Gaming as Family Time: Digital Game Co-play in Modern Parent-Child Relationships

GEOFF MUSICK, Clemson University, USA
GUO FREEMAN, Clemson University, USA
NATHAN J. MCNEESE, Clemson University, USA

The role of digital gaming on parenthood and parent-child relationships is a common research interest in HCI and CHI PLAY. Yet, how technology co-use, such as co-playing digital games, affords and impacts parent-child relationships is still understudied. Using 20 in-depth interviews of adults who had co-played modern digital games with their parents and/or children, in this paper we investigate parent-child relationships mediated by co-playing modern digital games. We update prior HCI and CHI PLAY research on game-mediated parent-child relationships by suggesting a "democratized" family life and a fading digital divide for families with favorable digital game co-play experiences. We also contribute to HCI and CHI PLAY by providing new perspectives of technology co-use in the context of gaming, such as an important relational tool that parents can use to promote conversations with their child(ren). These insights can further inform the design of future play to better support parent-child interactions during digital game co-play.

CCS Concepts: • **Human-centered computing** → *Human computer interaction (HCI)*.

Additional Key Words and Phrases: modern digital games; technology-mediated relationships; co-play; co-use; families; parent; children

1 INTRODUCTION

As society continues to evolve and change, it is increasingly challenging for parents to assist their children in navigating childhood. At times, technology effectively helps parents and their children in navigating these challenges [7, 12, 50], while other times, technology itself contains new challenges for the emerging form of modern parent-child relationships [44]. In particular, playing digital games together has become an important aspect of modern family life and has potential to affect parent-child relationships. According to the Entertainment Software Association, more than half of parents (55%) say they play digital games with their children at least once a week [4]. Similarly, a study by the Joan Ganz Cooney Center found that for parents of children who play digital games, 57% of parents played digital games with their children at least a few times a month [1]. As such, this growing trend is affecting *how* families play together. For parents of 4-13 year old children who play digital games, a recent survey showed that 47% of these families played digital

Authors' addresses: Geoff Musick, gmusick@clemson.edu, Clemson University, Clemson, South Carolina, USA, 29631; Guo Freeman, guof@clemson.edu, Clemson University, Clemson, South Carolina, USA, 29631; Nathan J. McNeese, mcneese@clemson.edu, Clemson University, Clemson, South Carolina, USA, 29631.

games together more often than they played board games together [2]. Though many parents are utilizing digital games in shared family time, there are still many parents who abstain from this due to concern that their child is getting too much screen time or that digital games have a mostly negative effect on family life [3].

Even though more and more parents are choosing to play digital games with their children [1–4], existing research on technology-mediated parent-child relationships tends to focus on how modern parent-child relationships may be disrupted or disconnected as parents and children use technologies separately rather than co-using [41, 48]. Despite a small body of HCI research that has used the lens of technology co-use (i.e., parents actively interacting or engaging with technology alongside their child(ren)) [21] or co-play (i.e., co-use with playful interactions) [53] to understand social dynamics involved in contexts such as e-books [63], family computer programming [8], and video watching [43], how technology co-use, such as co-playing digital games, affords and impacts parent-child relationships is still understudied.

To address these limitations, in this paper we investigate the role of *co-playing digital games* in modern parent-child relationships based on 20 in-depth interviews of adults who had favorable experiences co-playing modern digital games with their parents and/or children. It is important to note that this study only sheds light on play for families with positive digital co-play experiences; therefore, this study does not include family perspectives or experiences for those who have had negative experiences or have avoided co-play due to disinterest or other reservations (e.g., desire to avoid screen time). Further, we consider it useful to include adults' co-play experiences with their parents in this study because it provides an understudied perspective regarding how some families find support for their parent-child relationships through digital games into adulthood.

Specifically, we focus on the following research questions pertaining specifically to families with favorable co-play experiences:

- RQ1: How do parents and children co-play modern digital games together?
- RQ2: What are the positive impacts of co-playing modern digital games together on parent-child relationships?

Our contributions to the HCI and CHI PLAY community are two-fold. First, we provide empirical evidence on the social dynamics of how parents and children conduct favorable co-play in a gaming context, which adds to the growing literature on technology-mediated family relationships by focusing on a unique and understudied context. Second, we extend HCI and CHI PLAY research on technology co-use by shedding light on how gaming technology can be used by families and its potential positive impacts on one of the most essential domestic relationships (i.e., parent-child relationships). Based on these findings, we also offer suggestions for designing future games to better support parent-child relationships.

2 RELATED WORK

A significant body of research in HCI has explored the role of technology in family relationships, and thus the importance of accounting for these interactions in design [8, 11, 18, 21, 27, 37, 41, 43, 48, 57, 63, 67, 68]. In this paper, we aim at contributing to and expanding this body of work by investigating interaction dynamics between parents and their children through co-playing modern digital games. In this section we outline previous research pertaining to technology co-use and mediated parent-child relationships as well as the role of modern digital games in family relationships.

2.1 Technology Co-Use and Mediated Parent-Child Relationships

Parents often use strategies to mitigate their concerns regarding technology. Based on well-established parental mediation theory, these strategies often fall under the categories of *active mediation* (parents taking an active role in research and engaging in conversations with their children regarding technology), *restrictive mediation* (establishing rules, limits, or guidelines for technology use), and *co-use* (engaging in technology use together) [20, 53, 62]. Recent research has suggested that these three categories are insufficient in fully capturing the mediation activities that parents use to address the complexities of the modern media landscape. For instance, research on parent-teenager dyads revealed that parents often use mediation processes labeled as *gatekeeping* (regulating digital game exposure), *discursive* (parent-child discussions about digital games), *investigative* (parent information-seeking activities), and *diversionary* (parents actively directing children away from digital games) [39]. Importantly, this new framework augments and does not dismantle the previous "restrictive, active, and co-use" framework [39].

Co-use, or *co-playing* [53], persists as an important theoretical lens to understand the complicated social dynamics involved in technology-mediated family relationships [39]. For example, parents, who are often concerned with negative outcomes of child technology use, show great interest regarding how their children interact with technology [31, 36, 65]. Thus, co-use, or co-playing, becomes a crucial strategy to mitigate their concerns regarding technology by actively interacting or engaging with the technology alongside their children.

One way in which co-use has been described is through the lens of "hanging out" where people can engage with technology as a social experience [38]. In this form of co-use, the emphasis is placed on communication, bonding, and spending time with one another rather than on the media form itself. For instance, previous work has shown that long-distance families are able to promote "togetherness" and support their social relationships by augmenting talking with an activity [38] such as shared book reading and lightweight games [26].

Another way to understand co-use is through the conceptualization of joint media engagement (JME). JME refers to "the spontaneous and designed experiences of people using media together" [58]. One reason why JME benefits families lies in its ability to promote learning [30, 59]. From an educational standpoint, parents can scaffold experiences and encounters specific to their child and apply situations to future contexts [58]. Importantly, JME is not limited to educational contexts but concerns any media that is valued by children [59], which has proved to promote conversations and relationships between parents and children [26]. This contrast between JME and "hanging out" has also been articulated by other researchers who emphasized the importance of an interdisciplinary approach to understanding how families co-use technology including different frameworks which view digital games as (a) digital media, (b) play, or (c) a family routine [30].

The concept of technology co-use or co-play has also informed HCI research on technology use by families [8, 57]. For instance, research on Pokémon Go, an augmented reality mobile game, revealed that this form of co-play led to family bonding experiences [57]. Studies on the co-use of reading technologies also highlighted how family co-reading can create relational intimate experiences [63]. In addition, other research has shown the importance of joint engagement in the design of technology for children [52]. Especially, a body of research has pointed to the negative or absent parent-child interactions when technology is not co-used by families. For example, families have described their attitudes toward mobile phone use at the table when used separately [51]. A study also revealed that parents often withdraw to technology when facing challenging child behavior [48]. Since parents often use screens to facilitate parent independent activities, turning off screens used by children without co-use transitions can often be a painful experience [36].

In summary, technology co-use has been considered beneficial for parent-child interaction [59]. However, most previous studies often tend to focus on certain technology co-use contexts such as eBooks and television [21], while how parents and children may conduct and experience technology together in other media contexts is less known. For example, digital gaming has emerged as one of the key aspects of modern family lives. Yet how exactly parents and children co-play digital games in their relationships is understudied. Therefore, we argue that it is important and valuable for the HCI and CHI PLAY community to further investigate technology co-use in modern parent-child relationships in the context of digital gaming. Understanding how parents and children co-play together and the impact of co-play on their relationships will not only inform design decisions to better afford positive and emotionally satisfying parent-child interactions, but also can inform the design and development of more family-friendly digital games in the future. We therefore introduce modern digital games and their potential for mediating, supporting, and promoting family relationships in the next section.

2.2 Modern Digital Games and Family Relationships

Digital games, as an umbrella term, refers to interactive electronic media and encompasses computer games, video games, mobile games, and online games [42, 60]. Many modern digital games provide ways in which to engage with other players through co-located or online settings [16]. Further, modern digital games elicit a myriad of emotions and experiences from players due to the great variety in both game genres and game players [55].

Therefore, recent research has increasingly shed light on how digital games are played within families and how this play might affect family relationships. For instance, initial research in this field suggested that such influences were primarily negative because parents and children would monopolize the communal space at the exclusion of the other in order to play digital games [6, 17]. Early research also suggested that a digital divide or generational gap was present between children and parents [5], which affected *how* different generations played with one another. Children would use the divide to control the playtime while parents and grandparents feigned ignorance to encourage playtime [5].

However, more recent research reports diverse findings and shows that digital games can positively affect family relationships by 1) reinforcing family bonds, 2) enhancing reciprocal learning, 3) increasing understanding of the other generation, and 4) reducing social anxiety [22, 24, 71]. For example, research has indicated that modern digital games can assist in improving inter-generational perceptions [19] and promote positive interaction outcomes [56]. Family members can also use social networking games [13] and mobile augmented reality games such as Pokémon Go [57] to support their connections with each other. In particular, social networking games have been found to "provide common conversational topics... and enrich family time" for local families while emphasizing the importance of using virtual spaces for remote families [66]. Further, console gaming is sometimes seen as a meeting place for families to spend time together [64]. Though these findings are of interest, it is important to note that parents and children co-playing digital games together "is difficult to execute and hardly practiced" [39].

These diverse findings on the role of digital gaming in modern family relationships as well as parent hesitancy to co-play digital games motivate us to further investigate parent-child dynamics during co-play for those families with positive co-play experiences as well as the impacts of co-pay on their relationships. As technology continues to evolve, the way in which families co-play modern digital games also changes overtime. These interactions are also changing as more and more parents as well as their now-adult children have grown up with an understanding of digital games from their childhood [14]. Understanding these modern interactions will lead to insights regarding design implications for the next generation of games and play. Therefore, in this paper we focus on

families with favorable co-play experiences to explore 1) how exactly co-playing digital games is conducted and experienced in parent-child interaction (RQ1); and 2) the potential positive impacts on parent-child relationships from co-playing modern digital games (RQ2).

3 METHODOLOGY

3.1 Data Collection

To better understand how parents and children with favorable family co-play experiences play modern digital games together and how such co-play affects their relationship and interaction dynamics, we recruited adults who had played modern digital games with their parents and/or children for interviews. In other words, our sample included both parents currently playing digital games with their children and adults who still play digital games with their parents into adulthood. We consider it useful to study adults' co-play experiences with their parents because it provides an understudied perspective regarding how certain parent-child relationships can be supported by digital games into adulthood. Thus, it should be noted that in this study, we still refer to adult participants as "child" if they were the "child" in a parent-child relationship.

It is well researched that parents often use social media sites such as Reddit and Facebook to find advice and support [7, 9, 32, 50]. Thus, we searched Reddit and Facebook with keywords related to our topic such as *family digital games, family gaming, gaming moms, gaming dads, and parent video games* to find relevant groups/Subreddits. If we gained permission from a Facebook group, we would make a recruitment post. Also, if the Subreddit (a sub community within Reddit), did not have rules against posting, we would post our recruitment message there as well. Everyone who responded to our messages and agreed to participate was interviewed. In addition, a snowball sampling was used to recruit participants by asking interviewees if they knew other parents or adult children who had co-play experiences with their children/parents. In total, 20 semi-structured in-depth interviews were conducted through voice chat on Discord, Skype, Facebook Messenger, or WhatsApp from March to April in 2020. Due to the nature of recruitment, we did not balance for gender (see more below), age of children, games played, or devices used. As such, chance resulted in a heavier weighting of male parents, children between the ages of 5-12, and mostly console or PC experience.

In each interview, the participant was asked a series of 26 predefined questions. Questions included demographic information such as their age and the age of the parent(s) or child(ren) whom they played with. We also asked questions about how they played together (e.g., *How frequent do you play together? What do the interactions look like when you play together? What do you like/dislike about playing together?*) and how playing modern digital games together affected their relationship and interactions (e.g., *How does the game overflow offline? What impacts are seen outside of the game because of gaming? How is your relationship with your child/parent positively/negatively affected?*).

Among the 20 participants, 5 are female and 15 are male. Though this sample is not gender balanced, it is a result of the self-selecting nature of this study. Efforts were made to recruit from gender neutral groups (e.g., parent video game groups) and equally from gendered groups (e.g., mom and dad groups). 15 of the participants shared their experiences as a parent while 4 participants offered their experiences playing with their parents. One participant shared both perspectives. Table 1 shows demographic information of the participants as well as additional details including typical games that they played with their child or parent and what devices were typically used in co-play. Most participants described using either a console or PC for co-play. Though many participants mentioned mobile gaming in passing, alluding to a child playing mobile games on their own, only one participant (P13) mentioned using mobile devices for co-play. It should be noted that this does not mean that parents do not commonly co-play mobile games with their children.

Table 1. Demographic information of interviewees

ID	*Parent/Child	Gender	Parent Age	Child Age(s)	Location	**Co-Play Frequency	Example Game(s) Played Together	Device(s) Used
P1	Parent	Female	37	5,8	Germany	1/Week	Mario Party, Mario Kart, Mario Brothers, Kirby, Scooby Doo	Wii, Wii U
P2	Parent	Male	45	7,11	USA	1/Week	Overcooked, Fortnite	PS4
P3	Child	Male	40s	23	USA	1/Week	Rocket League	Various consoles, PC
P4	Parent	Female	34	7	USA	1/Month	Mario, Mario Kart, Yoshi	Wii
P5	Parent	Male	40	4,9	USA	1/Week	Skylanders, Disney Infinity, Shadows of Mordor	Various consoles
P6	Child	Female	40s	22	USA	1/Week	Super Smash Bros, Minecraft	Various consoles, PC
P7	Parent	Male	36	6,8	USA	1/Week	Mario Kart, Breath of the Wild, Mario Odyssey	Switch
P8	Both	Male	33	2	USA	1/Week	Super Smash Bros, Warcraft 2, Diablo	Various consoles, PC
P9	Parent	Male	39	11,12	USA	3/Week	Mario Kart, Super Smash Bros, Mario Party, Jackbox, WWE, Gang Beasts	PS4, Switch
P10	Parent	Female	26	3,5	USA	3/Week	Mario, Zelda, Minecraft, Spyro, Animal Crossing	Switch
P11	Parent	Female	49	8,16	USA	7/Week	Call of Duty, PUBG, Animal Crossing	Switch, XBox One
P12	Parent	Male	31	8,5	USA	2/Week	Mario, Luigi Mansion, Fortnite, Lego games	PS4, Switch
P13	Parent	Male	33	8	USA	7/Week	Mario Party, Minecraft, Mario Kart, Roblox, Fortnite, Zelda, Battlefront	PS4, Switch, iPad
P14	Parent	Male	29	5	England	1/Week	Mario Kart, Pokemon, Lego Marvel Avengers	PS4, Switch
P15	Child	Male	50s	28	USA	2/Month	Super Smash Bros, Mario Kart, Halo, Medal of Honor	Switch, XBox
P16	Child	Male	69	35	USA	3/Week	Call of Duty, PUBG, Goldeneye, Mario Kart, Doom, Duke Nukem, Unreal Tournament	PC, N64, Super Nintendo
P17	Parent	Male	36	13	USA	3/Week	Rainbow 6 Siege, Overwatch, Minecraft	PS4, PC
P18	Parent	Male	38	10,14	England	1/Week	Call of Duty, Fifa, Fortnite	XBox One
P19	Parent	Male	33	6,2	USA	7/Week	Animal Crossing, Star Wars, Mario Odyssey, Mario Maker, Super Smash Bros, Mario Kart, Untitled Goose Game	Switch
P20	Parent	Male	47	23, 19, 15, 13	USA	3/Week	Animal Crossing, Mario, Rocket League	N64, XBox 360, Playstations, Switch

*"Child" refers to adult participants as long as they were "child" in a parent-child relationship.
**Co-play frequency refers to how many play sessions the parent/child have together (i.e., 3/Week would indicate that they have approximately 3 play sessions together in a typical week)

Rather, it provides an overall image of our sample regarding the primary devices they used for parent-child digital gaming co-play experiences.

3.2 Data Analysis

An in-depth qualitative analysis based on grounded theory [34] was used to better understand how playing modern digital games together affects parent/child relationships. Our analytical procedures focused on eventually yielding concepts and themes (recurrent topics or meanings that represent a phenomena) rather than agreement – because even if coders agreed on codes, they may interpret the meaning of those codes differently [49]. Therefore, we did not seek inter-rater reliability in our analysis but endeavored to identify recurring themes of interest, detect relationships among them, and organize them into clusters of more complex and broader themes.

Specifically, our data analysis included the following steps: 1) the first author asked open-ended questions so that participants could reflect and articulate their personal experiences; 2) the first author read through each participant's narratives to gain a general understanding for how parents and children play together and how it affects the relationship; 3) the first author identified a preliminary set of themes that emerged from the narratives; 4) the first author extracted quotes based on the determined themes and refined the themes; 5) all authors discussed the themes further in order to refine themes and sub-themes to establish a thorough representation of the findings with regard to each research question.

4 FINDINGS

In this section, we present our findings as two parts: 1) how parents and children with favorable co-play experiences conduct co-playing modern digital games with one another (RQ1); and 2) potential positive impacts of co-playing modern digital games together on the parent-child relationship for such families (RQ2).

4.1 Re-examining Parent-Child Modern Digital Game Interactions

While investigating RQ1, a myriad of parent-child dynamics and playstyles were described based on family preferences and personalities. In particular, five main themes emerged regarding how parents and children conducted and experienced co-play, including how they set up the physical co-play space, their management of both collaboration and competition dynamics in co-play, their approach for leadership in playtime, the facilitated conversations/interactions both in and out of gameplay, and the emerging spectating experiences.

4.1.1 Setting Up the Physical Co-play Space. Before addressing the ways in which parents and children interact with one another during play, it is important to note that how modern families set up the physical space for co-playing digital games sometimes diverges from what it looked like previously, for example ten years ago. Many families, especially those with young children, still play on one console in what is called *couch co-op*. However, there is anecdotal evidence of a decline in couch co-op games in favor of games played online as game studios prefer to reserve graphics processing for a single perspective [40]. Of those interviewed in this study, 17 participants reported recent experiences of playing on the same console in the same room, 7 reported experiences playing in the same room on different consoles or PCs, 3 reported playing with each other online in the same house, and 3 reported playing with each other online from different locations of residence. Importantly, some participants noted having recent experience playing modern digital games in more than one of these categories. Some participants noted that the ideal setting was having everyone in the same room on the same console. P2 shared an example of playing *Overcooked* with his two children on a PS4:

> *Well, since when we're playing [on] one screen, we are kind of like all sitting together. You know, so we have the popcorn there, so we are close by. But also when we play on separate screens, we are you know, this is not a big room. So we're still together. .. So I think for family, I mean, one screen, we like it a lot.* (P2, Parent, Male, Age 45)

P2 showed a preference for playing on one screen together compared to playing on multiple screens. Since playing on one screen resulted in closer physical proximity, P2 appreciated the resulting intimacy and perceived this intimacy to be beneficial for the family relationship. However, as with 5 other participants, P2 felt that adapting to multiple consoles in the same room seemed to offer an acceptable solution. The family was still able to see and hear one another while in the same room even if they are not as physically close or playing on the same screen. Meanwhile other families found ways to play together from different rooms by using voice chat or other methods

for communication. P11 described playing games like *PUBG* and *Call of Duty* on different XBox consoles:

> *We use our phones to communicate, where we'll leave the speakerphone on. And then we'll be in different rooms playing and that tends to be the best way for us to do it so far... So we use that instead of using Discord or any headphones... So mostly we play in other rooms.* (P11, Parent, Female, Age 49)

Though face-to-face interaction was missing, P11 described how her family can accomplish co-play in separate rooms. Similar to two other participants, P11 used an online connection and multiple consoles in order to co-play with her children. They also used phones rather than in-app or alternate app (i.e., Discord) features to facilitate communication.

Finally, it is important to note that some parents took advantage of online games to play with their adult children who no longer lived in the same house. An example of such includes P16's description of playing *Call of Duty* on separate PCs:

> *I think now since voice-over internet is so prevalent I don't think it changes things that much simply because we can still talk to each other. If you go back to like the Quake 2 days when there was no voice over internet and the only way to communicate with somebody was over like typing to them. I think that would have had like a negative affect on it.* (P16, Child, Male, Age 35)

One thing to note from P16's quote is the importance in the change in technology. As internet voice communication has become so common, it is much easier for family and friends to communicate effortlessly with one another online. Another important takeaway from this quote is that P16 is using modern digital games as a method to communicate with his parent who he might not otherwise get to talk with if they were not playing online together. This will be discussed further in later sections.

4.1.2 Managing Collaboration and Competition Dynamics in Co-Play. As parents described how they play modern digital games with their children, they often mentioned the competitive dynamic between players through playing. From these descriptions, a clear observation was that many parents did not go easy on their children through play. For example, P4 (Parent, Female, Age 34) revealed how she played games like *Mario Kart* and *Yoshi* with her child on the Wii:

> *We don't hold back - we play the same way I would with anybody else. And he loves it.*

P4, whose child was 7, described playing with her son as playing with a peer. Further, her perception was that her son appreciated this approach and enjoyed this form of gameplay dynamic. This sentiment was also shared by P1 (Parent, Female, Age 37) who discussed playing *Mario Kart* with her child on Wii U:

> *Every now and then he does get mad at me for beating him. But then I have to tell him, I'm like "if I took it easy on you and you won every time then those times that you did actually beat me wouldn't mean anything". Because he still gets frustrated, but whatever. I tell him, "Hey, this wouldn't mean anything if I let you win all the time." It kind of makes it better.*

According to P1, there was an understanding that the child might (and has) become frustrated by consistently losing to the adult. However, there was an important dialogue and a learning moment that came from the parent telling the child why they are not going easy on them. This learning moment was also described in this quote by P14 who discussed playing *Mario Kart* with his 5 year old on the Switch:

> *Obviously, the adult is going to win most of the time. I mean, it's just going to happen until the kids a bit older, and then they got the faster reflexes and kids are gonna start winning. But until that happens, I think it's good because you can sort of like, you know, show that losing is not bad. It's the trying to win and improving at the same time.* (P14, Parent, Male, Age 29)

Similar to P1, P14 described how parents will naturally be better than children until they reach a certain age. However, playing together and this imbalanced dynamic gave P14 an opportunity to discuss concepts (e.g., sportsmanship and learning through losing) which P14 perceived to be valuable and applicable to contexts outside of games. Other participants confirmed this dynamic based on their experiences playing with their parent:

> *He would consistently beat me. Like, I know that sounds weird, but he's the only one who would really be able to consistently beat me usually, which frustrated me a little bit. but also it encouraged me to try and do better. So that's really what I like.* (P8, Both, Male, Age 33)

> *Growing up, he was always the one who was better and I was trying to beat him and it still feels like even with new games where we came into it at the same time that sometimes I still have a hard time beating him at games that should be more my speed.* (P3, Child, Male, Age 23)

Both P8 (*Super Smash Bros* among other games) and P3 (*Rocket League* among other games) described playing with their parents and how their parent would typically beat them. The main takeaway from these quotes is that many parents today, perhaps in contrast to previous generations, show a tendency to not go easy on their children while playing digital games together. This dynamic importantly affects what games parents choose or even how the family plays a particular game. For some, the parent and child lean into the competitive nature as a source of enjoyment:

> *He always wants to play against me, because it's always, "Hey, Dad, I'm going to show you how good I've gotten. I'm going to show you how I can beat you now."* (P9, Parent, Male, Age 39)

For this family, who enjoyed playing games like *Mario Kart* and *Super Smash Bros* among others on the Switch, the son appreciated the competitive nature of their relationship and found value and enjoyment in trying to show the father his improvement. In contrast, other parents played on the same team:

> *Now we're almost always on the same team. He knows dad's going to win if he versus so, he likes to be on the winning team.* (P13, Parent, Male, Age 33)

> *I'll try to win pretty hard... They are not as proficient as me, and they see that if I'm on their team, they will win, I think is the brutal answer. And I think that as they get more skill, they'll be more willing to compete against me.* (P7, Parent, Male, Age 36)

> *We're usually on the same team. So, especially the younger one likes that. At the very end of it, whenever you see the trophy or whatever, he likes that we're all on the same team. We're all, you know winning because he's in 12th every time.* (P1, Parent, Female, Age 37)

All three participants are parents of children who are of ages 8 and younger. What's interesting is that the games that they were playing are competitive in nature where players are often competing against one another (e.g., *Mario Kart*). However, either by using a game mechanic or the way they phrased the results, they were able to approach the competition in a way that aggregated their scores so that the family perceived the results as cooperative. For these parents, they perceived that their children enjoyed the experience more since their children were able to win while the parents could still try their best. Alternatively, other parents used their understanding of the competitive

mismatch with their child to inform their decision of which games to play. P17 (Parent, Male, Age 36) compared different game titles:

> *I've always lived by the idea that I'm not going to hold off and I'm not going to back off…*
> *I will tell them if you want to win, you have to earn it. So I try to make sure I steer clear*
> *of overly competitive games that like, for example, I excel at battle royale games where*
> *he wouldn't. He's more of a thinking person. So I wouldn't invite him into like League of*
> *Legends, that I would play alone, whereas with him I could get into Overwatch where he*
> *would have a little bit of an edge.*

P17 described his own strategy of being selective toward games where his son might perform better than him in. In this way the father can still try his best while still creating an enjoyable experience for the son. This selection is perhaps more relevant to modern parents who are more likely to bring digital game expertise to the co-play experience than previous generations of parents. In summary, a clear theme from these quotes is that some parents today do not go easy on their children while playing modern digital games. Though their motives may vary, parents found more meaning in the playtime by playing in this way. Further, many parents utilized strategies based on the age of their children and the temperaments of the family members in order to leverage an enjoyable experience while still not going easy.

4.1.3 Fluid Leadership Dynamic in Playtime. Similar to parents describing their willingness to play competitively, our data revealed that the child did not always lead playtime. Here we refer to *the leader* as the person who is guiding the play through objective selection, teamwork leadership (e.g., calling the shots), or offering strategy. Instead of only the child providing this leadership, a more fluid dynamic for leadership emerged, as P2 (Parent, Male, Age 45) and P3 (Child, Male, Age 23) explained:

> *Yeah. There's no leader - everybody is the leader. One level maybe I'm the leader. And the*
> *next level somebody takes it. We work it out.* (P2)

> *It's usually just one of us says, "I'm going to do something" and the other one says, "Okay,*
> *I'll try to help." But it's usually just whenever someone gets an idea, or has an action they*
> *want to go do, the other one just kind of tries to support it how they can.* (P3)

Both P2 (*Overcooked* and *Fortnite* on PS4) and P3 (*Rocket League* on console) described a playtime dynamic where parent and child were on equal footing through the collaboration process. The person making the decision was defined by who had a better understanding of the situation rather that who the parent or child was in the relationship. P2 described this dynamic from the parent's perspective while P3 described the same dynamic from the child's viewpoint. A similar dynamic was also described in the following quote about *Fortnite* on XBox One:

> *If we use Fortnite as an example, there are certain strategies that I like to implement*
> *because I know that it will work. But then once I've implemented those, I'm happy to*
> *take a backseat, and kind of let them lead. And because, to be fair, on something like*
> *Fortnite both the lads are probably better players than what I am. Whereas I've got the*
> *more strategical knowledge to take on what's in front of us. So it's a bit of both.* (P18,
> Parent, Male, Age 38)

P18 described a leadership dynamic highly dependent on who in the family was better at what. P18 perceived that he was the better strategist and his sons were more skilled at fighting. This understanding dictated the dynamic flow of leadership between himself and his sons. For other families, leadership might center around the child as a playful way to interact with one another:

> *We're playing Star Wars with him. You know, he usually likes to play the clone team, so*
> *do I. And he'll actually, you know, from watching the Clone Wars series, he'll either take*

the role of a commander or call me commander... He likes to be the leader. So I follow him and just kind of clean up, so I let him go. (P13, Parent, Male, Age 33)

P13 described a fun experience playing *Battlefront* on the PS4 that he and his son were able to have by play acting when the child took the lead. Though importantly, P13 mentioned that both he and his son took the leadership role from time to time. For some families, this flow of leadership may depend on the age of the child and the type of game that they are playing:

Yeah, so I'll usually take the lead on if it's more of a action style game. But if it's more of a puzzle style game, I sort of like drop back and just to see how she handles that sort of situation. So when she's posed those questions or she's encountered these issues, you know, how does she react? (P14, Parent, Male, Age 29)

In this quote, P14 described how he will let his 5-year-old child take the lead in puzzle-type games as he found values in watching her work out the problem and determine the solution. This interaction allowed the child to experience a learning experience while it also provided the parent insight into the child's thinking process or cognitive development.

Therefore, an important takeaway from our data is the fluid leadership dynamic between parents and children during digital game playtime. There was no evidence of a power imbalance found in these interviews. Parents and children often found themselves on equal footing in understanding game mechanics and leading playtime in modern digital games.

4.1.4 Facilitated Conversations/Interactions both In and Out of Gameplay. Whether through on-line voice chat or talking in the same room, modern digital games have the ability to promote conversations and interactions in a myriad of ways. Before detailing all the ways in which digital games encourage such interactions, it is important to note that parents repeatedly emphasized that intention with modern digital games is important. This sentiment was described in the following:

A lot of parents don't understand. They think that the kids are sitting in front of a TV screen... and they are getting you know, addicted to - and you see these Fortnite kids and whatnot, you see the videos on YouTube. And a lot of times taking a more proactive approach - instead of using it as an electronic babysitter, use it as a medium of communication. (P17, Parent, Male, Age 36)

P17, who played games like *Overwatch* and *Minecraft* with his 13 year old child, was cognizant of the perception of children playing digital games in the media. However, P17 perceived that being proactive and intentional can allow parents to use modern digital games to support communication and their relationship with their children. Some parents/children discussed how the type of game afforded different interactions during co-play. An example of this is how modern digital games can define and constrain interactions:

A lot like when he wants me to play like LEGOs or something with him, he tells me how to play and tells me if I'm doing it right or wrong. When we're playing like the characters on the Wii for Mario - he can't tell me what to do. We're both interactively playing so we're interacting more... we both are playing equally... It's just fun to play and like, play in like a way where he's not critiquing me like how we play. (P4, Parent, Female, Age 34)

P4 described how the interactivity can be constrained in digital games such as *Mario* games on the Wii. This was perceived as a positive in this scenario as the child was less likely to dictate the play and they were able to play on the same level. Interestingly, some modern digital games offer the opposite effect:

The video games that we would play together often didn't have very strict or set rules... It's a lot easier for it to be akin to essentially you being yourself, but just doing silly things like out in the woods, you know... Where you're just like, oh, I found this cool thing. And

then you just like mess with it for like a while... Whereas with board games in our family and growing up, you had to follow the rules of the board game. So I think in a way, video games afford a lot more freedom than a board game. (P6, Child, Female, Age 22)

On the other end of the spectrum, P6 described how open-world games such as *Minecraft* can encourage richer and more natural interactions by allowing players to be themselves while playing. The described difference in interactions between P6 and P4 shows a strength in modern digital games in that families can choose games that support desirable interactions for their family. A common interaction mentioned by parents was that of mutual communication during play:

We're typically in our living room. We're laughing we're talking back and forth, we there, I encourage a little bit of fun and light trash talking... But, I mean, one of the things, there's a lot of communication, I would say, because, especially like in a game when we're playing together, you know, we're "hey, let's try this" or "let's go over here", "hey, I need you over here". So it definitely opens up communication in a way that other activities don't. (P9, Parent, Male, Age 39)

In this quote, P9 (who described games such as *Super Smash Bros*, *WWE*, and *Gang Beasts* on PS4 and Switch) emphasized that one of the affordances of modern digital games is how much collaborative communication is required. He appreciated how much dialogue occurred while playing digital games with his son that might not happen as much in other activities. Since digital games are often collaborative and interactive, this type of communication is perhaps common. This collaborative talking was also described in the following quote about *Fortnite* on XBox One:

We are constantly communicating with each other. What I have encouraged them to do, we sort of talk through what they're doing to each other. [In Fortnite] we are constantly communicating with what we pick up, whether we get in any engagement with other players, what we need you know... And hopefully that kind of thing, will help them out in later life and stuff as well. (P18, Parent, Male, Age 38)

P18's quote shows some similarities to P9's description in emphasizing how much back and forth conversation between parent and child regarding gameplay strategies and engagement in digital games occurs. Further, P18 indicated that such constant conversation enabled by co-playing games could potentially help out his sons later in life through gaining experience with collaborative conversations. Importantly, participants also discussed how they could talk about other topics with their parent/child while playing digital games:

And we do talk about, you know, other things while we're playing games too. So it's kind of nice to have that time with him and you know, time that I might not have otherwise if we weren't playing games. (P13, Parent, Male, Age 33)

As perceived by P13 (who played games such as *Mario Party* and *Mario Kart* on the Switch, *Minecraft* and *Fortnite* on the PS4, and *Roblox* on the iPad), modern digital games allows for parents to discuss with their children a wide range of topics beyond gaming in a relaxing and pleasant environment. And since playing digital games is "time they might not have otherwise", these are conversations that might not occur had they not been playing digital games together. A similar awareness was described in the following:

I just sort of set [the phone] down next to me, and we just talk back and forth. I actually feel like we get to talk to him more that way. Sometimes, you know, I mean it. I don't know how to explain it. It just changes the dynamic in a way almost because we're not in the same room. He's more open to talk about stuff. If that makes sense. (P11, Parent, Female, Age 49)

P11, who at times played digital games with her teenage child in separate rooms such as *Call of Duty* and *PUBG* on XBox One, discussed how talking while playing digital games in this manner opened communication pathways. As they were talking over the phone while playing, P11 felt that her child was more willing to talk about things with her that the child might not be willing to talk about otherwise in person.

Though many parents discussed how much they were able to have conversations with their children while playing modern digital games, interestingly, digital games also encourage such interaction and conversations outside of play:

> *Children want to talk about gaming, after the game is off. They want to be able to reminisce, they want to be able to tell you the war stories about when they're by themselves.* (P17, Parent, Male, Age 36)

P17 noted that his child often wanted to talk about the game outside of playing since the child was so passionate about digital games. Since P17 was involved in the games (e.g., *Rainbow 6 Siege*, *Overwatch*, and *Minecraft*), his child felt comfortable discussing and recollecting about his recent digital game experiences. P18 (Parent, Male, Age 38), who plays games such as *Call of Duty*, *Fifa*, and *Fortnite* on XBox One, described a similar experience:

> *[Digital games] give us that common sort of level to talk about things you know what I mean... There aren't too many things I feel that we can actually sit and talk about, but gaming is definitely one of them and it helps us communicate.*

P18 as a parent described how hard it was to find common topics to talk about with his sons. According to him, co-playing digital games allowed for common ground with his sons and facilitated his connection and interaction with them. As seen in the next quote, digital games seem to have an affordance for encouraging these conversations outside of play:

> *I feel like there's more to talk about after the fact when you're playing video games. Like, when you play a board game, you don't have stuff really to talk about after it's over. Like, I know when we play Animal Crossing, when I'm done this afternoon [my child is] gonna know if I was able to find yams [etc.] which that conversation will probably last for the rest of the day, where we talk about little things that we're doing or whatever. Unlike when we play Monopoly. You're there for three hours and you're done. And we talked, yeah during - but afterwards you're not really talking as... there's nothing to carry over. Like with Fortnite, there are seasons and patches and things that are coming, things you're looking forward to, you know, it's more ongoing.* (P11, Parent, Female, Age 49)

The ability to talk about games outside of play, though not solely reserved to digital games as a design feature, is certainly an affordance of modern digital games as described by P11 (games such as *Call of Duty*, *PUBG*, and *Animal Crossing*). Since such games are updating fairly regularly and are designed to afford various collaborative activities in gameplay, they often trigger interests, passion, and shared experiences that could be discussed even after the game is over. Importantly, parents can use these conversations to pivot in other directions:

> *There's a lot of times we'll get into a conversation about a game and it ends up being, you know, something that goes deeper. And for each household, like, you learn your kids and you learn their boundaries... and you're able to pull those conversations away to something that is different.* (P9, Parent, Male, Age 39)

As P9 mentioned, since children like to talk about digital games, parents can use these conversation to discuss other things that the parent feels like they need to discuss with the child. From our data, there seems to be evidence that digital games can support conversations both during the

game and after the game is over, which could promote parent-child interaction both in and out of gaming.

4.1.5 Finding Value in Spectating Single-Player Games. Interestingly, many participants also described spectating family members playing single-player games or having a family member spectate them as important co-use experiences. One way this occurs is through helping the child with levels:

> *If he needs help beating the level, I can kind of teach him how to beat the level, what he's missing... and then give the control back to him. So it's kind of a shared time playing the same game. And we're talking about the game and other things while it's going on. So both of our attention isn't completely on the game. That's kind of neat.* (P13, Parent, Male, Age 33)

In this quote, P13 described the benefits of watching his child play a single-player game, in this case *Zelda* on the Switch. Not only could he help his child beat the game, but also there was an opportunity to have conversations since less attention was given to the game. Another parent, P2 (Male, Age 45), described a child's desire to be spectated in a game like *Fortnite* on PS4:

> *My son is always "dad I want to play. But can you come down with me, I don't want to be there by myself." So I usually sit by him next to him.*

P2 noted how his child found value in their quality time even if only one of them was playing. Similar to a child wanting a parent to spectate them playing a sport, this child found value in the parent spectating his digital game play. In this way the adventure or game experience can be discussed during or after play as a shared experience. Similarly, the following multi-child families found value in spectating single-player games together:

> *When we're playing Breath of the Wild, then it is common for us to basically take turns... And for the most part, it's like, "hey, notice this, did you see that" or "pick up this" or "try this weapon", or mostly just shouts of encouragement along the way where we're just enjoying the scenery of Breath of Wild.* (P7, Parent, Male, Age 36)

> *I've actually found Breath of the Wild is really, really good for conversation. All three of my kids love to watch it because it's absolutely beautiful. And they like to give their input. It's so open world that you can go and do anything at any given time. And it just stimulates a lot of conversation about what we're going to go next.* (P10, Parent, Female, Age 26)

Both of these parents described the same single-player game, *Breath of the Wild* on Switch. They both found the benefit of their families enjoying a shared storyline experience through a beautifully made world. Also, they found value in cooperatively playing a single-player game by providing encouragement or advice to the "driver" holding the controller. P6 (Child, Female, Age 22) also described such experiences in *Metroid Prime* on Nintendo:

> *One of my earlier memories, as far as far as games go, is watching my dad play the Metroid Prime game on the Nintendo. And I just really enjoyed doing that... I feel like it's a way of getting to experience the game with someone similar to like someone reading you a book. It's more like I'm sharing this with you.*

According to P6, not only do children enjoy being spectated, they also might find meaning in spectating their parents if presented in the right way with appropriate intentions. Thus, according to our data, parents and children sometimes enjoy interacting with one another by spectating (or being spectated) while playing digital games. This interaction is also perceived by some parents and children to have relational value as parents and children gain shared experiences and are able to collaborate and communicate through this method of play.

4.2 Potential Positive Impacts of Co-Play on Parent-Child Relationships

As described in the previous section, modern digital games can be co-played and experienced in various ways in parent-child relationships. It is also important to understand how these activities and experiences might positively impact the actual parent-child relationship (RQ2). In this section, we especially highlight three main positive impacts on parent-child relationships through co-playing digital games: augmenting parent-child relationship with friendship, promoting close connection by removing physical and emotional barriers, and facilitating quality time.

4.2.1 Augmenting the Relationship with Friendship. One significant impact of co-playing digital games in modern families can be augmenting the parent-child relationship with friendship. The following quote from a parent outlines how this might happen:

> *I mean, man, you have a certain kind of relationship with people who you share a hobby in common... I mean, most of your friends are people who you have things in common with, things that you like doing stuff together with. That's not necessarily true between family members, because you know, family members are a unit that comes together not because they found something, but because they are a family. But by inserting like a hobby such as video games into the relationship between me and my son, it's created that element of friendship, of camaraderie that you might not necessarily get... I think video games happens to be a pretty good medium for making that happen... Sounds weird to say that you're friends with a six-year-old. But that is kind of what happens you know as you get to game together with him.* (P19, Parent, Male, Age 33)

P19, who plays numerous Switch games with his child, found that family relationships, especially those between parents and children, can be enhanced through friendship. He also noted that friendship bonds often occur through a common interest. Though that common interest did not have to be digital games, P19 found that this interactive medium worked well for creating a friendship with his child. This sentiment was also echoed by the following two participants reflecting on the relationship with their parents:

> *So it kind of allowed us to have a bond beyond just father and son but almost like you would with a close friend who you've known for a long time and you know very well. I guess if I had to talk about gaming in terms of the general relationship I'd say it helps turn it for more than just a "you're my father and I'm the son" to a "you're someone I trust, a confidant, a friend and my father, someone I can enjoy spending time with."* (P3, Child, Male, Age 23)

> *I think it's definitely strengthened our relationship. I'm at the age now where I no longer see him as like a father figure. Like he's more of a friend now. So it's a lot of fun to have games with him.* (P16, Child, Male, Age 35)

Compared to P19, the parent perspective, P3 (who plays *Rocket League*) and P16 (who plays *Call of Duty*) confirm this parent-child friendship dynamic from the child's perspective. These complimenting viewpoints suggest that the perceived friendship in these interactions is reciprocated rather than idealized. Starting at the age of 5 (P3) and 4 (P16), these participants began playing digital games with their respective fathers at a young age. Through this shared hobby, P3 and P16 continue to play digital games with their fathers into adulthood as a means to maintain and strengthen their domestic friendship.

4.2.2 Promoting Close Connection by Removing Physical and Emotional Barriers. Parents also reflected on how modern digital games sometimes helped them connect with their children when

it would be difficult to connect otherwise. For some, digital games served as a bridge to connect adult children who no longer lived with their parents:

> *And now since he doesn't live at home, and we don't really have many opportunities to connect and communicate, it's kind of worked as a chance for us to conversate, communicate, catch up socially in each other's lives and at the same time at the period of relaxation, not just sitting and talking to each other, but interaction in play.* (P20, Parent, Male, Age 47)

As described by P20, digital games (in this case *Rocket League*) can help parents connect with their children when parents are physically separated from them. Not only did digital games allow P20 to have conversations and catch up, but they were able to interact and play with one another while physically separated.

Meanwhile, other parents discussed how modern digital games help them connect with children by helping them avoid the generational divide:

> *It helps me stay relevant to them... A lot of families, with the different generations, this huge chasm of things that they enjoy doing you know what I mean. My oldest lad for instance, he - we do struggle to get him out of his bedroom a lot. But obviously when comes out of his bedroom, he comes down for food, we can talk about and sort of what he's got up to. And he tells me about sort of what kind of games he's played and stuff like - actually to me, helps me stay relevant to to him and what's going on in his life.* (P18, Parent, Male, Age 38)

P18 found that digital games such as *Call of Duty*, *Fifa*, and *Fortnite* on XBox One allowed him to stay relevant and close to his son. Not only did digital games give them something to talk about, they helped P18 understand his son better and his interests. As previously mentioned, parents use these facilitated digital game conversations to discuss other topics important to the parents. Similarly, other parents found reconnecting with teenagers to be easier with digital games:

> *Yeah, but the video games have definitely been a bridge for us, especially with the teen. And like, any time, like if there's a big fight, or if he's just really being stubborn about anything, I noticed a huge increase in one - the amount of time that he wants to talk to us. He'll come back to the back room where a bedroom is and say, you know, and actually sit down and have conversations with us about the games that we're playing.* (P11, Parent, Female, Age 49)

P11, who described a recent fight with her teen, found that she and her son were able to reconnect the relationship with conversations about digital games including *Call of Duty*. As disagreements with family can often make conversations sensitive and difficult, digital games can serve as a bridge or common ground when difficult to connect otherwise. Similarly, P17 (Parent, Male, Age 36) described how digital games like *Overwatch* and *Minecraft* on PS4 had been used in his family to bridge the gap between him and his stepson:

> *Well, he's actually my stepson, and I've been around him for the past seven years. And so at the age of six, he was very much an introvert. He was very much reading books not being around anybody, and just kind of doing his own thing... And, you know, I mean, it was nice to see him as an introvert kind of come out of his shell and a lot of that stems with giving him the the ability to have some kind of, you know, say in things [in digital games].*

P17 mentioned trying to connect with his step-son. Coming in as an outsider to the family, it is often challenging for stepfathers to "develop a sense of group belonging and a father-like identity" [46]. Since developing this type of father-son relationship might be awkward and difficult

at first, digital games helped P17 connect and develop a relationship with his step-son by offering a common interest and a low-pressure environment that facilitated conversations and quality time.

It is important to note that bonding and forming a friendship over a hobby is not unique to the digital game context [15]. However, this opportunity for bonding might be overlooked by parents when the child's interest is digital games. With the stigmatization around digital games [35] and the research suggesting negative behaviors and habits associated with gameplay [29], parents might be hesitant to participate in gameplay with their child and show support for this activity. P17 (Parent, Male, Age 36) discussed the value of staying involved in the child's interests:

> I mean, you're going to have a lot of parents who just say "here's the newest game, go ahead. So that way I can finish worrying about bills and things like that." And children feel a portion of, they're not a part of the family structure because they're so disenfranchised. And then [digital games] become an escape. And that's when you get a lot of the problems. It's a rewarding thing to be able to have these games, have that communication, and it's it's big.

According to P17, if parents are not involved or interested in the child's hobby, in this case digital games, that hobby might turn into an escape mechanism for the child. Instead, P17 encouraged parents to stay involved in digital games and use it as a communication tool. P15 (Child, Male, Age 28) shared the child's perspective on this dynamic:

> [My father] having an interest in playing the game - it showed that he was interested in what I was doing. And he cared about me in that sense you know what I mean.

Here P15, who played games like *Halo* (XBox) and *Mario Kart* (Switch), described how much he valued his father's interest in his digital game hobby. Not only did playing together give them quality time, it showed the child in the relationship that the parent did care about them.

4.2.3 Improved Quality Time. The third major theme is how co-playing digital games can make it easier for some families to participate in quality time. Though families can participate in many other types of games and activities, one strength of modern digital games is how easy it is to gather and keep the family together for this activity. Digital games are able to create this ease through convenience and engagement. The convenient nature of digital games helps families gather in the first place:

> Yeah, the biggest one being that you can load up a video game play for 10 minutes and if you decide you're done, great, turn it off. Whereas the board game, probably spent 10 minutes getting it set up... and spend 15 minutes packing up after. ..The pace at which you can start stop and change and still get to play. (P5, Parent, Male, Age 40)

For a parent with more than one child, P5 found value in digital games (in this case *Skylanders* and *Disney Infinity*) since they are much easier to start and stop. This is especially valuable if children lose interest quickly. In this way, P5 was able to have quality time through digital games that the family might not have otherwise. Similar to the quick setup time for modern digital games, participants also mentioned how easy it is to learn a new digital game:

> I think it's sometimes easier to get people to play like a new video game than a new board game. Because it's just kind of like, okay, well hit the buttons, we'll figure it out. With a video game you can kind of screw around and figure out what you're doing. Because you kind of have that freedom, right?... You can't really do the same thing in a board game right? (P15, Child, Male, Age 28)

P15 described another impact of digital games. The very nature of modern digital games usually involves learning by experimenting while playing. This is often a much faster and enjoyable experience than someone trying to learn and explain the rules of a board game. In this way, digital

games can remove the barrier for adoption that other types of games might have. Another way that modern digital games offer convenience to families is through their diversity:

> *I think one of the nice parts [with] gaming is the variety. There's so many options, and so many different games. And so like we have, you know, six, seven board games, but we've played the six, seven board games, how many times versus you know, how many games are constantly coming out, you know, on an electronic version. And that we have access to at the touch of a button. So convenience has definitely been very helpful.* (P10, Parent, Female, Age 26)

There are a few conveniences touched on in this quote. First, P10 mentioned the variety of digital games. This is helpful with families of diverse interests as it makes it easier to find games that everyone can enjoy. Second, this diversity makes it easier to find and obtain a new digital game when the family tires of games they have already played. The third aspect P10 mentioned pertains to access. As digital games are shifting toward digital downloads, parents can quickly and conveniently access new content from their home. All of these affordances result in the potential for improved or increased quality time for the family.

Another way modern digital games might make quality time easier for families is through keeping everyone engaged. Participants often discussed the struggle of keeping their family engaged on a common activity with so many distractions and stimulations simultaneously occurring. For some, digital games were a way of keeping the family engaged once they were involved in quality time:

> *For me, it seemed to pull people's attention in better with video games over certain board games... But, you know, again, it was just a chance to interact. A chance to have that social aspect.* (P20, Parent, Male, Age 47)

For P20 (experience with games such as *Mario* on Switch and *Rocket League* on PS4), it seemed that the main benefit of digital games for relationships with children was the ability to interact. Though other mediums offer this same interaction, the engaging nature of modern digital games helps everyone keep their attention on the mutual activity. This engagement was perceived to assist with younger children as well for games like *Mario Kart* on the Wii:

> *They're just so engaged and like excited to be playing something like [digital games] versus physical pieces like you play on a board game. If he gets frustrated with the board game, he'll just want to go do something else.* (P4, Parent, Female, Age 34)

P4 also found that the quality time can be extended through the engaging nature of digital games. The engagement also seemed to lower frustrations in play that were perceived to be more common in board games. However, it is important to note that the increased engagement is not only because of the novelty or the flashing lights of digital games. The interactive nature of digital games can also help families stay engaged:

> *The big thing with a video game and stuff like that is the - there's constant interaction there for the players. There's constantly something going on , there's constantly something that you can be doing. Whereas with a board game for instance - for a game like monopoly, you have your turn and then you're sitting there doing nothing waiting for three other players to take their turns... The attention spans are very very limited because if they're sitting there doing nothing while somebody else takes their go, so that's where I think video games are massively better off for the kids than what board games and stuff are.* (P18, Parent, Male, Age 38)

P18, who played games like *Fortnite* and *Fifa* on XBox One, perceived that digital games can keep his family engaged longer due to the constant interaction. Though board games come in many different genres, P18 mentioned that board games often rely on turn-based mechanics that often

leave other players waiting. This waiting period can lead to disengagement which might result in the quality time ending sooner than desired, especially for young children.

5 DISCUSSION

To answer RQ1, we have highlighted ways in which parents and children with favorable experiences co-play with each other while playing modern digital games. First, an examination of the physical co-play space revealed that parents and children play together in a myriad of contexts including the same console, multiple consoles in the same room, multiple consoles in the same residence, or even on different consoles in different residences. Second, parent-child co-play often exhibits fluid leadership and competitive dynamics which indicate a fading digital divide. Third, modern digital games facilitate conversations and interactions between parents and children both during and after gameplay. Last, we found that many children and parents found value in single-player games which formed a hybrid between co-viewing and co-play.

Regarding RQ2, we have presented three potential positive impacts on parent-child relationships from co-playing modern digital games. For some, playing digital games together resulted in a sense of friendship between parents and children which was helpful in enhancing the family relationship. For others, digital games promoted close connections by removing physical and emotional barriers such as separate residences, teenagers disengaging, or seemingly stigmatized interests of children. Unsurprisingly, modern digital games can also facilitate quality time for families by lowering barriers to starting the activity and also by maintaining the activity through its engaging nature.

In this section, we discuss how our findings regarding co-playing digital games expand on our understanding of game-mediated parent-child relationships. Additionally, we offer implications for designing future play (e.g., digital games) to better support and promote such relationship and more productive technology co-use in modern family lives.

5.1 Emerging Modern Parent-Child Interaction Dynamics Through Gaming

One highlight from our findings is how digital gaming continues to shape today's technology-mediated family lives in two ways: to facilitate a "democratized" family life and the fading digital divide.

A "Democratized" Family Life. A consistent theme that arose from our data was the democratization of the common space, game selection, and the interactions within play. We came across little evidence of children monopolizing play with their greater digital game knowledge or parents "playing dumb" to gain access to play time as previous research has suggested [5, 17]. On the contrary, we found that parents and children collaboratively selected games. Many parents also emphasized how they played to win which resulted in an imbalance of skill that often favored parents.

Though the reason for not going easy varied from parent to parent, parents often cited their own childhood gaming experience as the reason for their level of skill and interest. This provides additional insight into how some parents are utilizing technology literacy to augment their parenting [7, 12, 50]. Some parents also expressed a desire to enjoy the playtime for themselves and an understanding that the child's long-term enjoyment of competition requires the parent to not go easy. Therefore, another general trend that our data showed was a more fluid leadership dynamic while playing. This fluid dynamic was present as parents and children worked to determine strategy, solve puzzles, or even when determining next steps for an open-world game. As previous research has pointed to the democratization of the family [10] and the democratization of technology itself [28, 61], the balanced collaboration described in this study further provides insights into today's "democratized" family lives through technology [26].

The Fading Digital Divide. Our data also offers evidence of the faded digital divide in today's technology-mediated family lives, which is in opposition to, or rather the updating of, prior research on co-playing digital games [5]. For example, though previous literature has suggested parents and children exclude one another from play and the play area [6, 17], we found the contrary. Our findings suggest that families show the highest preference for playing in the same room and on the same console. This preference also extended to families desiring to spectate one another while a parent or child played a single-player game. Participants described high levels of engagement while spectating as spectators often offered advice or encouragement to the person controlling the game. This family enjoyment of spectating expands research on mediation theory [53] which offers a hybrid of co-playing and co-viewing. Families also showed their desire to share the common room for digital games by playing in the same room on different consoles. Since many games offer online multiplayer without the option for couch or local co-op, families cope with this design inconvenience by finding a way to still play in the same room to enhance their sense of co-presence.

In summary, our findings indicate that for families with favorable co-play experiences, modern digital games can be used as a communal activity for families which can support the parent-child relationship through a "democratized" family life. Not only are gaming rooms democratized by such families, interactions while playing often take balanced and collaborative forms due to a fading digital divide. Thus, this research supports recent research that has indicated the viability of digital games as a medium to support family relationships [13, 57]. However, our research expands upon this literature by broadening the relational implications for digital games from simply mobile or social network games as a means to support the specific parent-child relationship.

5.2 New Perspectives of Technology Co-Use in the Context of Gaming

Our findings also point to an emphasis on the ability for modern digital games to facilitate conversations. Though previous research has indicated positive familial outcomes in co-play for digital games [13, 23, 57], little research has revealed insights into the affordances of digital games and the interaction outcomes for families. As modern digital games typically have high levels of interaction and engagement, participants often described how much players talk to one another in-game. For some, these conversations are rooted in the necessity to collaborate to solve a problem or accomplish a goal. Others noted how competition also brings out communication through excitement and even "trash talking." Either way, parents and children found value in these interactions and conversations that might not happen otherwise. These insights provide a better understanding for how families with favorable co-play experience communicate through co-play which extends a body of research seeking to understand the benefits of co-use in various contexts [52, 59].

Participants also discussed the frequency in which their families talk about digital games outside of play. Since children are often excited about their recent digital game play sessions, they are often inclined to keep talking about their experiences afterward. Parents described how they felt more equipped to engage in these conversations due to their knowledge of the games from co-playing with their children. This facilitating of conversation offers an additional benefit to parental digital game literacy [47]. Additionally, parents emphasized their use of digital game conversations to transition into other more meaningful conversations. This ability to pivot conversations is used both during and outside of play. Some participants did mention the sacrifice of face-to-face conversations while playing compared to a medium such as board games. This trade-off is in line with prior research which indicates negative social effects associated with technology that does not accommodate face-to face interactions [45, 54]. However, for most participants the communication positives of digital games outweighed the negatives. Further, parents and adult children who now live physically apart perceive online digital games as their best chance to have meaningful conversations and interactions while living apart similar to prior studies involving young children

[26, 27, 67, 68]. Importantly, these communication benefits for parent-child relationships were present for both male and female children in contrast to prior research suggesting that only female children benefited from these digital game interactions [23].

5.3 Designing Future Play for Promoting Parent-Child Relationships

Our findings show how parents and children with favorable co-play experiences participate in digital game co-play and the relational outcomes of such experiences. Based on these findings, we now present potential design implications to promote or reinforce the positive aspects described by these families and contribute to research focused on designing for parent-child relationships [69] and co-play for children [52]. Though the participants interviewed in this study only represented those with favorable co-play experiences, it is important to learn from their experiences in order to make positive co-play through digital games supported and more widely accessible. These suggestions include encouraging gameplay conversations and promoting co-viewing through modern digital games.

5.3.1 Encouraging Conversations Both In and After Gameplay. Data from this study revealed that parents with favorable co-play experiences with their children appreciated the game-facilitated conversations from co-play. This was described for conversations both in and out of gameplay. To support these conversations, we propose the following two designs. First, developers can incorporate conversation prompts into their games. An analog to this is how children's television programs break the fourth wall to ask the viewers questions (e.g., *Blue's Clues*, *Dora the Explorer*, etc.) [33]. The goal of these television prompts are often to promote the child's self esteem or for educational purposes. Similarly, a game conversation prompt could be used to encourage parents and children playing together to discuss next steps in the game or reflect together on more serious situations presented in the game. Though our findings showed that games often naturally afford such conversations, a more direct approach like this could encourage more conversations or assist parent-child co-players who are less inclined to communicate during gameplay.

Second, game studios could create conversation guides to go along with their released titles. Currently, television program distributors like PBS create conversation starter guides for some of their children programs [25]. These guides give parents a resource for discussing aspects of the show with their children which can improve educational benefits and promote conversations between parent and child [25]. Similar guides could be created for digital games for both in-game and out of game conversations. In-game guides could give parents cues for potential conversation starters based on upcoming decision points or storylines in the game. Out of game guides could be used by parents who are not co-playing with their children but still want to stay involved and have conversations about the games their child is interested in.

5.3.2 Promoting Co-Viewing to Strengthen Connections through Shared Interests. Likewise, our data revealed that some parents and children appreciated spectating single-player digital games and being spectated by their respective child/parent. Many participants also perceived that this experience, though not co-play but co-use of digital games, brought value to the relationship through a shared storytelling experience and facilitated conversation. To support and perhaps enhance this interaction, we suggest that developers design games that take spectators' views into account. Already developers, streaming platforms, streamers, and viewers have expressed interest in games/platforms that afford spectator participation and interaction [70]. For example, games like *Jackbox* allow for spectators to influence the game which makes it more interactive for the audience. Similar concepts and developer kits could be applied to the local/family level to encourage richer spectating interactions for parent-child co-use. Such an implementation would support family members who already appreciate spectating by providing a more rich viewing

experience. Further, families who do not currently spectate each other might express interest in this shared activity once spectator features are available to increase their involvement.

5.4 Limitations and Future Work

It is important to note the limitations of this research. First, very little evidence or account is given toward negative effects on the parent-child relationship as this study only focused on families with favorable co-play experiences. The one-sided nature of the narratives is likely due to two study limitations: 1) participants were self-selected based on responses to recruitment messages; and 2) recruitment was limited to those who still play digital games with their parent or child. Increasing data sources (e.g., large-scale surveys) and a broader participant population could potentially increase the generalization of these findings.

Second, in order to provide a comprehensive image of co-playing digital games in modern family relationships, we did not focus on specific types of digital games (e.g., multiplayer online games, video games, console games, and mobile games) or different games in our data analysis. Future work can be conducted to further unpack how co-playing different types of digital games and how different gaming mechanisms may lead to various patterns of co-play and impacts on parent-child relationships.

Third, the data collected in this study focuses on the perspectives of parents and the perspectives of adults who still play digital games with their parents. It should be noted that a majority of the interviewees were adults representing the parent perspective in the relationship (mostly of children ages 5-12). It would be useful to interview more adult children to ensure there is no discrepancy between co-play perceptions. Even better, it would be valuable to further compare these adults' perspectives with those of young children of more diverse ages who co-play with their parents to shed light on how children perceive co-playing with their parents.

Finally, despite our effort to recruit diverse participants, our sample is male dominated. The self selection used in recruitment likely contributed to this gender distribution in some way. Though no meaningful thematic differences were found between genders, future work should focus on better capturing the gendered perspectives of parent-children co-play.

6 CONCLUSIONS

In this study, we focus on how adults with favorable co-play family experiences play modern digital games with their parents and/or children and how such co-play impacts their relationship. Our findings have highlighted the specific ways through which such parents and children co-play modern digital games together, including how they set up the physical co-play space (e.g., ranging from playing on the same console to maximize intimacy to playing online in different households to accommodate distance relationships), how they manage collaborative and competitive dynamics as well as leadership in play, and how families co-use/co-view single-player games. Our findings have also shown that co-playing digital games can impact the parent-child relationship by augmenting domestic relationships with friendship, serving as a means to remove relational barriers (e.g, physical separation and emotional barriers), and facilitating improved quality time. These findings point to the emerging technology-mediated parent-child interaction dynamics by highlighting a "democratized" family life and the fading digital divide. They also provide new perspectives of technology co-use in the context of gaming, such as an important relational tool that parents can use to promote conversations with their child(ren). Not only were parents able to use interactive co-play to promote playful conversations, they were able to use digital gameplay or conversations about gameplay to segue into rich conversations about topics important to the parents.

This study updates and expands prior research on technology-mediated family relationships by offering empirical evidence regarding how parents and children with favorable co-play experiences

conduct co-play through modern digital games. These insights are helpful to HCI and CHI PLAY researchers who are concerned about the challenges and potential outcomes of today's complex family relationships supported by various interactive technologies such as gaming. Further, these insights could also inform the design of future play to mediate and promote more interaction during parent-child co-play to support these relationships.

REFERENCES
[1] 2016. Digital games and family life: When parents and kids play together. https://joanganzcooneycenter.org/2016/12/16/digital-games-and-family-life-when-parents-and-kids-play-together/

[2] 2017. Digital Games and Family Life: Families Play Both Board/Card Games and Digital Games Together. https://joanganzcooneycenter.org/2017/01/30/digital-games-and-family-life-board-games-and-video-games/

[3] 2017. Infographic: Parents on How Digital Games Affect Family Life. https://joanganzcooneycenter.org/2017/05/26/infographic-parents-on-how-digital-games-affect-family-life/

[4] 2020. 2020 Essential Facts About the Video Game Industry. https://www.theesa.com/esa-research/2020-essential-facts-about-the-video-game-industry/

[5] Pål André Aarsand. 2007. Computer and video games in family life: The digital divide as a resource in intergenerational interactions. *Childhood* 14, 2 (2007), 235–256.

[6] Pål André Aarsand and Karin Aronsson. 2009. Gaming and territorial negotiations in family life. *Childhood* 16, 4 (2009), 497–517.

[7] Tawfiq Ammari and Sarita Schoenebeck. 2015. Understanding and supporting fathers and fatherhood on social media sites. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*. 1905–1914.

[8] Rahul Banerjee, Leanne Liu, Kiley Sobel, Caroline Pitt, Kung Jin Lee, Meng Wang, Sijin Chen, Lydia Davison, Jason C Yip, Andrew J Ko, et al. 2018. Empowering Families Facing English Literacy Challenges to Jointly Engage in Computer Programming. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. 1–13.

[9] Mitchell K Bartholomew, Sarah J Schoppe-Sullivan, Michael Glassman, Claire M Kamp Dush, and Jason M Sullivan. 2012. New parents' Facebook use at the transition to parenthood. *Family relations* 61, 3 (2012), 455–469.

[10] Ulrich Beck. 1997. Democratization of the family. *Childhood* 4, 2 (1997), 151–168.

[11] Erin Beneteau, Ashley Boone, Yuxing Wu, Julie A Kientz, Jason Yip, and Alexis Hiniker. 2020. Parenting with Alexa: Exploring the Introduction of Smart Speakers on Family Dynamics. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*. 1–13.

[12] Lindsay Blackwell, Jean Hardy, Tawfiq Ammari, Tiffany Veinot, Cliff Lampe, and Sarita Schoenebeck. 2016. LGBT parents and social media: Advocacy, privacy, and disclosure during shifting social movements. In *Proceedings of the 2016 CHI conference on human factors in computing systems*. 610–622.

[13] Kelly Boudreau and Mia Consalvo. 2014. Families and social network games. *Information, Communication & Society* 17, 9 (2014), 1118–1130.

[14] Julie A Brown and Hannah R Marston. 2018. Gen X and digital games: Looking back to look forward. In *International Conference on Human Aspects of IT for the Aged Population*. Springer, 485–500.

[15] Lydia Buswell, Ramon B Zabriskie, Neil Lundberg, and Alan J Hawkins. 2012. The relationship between father involvement in family leisure and family functioning: The importance of daily family leisure. *Leisure Sciences* 34, 2 (2012), 172–190.

[16] Paul Cairns, Anna L Cox, Matthew Day, Hayley Martin, and Thomas Perryman. 2013. Who but not where: The effect of social play on immersion in digital games. *International Journal of Human-Computer Studies* 71, 11 (2013), 1069–1077.

[17] Deborah Chambers. 2012. 'Wii play as a family': The rise in family-centred video gaming. *Leisure Studies* 31, 1 (2012), 69–82.

[18] Anna Cherenshchykova and Andrew D Miller. 2019. Family-Based Sleep Technologies: Opportunities and Challenges. In *Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems*. 1–6.

[19] Puay-Hoe Chua, Younbo Jung, May O Lwin, and Yin-Leng Theng. 2013. Let's play together: Effects of video-game play on intergenerational perceptions among youth and elderly participants. *Computers in Human Behavior* 29, 6 (2013), 2303–2311.

[20] Lynn Schofield Clark. 2011. Parental mediation theory for the digital age. *Communication theory* 21, 4 (2011), 323–343.

[21] Sabrina L Connell, Alexis R Lauricella, and Ellen Wartella. 2015. Parental co-use of media technology with their young children in the USA. *Journal of Children and Media* 9, 1 (2015), 5–21.

[22] Liliana Costa and Ana Veloso. 2016. Being (grand) players: review of digital games and their potential to enhance intergenerational interactions. *Journal of Intergenerational Relationships* 14, 1 (2016), 43–59.

[23] Sarah M Coyne, Laura M Padilla-Walker, Laura Stockdale, and Randal D Day. 2011. Game on... girls: Associations between co-playing video games and adolescent behavioral and family outcomes. *Journal of Adolescent Health* 49, 2

(2011), 160–165.

[24] Teresa De la Hera, Eugène Loos, Monique Simons, and Joleen Blom. 2017. Benefits and factors influencing the design of intergenerational digital games: A systematic literature review. *Societies* 7, 3 (2017), 18.

[25] Sara DeWitt. 2021. Making the Most Out of Screen Time: Conversation Starters. https://www.pbs.org/parents/thrive/making-the-most-out-of-screen-time-conversation-starters

[26] Sean Follmer, Hayes Raffle, Janet Go, Rafael Ballagas, and Hiroshi Ishii. 2010. Video play: playful interactions in video conferencing for long-distance families with young children. In *Proceedings of the 9th International Conference on Interaction Design and Children*. 49–58.

[27] Azadeh Forghani, Carman Neustaedter, and Thecla Schiphorst. 2013. Investigating the communication patterns of distance-separated grandparents and grandchildren. In *CHI'13 Extended Abstracts on Human Factors in Computing Systems*. 67–72.

[28] Guo Freeman, Nathan McNeese, Jeffrey Bardzell, and Shaowen Bardzell. 2020. "Pro-Amateur"-Driven Technological Innovation: Participation and Challenges in Indie Game Development. *Proceedings of the ACM on Human-Computer Interaction* 4, GROUP (2020), 1–22.

[29] Jeanne B Funk and Debra D Buchman. 1996. Playing violent video and computer games and adolescent self-concept. *Journal of communication* 46, 2 (1996), 19–32.

[30] Elisabeth Gee, Sinem Siyahhan, and Anna Montana Cirell. 2017. Video gaming as digital media, play, and family routine: implications for understanding video gaming and learning in family contexts. *Learning, Media and Technology* 42, 4 (2017), 468–482.

[31] Douglas A Gentile, Amy I Nathanson, Eric E Rasmussen, Rachel A Reimer, and David A Walsh. 2012. Do you see what I see? Parent and child reports of parental monitoring of media. *Family Relations* 61, 3 (2012), 470–487.

[32] Lorna Gibson and Vicki L Hanson. 2013. Digital motherhood: How does technology help new mothers?. In *Proceedings of the SIGCHI conference on human factors in computing systems*. 313–322.

[33] Judith S. Gillies. 2002. 'BLUE'S CLUES'. https://www.washingtonpost.com/archive/lifestyle/tv/2002/08/04/blues-clues/68074f15-675f-425a-b6fb-79c19c427e1f/

[34] Barney G Glaser, Anselm L Strauss, and Elizabeth Strutzel. 1968. The discovery of grounded theory; strategies for qualitative research. *Nursing research* 17, 4 (1968), 364.

[35] Stacey Guy, Alexandria Ratzki-Leewing, and Femida Gwadry-Sridhar. 2011. Moving beyond the stigma: systematic review of video games and their potential to combat obesity. *International journal of hypertension* 2011 (2011).

[36] Alexis Hiniker, Hyewon Suh, Sabina Cao, and Julie A Kientz. 2016. Screen time tantrums: how families manage screen media experiences for toddlers and preschoolers. In *Proceedings of the 2016 CHI conference on human factors in computing systems*. 648–660.

[37] Sara Isola and Jerry Alan Fails. 2012. Family and design in the IDC and CHI communities. In *Proceedings of the 11th International Conference on Interaction Design and Children*. 40–49.

[38] Mizuko Ito. 2013. *Hanging out, messing around, and geeking out: Kids living and learning with new media*. The MIT press.

[39] Hee Jhee Jiow, Sun Sun Lim, and Julian Lin. 2017. Level up! Refreshing parental mediation theory for our digital media landscape. *Communication Theory* 27, 3 (2017), 309–328.

[40] Maxwell Kamlongera. 2018. The decline and death of couch-based multiplayer. https://www.criticalhit.net/gaming/decline-death-couch-based-multiplayer/

[41] Cory A Kildare and Wendy Middlemiss. 2017. Impact of parents mobile device use on parent-child interaction: A literature review. *Computers in Human Behavior* 75 (2017), 579–593.

[42] John Kirriemuir. 2006. 2 A history ofdigital games. *Understanding digital games* (2006), 21.

[43] Jennifer Lee, Alvin Jude, Meral Shirazipour, and Julien Forgeat. 2018. "I don't need to see that" Seeking, Avoiding, and Attempting to Control Video Content. In *Extended Abstracts of the 2018 CHI Conference on Human Factors in Computing Systems*. 1–6.

[44] Douglas Levin, Sousan Arafeh, Carla Baker Deniz, and Julie Gottesman. 2004. Navigating the children's media landscape: A parent's and caregiver's guide. *American Institutes for Research, Washington, DC* (2004).

[45] Regan L Mandryk and Diego S Maranan. 2002. False prophets: exploring hybrid board/video games. In *CHI'02 extended abstracts on Human factors in computing systems*. 640–641.

[46] William Marsiglio. 2004. When stepfathers claim stepchildren: A conceptual analysis. *Journal of Marriage and Family* 66, 1 (2004), 22–39.

[47] Jane Mavoa, Marcus Carter, and Martin Gibbs. 2017. Beyond addiction: positive and negative parent perceptions of minecraft play. In *Proceedings of the Annual Symposium on Computer-Human Interaction in Play*. 171–181.

[48] Brandon T McDaniel and Jenny S Radesky. 2018. Technoference: longitudinal associations between parent technology use, parenting stress, and child behavior problems. *Pediatric research* 84, 2 (2018), 210–218.

[49] Nora McDonald, Sarita Schoenebeck, and Andrea Forte. 2019. Reliability and Inter-rater Reliability in Qualitative Research: Norms and Guidelines for CSCW and HCI Practice. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW (2019), 1–23.

[50] Meredith Ringel Morris. 2014. Social networking site use by mothers of young children. In *Proceedings of the 17th ACM conference on Computer supported cooperative work & social computing*. 1272–1282.

[51] Carol Moser, Sarita Y Schoenebeck, and Katharina Reinecke. 2016. Technology at the table: Attitudes about mobile phone use at mealtimes. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. 1881–1892.

[52] Catalina Naranjo-Bock and Jennie Ito. 2017. Playing together: The importance of joint engagement in the design of technology for children. In *Proceedings of the 2017 Conference on Interaction Design and Children*. 749–752.

[53] Peter Nikken and Jeroen Jansz. 2006. Parental mediation of children's videogame playing: A comparison of the reports by parents and children. *Learning, media and technology* 31, 2 (2006), 181–202.

[54] Roy Pea, Clifford Nass, Lyn Meheula, Marcus Rance, Aman Kumar, Holden Bamford, Matthew Nass, Aneesh Simha, Benjamin Stillerman, Steven Yang, et al. 2012. Media use, face-to-face communication, media multitasking, and social well-being among 8-to 12-year-old girls. *Developmental psychology* 48, 2 (2012), 327.

[55] Karolien Poels, Yvonne De Kort, and Wijnand Ijsselsteijn. 2007. "It is always a lot of fun!" exploring dimensions of digital game experience using focus group methodology. In *Proceedings of the 2007 conference on Future Play*. 83–89.

[56] Sinem Siyahhan, Sasha A Barab, and Michael P Downton. 2010. Using activity theory to understand intergenerational play: The case of Family Quest. *International Journal of Computer-Supported Collaborative Learning* 5, 4 (2010), 415–432.

[57] Kiley Sobel, Arpita Bhattacharya, Alexis Hiniker, Jin Ha Lee, Julie A Kientz, and Jason C Yip. 2017. It wasn't really about the PokéMon: parents' perspectives on a location-based mobile game. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*. 1483–1496.

[58] Reed Stevens and William R Penuel. 2010. Studying and fostering learning through joint media engagement. In *Principal Investigators Meeting of the National Science Foundation's Science of Learning Centers*. USA Arlington, VA, 1–75.

[59] Lori Takeuchi, Reed Stevens, et al. 2011. The new coviewing: Designing for learning through joint media engagement. In *New York, NY: The Joan Ganz Cooney Center at Sesame Workshop*.

[60] Ed S Tan and Jeroen Jansz. 2008. The game experience. In *Product experience*. Elsevier, 531–556.

[61] Theresa Jean Tanenbaum, Amanda M Williams, Audrey Desjardins, and Karen Tanenbaum. 2013. Democratizing technology: pleasure, utility and expressiveness in DIY and maker practice. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. 2603–2612.

[62] Patti M Valkenburg, Marina Krcmar, Allerd L Peeters, and Nies M Marseille. 1999. Developing a scale to assess three styles of television mediation:"Instructive mediation,""restrictive mediation," and "social coviewing". *Journal of broadcasting & electronic media* 43, 1 (1999), 52–66.

[63] Yvonne Vezzoli, Sara Kalantari, Natalia Kucirkova, and Asimina Vasalou. 2020. Exploring the Design Space for Parent-Child Reading. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*. 1–12.

[64] Amy Voida and Saul Greenberg. 2009. Wii all play: the console game as a computational meeting place. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. 1559–1568.

[65] Ellen A Wartella and Nancy Jennings. 2000. Children and computers: New technology. Old concerns. *The future of children* (2000), 31–43.

[66] Jing Wen, Yong Ming Kow, and Yunan Chen. 2011. Online games and family ties: Influences of social networking game on family relationship. In *IFIP Conference on Human-Computer Interaction*. Springer, 250–264.

[67] Marisol Wong-Villacres and Shaowen Bardzell. 2011. Technology-mediated parent-child intimacy: designing for ecuadorian families separated by migration. In *CHI'11 Extended Abstracts on Human Factors in Computing Systems*. 2215–2220.

[68] Svetlana Yarosh and Gregory D Abowd. 2011. Mediated parent-child contact in work-separated families. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. 1185–1194.

[69] Jason C Yip, Tamara Clegg, June Ahn, Judith Odili Uchidiuno, Elizabeth Bonsignore, Austin Beck, Daniel Pauw, and Kelly Mills. 2016. The evolution of engagements and social bonds during child-parent co-design. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. 3607–3619.

[70] Melissa Zeloof. 2019. Spectator-Participation: the next step for gaming. https://medium.com/ironsource-levelup/spectator-participation-the-next-step-for-gaming-c70f565adf45

[71] Fan Zhang and David Kaufman. 2016. A review of intergenerational play for facilitating interactions and learning. *Gerontechnology* 14, 3 (2016), 127–138.