

“It wasn’t really about the Pokémon”: Parents’ Perspectives on a Location-Based Mobile Game

Kiley Sobel¹, Arpita Bhattacharya¹, Alexis Hiniker¹, Jin Ha Lee², Julie A. Kientz¹, Jason C. Yip²

¹Human Centered Design & Engineering, ²The Information School

DUB Group, University of Washington, Seattle, WA, USA

{ksobel, arpitab, alexisr, jinhalee, jkientz, jcyip}@uw.edu

ABSTRACT

Though prior work shows parents worry about screen media experiences displacing physical activity and time outdoors, this research does not account for location-based mobile games like *Pokémon GO*, which specifically facilitate outdoor activity. To fill this gap in the research, we surveyed and interviewed parents to understand (1) their values and perceptions of this type of gameplay and (2) how they co-play *Pokémon GO* with their children. Our findings provide empirical evidence that, in addition to appreciating the increased exercise and time outdoors, parents valued how play led to family bonding experiences. Furthermore, some traditional concerns about screen time persisted in this context, and new concerns about safety in real-world environments emerged. Parents mitigated these concerns with rules and gameplay choices, such as maintaining control of the mobile device, to ensure children were safe. This work contributes an empirical understanding of families as co-users of technology and offers a generative lens to study and design for joint media engagement among family members where gameplay differs from normative notions of screen time.

Author Keywords

Pokémon GO; location-based mobile games; augmented reality games; joint media engagement; parental mediation; families; children.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

As technology becomes ubiquitous in our lives, with an increasing number of adults, teens, and children owning and using mobile devices [26,33,50,60], screen time has become a highly debated and elusive topic for families [56,66,71]. Overexposure to screens has been associated

with hostility in children [65]; development of anxiety [77] and attention disorders [78]; risk of obesity, disordered sleep, and other health problems [15,59]; Internet addiction [9], and a myriad of other concerns. As such, the fear that children are displacing other “healthier,” more “social,” or more “educational” activities by engaging with screen-based media is seemingly omnipresent [67]. In response to these concerns and the fact that digital media is now everywhere, parents have had to take on new roles as mediators of their children’s screen time [3,6,16,58].

Yet, with advances in digital technologies and new media comes the knowledge that not all screen time is created equal. Children passively and silently viewing television programming alone is “different” than them talking to grandparents over video chat, actively reading a digital book with a parent, or playing *Dance Dance Revolution* (a dancing game) with a sibling. One way to conceptualize this difference is through *joint media engagement* (JME). JME refers to the experiences of people using media together, which include viewing, playing, searching, reading, contributing, and creating with either digital or traditional media [68]. JME supports learning by providing context and resources for people to co-create meaningful connections among representations, interests, and experiences [68]. Because of how co-engagement leads to social interactions and learning, the American Academy of Pediatrics recommends that families participate with new media together [6,58].

JME is not a static concept though, as the options for how families can co-engage with new media are rapidly evolving. On July 6, 2016, Niantic, Inc. released *Pokémon GO*, a location-based mobile game in which players use their device’s GPS capabilities to navigate their avatar in the virtual world by physically moving through real world locations that are meaningful in the game. Then, players can locate, capture, battle, and train virtual characters in the game world called Pokémon (‘Pocket monsters’) [43]. The game also enables optional augmented reality features that use a mobile device’s camera, such that Pokémon appear on the screen as if they were physically co-located in the surrounding area.

As *Pokémon GO* became popular so quickly, with over 500 million downloads in two months [41], it seemed to attract parents and children alike to play together [29,30,49,51]. While other types of similar games exist both commercially

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(e.g., *Ingress*) and as research prototypes (e.g., [7,8,35,62]), *Pokémon GO* is the first popularized mainstream location-based mobile game that is available for families to play together. Moreover, unlike *Ingress*, which requires its players to be 13 years or older, *Pokémon GO* has explicit provisions for children under 13 to play with parental consent [44], which are in compliance with laws like the United States' Children's Online Privacy Protection Act [13]. Consequently, the emergence of *Pokémon GO* provided an ideal platform to study how parents are mediating and jointly engaging with their children with a location-based mobile game—a type of screen-based media that, in some ways, flips the normative paradigm of screen time by encouraging more physically grounded experiences that screen time is often perceived to displace. While its usage has declined since the game debuted, the main concern of this paper is not *Pokémon GO* itself per se. Rather, it is about families' experiences with and views of this kind of gameplay from the perspective of parents.

Specifically, in this work, we were interested in understanding parents' experiences, perspectives, and attitudes regarding their children playing location-based mobile games, in particular, *Pokémon GO*. We wanted to learn more about the choices parents and families make on how to play the game, any rules they set about their children's game use and why, how they might jointly engage in this type of gaming with their children, and other relevant experiences. To answer these questions, we administered a qualitative survey to 67 parents (the majority from the U.S.) and conducted interviews with 20 parents in Seattle, Washington, USA from late-July to mid-August 2016. We approached and interviewed all 20 interview participants in a public space where they were already playing or watching their children play *Pokémon GO*.

We found that, in addition to exercise and time outdoors, parents valued how play led to family bonding experiences. This play fit into their lives, coinciding with other important activities (i.e., family walks, dog walks) or as specifically planned *Pokémon GO* time. Additionally, while some traditional concerns about screen time persisted for parents, new concerns about safety in real-world environments emerged. Parents made rules and gameplay choices centered around these concerns that have not been previously reported in literature, which ensured their children were safe. For example, parents reported always accompanying their children while playing and staying in control of the mobile device during gameplay to make sure children were not harmed in the physical environment. These findings both support and bring new light to research on joint family participation and learning with new media.

With this work, we make two main contributions to the HCI community. The first is a new empirical understanding of families as technology users, their values, and perspectives. This understanding can help us reflect on how we may or may not be designing appropriately for this user group.

Second, we contextualize families' experiences with *Pokémon GO* within the conditions and processes that Takeuchi and Stevens [68] identify as leading to productive JME. We validate how these conditions have been brought to life by the implementation of *Pokémon GO*, and therefore (as predicted) fostered JME for families. We also bring up new conditions that fostered JME in this distinctive context of playing *Pokémon GO*. Thus, through our discussion, we contribute a generative understanding that promotes studying and designing for JME among family members, where gameplay differs from normative notions of screen time.

RELATED WORK

There has been a significant, growing body of research in family technology and media use within the HCI community [24]. This work has examined the role of technology in family life and how technology supports family interaction and learning through co-use in different ways (e.g., [17,19,20,22,23,27,28,36,39,70]). We build on this work to expand our notions of HCI in the family context. In the interest of space, in this section we primarily focus on theory and literature in parental mediation and forms of family co-use in relation to games specifically.

Parental Mediation of Children's Digital Media Use

Throughout their long-term collaborative ethnographic study of the everyday digital media practices of children and teens in the United States, Ito et al. [25] found that parents consistently worried about the amount of time their children spent using new media. They were concerned with how their children were spending time online, on their mobile phones, playing video games, using their iPods, and talking to their friends over instant messenger, on social networking sites, and their mobile devices. As shown in other studies (e.g., [16,21,57,76]), these types of concerns are common among parents. According to parental mediation theory, there are three main ways that parents counteract their concerns about screen time. They mediate their children's digital media use through *restrictive mediation*, *active mediation*, and *social co-viewing or co-use* [10,72].

Parents who make rules, control, and place limits on children's media use, mainly to counteract negative effects, are engaging in *restrictive mediation* [45,72]. Contrasting parents who allow their children to use devices freely without any limits (i.e., *digital enablers*), parents who engage in restrictive mediation to avoid negative side effects of technology use are known as *digital limiters* [54,55]. In Ito et al.'s [25] study, parents placed restrictions on new media use, such as setting time limits and requiring children to finish schoolwork, chores, and "productive activities" before playing digital games or going on social networks. They also set up specific media areas in the house to be able to monitor their children's digital media use in a more public space [25]. These types of rule setting

emerge in many other studies on parental restrictions of children’s screen time as well (e.g., [21,34,47]).

As a protective measure, parents also enter dialogues with their children to explain and discuss aspects of new media and its usage, with purposes that are both instructive (e.g., to teach about content in child-friendly language) and evaluative (e.g., to express disapproval). This type of mediation is referred to as *active mediation* [10,72]. Active mediation occurs particularly in families with older children [61] or when parents have positive perceptions about Internet use for younger children [46].

The last type of mediation within parental mediation theory is *social co-viewing* or *co-use* [10,68,72], which has both educational and entertainment purposes [48]. Often, parents who mediate their children’s screen time by engaging in it with them are scaffolding the experience [68]. Following Vygotsky [74], they guide or help in areas where their children need support, ultimately enhancing what is good about the experience and allowing their children to learn and grow. In these moments, parents teach, collaborate with, consult on non-technical issues, provide resources to, and even learn from their children [4], which all positively impact children’s learning. A middle ground between *digital enablers* and *digital limiters*, parents who both *actively mediate* and *co-use* digital media with their children are known as *digital mentors* [54,55].

One survey of 4,000 families in the U.S. [12] found that 59% of parents of “gamer children” played computer and video games with them weekly. However, parents also imposed time limits on this usage more than on any other form of entertainment [12]. In another study of 3,000 U.S. parents [37], researchers found 92% of parents whose children play video games play with them; and 77% of those parents said it was to spend time together. Still, most parents preferred that children played on game consoles, not computers or mobile devices, because they are easier to monitor.

In the following two sections, we further discuss two forms of co-use (that allow for active, instructive mediation in situ), specifically focusing on gaming together: *hanging out* and *joint media engagement*.

Families ‘Hanging Out’ with Games

One way that co-use has been conceptualized is as a genre of participation with new media called ‘hanging out’ [25]. Ito et al. [25] define ‘hanging out’ as when people engage with new media in the process of spending time together. This is a social experience, and so the digital media itself is not necessarily the central focus. In Ito et al.’s [25] studies, families ‘hung’ out with new media and viewed this time as a way to facilitate both communication and bonding. This was even true for families who “idealized unplugging,” yet still watched television and movies together. In some families, the main way that parents and children connected (especially fathers and sons) was through joint gaming. For others, gaming was still a consistent yet fluid way to spend

time together as a family. Therefore, overall, gaming was a particularly important aspect for families ‘hanging out’ together. Ito et al. [25] note specifically, “‘Hanging out’ genres of gaming enable people to bridge different forms of gaming expertise and to cross generational and gender divides” (p. 207).

This finding about gaming as a bridge holds across various other studies as well. For instance, Lee et al. [32] found that their gamer interviewees often fondly remembered playing games with family members from as early as four to five years old; thus, gaming was an important part of their childhood. Similarly, in their qualitative study of console gaming, Volda and Greenberg [73] found that these types of games serve as a “computational meeting place,” bringing together individuals in families to foster social interactions. Following this research, we wanted to understand if, how, and why this type of ‘hanging out’ might occur around *Pokémon GO*.

Joint Media Engagement (JME) & Gaming in Families

Another type of parental co-use, which encompasses ‘hanging out,’ is JME. As mentioned in the Introduction, JME refers to the experiences of people using media together. JME is considered important because of how this engagement supports learning [68]. Through JME, participants can make sense and meaning together in a particular situation and for future situations [63]. However, JME is not limited to solely “educational” media; rather, it concerns studying “all forms of media, especially those that dominate young people’s time and experience” [68, p. 5]. Regarding gaming, Stevens et al. [64] claim that collaboration during and around video gameplay provides a positive learning environment; this is because “in-room” (i.e., literally in a room, around gameplay) interactions are social and empowering as players share knowledge and see it successfully used by others. Moreover, boundaries between “in-game,” “in-room,” and “in-world” (i.e., everyday life) interactions are blurred, facilitating the transfer of knowledge between them [64]. Particularly, “in-room” interactions have complex bidirectional continuities with players’ everyday lives [64].

There are a small but growing number of HCI researchers who have studied JME, specifically joint gaming and digital play, within families that include children. While not exhaustive, we discuss some of these studies below. First, researchers have found that parents and children need explicit roles to productively engage with media together. In Brooks et al.’s [5] case study with *Electric Racer*, a computer game specifically designed for two-player intergenerational play, parents and children needed roles within the game clarified, so that parents knew the game’s educational goals and how they were supposed to scaffold their children’s learning. Second, technology design can also foster JME among siblings (i.e., family members that represent a different co-user group than friends and parents). Ballagas et al. [2] found that their mobile augmented reality and cooperative problem solving game (*Electric Agents*) facilitat-

ed physical coordination, physical support, and verbal instructions, clarifications, and communication between older-younger sibling pairs. Third, JME does not require even expertise between co-participants. In Aarsand's [1] ethnographic study, uneven expertise between children and parents about video games fostered joint gaming. When children have more expertise and adults are novices, it allows children to take the lead and disrupt the typical balance of power between children and adults. This can be motivating for sustained joint engagement. Fourth, JME can happen over distances and foster a sense of togetherness. Through a lab study, Follmer et al. [14] found that, for children under seven and their remote family members, playing over video creates a sense of "togetherness" by physically doing something together, as opposed to just talking; that physical objects in play scaffold physical interactions, which lead to discussions; and that story-based content leads to communication and helps scaffold parental guidance. Finally, exergames have been found to be productive for JME. Saksono et al. [53] designed and evaluated *Spaceship Launch*, a task-mastery exergame for parents and children. They found parents viewed in-game competition between players as motivating, which spurred social interactions. Their findings also highlighted the importance of designing systems to help children and parents increase both of their physical activity together.

Moving forward, Takeuchi and Stevens [68] note an important area for future research is studying "the qualities of media design and deliberate use that encourage productive JME" (p. 55). Since JME is not a static issue, it will need to be consistently reassessed as new technology changes and develops over time. Here, we examine the values, practices, interactions, and relationships that occur and develop around the deliberate use of a type of game not currently covered in the family JME literature (*Pokémon GO*) from the point of view of parents. By understanding these perspectives of and experiences with a game that have already pervaded families' lives, which we relate back to the game's design, we follow Takeuchi and Stevens' [68] call for research; ultimately, we help build knowledge about what design can do to foster productive JME.

METHODS

For this study, we targeted surveying and interviewing adult guardians who allowed their children to play location-based mobile games. Initially, our research team conducted non-participant observations of families playing *Pokémon GO* with children in public locations, such as parks, shopping centers, Pokémon events, and a university campus. Our team discussed insights from these observations, which informed our qualitative survey and interview questions. We both piloted and iterated on these protocols before deploying them. We recruited for the survey on online social media platforms such as Facebook, Craigslist, and community mailing lists, which enabled participation from a wider range of people. Even though we encouraged participation from families who played other location-based

mobile games with children, every survey respondent reported on playing *Pokémon GO*. Respondents completed the survey in approximately 45 minutes. They were then entered into a US\$50 Amazon gift card drawing, which four people received. In parallel, we also conducted 10-minute in-person semi-structured interviews with parents in a local public park, where many people played *Pokémon GO*. Interviewing parents in the context of family gameplay ensured that they could reflect on their gaming process in-situ. We conducted interviews in the afternoon and evening, over two days: 2 weeks ($n = 6$) and 6 weeks ($n = 14$) since the release of the game. Parents received small toys for their children for participating in the interview.

The interview and survey included similar open-ended questions to ensure triangulation. Question topics included: (1) perceived benefits of and concerns about the game, (2) their rules for their children playing the game, (3) how the above topics were similar to or different from other games their children played, and (4) descriptions of their most memorable and recent experiences playing the game. All interviews were audio recorded and transcribed. The study was approved by the University of Washington's Human Subjects Division.

Participants

A total of 87 adult guardians (of children under age 18) participated in this research; 67 were survey participants (*S1-S67*) and 20 (*P1-P20*) were interviewees. All but one was a parent (one interviewee was an aunt); thus, we refer to our participants as "parents." Parents' ages ranged from 25 to 65 years old ($M = 42$; $SD = 7.2$); 70% identified as female, 28% as male, and 2% as androgynous/other. Parents' children's ages ranged from 2 to 17 years old ($M = 9.6$; $SD = 3.9$); 62% of these children were reported as male and 38% as female. Most families lived in the United States, with only two survey participants reporting living elsewhere (i.e., Netherlands and Canada). Of the survey participants, 30% held a master's degree, 25% a bachelor's degree, 24% a doctorate, 7% a professional degree, and 3% an associate's degree; 4% had vocational training, and 4% completed some college but did not hold a degree. These survey participants' household incomes ranged from less than \$20,000 to over \$200,000 per year with 74% them earning over \$100,000 per year.

Data Analysis

We took a joint inductive-deductive approach to the analysis of our qualitative data [11]. Two authors first independently open coded all the survey data, following an inductive approach. They then met to group and iterate on the codes according to consistent themes. Next, the same two coders read through half of the interview transcripts each, and coded them following a similar process. However, for coding interviews, authors looked for similarities across themes in the survey and interview data (a deductive approach) while iterating on and adding new

codes as they emerged. Finally, the coders wrote memos, from which they abstracted higher-level themes.

FINDINGS

In this section, we describe the main themes that emerged from our analysis, regarding parents' experiences, values, and perspectives about their children playing *Pokémon GO* and playing *Pokémon GO* together with their children.

Characterization of Family Play

The majority of our participants indicated that they played *Pokémon GO* with their children, as opposed to their children playing independently from them. Seventeen (85%) of our interview participants were at our interview site specifically to play the game together with their children. For our survey participants, 59 (88%) reported that they play *Pokémon GO* together, either with other family members, friends, or just them two. For the other eight participants (12%) who did not play with their children, five participant's children (age 10-17) played with their siblings and/or friends without an adult; and two participants' children (age 8 and 17) played with their other parent. Additionally, 37 survey participants (55%) specified that they play *Pokémon GO* by themselves or with other adults, without any children present.

The families in our study reported that joint *Pokémon GO* gameplay happened both spontaneously, such as on the way to other activities or errands, and as a planned activity. Regarding spontaneous play, parents reported that their children often played when the parents were driving, when they noticed there were Pokémon nearby, or in other situations to "kill time." Some examples reported by parents included seeing Pokémon nearby after having dinner at a restaurant, while waiting for another child to be dismissed from camp, or when having to walk from the car that was parked a half-mile from where they were going.

Yet, other parents talked about how playing *Pokémon GO* became a specific activity that the family planned to do together. In some cases, especially for our interview participants, families decided to go to certain locations because they had heard from their friends, co-workers, or the Internet about these locations being great spots to find Pokémon. At these spots, there were often many other people playing. Specifically, interviewees perceived the experience of seeing crowds (sometimes hundreds) of people out enjoying a similar activity as exciting. However, most survey participants also reported playing *Pokémon GO* in and around the neighborhood and at nearby parks with fewer crowds, which they specifically described as "safe." Furthermore, *Pokémon GO* led to entire extended family and friends playing together. For example, P15 (a 31-year-old mother) brought a group of ten family members (three adults, five children, and two infants) to the interview site to play the game, which is a new and extremely social form of media co-participation.

Parents also appreciated how the game became a motivation for both their children and them to go outside and exercise in ways that were convenient and fit into their lives. Here, we see a shift in screen time usage; families are purposely scheduling time together outside their homes to engage in the game. For instance, S26, a 43-year-old mother who played with her 7-year-old son, said, "*There are times I cannot get out and walk the dogs as my husband works nights and my son just doesn't want to walk. But now I can incite [my son] with the game and he wants to go!!*" Another mother, S7, a 31-year-old with a three-year-old daughter and another one-year-old, mentioned that her family is walking more because of the game. She noted, "*We go out for nightly long walks as a family... We stop when we see Pokémon and they help to catch them. They get really excited to go out for walks so I love taking them.*" For some participants, this led to walking thousands of more steps a day. A 41-year-old father (P13) said his 11-year-old daughter "*probably lost twelve pounds since she's been playing [the game].*" A popular term participants used for such walks was "Poké-walks," which became dedicated family experiences that parents predictably appreciated for how they were motivation for exercising and going outside.

Turn-Taking & Gameplay Roles

Parents consistently reported on their gameplay practices that involved taking turns and having particular roles during gameplay. In most instances, the family shared one phone to play the game. Some families took turns in specific time intervals; some planned based on gameplay, such as each member catching a specific number of Pokémon, and some let children take turns on one device in ways that were age appropriate and/or matched the child's abilities and interests. For S34, a 35-year-old mother who played with her 2-year-old daughter, this meant that they took turns on the phone because her daughter is learning to share. S34 holds and stays in control of the phone, but "*tell[s] her [daughter] what she needs to do and let[s] her do things that are age appropriate, ie [sic], she can spin, but she's not evolving or transferring Pokémon.*" Other parents set time limits on turns. A 42-year-old mother, S55, and her 6-year-old son each got about five minutes with the phone, passing it back and forth. S6, a 46-year-old mother who plays with her 7-year-old son, said that they set a timer for five minutes each to ensure equal turn-taking. In addition to being a mechanism for imposing rules, some parents were also constrained to a single device due to low memory or compatibility issues, or not wanting to spend money on additional data plans and devices. An interesting work-around to this was tethering a data-enabled device's hotspot with a child's Wi-Fi-only device (which had the added benefit of also keeping them close by).

Nevertheless, other parents reported that each person in the family had their own individual device when playing in the same space. Although parents and children were on separate devices, they were still playing together because of how they ran to catch Pokémon at the same time, took over

Gyms together (a competitive aspect of gameplay, where players battle for ownership of a particular public location), or generally talked about the game. In some cases, having multiple phones still led to sharing the devices. For example, S18, a 50-year-old mother of two sons (the main player being the 12-year-old son), described how she, her sons, and two of their friends played the game in the car while her husband drove them to the pool. She recounted, “*We had 3 phones to play on so we took turns giving each other time to play... We just passed the phones around.*”

Parents also spoke about the ways in which they took on separate roles during gameplay, which often integrated into how they took (or did not take) turns. These roles included parents taking safety roles, such as holding the phone while walking or navigating and suggesting routes. Often, roles were also divided based on skill level or difficulty of the gameplay. A 37-year-old mother (S35) said her 7-year-old daughter played mostly, “*but sometimes she gave [her] the phone for [catching] harder Pokémon.*” Comparably, a 37-year-old mother who plays with her 7-year-old son on her device (S33) described how they decided where to go together but took turns catching Pokémon; she usually caught those, and “*if he didn’t capture [one] in 3 tries, he’d give up control to [his mom].*”

Family Bonding

Another theme that emerged from our data was parents feeling that *Pokémon GO* time with their children led to family bonding. Playing together or watching their children play the game was perceived as quality time between parents and children. Parents reported that it even led to them spending more time together and talking more than usual (both about and/or not about the game). For instance, P4, a 45-year-old father who plays *Pokémon GO* with his 42-year-old wife, 15-year-old daughter, and 9-year-old son, stated, “*I think it reinforces that we have common interests and helps us to have a good dialogue as we’re sharing this experience.*” Father P13 said that due to the game, he and his daughter “*honestly talk a lot more.*” Parents recounted how they talk about the game itself, beyond playing the game. Additionally, parents spoke about how they enjoyed playing separately from their children and then showing their children what they had accomplished. P16, a 38-year-old mother of two boys (age 7 and 4) whose older son plays *Pokémon GO*, said she sometimes plays for her son and moves him up to the next level; then her son says, “*Yay mom! You’re the coolest mom ever!*” Similarly, S35 recounted, “*I love that this is a game we can play together as a family, and I often play a little during the day (alone) so we can talk about my progress at night. My daughter’s enthusiasm is turning me into a gamer!*” Being able to play together has encouraged her to play separately so they can talk about it together more.

P14, a 31-year-old father who plays with his 7-year-old daughter, discussed how they talk about the game, feel a sense of camaraderie, and have been brought closer by the

experience. He recounted a time when they ran together to find a Pokémon: “*Yeah, we were both running together, and she was looking at me, and she was smiling. It was just a great experience. It turned out it was a Cubone [a type of Pokémon]. I think that was her first Cubone, so that was cool. But it wasn’t really about the Pokémon.*” This example shows how, in relation to family bonding, the experience does not necessarily have to do with the game itself but with what the game facilitates and fosters for family interactions and relationships.

As some parents played the game on their own without their children (55% of survey participants) or had played older versions of Pokémon when they were growing up, playing the game together offered a chance for parents to show their expertise to their children and share a similar “growing-up” experience. P12, a 25-year-old father who plays with his 3-year-old son and 5-year-old daughter, indicated he was the most interested in the game out of everyone in the family. When asked about what he learned from playing the game, he said, “*That you can share a game [among all ages]...I grew up on this game. For them to also grow up on it, it’s like there’s that bond, and I learned that my kids can love something as much as I can. We can both be kids together.*”

Yet, in many instances, there was a shift in expertise: children were the experts in the game and parents were open to learning. Children taught their parents about it and/or parents made efforts to learn about the game, reportedly facilitating bonding. P2, a mother of a 10-year-old boy, relayed how her son has taught her “*a lot about the game,*” which was different from when she “*didn’t care*” about engaging with or learning from her son while he was playing *Pokémon* on his Nintendo DS. Along the same lines, P10, a mother who just began playing with her 10-year-old son, said, “*I’m just amazed at how much I learned about this game so I could understand what he’s talking about.*” In both examples, parents were making efforts to learn about a game in which their children were interested to facilitate playing and talking about the game together.

Some parents also explicitly mentioned that they thought this type of bonding would not have occurred without the game. S25, a 43-year-old parent who goes out every night with their 16-year-old daughter to play *Pokémon GO* as “*basically her chauffeur and bodyguard,*” said that the game allows them to spend quality time together, and “*as an older teen that’s not always something that happens.*” P11, a 27-year-old mother, indicated that the game gave she and her 7-year-old son “*common ground to interact*”. A 41-year-old mother (P9) who plays with her 8-year-old son, explained: “*I think it’s just helping us find a common thing we can do together as a mom and a boy, and that’s really awesome for me. I’m excited about that. I like that he wants to share with me and talk to me about it. As a boy coming home from school, they don’t tell you what they ate, or they don’t tell you what their teacher said, but now he’s telling me this stuff so it’s a good way to be communicating. I think*

hopefully it will keep transcending into him wanting to communicate about more things.” Playing the game together has caused them to talk more, especially (as she points out) as a mother and son. Similarly, fathers expressed the same sentiment about their daughters. Both fathers P13 and P14 noted they were talking more with their daughters since playing *Pokémon GO*.

Concerns & Workarounds

Safety

Unsurprisingly, almost all of our participants had safety concerns for their children in regard to gameplay. These concerns centered around their children being potentially harmed by strangers or getting physically hurt, such as getting hit by a car, due to not paying attention to where they were going. Pointedly, S45, a 39-year-old mother of a 12-year-old son, commented, *“I don’t want my kids to be the dumb dumbs who fall off a cliff or [get] run over by a car because they [are] too engaged.”* As the most extreme response about strangers, P19, a father in his 50’s with a 10-year-old son, said he and his wife were worried about the crowds and “crazy people.” He said, *“Terrorists can also kill people here. Somebody with a gun comes, can easily do a lot of damage... We don’t feel safe right now.”*

Therefore, many of the rules parents had for gameplay directly related to these concerns. All the parents, not including the few that had older children (i.e., mid- to late-teens), required that they or another adult be with their children while playing. Many explicitly reported that their children were not allowed to speak or play with strangers. For older children who were allowed to play on their own, parents requested that their children always be available by phone and only travel a certain distance from their home. Some also had rules that their older children were not allowed to play at night, unless they were with an adult.

The ways that parents and younger children played together were associated with these concerns as well. First, many of the children only played on their parent’s personal device, ensuring that the child could not play without their parent. Most pertinently, parents consistently reported on how they were in control of the phone while walking; parents would either hold the phone or it would stay in their pocket until it vibrated (indicating that a Pokémon was nearby), and then they would hand the phone to their child. Some families took turns looking at the phone, so that one person was always looking at the street while they played. These practices ensured that children (and parents) would not be physically endangered by not looking at their surroundings.

Screen Time

Other concerns of parents related to the concept of screen time. Participants referred to “screen time” broadly and spoke to the idea of balance, using rhetoric like “addiction” and “obsession.” For instance, regarding the former, P1 (a 38-year-old mother whose nine-year-old daughter plays) said her main concern about the game was *“just the screen”*

because *“it’s still screen time.”* She noted, *“I don’t know how to... stop it. It’s a constant.”* Similarly, P16 said that the game is just adding to *“kids just always wanting to have screen time.”* Similar to other research (e.g., [20]), some parents also noted how it was difficult to get back their mobile devices from their children when they were playing *Pokémon GO*, which sometimes led to conflicts. To counteract these concerns, a few parents had rules (which extended to other forms of screen time) about gameplay. These included setting time limits, shutting down the mobile device if children did not give it back, and parents staying in control of the phone. Many also required that their children had to attend to their other responsibilities and commitments before playing the game. These included chores, homework, reading, drawing, driver’s education training, sports, and other similar activities. Some parents also mentioned that they would begin to implement or intensify rules once the academic school year begun.

However, some of these same parents and others also indicated that this type of screen time with the game was “different” than other types of screen time, which changed their rules and perceptions of gameplay. Participants reported this was due to perceived net benefits of getting exercise, spending time outdoors, learning about the neighborhood, spending time with family and friends, and socializing offline. For example, S35 said they break their general solo screen time limit for *Pokémon GO* because it is a family activity. A 36-year-old stepmother of a 9-year-old boy (S66) mentioned, *“[E]ven if it’s screen time, it’s better than when he’s playing Minecraft”* because they are walking around and spending time together. Likewise, a father of a 5-year-old boy and 4-year-old girl whose son mainly plays (P8) was *“less stringent on”* screen time limits because of how the activity was outdoors and physically active. He said, *“I like that. It’s less screen time. They’re not just buried in [the screen] the whole time.”* Other participants continually identified *Pokémon GO* gameplay as distinct from other forms of screen time, like sitting and playing video and computer games.

Many participants also reported about how playing allowed them and their children to learn more about the neighborhood and surrounding areas. This included learning about how to navigate streets and about specific structures, landmarks, locations, and art in the neighborhood that they did not know about before. A 39-year-old mother of a 12-year-old son (S45) noted, *“There was a giant anchor memorial hidden behind trees that we would never have seen if it weren’t for it also being a [PokéStop, an important location in the game].”* Similarly, S9, a 51-year-old mother of a 17-year-old son, said, *“What I like about [the game] is that it points out some of the little things (signs or artwork) that I might normally miss. Like at [a nearby lake] - the benches that are PokéStops are marked with memorials. Most people overlook those - it’s kind of cool to stop and read them.”*

Finally, parents noted how the game enabled their children to be social with other people outside of the family, including connecting with new friends and even strangers. While most parents had rules that their children were not allowed to play with or talk to strangers, some noted how the game allowed them to see how friendly other players, who they do not know, are. For example, S25 (age 43) said she and her 16-year-old daughter learned how *“in general other [Pokémon GO] players are quite nice and friendly.”* P2 explained they were playing one night and her 10-year-old son worked with other players who they did not know on an externally collaborative aspect of the game: *“They were a team. It was really nice, you know, to open up those channels of communication.”*

Connecting with new friends outside of the family was particularly important for several participants. This was true for P8’s son who was homeschooled and for whom the game enabled him to play and talk with other children; for P13’s daughter who has autism spectrum disorder and for whom the game gave her *“something in common to talk to the kids [at camp] about”*; and for S26’s son who has attention deficit hyperactivity disorder, sensory issues, and high-functioning autism and for whom the *“game gives him the opportunity to fit in with kids and talk about it.”* Thus, because of how playing was a family, social, outdoor, and/or exercise activity, parents changed their rules and had fewer concerns about screen time.

DISCUSSION

Our findings give us insight into the perspectives, values, and experiences of parents as they relate to screen time, JME, and ‘hanging out’ while playing *Pokémon GO*. For our parent participants, some traditional concerns about screen time held, namely regarding digital media addiction and obsession. Still, most parents did not seem to be concerned about the displacement of social, physical, and outdoor activities (i.e., normally common concerns for parents regarding screen time) because of how *Pokémon GO* augments and motivates these types of experiences. Additionally, the game sparked learning about the neighborhood because of how it caused them to go to locations that they would not have noticed otherwise. For this reason, parents valued this gameplay as different from normative notions of screen time.

However, new concerns also emerged for parents that focused on safety, namely about their children getting harmed by strangers or getting physically hurt, like walking into the street and getting hit by a car, because of how this type of game can lead players to not pay attention to their surroundings as they travel through space. While not paying attention due to focusing on a screen is a common concern for mobile devices [38], it is more of a focus here because of how the game might encourage players to pay attention to the digital map as they walk.

These types of concerns led to parental mediation practices that are particular to location-based mobile gaming.

Livingstone and Helsper [34] refer to differences between mediating personal computer use compared to game console use; our results complement their notion of how changing technology is making restrictions and casual monitoring more difficult [68]. Specifically, parents safeguarded their children by engaging in restrictive mediation (e.g., setting rules for how far older children were allowed to travel), active mediation (e.g., having discussions about where to travel to next), and co-use (e.g., playing together such that a parent takes on the role of always keeping the phone in his or her pocket). This contrasts parents’ past preferences for wanting their children to play on consoles [37] and in shared media spaces in the home [25]. Thus, these mediation practices extended beyond typical rule setting, discussions, and co-engagement for screen time because of how normally considered “in-room” activities completely overlap with “in-world” activities. Because it is a location-based mobile game, mediation was mainly about physicality (e.g., physical space, the body, in-person strangers, etc.).

The ways in which families took turns, shared, and/or had specific roles during gameplay supports research in JME as a form of parental mediation that facilitates learning as well. Parents and children playing the game together while taking turns and sharing (and even using timers to scaffold this experience) has the potential to help children learn these skills *in situ*. The fact that parents completed more difficult or less developmentally appropriate aspects of the game for their children, by either stepping in when necessary or taking on specific gameplay roles, is a form of scaffolding for their children to learn how to play the game too. Also, the fact that parents reported that they and their children discovered new things about their neighborhoods and nearby locations while traversing these areas supports research that location-based mobile games are valuable for learning in new ways [31,69].

Furthermore, one child or one parent having expertise or tremendous interest in the game served as motivation to play together and as a form of bonding for families. This occurrence is specific to *Pokémon GO* because of how the franchise has existed since 1995, and the children of 1995 have grown up to become parents themselves. This notion of disparate child/parent knowledge and interest as incentivizing play parallels findings that one-sided expertise in a game is motivation to keep playing together [1].

Finally, our results follow research about joint participation and gameplay as a form of ‘hanging out’ around new media that leads to family bonding [25]. Contrasting “in-room” activities, *Pokémon GO* fit into families’ lives outside of the home and incentivized more “in-world” experiences, which made it a new valuable way to be together. Thus, playing *Pokémon GO* was (both immediate and extended) family time for our participants. Parents appreciated how they learned, talked, and spent time together playing the game. This was particularly important to some of our participants

who were parents of older teens, mothers of sons, and fathers of daughters. Our work provides incentive to further study why location-based mobile games might be effective avenues through and around which these different groups can bond. Perhaps this type of bonding and communication among the family can extend long-term to other contexts or continually in this gaming context.

Design Features that Encourage JME and ‘Hanging Out’

Using our findings, we can reflect on the conditions and processes surrounding *Pokémon GO* (as a location-based mobile game) that make it productive for family JME and ‘hanging out.’ First, we use our findings and *Pokémon GO* design features to briefly show how the game facilitates the six conditions [68] that lead to productive JME:

1. **Mutual engagement** (i.e., multiple people should be motivated equally to participate; both find it challenging and/or appealing): Families were both able to participate in modes that parents deemed appropriate, whether that be taking turns, parents scaffolding harder elements, or parents mainly watching their children play.
2. **Dialogic inquiry** (i.e., should inspire collaboration to make meaning of situations): Parents and children bonded and talked about the game together, even beyond the gameplay setting.
3. **Co-creation** (i.e., through co-use, people can create shared understandings, which “provide grounds for communication and learning” [68, p. 43][52,75]): Parents and children learned about the game or taught each other about it. They also learned about their neighborhood and surrounding areas.
4. **Boundary crossing** (i.e., it spans times and settings, stimulated by past experiences, and inspiring future activities): The fact that the game motivates parents and children for similar or different reasons (e.g., intergenerational interest in game content, walking, or spending time together) crosses boundaries. Many parents even played this game on their own without their children, facilitating boundary crossing as well.
5. **Intention to develop** (i.e., one person should intend to grow through participation, like leveling up): The game involves finding and catching many and rare Pokémon and leveling up. For example, P16 moved her son up to the next level in the game, which excited him and brought them closer. P14 and his daughter had a bonding experience as they ran to catch a new Pokémon.
6. **Focus on content, not control** (i.e., technical and user interface features do not distract or take away from partners’ interactions or their interactions with the content): The game has simple gameplay mechanics that involve only a few different activities. Thus, parents and children could share in this gameplay in ways that made sense for their family. Additionally, the game does not require players to constantly look at the screen. Rather, parents could put the phone in their pocket as they walked until it was necessary for gameplay.

Additionally, based on this research, we claim that there are other specific qualities about *Pokémon GO* that make it particularly encouraging for productive family JME and ‘hanging out.’ The first is that, as a location-based mobile game, it hinges on players going outside, walking, and working in teams. Therefore, the game **reconciles some of the issues parents have with screen time and fits into the lives of families**, including in their schedules, within various contexts, and during valued activities, while also not tying them to the living room. Because of this, parents may be more likely to accept or promote gameplay or jointly participate with their children.

Next, this type of gameplay depends highly on a **dynamic outdoor context**. For our participants, this led to new forms of learning (i.e., about the neighborhood) that further blurs lines between “in-room” and “in-game” knowledge transfer [31,69]. Providing opportunities for families to learn in new ways is appealing and may lead to more productive JME.

Pokémon GO also facilitated **families and children connecting and being social with other people outside of the family**, sometimes in very large numbers. Because the game requires going outside and moving, there is some incentive to interact with people that are not co-engaging in the one instance of gameplay. This added value of diverse, extremely social learning does not occur during games that are bound to a specific place (besides perhaps in collaborative remote games). However, as shown in our findings, this value also comes into conflict with parental concerns about strangers. This tension highlights the importance of parental mediation of children’s screen time in this context for families to gain added benefits while mitigating potential dangers.

Finally, while, based on findings of Brooks et al. [5], Takeuchi and Stevens [68] list “differentiation of roles” as a JME design principle (due to how this can ensure all participants are challenged and/or entertained) and also claim, “less structure may fail to elicit dialogic inquiry” (p. 46), no parents reported *Pokémon GO* as being frustrating or causing conflict due to a lack of in-game mechanisms for sharing. Rather, *Pokémon GO* was not designed explicitly for co-use on a single device, but it is still effectively being used as such. Perhaps because **gameplay can be shared differently depending on how parents want to participate**, it is motivation for JME. Some parents wanted to consistently play the game with (and without) their children; others wanted to watch their children play and be their cheerleaders; and some wanted to help when their assistance was necessary. The fact that the roles were *not* prescriptive allowed different types of families to participate together.

Designing Location-Based Mobile Games for Families

Finally, we want to reflect on what our findings may mean for researchers and other practitioners who want to design location-based mobile games for families. What might these designs be disrupting? What might they be enhancing?

In terms of disruptions, we first point to the concerns that parents had about these types of games. It is important to be aware that these types of games, particularly those that are augmented reality games, still cause some worry for parents about the dangers that come along with traveling while looking at a phone. Yet, new hardware like the *Pokémon GO* Plus [42], the Apple Watch [18], Google Glass, or HoloLens, which help players to keep watch of where they are going and still pay attention to the game, could improve safety while navigating. There also may be privacy concerns, which *Pokémon GO* did not elicit, but could be relevant for other location-based mobile games. Depending on the game mechanics, reflecting on issues of tracking and data sharing are especially relevant in this design context. Lastly, it is possible for these types of games to be inaccessible to those who cannot travel outside or in certain areas, and exclusionary to families who live in rural areas and/or who cannot afford large data plans.

In terms of enhancements, it seems that, to parents, the true unique value of location-based mobile games over other games was being outside and physically active and that this could be done *all together*. Some parents even specifically mentioned that they want to see more of these kinds of games produced. There are more opportunities to explore what the integration of other types of content could enhance in terms of family participation and learning as well. Similar yet non-digital versions of these types of games, like geocaching and scavenger hunts, and the research on their effects [40] could help designers understand what new types of features could be integrated to enhance location-based mobile gameplay for families. Overall, it seems that supporting families in jointly participating in new media use together socially, outside, and while exercising poses an exciting new research and design direction that appears to outweigh normative new media concerns.

Limitations & Future Work

In this study, we did not discuss the perspectives or values of parents who do not allow their children to play *Pokémon GO*. Without these perspectives, we cannot make claims about how to potentially engage families in joint gaming who are not doing so already. Future work entails unpacking these parents' values and opinions. We also did not survey or interview children about what they value in this context. It is *extremely* important for future work to consider these co-players' opinions and personal experiences, as their perspectives and values affect how we understand and design location-based mobile games for families.

Furthermore, as our data is highly skewed toward mother participants and sons, future research needs to work toward collecting greater responses from fathers and parents with daughters; then, we can examine if and, if so, how findings may shift according to gender. Along these same lines, our participants also have higher than average income and education levels, which may affect our results' transferability. Future work needs to examine how socio-economic status

and other relevant demographic factors influence parents regarding location-based mobile gaming with their children.

Additionally, we only studied this phenomenon in the summer, immediately after *Pokémon GO* was released. The looser screen time rules that some of our participants had for their children correspond to prior work that routines (like structuring time in order to play games) change seasonally, with summers and breaks being less structured [25]. It will be interesting to see how families' rules and the characteristics of gameplay change during the school year, and as the excitement (a type of novelty bias) for *Pokémon GO* wanes. Likewise, studying how and why the usage may have declined for families is important for future research, as it can potentially validate if our findings hold over time and may lead to understandings of what can increase the longevity and benefits of these technologies for families.

Finally, future ethnographic observations of families playing location-based mobile games will triangulate this research, and support (or invalidate) parents' reports of their gameplay practices. New insights could also be gained by seeing how families potentially use the *Pokémon GO* Plus and the Apple Watch to increase safety while playing.

CONCLUSION

For this research, we surveyed and interviewed 87 parents who allow their children (under age 18) to play *Pokémon GO*, a new widely available and popular location-based mobile game. By unpacking parents' values and perceptions of this type of gameplay, we better understand families as co-technology users in a context where common perceptions of screen time appear to be flipped. While parents still had some typical concerns about screen time, the fact that the game motivates outdoor, social, and bonding activities helped mitigate these worries. Parents could alleviate new concerns about safety by accompanying and playing with their children. Because this type of gameplay fit into the lives of families, connected "in-room" and "in-world" experiences, lessened typical screen time worries, allowed for sharing and mixed control, and supported family bonding, this location-based mobile game created a productive platform for JME. Perhaps it was *Pokémon* itself that initially on-boarded families to play, but the valuable experiences of and interactions within families existed and continued to exist beyond the actual content of the game. Without these other important elements, we argue the game's popularity for families would not have been sustained. Through our discussion of these notions and fitting our research into past work in JME [68], we provide a greater generative understanding of what types of contexts and processes support JME. We hope this work will inspire new study and design for families' joint participation with new media where gameplay differs from normative notions of screen time.

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