

Abstract

This chapter examines the integration of children's public play spaces into the infrastructures of the smart city. While prior research has focused on personal mobile devices, this chapter examines deliberate design interventions that digitally augment children's play spaces. Drawing on perspectives from children's geography and game studies to conceptualise childhood play in the smart city, the chapter highlights the sometimes-contradictory relations that emerge. These contradictions arise in the smart city through the digital augmentation of spaces historically and culturally designated as play-spaces. We introduce the notion of the postdigital to emphasize the blurring of boundaries of digital and non-digital play in children's play in playgrounds and conceptualise the integration of playgrounds into digital infrastructures in relation to the broader impact that the smart city has on the uses of public space.

This chapter explores this ongoing integration of playgrounds into the smart city through two recent examples of interactive play designs that digitally augment public playgrounds and parks: *HybridPlay*, and *Disney Fairy Trail*. These examples of postdigital play in public playgrounds are analysed in terms of their functionality, representation, and online reception. Operating within along a broader trajectory of smart city infrastructures characterised by the blurring of discrete spaces of sociality, these examples of postdigital play highlight tensions associated with the cultural sensibilities and historical meanings attached to public play spaces, digital technologies, and childhood.

Keywords: children, mobile media, playground, postdigital play, augmented reality, smart city, public space

6

The postdigital playground

Children's public play spaces in the smart city

Bjørn Nansen and Thomas Apperley

Introduction

This chapter explores the intersection of digital technology and children's public play spaces, in which the historical distinction between the digital and the nondigital is increasingly blurred through mobile, locative and ambient media. The integration of playgrounds into digital infrastructures fits along a broader trajectory of smart city technologies, in which urban space is becoming digitised and 'sentient', embedded with digital media and networked communication infrastructures that are reconfiguring the operation and experiences associated with various spaces of public life (Gabrys, 2019; McQuire, 2017; Shepard, 2011).

The question of how this integration into the smart city is playing a role in reconfiguring the spaces, experiences and meanings associated with public playgrounds and children's play practices remains a largely unexplored topic. In contemporary discourse, the positive associations of public play in the playground are often contrasted with solitary and sedentary behaviours associated with indoor digital play and screen time. Here outdoor play often enters the discussion as a way of getting children away from the screen (e.g. Mavoia et al., 2017). Yet

children's presence in and movement through public space has declined in many parts of the developed world (e.g. Garrard, 2009; Hillman et al., 1990, where public play has often been reduced to designated safe spaces, such as playgrounds (Valentine, 1997; see also Lauwaert, 2009). This circumscription of children's participation in public space aligns with broader shifts in the Western cultural construction of childhood and in the governance of children's play (Malone, 2007), and it is attributed to a wide range of factors that reflect changes in built environments, social norms, parental concerns about safety and evolving practices of technology use. This chapter asks, what is at stake for children's play culture when children's play in public spaces is in increasingly dense ecologies of digital media infrastructures and practices?

A prominent way that children's public play spaces are integrated into the infrastructures of the smart city is through the widespread and often-incident use of personal mobile devices in children's public play spaces. However, they are also increasingly subject to more-deliberate design interventions that aim to embed or augment children's play spaces with digital sensors, interfaces and software applications. The steady accretion and dispersal of media throughout home environments has already created dense household ecologies of media. These ecologies have become further intensified through emerging technologies in which computation and play spread beyond the screen through Internet-connected toys. In game studies, this has been described as a postdigital phase of play, wherein play is no longer a singular activity contained by one digital device at a time (Giddings, 2014; Jayemanne et al., 2016; cf Tyni et al., 2016). Broadly, the postdigital describes a moment when 'the historical distinction between the digital and the non-digital becomes increasingly blurred . . . [and] computation is part of the texture of life itself which can be walked around, touched, manipulated and interacted with in a number of ways and means' (Berry, 2014). In terms of play in public spaces, this notion connects neatly with changing infrastructures, devices, software and connectivity, creating the possibility for activities that are at once analogue and digital, virtual and actual, technical and affective, narrative and playful.

The postdigital situates the integration of playgrounds into digital infrastructures in relation to the broader impact that such technology has on public space and on the blurring of boundaries of digital and nondigital play in children's domestic space (Giddings, 2014; Nansen et al., 2019). Through these contexts, we further develop the concept of postdigital play (Jayemanne et al., 2016) and apply it to an analysis of two recent examples of interactive play designs that aim to augment children's public play spaces: HybridPlay and *Disney Fairy Trail*. These examples of postdigital play in public playgrounds are analysed in terms of their functionality, representation and online reception. Operating along a broader trajectory of smart city infrastructures characterised by the blurring of discrete spaces of sociality, these examples of postdigital play highlight tensions associated with the cultural sensibilities and historical meanings attached to public play spaces, digital technologies and childhood.

The digitisation of public spaces

To understand how digital technologies are reconfiguring playgrounds and children's play therein, mobile phones must be considered in a broader ecology of urban media involving technical infrastructures, devices, networks (Wi-Fi, near-field communication), software applications and increasingly a world of interconnected things, referred to as the Internet of Things. While mobile technologies have 'profound implications' for 'our perception of space' in a general sense (de Souza e Silva, 2013, p. 118), in relation to the playground, the intensification of digital media in the city challenges everyday use and understanding of play in these sites. Existing research has fruitfully explored the reappropriation of the city for playful purposes through location-based games and social media (e.g. Hjorth & Richardson, 2017; Leorke, 2018; Moore, 2015). Yet as mobile devices and the accompanying media ecology reinscribe play and playfulness in everyday urban spaces, the question of how this affects environments that have been specifically set aside for the play activities of children has yet to be addressed.

The concern of this chapter is to understand the implications that these processes have for the specific place-based qualities of the public playground, which have been historically and culturally understood as spaces that are set aside for play. Public playgrounds, which grew in number and popularity in the early 20th century, were from their origins associated with children's safe outdoor recreation and physical health (Frost, 2012). Over time, the public playground familiar to us today, composed of standardised commercial play equipment in fenced or segregated areas of public parks, emerged as the dominant form (Erickson, 2011). There are historical movements and differences in the politics and designs of playgrounds, including more unfinished adventure playgrounds (Shier, 1984); more child-focused participatory playground designs (Whitzman et al., 2009); and the development of private, indoor or commercial play centres that commodify play. But these spaces nevertheless have a common goal: to foster children's engaging in active, safe and physical play, in light of the history of the playground as a site set aside for the explicit purpose of children's active, safe and social play.

Children's public space is, like in many other contexts, predominantly integrated into everyday digital infrastructures through the widespread and often-incidental use of personal mobile devices in children's public play. The use of mobile phones in such contexts also operates in the broader arrangements of mobile and intimate parental surveillance (Leaver, 2017). Yet there is little research explicitly investigating how mobile devices are used in children's public play spaces. More broadly, research explores the role of mobile technologies in mediating children's mobility and movement in public space, emphasising the surveillance capacities or functions of communications technologies and how they reinforce parental fears and anxieties (e.g. Malone, 2007). Other research is more ambivalent, highlighting how the affordances for surveillance are countered by the importance of mobile devices for extending children's public geographies and spatial mobilities (e.g. Nansen et al., 2017; Pain et al., 2005). Complementing this focus on the child is a growing body of research emphasising the social and

health risks associated with *parental* phone distraction (e.g. Radesky et al., 2014). Research in playgrounds addressing the impact of mobile phones on adult–child relationships emphasises the potentially negative consequences in terms of distraction, social distance, safety and behaviour modelling from parents (Hiniker et al., 2015). This research needs to be extended to explore how both mobile media and digital media devices and software more generally now operate as part of the infrastructure of social relationships, communication and play.

In contemporary imaginaries of childhood, playgrounds often serve as the antithesis of screens, and yet mobile media operate to spatially extend existing parental concerns about screen time (Haddon, 2013). Playgrounds are thus positioned as a ‘natural’ resource for parents or guardians who believe their children need time away from screens because they are spending too much time engaged with media. The penetration of mobile media infrastructures into playgrounds disrupts this understanding of the playground as a site that is ‘unmediated’.

Restricting children’s use of mobile devices in such spaces, however, overlooks the ways that public spaces like playgrounds are already connected to a wider mobile media infrastructure and the ways that existing mobile phone use among parents and other supervising adults remediates the playground.

The recent public integration of sites in parks, including children’s playgrounds into the digital infrastructures of *Pokémon GO* (Niantic), highlights the potential tensions of the postdigital playground. For the everyday spaces of the city, the augmented layering of the *Pokémon GO* app reciprocally maps digital onto place and transforms banal and familiar surroundings, creating new opportunities for and politics surrounding ambient social play (Apperley & Moore, 2019; Hjorth & Richardson, 2017). But in spaces set aside for children’s play, *Pokémon GO* can create an unwelcome intrusion. In the weeks after its release, the rapid uptake of the app meant that public spaces with access to key game infrastructure (known as PokéStops and Gyms) were often crowded with players. For instance, in Tampere’s Pikku Kakkonen, a large public playground near the city centre, the impact of the hordes of players

entering the park to access the multiple PokéStops located there was felt profoundly by families who used the facilities.¹ The Visit Tampere website retains a warning for *Pokémon GO* players: ‘Poke Stops [*sic*] at Pikku Kakkonen playground are inside the playground, but you can get to them going around the park – you don’t have to go in disturbing kids’ play’.² This issue, which affected Pikku Kakkonen, illustrates how the installation of augmented ambient play in everyday urban space, which reconfigures the environment into a ‘playground’ for mobile device users, comes into conflict with the perceived values of play that are embedded and enacted in a discrete playground location.

It would be reductive to treat digital media as simply intruding on or negating play, as mobile media and devices can also encourage creative forms of play. Children’s public spaces, including their street cultures and playground play, have always been sites of mediation in which playful practices borrow from cultural and media resources, such as stories and characters, to shape play activities (Factor, 2004; Opie & Opie, 1969). Mobile media extend these traditions with, for example, children integrating media-based Pokémon play resources such as animations, collectable card games and videogames into the structure of their spatial practices and daily routines, effectively interweaving their homes, local shops and neighbourhoods with the Pokémon universe (Horton, 2012). Giddings (2014, 2017) argues for understanding this mediated play as a form of ‘distributed imagination’ that is both technosocial and collectively realised, drawing seamlessly on both physical environments and imaginative interpretations. Play thus actively recruits materials from the mediated worlds of children, whether media technologies are old or new, absent or present.

Postdigitality and continuous interfaces

The digital augmentation of children’s playgrounds and public play spaces is only one example of a larger trajectory of digital and postdigital spaces of play. Augmentation has affected the reimagining and transformation of numerous sites, including family homes and city

streets. Yet the disjunctions and seams of digitally augmenting an everyday environment associated with specific cultural and historical values of play are revealed in the contemporary playground. Here the idea of the continuous interface is helpful for highlighting how such reconfigurations of the postdigital have implications for embodied experience, media economies and social relations in the city:

The interface as a thin membrane over computational devices is increasingly being stretched across computational devices, objects, practices and processes to create what I am calling *continuous interfaces*. (Berry, 2014, emphasis added)

The messy postdigital hybridity of real and augmented realities also raises crucial questions for the current and future uses of playgrounds, parks and other dedicated play spaces.

In a postdigital environment, play multiplies across digital infrastructures and environments, and media companies are thus incentivised to broaden their interface ‘envelopes’ (Ash, 2015) to use continuous interfaces to capture increasingly unruly and transgressive forms of digital/physical play. Examples of commercial products that seek to recapture play practices that spread beyond the screen include a range of what have been referred to as Hybrid Playful products (Tyni et al., 2013) and include well-known commercial products like *Disney Infinity* (Avalanche Software) and Nintendo’s Amiibo figurines (Nansen et al., 2019). These products incorporate tangible elements such as figurines into the screen-based play space by using communication protocols, near-field communications and radio frequency identification tags to connect the physical and the digital. In doing so, products like Amiibo not only solicit playful practices that cut across physical objects and digital spaces but also operate to envelop children in Nintendo’s ecosystem and the increasing datafication of play, enabled through the software affordances of the figurines, which are capable of storing data corresponding to personal game experience and progress.

These games and playful devices are part of a broader reconfiguration of material and digital elements in computers that are increasingly mobile, ‘pervasive’, ‘locative’, ‘augmented’ and ‘mixed’ (Montola, 2011) and that are often described through the language of the Internet of Things (van Kranenburg, 2007) and its toy-based variant, the Internet of Toys (Holloway & Green, 2016). They can, however, also be characterised as part of a broader regime of postdigitality, in terms of gaming that is continuous with the digital yet that also exceeds the digital through conditions that are technical, historical, aesthetic and affective (Berry, 2014; Schinkel, 2014).

The extensive patterns of player bodies and data captured by postdigital games represents an ‘aesthetics of recruitment’ (Jayemanne et al., 2016), in that they enrol and assemble diverse play practices, spaces and data in novel but often-unstable arrangements. In doing so, they extend and intensify trends identified in digital homes research, which reveal how mobile devices and infrastructures in homes blur what were previously distinct and dedicated spaces (e.g. bedrooms) or times (e.g. family meals), to become sites of potentially continuous digital mediation (e.g. Nansen et al., 2009). These remediated spaces, as with digital play products in the playgrounds of the smart city discussed later on, are accompanied by contradictory forms of reception: some celebrate possibilities for new kinds of digitised social interaction, while others repeat concerns along familiar tropes about the erosion of family interaction and relationships.

Just as we are seeing digital transformations in domestic spaces, the emergence of interactive playgrounds reflects some broader movements occurring in the landscape of the smart city. The vision of the smart city is typically a part of an ecology of digital infrastructures, IoT technologies, embedded sensors, mobile devices and location-based technologies or services that produces the city as a continuous interface of data collection, networked connectivity and urban operation management (e.g. Shepard, 2011; Greenfield, 2010). But as the postdigital highlights, such aggregated configurations often overlook the

particularities of urban politics, materialities and experiences in which the ideal of seamless interconnectivity operating at the scale of the city through the aggregation of individually connected devices in a system of real-time data processing treats the diversity of urban places as a homogenous, smooth space of computational operation. Critiques of the smart city build on such theoretical resources to highlight contradictions between, on one hand, visions of technologies working together to function consistently and uniformly and, on the other, cities, which exist as collections of various geographies, social milieus and inhabitants (e.g. Greenfield, 2013).

In smart city visions that privilege technologised spaces, privatised infrastructure and ‘citizens’ that are assumed to be professional, technologically literate and able-bodied adults, specific public sites like playgrounds or disenfranchised inhabitants like children are often overlooked. Nevertheless, the intersection of digital technologies and public spaces may also be harnessed otherwise, including for playful purposes (Greenfield & Shepard, 2007; Leorke, 2018; Nijholt, 2017). Here the appropriation of digital technologies and of data in the city offers opportunities for reimagining and reshaping public spaces towards playful purposes and applications. The development of playful ways to augment public spaces with digital technologies has been promoted through various playable city movements, including Bristol’s well-known city-branding project, which aims to bring art, technology and culture together through interactive design projects to enable playful digital layering or interactions with places around the city.³ Yet the city as a continuous and playable interface is evidenced by a range of other commercial, government and independent projects, including more structured gameplay, such as the augmented reality massive multiplayer online location-based game *Ingress*, which connects to a longer history of locative media and play (Moore, 2015) and to more temporary and experimental projects, such as embedding urban furniture with affordances for digital annotation or communication (e.g. Nansen et al., 2014; Nijholt, 2017).

Examples of playing in the smart city speak to a broader trajectory of blurring of the historical distinction between the digital and the nondigital. Such postdigitalities, however, potentially open up new points of affective disjuncture, disruption and disillusion. Although there are clearly endeavours to reimagine and reshape public spaces through playful interactions or communication, the implications for children's public play spaces – such as playgrounds, which are already associated with specific values of play – remain under explored. How are postdigital imaginaries, products and practices received in terms of the social meanings and values associated with the functions of children's playgrounds, and what role if any should digital devices play in these spaces? Two examples of augmented and interactive play technologies, HybridPlay and *Disney Fairy Trail*, are analysed next, in terms of their functionality, representation and online reception, to explore how these often-contradictory sensibilities unfold in relation to the configuration of and meanings associated with children's public play spaces. These sensibilities, as we elaborate in the following section, sometimes reinforce, sometimes remediate and sometimes reject the dominant discursive framing of children's public play spaces or children's digital media.

Case studies of digitally augmented children's play spaces

In addition to the use of mobile phones in mediating children's public spaces and experiences, there are more-deliberate design interventions emerging that aim to embed or augment children's play spaces with digital sensors, interfaces and software applications. Here the potential of the Internet of Things operates in combination with a logic of technology innovation in imagining and designing 'interactive playgrounds' (Poppe et al., 2014), to transform children's physical play spaces and activities. Digitally augmenting children's play spaces is imagined in these contexts as a way to provide more-engaging, more-entertaining and more-immersive play experiences while also promoting physical activity, social interaction or inclusion. Soler-Adillon and Parés (2009), for example, report on their interactive playground

project, the Interactive Slide, in which a large inflatable slide augmented with an interactive camera-projector acts as an image projection screen, and the projector includes motion-detection sensors to transform the slide into an interactive surface (2009). The Interactive Slide, then, becomes a platform for game designers to develop different applications and experiences. An initial application was the *Virtual Mosaic*, a *Tetris*-inspired game that projected coloured falling squares onto the interactive surface of the slide, which could then be touched or moved or even scattered by sliding down the slide.

Commercial examples of physically embedding sensors and digital interfaces into playgrounds are growing,⁴ though they remain at this point relatively rare; they mostly exist as lab-based prototypes rather than real-world applications, owing to issues of cost but also durability, vandalism and maintenance. There are, however, emerging interaction design prototypes and software-based products that take advantage of smartphone location-based functions, built-in sensors such as accelerometers, near-field communications such as Bluetooth and the possibilities of connecting mobile devices to a range of peripheral hardware. These offer opportunities for augmenting play spaces without requiring the complete redesign of play equipment or infrastructure.

The two cases studies of augmented and interactive play technologies, HybridPlay and *Disney Fairy Trail*, were analysed in terms of their functionality, representation and online reception. The functionality analysis of the technologies drew on platform and affordance study approaches to unpack their operations, features and technical mediation of public space. The representation of these designs was analysed by drawing on corporate promotional and marketing material to investigate how the scenarios and contexts of use for each game was discursively constructed for consumers. The public reception of these media technologies was analysed through available online data collected across social media platforms. The number of posts and comments collected totalled almost a hundred. For *Disney Fairies Trail*, public responses were collected from posts, comments and content shared using keywords and

hashtags (e.g. #disneyfairytails) across Instagram, Pinterest, Facebook and Twitter. For HybridPlay, public comments and conversation threads were collected from online spaces – though these were less from social media platforms and instead more commonly found below the line on news and tech journalism articles and on blogs and crowdfunding sites. These public comments were identified, collected and analysed across both case studies to gauge the public response to postdigital interventions into children’s public space.

Disney Fairies Trail

In 2015, Walt Disney Company (Australia) partnered with the Royal Botanic Gardens to develop and install the *Disney Fairies* Trail experience (the Creative Shop), an augmented_reality application that allowed children to find, collect and fly fairies such as Tinkerbell and her friends from the *Disney Fairies* movie franchise in a number of public parks in the urban centres of Sydney and Melbourne. The downloadable app worked on Internet-connected mobile devices and geolocation technology, and guided by a digital map on the mobile screen, children searched for fairies in the gardens, which appeared as animated characters overlaid on physical places, with the augmented reality content activated by the app receiving push notification from beacon technology on the location of the user in the gardens and their proximity to each fairy hiding place. The *Disney Fairies* Trail experience was launched as a temporary installation as part of a school holiday programme of events, using a commercial entertainment brand to promote engagement with and education about the natural environment. As a commercial partnership between an entertainment company and a public nonprofit institution responsible for botanical conservation and education, the full title of the installation, the *Disney Fairies* Trail: Magic in our Natural World, speaks to the multiple hybridities of the application: public–private, commercial–educational, digital–physical, mobile–located and natural–magical, which were at once elided and celebrated in the marketing representations:

The *Disney Fairies* Trail showed thousands of children the true magic of our natural world.

The partnership reinforced brand recognition and values while fulfilling key social

responsibility and education objectives for the Walt Disney Company in Australia.

(The Australian Botanical Garden, www.australianbotanicgarden.com.au/)

Apart from promotional material from the corporate developers, designers, sponsors and parks, there was surprisingly little public communication about this mobile app and its digitised experience of public place. Of course, this research looked only at public communication online and so did not include private communication on messaging applications or social media networks. But given that this was an overt commercial branding of a public space; that it was an explicit digital re-mediation of what is otherwise a 'natural', if constructed, physical setting; and that the claims to supporting curiosity, engagement and learning about the natural environment were somewhat murky and tenuous, there was surprisingly little negative reaction to this application.

Instead, most of the public posts and discussion revolved around enjoyment, with images of the app and experience shared on Instagram or conversations anticipating and planning when to go and whom to take, especially as an activity to entertain children during the school holidays, and suggesting the experience to friends:

How cute

The kids would love this

We are planning to go, so definitely would love to join you! (public Facebook posts)

Critical reactions to the fairy trail augmented reality app revolved round much-more-prosaic complaints and in particular difficulties getting the application to load or function properly, along with other less-relevant complaints, such as the poor quality of coffee available at the site:

6 The postdigital playground

It won't let me download the app on my iPad stupid thing

Yeah I had probs with mine at first but the guy in the office had a troubleshooting sheet! Just had to fiddle with some settings. . .

That would have been helpful!! We were with people who had a working app so we just looked at the fairies through that. (public Facebook posts)

In considering how this postdigital intervention into public space was received in terms of social values and sentiments associated with either public parks or digital devices, the analysis of public online comments revealed almost no sense of this hybridising as unsettling, as transformative, as exceptional or as corrosive. Instead, it was seemingly accepted as a novel but relatively familiar piece of entertainment and as a holiday activity aligned with the experience of the everyday. In many ways, this is probably not surprising, given the context and functionality: this was a temporary application that is reminiscent of many contemporary museum and gallery exhibitions; it was deployed as a mobile application involving commercial content and technical features familiar to many parents of young children using tablets and smartphones; and it was installed in a public park for only a brief period in a manner that was not visually obtrusive or physically damaging. The negative comments primarily involved highlighting the relative complexity of operating the app, which meant children could not simply 'play' it seamlessly without adult support. Such a concern is worth exploring more fully, because it suggests that there is also a literacy dimension that shapes the experience and reception of this kind of postdigital intervention. However, primarily due to its temporary and clearly bounded implementation, this project did not make a significant challenge to the everyday cultural sensibilities associated with children's parks, play or use of digital media.

HybridPlay, a crowdfunded app, is more directly oriented towards reconfiguring the ways public playgrounds are used and conceived. HybridPlay (lalalab) is a mobile gaming system that incorporates sensor hardware with a smartphone game platform (for its history of design and a technical description, see Díaz et al., 2016). The hardware is a sensor clip made of rubber with built-in sensors, including accelerometers, gyroscopes and proximity sensors, and this chip is designed to be attached to different pieces of playground equipment (see Figure 6.1). The clip wirelessly connects to a smartphone to incorporate movement from the sensor as a physical game mechanic in mobile app games and the digital play space of the screen. An example of a HybridPlay game is *Space Kids*, which uses the sensor attached to swings or a seesaw to physically control an astronaut character onscreen that is navigating in and through space. Designed and developed by a team of Spanish new media artists, designers and programmers, HybridPlay is informed by the philosophy of the open-source movement – it is a gaming platform powered by Arduino open hardware, enabling other game developers to build or customise games that incorporate the different sensors into new digital game designs.

HybridPlay is explicitly designed for children's public playground use; it not only depends on the presence of and interaction with various pieces of popular playground equipment but in attaching them to a digital game experience also clearly reimagines their functions, affordances and meanings (see Figure 6.2). The tagline 'A new way to play: HybridPlay transforms playgrounds into video games' is literal: playgrounds are transformed into an element of the digital gaming ecology when the sensor clip is attached to play equipment. And by requiring that children play on physical playground equipment to control actions in a digital game space, the playground becomes a control interface much like a joystick.



Figure 6.1 HybridPlay sensor clip.

Source: HybridPLAY Clara Boj and Diego Diaz 2015

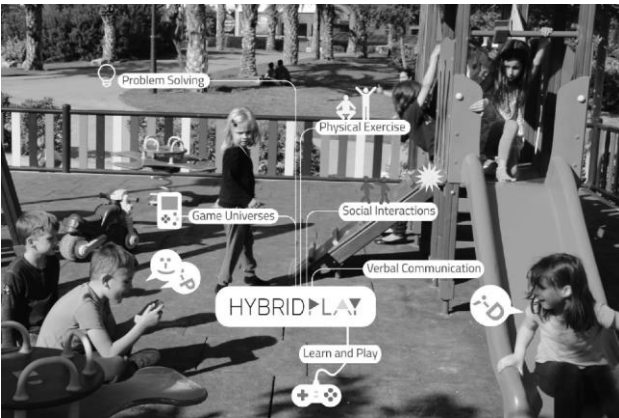


Figure 6.2 HybridPlay design scenario.

Source: HybridPLAY Clara Boj and Diego Diaz 2015

The current status of HybridPlay is uncertain. It was launched on a crowdfunding site but did not reach its funding goal, and the campaign is now closed.⁵ While the product website is still live, it appears that it never went into production. This may be related to the product promotion and marketing representation of the application, which directly targeted and reshaped the use and meaning of playgrounds. As a kind of gamification, it was informed by an

ideology of digital gameplay as radically and positively transformative that could overcome the sedentary effects of digital games by combining their playful attraction with the benefits of physical activity – sometimes referred to as exertion gaming (see Mueller et al., 2011) – while drawing on the benefits of digital games for communication and teamwork by transplanting these dimensions into playground spaces:

HYBRIDPLAY is a new, revolutionary inclusive fitness game device for you and your children to engage in physical activity by playing video games outdoors. Too many phones and tablets. Video games are a fun and enriching tool, but we can go a step further and make games not only mentally, but physically engaging, while bringing kids and adults together outdoors. HYBRIDPLAY combines the best of digital and physical play, enhancing the playground by making it inclusive for all abilities, and bringing back children's excitement for the outdoors. It is the ultimate inclusive fitness game system for kids and adults! Join us for engaging outdoor fitness and play now!⁶

In trying to combine the attractions and benefits of both digital experiences and physical experiences and to address health concerns about digital play by implying that the digital augmentation of public spaces would enhance their attraction to technology-oriented children – essentially suggesting that if you can't get children off the tablet, take the tablet into the playground – HybridPlay implicitly made claims that challenged social norms, values and sensibilities associated with the configuration and understanding of children's play, in particular normative assumptions about what kinds of play activities should be undertaken in places such as playgrounds.

Much like the *Disney Fairies* Trail, there was not a great volume of online public discussion about HybridPlay, but in contrast, the responses available were much more visibly critical. And these public critiques were more clearly aligned with received discourses about both public playgrounds and digital media, with most concerned about the

potential of digital play to migrate its negative qualities, such as distraction, sedentary behaviour and antisocial dynamics, into and then corrupt the positive qualities of playgrounds for free and physically active play (despite the claims of the product developers or mechanics of the system contradicting such pronouncements):

This is an absolutely awful ill-conceived application of digital technology. Proponents of the Internet of Things concept have gems like a sensor to tell you when your coffee mug is empty with an app to send a text message. Put the phone down and look in your mug! Same thing here. No Kickstarter needed. Just kick this bad idea to the curb.

For goodness sakes just let children play . . . don't get them addicted to computer games in the playground.

Like the kids are going to do any physical activity, when they have a gaming device in there hands. Here is a idea for you, lock boxes on the playground for phones/games that only open after a hour passes. (Comments posted to tech blog articles, typos in original)

These affective critiques not only centred on the inherently positive values of physical play and public spaces and the contrasting inherently negative values associated with digital devices and innovation but also encompassed broader notions about the corrosive trajectories of children's play cultures dominated by digital media and risk-aversion regulation:

Maybe we should consider letting kids get hurt now and then to teach them the world is a dangerous place. Let them jump out of swings let them meet random children and play with them. Merry Go Rounds just aren't any fun when you are not going fast enough that you have to hang on.

yo dawg i heard you like to play while you play so we put a tv on all the outside toys so your shut-in kids will want to go the fuck outside once in a while.

The sense of incompatibility between public parks and digital play evidenced in these online reactions and comments to HybridPlay is revealing in ways not apparent in the *Disney Fairies* Trail application. Again, however, this is probably not that surprising, given the context and functionality of the application. Rather than a temporary and peripheral exhibition, HybridPlay was imagined and represented as a direct restructuring of and transformation in children's public play spaces – something that aimed to radically reshape the interface and experience of the playground, the kinds of play engaged in within these spaces and consequently how the meanings of such spaces would be understood. Here the how the playground space was adapted with newer Internet of Things sensors, and connectivity profoundly reimagined what a playground could and should be. This reimagining jars with long-standing ideas and deeply held sensibilities about the role of public play and parks – sensibilities shaped by personal and cultural histories of association, memory and experience that are deeply ingrained and largely uninterrogated until they are opened up by seams of the postdigital that rearrange previously distinct technologies and practices of play. In the comments on HybridPlay, it is also clear that playgrounds are for many parents seen as a practical antidote for screen use. Thus, the critiques use the logic of screen time to position playgrounds as a natural break from the continuous interface. Nevertheless, this postdigital intervention into children's public play spaces resonates with the rearrangements that are already well underway – though still unresolved – in domestic spaces. Although the examples discussed are only temporary or incomplete, they render visible how these spaces are already highly digitally mediated through everyday mobile media infrastructures, devices and practices, and in turn, they register the ongoing potentials for both change and contestation in an era of continuously spreading interfaces.

This chapter has explored how children's contemporary public play spaces, such as playgrounds and parks, are increasingly subjected to forms of integration into digital infrastructures both through the widespread and often-incident use of personal mobile devices in children's public play and via more-deliberate design interventions that more deliberately seek to embed or augment children's play spaces. The chapter located this shift towards the broader contexts, conceptualisations and contradictions surrounding postdigital play, and the analysis was influenced and illustrated by two recent examples of augmented and interactive play technologies: HybridPlay, a smartphone game technology that wirelessly connects to a sensor-equipped clip to transform playground equipment into gaming interfaces, and *Disney Fairy Trail*, an augmented reality app leveraging Disney's Fairies franchise and designed to produce a 'magical' outdoor fairy hunt in public gardens.

These examples were analysed in terms of their functionality, representation and online reception to explore the often-contradictory sensibilities attached to the reconfiguration and reimagining of children's public play spaces. HybridPlay suggested that the literal application of an 'augmented playground' caused some consternation. *Disney Fairy Trail* was a more temporary project and was aligned with families' patterns of park use to create a child-focused activity during the school holidays in large flora-focused parks, which opened up the larger space of the park to children. Together, these case studies suggest that the postdigital playground is more welcome when it creates novel ways for children to play in spaces that may not typically be considered usual or appropriate for children's play. While this issue did not arise in the data set we gathered, future research clearly needs to explore the implications of these technologies for their capacities to capture personal data and what this datafication of children and play means for the encroachment of commercial activity into public play spaces through digital infrastructures or applications.

This chapter examined how – along a broader trajectory of smart cities and play in urban space, characterised by the blurring of discrete spaces of sociality – the messy

arrangements of postdigital playgrounds reveal emerging seams of affective disjuncture and disillusion at the level of social spatial experience. These seams expressed the logic and imperatives of technological innovation and development to spread and try to solve perceived problems while drawing attention to how such postdigital imaginaries, products and practices are received in terms of cultural values and personal sensibilities associated with public spaces, digital technologies and children's play.

Notes

References

- Apperley, T., & Moore, K. (2019). Haptic ambience: Ambient play, the haptic effect and co-
- Apperley, T., & Moore, K. (2019). Haptic ambience: Ambient play, the haptic effect and
- Apperley, T., & Moore, K. (2019). Haptic ambience: Ambient play, the haptic effect and
- Apperley, T., & Moore, K. (2019). Haptic ambience: Ambient play, the haptic effect and
- Ash, J. (2015). *The interface envelope: Gaming, technology, power*. London: Bloomsbury Academic.
- Berry, D. (2014, June 6). The post-digital ornament. *Stunlaw Blog Post*. Retrieved from <http://stunlaw.blogspot.com.au/2014/06/the-post-digital-ornament.html>
- de Souza e Silva, A. (2013). Location-aware mobile technologies: Historical, social and spatial approaches. *Mobile Media and Communication*, 1(1), 116–121.
- Díaz, D., Boj, C., & Portalés, C. (2016). Hybridplay: A new technology to foster outdoors physical activity, verbal communication and teamwork. *Sensors*, 16(4), 586.
- Erickson, A. (2011). The politics of playgrounds, a history. *The Atlantic Cities*, 10–20.
- Factor, J. (2004). Tree stumps, manhole covers and rubbish tins: The invisible play-lines of a primary school playground. *Childhood*, 11(2), 142–154.
- Frost, J. (2012). Evolution of American playgrounds. *Scholarpedia*, 7(12), 30423.

- Gabrys, J. (2019). Sensors and sensing practices: Reworking experience across entities, environments, and technologies. *Science, Technologies, and Human Values*. Online first. <https://doi.org/10.1177/0162243919860211>
- Garrard, J. (2009). *Active transport: Children and young people: An overview of recent evidence*. Melbourne: Victorian Health Promotion Foundation.
- Giddings, S. (2014). *Gameworlds: Virtual media and children's everyday play*. London: Bloomsbury Academic.
- Giddings, S. (2017). Pokémon GO as distributed imagination. *Mobile Media & Communication*, 5(1), 59–62.
- Greenfield, A. (2010). *Everyware: The dawning age of ubiquitous computing*. Indianapolis: New Riders.
- Greenfield, A. (2013). *Against the smart city: The city is here for you to use, part I* (pp. 1–153). New York: Do Projects.
- Greenfield, A., & Shepard, M. (2007). *Urban computing and its discontents*. New York: Architectural League of New York.
- Haddon, L. (2013). Mobile media and children. *Mobile Media & Communication*, 1(1), 89–95.
- Hillman, M., Adams, J., & Whitelegg, J. (1990). *One false move, a study of children's*
Hillman, M., Adams, J., & Whitelegg, J. (1990). *One false move, a study of children's*
- Hiniker, A., Sobel, K., Suh, H., Sung, Y., Lee, C., & Kientz, J. (2015). Texting while parenting: How adults use mobile phones while caring for children at the playground. In *Proceedings of the 33rd annual ACM conference on human factors in computing systems (CHI '15)* (pp. 727–773). New York: ACM.
- Hjorth, L., & Richardson, I. (2017). Pokémon GO: Mobile media play, place-making, and the digital wayfarer. *Mobile Media & Communication*, 5(1), 3–14.
- Holloway, D., & Green, L. (2016). The Internet of toys. *Communication Research and Practice*, 2(4), 509–519.

- Horton, J. (2012). 'Got my shoes, got my Pokémon': Everyday geographies of children's popular culture. *Geoforum*, 43(1), 4-13.
- Jayemanne, D., Apperley, T., & Nansen, B. (2016). Postdigital play and the aesthetics of recruitment. *Transactions of the Digital Games Research Association (ToDiGRA)*, 2(3), 145–172.
- Lauwaert, M. (2009). *The place of play: Toys and digital cultures* (vol. 3). Amsterdam: Amsterdam University Press.
- Leaver, T. (2017). Intimate surveillance: Normalizing parental monitoring and mediation of infants online. *Social Media + Society*, 3(2).
- Leorke, D. (2018). *Location-based gaming: Play in public space*. Singapore: Palgrave Macmillan.
- Malone, K. (2007). The bubble-wrap generation: Children growing up in walled gardens. *Environmental Education Research*, 13(4), 513–527.
- Mavoa, J., Gibbs, M., & Carter, M. (2017). Constructing the young child media user in Australia: A discourse analysis of Facebook comments. *Journal of Children and Media*, 11(3), 330–346.
- McQuire, S. (2017). *Geomedias: Networked cities and the future of public space*. John Wiley & Sons.
- Montola, M. (2011). A ludological view on the pervasive mixed-reality game research paradigm. *Personal and Ubiquitous Computing*, 15(1), 3–12.
- Moore, K. (2015). Playing with portals: Re-thinking urban environments with ingress. *Analog Game Studies*, 12(1).
- Mueller, F. F., Edge, D., Vetere, F., Gibbs, M. R., Agamanolis, S., Bongers, B., & Sheridan, J. G. Mueller, F. F., Edge, D., Vetere, F., Gibbs, M. R., Agamanolis, S., Bongers, B., & Nansen, B., Arnold, M., Gibbs, M., & Davis, H. (2009). Domestic orchestration: Rhythms in the mediated home. *Time & Society*, 18(2), 181–207.

- Nansen, B., Carroll, P., Gibbs, L., MacDougall, C., & Vetere, F. (2017). Mobilising children: The role of mobile communications in child mobility. In C. Ergler, R. Kearns, & K. Witten (Eds.), *Children's health and wellbeing in urban environments* (pp. 101–116). London: Routledge.
- Nansen, B., Nicoll, B., & Apperley, T. (2019). Postdigitality in children's crossmedia play: A case study of Nintendo's amiibo figurines. In G. Mascheroni & D. Holloway (Eds.), *The Internet of toys: Practices, affordances and the political economy of children's smart play* (pp. 89–108). Houndsmills: Palgrave Macmillan.
- Nansen, B., van Ryn, L., Vetere, F., Robertson, T., Brereton, M., & Dourish, P. (2014). An Internet of social things. In *Proceedings of OzCHI* (pp. 87–96). Melbourne: ACM.
- Nijholt, A. (2017). Towards playful and playable cities. In *Playable cities* (pp. 1–20). Singapore: Springer.
- Opie, I., & Opie, P. (1969). *Children's games in street and playground*. Oxford: Oxford University Press.
- Pain, R., Grundy, S., Gill, S., Towner, E., Sparks, G., & Hughes, K. (2005). 'So long as I take my mobile': Mobile phones, urban life and geographies of young people's safety. *International Journal of Urban and Regional Studies*, 29, 814–830.
- Poppe, R., van Delden, R., Moreno, A., & Reidsma, D. (2014). Interactive playgrounds for children. In A. Nijholt (Ed.), *Playful user interfaces: Gaming media and social effects*. Singapore: Springer.
- Radesky, J. S., Kistin, C. J., Zuckerman, B., Nitzberg, K., Gross, J., Kaplan-Sanoff, M., Augustyn, M., & Silverstein, M. (2014). Patterns of mobile device use by caregivers and children during meals in fast food restaurants. *Pediatrics*, 133(4), 843–849.
- Schinkel, W. (2014, July 9). *What is 'post-digital'? Rsearch tumblr*. Retrieved from <http://rsearch.tumblr.com/>

- Shepard, M. (Ed.). (2011). *Sentient city: Ubiquitous computing, architecture, and the future of urban space*. New York: Architectural League of New York.
- Shier, H. (1984). *Adventure playgrounds: An introduction*. London: National Playing Fields Association.
- Soler-Adillon, J., & Parés, N. (2009). Interactive slide: An interactive playground to promote physical activity and socialization of children. In *Proceedings of international conference human factors in computing systems (CHI 09)* (pp. 2407–2416). New York: ACM.
- Tyni, H., Kultima, A., & Mäyrä, F. (2013). Dimensions of hybrid in playful products. In *Proceedings of AcademicMindTrek '13* (pp. 237–244). New York: ACM Press.
- Tyni, H., Kultima, A., Nummenmaa, T., Alha, K., Kankainen, V., & Mäyrä, F. (2016). *Hybrid playful experiences: Playing between material and digital – hybrid ex project*. Final Report. Tampere: University of Tampere.
- Valentine, G. (1997). ‘Oh yes I can’ ‘oh no you can’t’: Children and parents’ understandings of kids’ competence to negotiate public space safely. *Antipode*, 29(1), 65–89.
- van Kranenburg, R. (2007). *The Internet of things: A critique of ambient technology and the all-seeing RFID chip*. Amsterdam: Institute of Network Cultures.
- Whitzman, C., Worthington, M., & Mizrachi, D. (2009). *Walking the walk: Can child-friendly cities promote children’s independent mobility?* Melbourne: GAMUT [Australasian Centre for the Governance and Management of Urban Transportation].

¹ www.tamperelainen.fi/blogi/420027-pokemon-pelaajat-pois-pikku-kakkosen-puistosta.

² <https://visittampere.fi/en/articles/hottest-pokemon-tips-in-tampere/>.

³ www.playablecity.com/cities/bristol/.

⁴ For example, see: www.fitness-gaming.com/news/schools/.

⁵ (www.indiegogo.com/projects/hybridplay-engaging-fitness-gaming-on-playgrounds#/).

⁶ (HybridPlay, www.indiegogo.com/projects/hybridplay-engaging-fitness-gaming-on-playgrounds#/story).