicated that both the digital and non-digital elements of the play were salient for Arjun, enabling him to engage with Hot Wheels cars, apps, videos and den play, sometimes simultaneously, in most spaces in the home.

In the play tours, the children were able to participate not only by contributing photographs, but by engaging in a 'show and tell' practice in which they would draw the researcher's attention to particularly significant play artefacts and practices for them. When in specific places in the home, the children would take particular playthings over to the researcher, or play and perform in front of her, as 2-year-old Amy did when she sang, *'For the First Time in Forever'*. This led to a discussion about the child's enjoyment of digital clothing – in particular, Disney princess dresses:

Interviewer: So that's another one from 'Frozen', isn't it? I don't think I've heard you sing that before. That's another thing she does a lot of.

Mum: That's because she's got that dress on, that's what Anna sings when she's got that dress on.

Interviewer: Oh, I see. So you tend to sing the song that's appropriate to your dress. Very good.

Mum: Don't you? Let's [unclear] the dress.

Interviewer: The dress sings? That's a new one for me.

Mum: Yeah, but the batteries . . .

Amy: The batteries have run down.

Mum: Yeah, but it's sewed in, so we can't change them. . . . That would involve me having to unpick the dress and then change a very small battery, so at the moment we're not doing that! . . . She's got new ones for her birthday and they've changed them now, so instead of having them . . . which is great, because it means you can access them, but they don't stay on the dresses. . . . So they go on the new dresses that she's got but they don't stay on, and she doesn't like it.

Amy: Play the Elsa one.

Mum: Yeah, the Elsa one's here.

Interviewer: I was going to say, that's an Anna one isn't it, that's the first one.

Mum: That's from your new Anna dress, but this is from your new Elsa dress, isn't it? And that one sings too, doesn't it? But it's supposed to go on your dress, isn't it? Oh . . . maybe you've run that one out, Amy, already. But your Elsa one lights up doesn't it?

Amy: Yeah.

Interviewer: Oh, the dress? Yes, I think you did show me that one the other week, it's absolutely beautiful.

Mum: She won't wear it so . . .

Interviewer: Why is that?

Amy: This is a very big dress.

Mum: That's far too big for you that one yet.

Interviewer: You could start a shop with all your dresses.

- Mum: *We could start a shop, we could earn a fortune with all your dresses. It's here look, that's your new Anna one.*
- Amy: *That's my new Anna one.*
- Mum: *And this is your new Elsa one, isn't it?*
- Amy: *I want to show my new El . . . Anna one.*
- Mum: *And that one lights up.*
- Amy: *I want to show my new Anna one.*
- Mum: *OK.*
- Amy: *My new Anna one.*
- Interviewer: *I can see a new Anna one. Let's pause this a minute.*

In this instance, the child's singing in a princess dress on the tour led to an informative discussion with both parent and child about her interest in the dresses that sing and light-up, with the child clearly indicating that she wanted them to be recognised by the researcher. The dynamic between the digital and non-digital in the dresses was problematic as the status of batteries impacted upon their uses, with Amy having to sing the *Frozen* song herself in this instance, without the dress version as a backdrop. Whilst the discussion about this aspect of play may have occurred during a standard interview, that would not necessarily be the case, and it was through the use of a tour, in which focusing on artefacts and their use in particular spaces is a key feature of the exchanges that take place, that enabled Amy's interest in singing and light-up princess dresses to emerge.

In this example, the researcher needed to turn off the recorder as she helped to find the desired dress, which Amy was insistent upon sharing. This kind of flexibility is important and is a reminder that this approach requires a range of skills from a researcher. Sometimes, a parent or older sibling may dominate the tour, and the researcher needs to ensure that she or he responds to relevant cues from the young child about what he or she wants to draw attention to. The younger the child, the more likely it is to be a non-verbal cue. Second, the researcher has to be sensitive to the family members' desires, and to respond if it seems that any of the family members appear to be uncomfortable about entering specific rooms. Third, the researcher has to accept that sometimes a child may get distracted during a tour, and want to move away to do other things. In these cases, decisions have to be quickly made about whether or not to complete the tour by just relying on the sibling's or adult's perspectives, hoping that the child will re-engage at some point. There are no simple answers to such contextually bound instances, and the researcher has to accept that, sometimes, the wrong decision will be made. Research is, as Law (2014) reminds us, messy.

The play tours led to rich information about how the digital and non-digital converged and/or separated in children's play across spaces. They led to discussions about, amongst other things, play with toothbrush apps in bathrooms, play with tablets in outdoor spaces such as trampolines, play with cooking apps in the kitchen and play with robots and other Internet of Toys artefacts in parents' bedrooms. The complexity of the 'bodies, devices, objects and spaces . . . organized around an interface' (Apperley et al., 2017), and the way in which these constellations of play practice crystallised in particular spaces and places, thus became more apparent, and informed an understanding of children's post-digital play in the home.

The second method which is focused upon in this chapter is the use of wearable cameras. This also aligned to a post-digital approach, as it enabled the capturing of play across and within analogue-digital assemblages, and also contributed to the development of a post-humanist understanding of the interactions between children and the devices they interacted with in their play.

Point-of-view cameras

Digital ethnography has a long history (Dicks et al., 2005), and part of its focus has been on how technologies such as cameras can offer powerful tools for exploring social worlds (Murthy, 2008). Work undertaken to date in this field has enabled an understanding to be developed of the value of cameras in ethnographic research as a means of capturing people's daily experiences and rendering them visible to others (Pink, 2007). There is now, however, an emerging critique of the notion of digital ethnography because of post-digital sensibilities of the way in which the digital and non-digital are co-constituted in 'the spatialities, temporalities, and phenomenologies of everyday cultural practice' (Duggan, 2017, p. 3). This acknowledgement of the complexity of research in post-digital contexts means that new forms of capturing data using cameras need to be explored.

In recent years, the greater affordability of wearable cameras has meant that there are now new possibilities for capturing the gaze and embodied experiences of research participants. Wearable, or 'point-of-view' (POV) cameras are cameras that enable video recordings to be made whilst the camera is attached to a person, often by a headband or hat. They have been used in a number of research studies to date in order to capture social worlds. For example, Brown et al. (2008) used GoPro cameras with walkers and mountain bikers in national parks, and they argue that with the use of such technologies, it is possible to 'convey and evoke the ways in which embodied, emotional, sensory and kinaesthetic knowledges and experiences are produced through social practice' (Brown et al., 2008: para 5.9). Indeed, this approach seems ideally suited to research that explores action sports such as cycling and surfing, and, therefore, it is of little surprise that POV cameras are used in these areas (e.g. Brown & Spinney, 2010; Chalfen, 2014; Evers, in press).

A small number of studies have utilised POV cameras with children, also to good effect. Ghekiere et al. (2014) enabled 9- to 10-year-old children to use POV cameras as they cycled, drawing on the footage to consider issues relating to the environment. Burris (2017) describes the use of such hardware with different groups of children aged from 5 to 12 who attended out-of-school learning events, such as a visit to the zoo and examining a dinosaur exhibit at a museum. Burris concluded that the use of such cameras had many advantages for her studies, including that it enabled the capture of experiences that would not have been possible otherwise by the researcher, e.g. the children's use of play tunnels. Green (2016) employed GoPro cameras with 3- to 6-year-olds on 'Sensory Tours' of a forest, and found that they were non-intrusive and enjoyable for children to use. Sumsion et al. (2011) described the use of what they called 'baby-cams' in an Australian project, offering an early account of what the technology might afford in furthering understanding of very young children's experiences. As in the other studies, they identified that the cameras offered possibilities for enriched understanding of children's lives, although they cautioned against interpreting the data as if it was a fully comprehensive record of a child's experience.

GoPros were used in the TAP study as a means of exploring children's experiences of digital play in the home. In particular, there was an interest in examining children's interactions with tablets and related artefacts. From a post-humanist perspective, it is clear that there is a need to move beyond a human/non-human binary. Barad (2007) refers to the 'ontological entanglements' (ibid: 332) that take place between humans and non-human objects. Through these ontological entanglements, there is a process of constant 'becomings' (Deleuze & Guattari, 1987) and what Barad (2007) terms as an 'intra-action' between matter, both human and non-human. In order to explore the intra-actions between children and technologies in their play, we invited children to wear a GoPro camera as they used tablets.

It was only possible to invite the children in the study aged 3 and over to use the cameras, as they are marketed as being safe for that age group. In addition, it was emphasised to both children and parents that the cameras could be removed at any time, as they may have been uncomfortable for the children. It was decided that chest harnesses would be more comfortable for this age group than head cams, although there was the danger that the camera would not capture what children were looking at if they turned their heads and not their bodies.

The films were valuable for offering key insights into children's digital play. In Marsh (2017), a number of play episodes of Amy, aged 2, who filmed herself playing with a tablet that interacted with a Furby, were analysed. Furby Boom is a soft toy that is marketed by Hasbro, and can be characterised as belonging to the Internet of Toys category. In this case, Amy used an app on her tablet that enabled her to feed and interact with her toy (see Figure 11.2).

Amy used the app to feed the Furby, flicking through a range of food items on the screen. As the food was pushed to the top of screen, towards the Furby, the toy's eyes flashed and it made noises. In Marsh (2017), this episode is analysed using Norris' (2011) Multimodal Interaction Analysis framework, which enables modal intensity/density to be traced. Marsh argues that the modal shifts in intensity from image (as Amy flicks through the food items) to noise, light and animation (as Furby responds to being fed), has the effect of enhancing the modality of the Furby and bringing it to life for Amy. This intra-action (Barad, 2007) fosters an emotional connection between Amy and the toy and leads to an understanding of the dynamic between analogue and digital in post-digital play episodes:

Connected play cannot be reduced to a conceptualization of play that connects the physical and the virtual. Rather, it is a constant flow between domains including, as Rogers et al. (2002) note in relation to MR game play, actions in the physical world that have effects in the physical world, actions in the physical world that have digital effects, digital actions that have digital effects, and digital actions that have physical effects.

(Marsh, 2017, p. 26)

Whilst this play episode could have been filmed in a standard manner by a researcher standing or sitting behind Amy, and similar conclusions could have been drawn, perhaps, what the

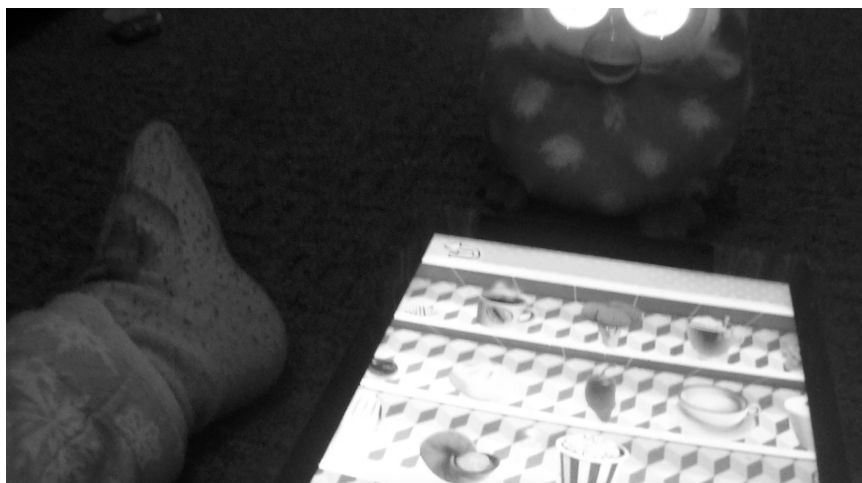


Figure 11.2 Still from Amy's GoPro footage

GoPro footage offers an embodied perspective. When viewing the footage, we experience the Furby from Amy's viewpoint, and this helps to foster an understanding of how such digital toys can become 'real' and powerful for children. The changes in modal intensity from the child's perspective are starkly clear on the GoPro footage, and this informs the analytic gaze. The GoPro cameras were also found to be valuable in capturing the emotions of children. They caught their squeals of delight as they played with various apps, and conveyed their sense of excitement as they rushed to the next stage of the gameplay. This was also found to be the case in Brown et al.'s (2008) study of cyclists and walkers in a national forest:

Headcam was found to be useful for exploring idioms of emotional experience. A range of sounds and vocalisations powerfully conveyed the affective highs and lows of particular practices. For instance, the negotiation of a tricky section of terrain might be accompanied by squeaks and whoops of elation, grunts of frustration, or whimpers and screams of fear.

(Brown et al., 2008, para 5.16)

There were, as other researchers have identified, limitations to the use of the POV cameras. The first relates to what is not recorded. It is not feasible to control where the camera lens points to, and sometimes this means that it is not possible to see some of the pertinent action that is taking place outside of the scope of the lens. It is also easy to get caught up in the visceral nature of the data and feel that the camera is capturing the full experience of the participant. In fact, it does not capture the child's bodily changes, or visual gaze, or inner thoughts, of course. POV cameras have the same limitations of other methods, in that there are always gaps and silences in what can be captured and understood. In studies with older children, researchers can use the footage as a means of talking to the children about their experiences. Second, children are inevitably curious about the cameras and may explore them whilst they are recording. This can lead to fingers being placed over the lenses, and even the cameras being turned off inadvertently during use. Third, the cameras may inhibit children from responding in naturalistic ways, although this could be said of more traditional recording methods also. In this study, the children did not appear to be inhibited when wearing the cameras. Finally, although it was not an issue in this study, Green (2016) noted that the young children who used GoPros on the sensory tour of the forest sometimes engaged in rough play with them, engaging in mock bull fights in which cameras worn by two children would be deliberately clashed together. This needs to be taken into account if researching siblings' digital play in the home. By their very nature, GoPros are robust cameras, however, and should weather most children's rough play.

Conclusion

As Couldry and Hepp (2017) suggest, we are in a period of 'deep mediatization', in which our everyday worlds are constructed through and within digital media. Nevertheless, the non-digital aspects of children's lives are still salient and indeed, the entanglement of the analogue and digital in assemblages of play is such that it is problematic to consider them separately in some cases. In this context, the use of play tours and POV cameras can offer ways of understanding young children's post-digital play, and can contribute to post-humanist analyses of such play.

There are a number of implications of this discussion for further research. First, in any examination of the way in which children's own voices on their experiences of post-digital play can be captured, considerations of the technologies used in data capture must be taken into account.

Some of the emerging technologies for post-digital play will provide methodological challenges. For example, virtual reality (VR) is becoming increasingly popular with many children (Yamada-Rice et al., 2017). Methods such as the use of POV cameras will not be effective in these contexts, so other ways of capturing the experiences will need to be explored, perhaps through the use of screen capture software such as MixCast VR (see Takahashi, 2017) alongside videoing the children. Second, the age at which children are engaging with digital technologies in their play is becoming increasingly younger. In the TAP study for example, parents reported very young babies playing with a range of apps. Technologies that have hitherto largely been used in laboratories, in disciplines outside of education and sociology, such as body sensors, may be useful to employ in ethnographies of play in the home in the future. Finally, in searching for useful tools to capture children's experiences of post-digital play in the home, it is worth remembering that this field is relatively new, in that it is only in the last two decades that many children of this age have begun to engage in digital practices which necessitate the development of appropriate research methods. It is, therefore, not surprising that we are in the early stages of developing methods to examine the practices that occur, and that we have moved from considerations of the digital to non-digital in ways that, at times, unnecessarily dichotomise the two. In this context, some forms of experimentation in relation to methods will be necessary, and researchers need to be open to the risks that might occur when exploring new ways of capturing complex data. Nevertheless, such experimentation and risk-taking are necessary if we are to develop deeper understandings of play in the post-digital age.

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