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STUDENTERRAPPORT

FreeTime: A Game to help Stimulate Awareness of in-home Screen Use

Master Thesis

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Families can experience issues with balancing screen use and family life. The aim of this study is to conduct a qualitative investigation of how a gamified design can help families stimulate awareness, inspire discussions and alleviate tensions from screen use. For this study, a board game was developed to be played by families at home and was tested by three danish families during the research period. The study used interviews and video analysis of play sessions to gain insight into the families' experience. The results indicate that a board game design can potentially have a positive impact on how families engage with screen use by making family members more aware of their own and each other's habits and consumption levels. For some participants, an increased awareness made it easier to abstain from using the phone or take proactive measures to change screen use habits. The game context seemed to be an environment where players could share tensions and influence shared understandings of screen use in the family as well as use the game sessions to inspire subsequent interactions on screen use.

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Chapter 1

Introduction

1.1 Motivation

Smartphones have become a pervasive part of most people's lives. The phones give users the opportunity to be increasingly connected to their social network, their work and every other affordance delivered by the internet. They do, however, also present certain challenges to the users like increased expectancy of availability and intrusions into users' personal lives outside work hours. Jarvenpaa and Lang (2005) argue that new technology like smartphones have led to paradoxical relationships between people and technology. The present-absent paradox denotes how we are less present toward surroundings as a consequence of being hyper connected to everything through technology. Similarly, the empowerment-enslavement paradox points to the liberating means we receive through technology but at the same time suggests that they might make users feel more pressured to engage with technology like for example if an employer expect workers to be available after hours. McDaniel (2015) has branded this experience of how technology interfere with our lives as *technoference*. More specifically, McDaniel (2015) defines it as, "when and ways that technological devices intrude, interrupt and/or get in the way of couple or family communication and interactions in everyday life" (McDaniel 2015: 2). McDaniel suggests that technological interference is common in relationships and that interference is related to reduced personal and relationship satisfaction.

Oduor et al. (2016) argue that family members experience frustration when other members partake in non-urgent activities on their devices while in their presence. Similarly, Hiniker and Kientz (2016) argue that families can experience tensions from an unclear understanding regarding when they are expected to be present. Many participants reported feeling frustrated by family members using their phones at times they found inappropriate and that they would like common expectations for when they should be present. Common expectations was also a key issue in a study by Blackwell et al. (2016) where both parents and children reported wanting times where they could expect others to be present instead of being on their phones. The studies point to the pervasiveness of unwanted screen habits during leisure times and specifically how they might lead to tensions while in the presence of others.

Self-awareness of consumption levels

Studies have investigated to what extent users are aware of their actual use of technology. Smartphone users' ability to estimate their own consumption levels has been studied in the context of figuring out discrepancies between self-reported and actual use (Boase and Ling 2013). The studies found that most participants were able to estimate daily use time within an hour or so. There were, however, a large discrepancy between the amount of times participants engaged with their phones and the amount of times, they thought they did. One study found that on average, participants had about twice as many engagements as

they thought (Abeele et al. 2013). Discrepancies can potentially have implications for how families negotiate media use. If they perceive their own use as lower than it actually is, they might be less likely to acknowledge any potential issues related to it, and similarly, if it's lower than anticipated, they might find that potential concerns connected to in-home screen use have been overblown. Family members might also have a skewed perception of other family members' use habits and experience frustrations caused by overestimating how often they use screens.

Another recent development is the study of how people avoid or abstain from using media. *Non-use* is a concept that has emerges to describe the attitudes and ways people abstain from technology use. The aim is to broaden the understanding how and why people use technology by looking at how and why some don't (Satchell and Dourish 2009). One aspect of non-use is how many smartphone users have developed deliberate strategies to control their use. Users will for example keep their phone on silent mode or deliberately leave it at a distance in order to avoid any temptation to interact with it. It appears to be increasingly common for smartphone users to utilize some of these strategies since both Oduor et al. (2016) and Blackwell et al. (2016) point to around half of their participants actively attempting to limit their use but with varied success. A lot of the participants would like to reduce their consumption levels further and found it difficult to do so. Related to the findings in Oduor et al. (2016) and Hiniker and Kientz (2016), family members might overestimate the amount of times, other family members use their phones in their presence, or how often other family members do it compared to themselves. Similarly, difficulties in estimating ones own consumption levels might lead to a skewed perception of what and when to interfere in ones use patterns.

Gamification to nudge and research

Gamification has been identified as a means to help change behaviour. The purpose of gamification is to nudge subjects into execute a task or participate in a situation they otherwise would not have participated in. By incorporating game elements, an otherwise uninteresting task can be transformed into a seemingly fun and appealing situation. Nicholson (2015) defines meaningful gamification as an incorporation of game elements in non-game environments. In this way, gamification is broadly applicable in a wide range of contexts. Gamification can also be utilized in shaping a more game like design and has been used to develop learning-based board games. In Banerjee et al. (2016) researchers developed a game to help increase awareness of how and when devices consume electricity in homes. The game consists of two teams competing over wasting or preserving energy in a household. The game aimed to teach families and especially children about which devices utilize electricity, the different amount of electricity appliances consume, and the fact that devices use electricity even when they are turned off. The researchers found examples of when the

board games helped stimulate conversations over over electricity consumption in the real world. Similarly, Hafsa Essop (2018) found that utilizing a board game to teach students about radiographic technique proved to be a fun way to engage with the subject material. They argue that the board game could stimulate critical thinking and that it contributed to the learning of students in different ways depending on their years in the program. For the novice students it contributed by prompting questions and discussions amongst them which they hadn't thought of before, and for the more experienced students, it was seen as a positive opportunity to rehearse and repeat previous material. Common for all students was that they found the experience to be an engaging way to reinforce and apply learning. The researchers concluded that well-designed board games can serve as a visual metaphor that can help students connect information.

Aim of the study

Through gamification I aim to confront families with their screen use and attitudes towards screen use. By comparing perceived and actual use, family members might realise new aspects of their own and each other's consumption levels, and similarly, sharing both attitudes and use habits might help participants realise discrepancies between the two. Based on the information revealed during the game sessions, family members might become more aware of their screen use, attempt to change habits, or try to influence each other's screen use in order to solve tensions. All in all, this study aims to investigate how a gamified design can help stimulate awareness, inspire discussions, and help reduce tensions from screen use.

1.2 Research Question

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How can a gamified design help stimulate awareness, inspire discussions, and alleviate tensions regarding in-home screen use in families?

1.3 Structure of the Report

The second chapter, *background literature*, presents a range of related work and theories. The chapter centres around previous studies of tensions as a result of screen use in families and theory on how families mediate screen use. The third chapter, *method design*, describes the approach to conducting the study. It is divided between two chapters, one dedicated to the development of the game design and one describing the research design process. The fourth chapter, *results*, presents the findings of the study. It includes findings from game sessions and interviews with the participants. The fifth chapter, *discussion*, discuss the findings in relation to the theory presented in the second chapter. The sixth and final chapter, *conclusion*, presents the concluding thoughts on the study as a whole. It highlights main points from the results and discussion chapter and presents the final remarks in relation to the problem statement.

Chapter 2

Background Literature

2.1 Tensions from Mobile Use

Mobile phone use can cause tensions among family members. Both Oduor et al. (2016) and Hiniker and Kientz (2016) found that family members sometimes experience frustration from other people using phones in their presence. Participants felt that other family members were less open for interactions and not sufficiently present, even though they were in the same room. Hiniker and Kientz (2016) surveyed 249 child-parent dyads with children from 10 to 17 years old in order to investigate family rules regarding technology. Hiniker and Kientz (2016) found that tensions were often caused by a lack of clear expectations for when it is acceptable to use the phone in other family members' presence. Both parents and children would like a common understanding of when they can expect others to be present without engaging with phones and when they themselves are expected to not use their phones. By developing a common understanding, the families can potentially avoid tensions at home. The studies found that participants often felt that their phone use was not important and could be postponed (Oduor et al. 2016; Hiniker and Kientz 2016). One aspect that caused this situation was the fact that family members cannot get insight into other family members' usage and therefore would have to guess whether or not they were doing something important. Blackwell et al. (2016) interviewed 18 child-parent dyads, where the children were age 10-17, with the aim to study the relationship between technology use and time spent with other family members. Blackwell et al. (2016) argue that the lack of insight into what other family members do on their screens as well as the expectation of constant connectivity can lead to tensions amongst family members. Having insight into people's interactions with their phones might be a way to reduce tensions. A large number of smartphone users also describe dissatisfaction with their current levels of use. Oduor et al. (2016) conducted a series of interviews with 20 participants age 20 to 60 which revolved around their family members' use of mobile devices during leisure time. Half of the participants in the study reported wishing to change their screen habits and a similar rate wanted to change the habits of other family members as well. This is similar to a survey conducted by Ko et al. (2015) of 114 smartphone users age 18-32 where around half of the participants also wanted to change their habits. More particularly, the users in both studies wanted to decrease their amount of use time.

2.2 Non-use and Temporary Non-Use

Non-use is theorized as the opposite of use. In the context of media consumption, it consists of thoughts, opinions and actions that lead to not using media (Satchell and Dourish 2009). Satchell and Dourish (2009) points out that non-use has often been theorized as a passive behaviour that characterized people who were waiting to become future users. In contrast, Satchell and Dourish (2009) points out that non-use is often meaningful and active and

consists of a conscious resistance toward the pervasiveness of media. One type of non-use is what Satchell and Dourish (2009) calls *active resistance* which consists of everything a person does to avoid adopting a technology, developing a media habit, or engaging with media content. Related to this, Baumer et al. (2013) points out that some users of technology have an ambivalent relationship with media where they partly wish to limit or avoid some of their habits. Baumer et al. (2013) characterized this term as *lagging resistance*. Users wanted to change their habit but had not found the motivation or means to do so. Lee et al. (2014) argues that the way most people utilize non-use is through abstaining from using on a temporary basis. From this perspective, non-use is a temporary activity instead of a permanent state. Most users do not wish to quit the use of technology completely but want to limit it in order to integrate it into their lives in a meaningful way. This perspective match the attitudes and practices found in Hansen et al. (2019). Families adopted different restraints and strategies in order to better control their relationship with technology without the intention of leaving it altogether. Participants described how technology could be tempting even at times where they knew they should not engage with it. By adopting temporary non-use practices, they can ensure that they only use it at the right times.

2.2.1 Non-use at home

Oduor et al. (2016) and Blackwell et al. (2016) found a common desire to change media habits amongst the participants in their studies. Around half of the participants would ideally like to reduce or limit their consumption levels but had not been able to do so successfully. Among the participants, there was a sense of not knowing where to start. The changes that need to be implemented in order to invert media habits can be somewhat profound and feel overwhelming. Hansen et al. (2019) found that one reason why people fail to implement changes is a lack of a strong desire. Some participants in the study wished to change their consumption patterns, but equally wanted to implement other changes in their lives like getting in shape. Their motivation to actively resist their own habits were not a distinguished priority but rather one amongst many. The level of motivation is in that sense an important factor in explaining why people do not manage to implement the desired changes. Some users have developed specific strategies in order to control their media behaviour. One strategy is keeping the phone on mute. Ko et al. (2015) points out that participants often felt that notifications had to be dealt with right away. The strategy aims to help limit the intrusive nature of notifications and remove the temptation to engage with the phone. In Hansen et al. (2019) participants also deliberately separated themselves from their phones. Participants would leave the phone at home or spend time at places where interacting with the phone is not possible like at the community swimming pool. Distancing oneself from the phone physically aims to avoid the intrusive nature of notifications and the desire to check ones phone. Similarly, it also provides a needed break from the daily consumption patterns.

Other strategies include deleting apps from one's phone like the Facebook app in order to engage less. Some also attempted to minimize any possible tensions from using their phones in other's presence like attempting to inform other people why they were using their phones or deliberately trying to keep interactions to a minimum (Oduor et al. 2016). Common for the strategies is, most are aimed at limiting the amount of time the user interacts with their phone. Nobody aims at increasing their phone use, but it is, however, also common not to have any strategies at all (Oduor et al. 2016).

2.3 Parental mediation of children's screen use

Part of the in-home negotiation of screen use is the relationship between adults and children where adults can take multiple approaches to manage screen use for children. Valkenburg and Piotrowski (2017) distinguishes between two types of parental mediation: *Restrictive mediation* and *active mediation*. Restrictive mediation concerns rules and boundaries the parents establish for their children. In relation to media consumption, it serves as a means to limit what, when, where and how children engage with media content. As a contrast, active mediation is a way to influence children without having to set up boundaries. It rather takes place through communication between parent and child before, during or after the child engages with media. Active mediation consists of two different types of mediation: *Factual monitoring* and *evaluative monitoring*. Factual monitoring consists of information regarding the construction of media texts or the media industry. It aims at revealing differences between reality and media and thereby uncover any illusions or misconceptions about the real world created by media consumption. Evaluative monitoring is facilitated through moral judgements about media content or behaviour. By communicating judgements, the parents hope to influence the child into adopting a similar attitude to the media content.

2.3.1 Participatory learning

Clark (2011) proposes another concept called participatory learning which involves learning alongside your child. Like active mediation, it attempts to foster a positive child-parent relationship by engaging in dialogue, but what sets participatory learning apart, is the fact that parents are encouraged to listen and learn alongside their child. It's more centered around two-way learning and communication compared to the hierarchical and instructive relationship in active mediation theory. Clark (2011) argues that the previous model of parental mediation is based on the medium of television where children were passive receivers of content from a fixed set of outlets. The situation today, however, is markedly different and children these days engage with numerous different platforms and outlays and often in a role as a creator of content. Another development is how focus in parent-child relationships have shifted more towards spending quality time together centered around the child's interest

which includes their digital interests and preferences. The media landscape that appeals to young people might seem confusing and difficult to keep track of for parents which is why participatory learning can be a beneficial strategy for parents. Parents can simultaneously spend quality time with their children as well as monitor and orient themselves in the their interests.

2.3.2 A new take on mediation concepts

Jiow et al. (2017) proposes a set of new concepts to describe the way parents mediate in their children's digital lives. In contrast to the classical concepts of co-viewing and restrictive and active mediation, they propose *gatekeeping*, *discursive*, *investigative* and *diversionary activities*. Jiow et al. (2017) argue that the earlier concepts were conceived based on a prior media landscape where TV was the only media and viewers were passive recipients of media texts. In contrast, today's landscape offers a broad range of platforms, channels and content where the child at times takes on an active role as content creator.

Gatekeeping activities

Gatekeeping activities covers all rules and limitations on media content, contexts or behaviour. It's similar to restrictive mediation in the sense that it often takes the form of rule setting that restricts media engagement. What sets the concepts apart is that gatekeeping activities should be seen as a more dynamic process where parents continually open or restrict the access to media. Whereas restrictive mediation only consists of limitations, gatekeeping activities consists of dynamically relaxing and tightening the rules regarding media consumption.

Discursive activities

Discursive activities consist of discussions between parent and child regarding media use. The term is related to active mediation in the sense that it involves dialogue between parent and child regarding media. Jiow et al. (2017) prefer the discursive concept because it includes any two-way discussions where parents also learn from the children. Similarly, it also distinguishes it more easily from gatekeeping activities where parents remind children about rules and restrictions.

Investigative activities

Investigative activities surround seeking information or insight that provides the tools to better mediate children's media use. The term can also refer to parents monitoring their children's media behaviour. Previously, this was regarded as a type of restrictive mediation, but Jiow et al. (2017) argues that parents do not exclusively monitor children's compliance

with media rules but also use it as a way to gain insights in their consumption habits which can help inform subsequent discussions on restrictions. Parents sometimes use a diverse range of activities to gain information which include consulting friends and relatives, searching through game databases, and reading various media sources. Some also partake in their children's media interests like a specific computer game in order to better understand them.

Diversionary activities

Diversionary activities involve all the active and intentional efforts from parents to divert children's attention away from media use. This usually involves encouraging or suggesting the child engage in other activities which are deemed healthier or more appropriate. Diversionary activities can also include suggesting or enlisting children in after-school activities or hobbies that engage children through analogue means.

2.4 Estimation

Abeele et al. (2013) conducted a survey with 446 mobile phone users age 18-65 in order to investigate how accurate self-reporting measures are. They compared the surveys to network provider data which revealed that light users tended to overestimate their mobile use while heavy users tended to underestimate their use. Additionally, they found that discrepancies especially appear regarding number of weekly phone calls and the duration of these calls, where users had a tendency to overestimate both. The researchers conclude however that the discrepancies are small enough that the data is still useful, but should be approached with some caution. In a similar study, Boase and Ling (2013) compared users self-reported data with log data and found that the two are only moderately correlated. The researchers conclude that there is reason to be cautious when including self-reported measures in a study. These studies only look at self-reported data for participants' own smartphone use. Given that users are only partly accurate in reporting their own use, there is reason to believe they are more inaccurate when estimating other family members' use. Frequency and duration of use is something that can lead to tensions with other family members. Users might underestimate how much they use it in other's presence while other family members might inaccurately overestimate the screen use. A more accurate picture of each other's phone use might therefore be a way to reduce tensions in the household.

Chapter 3

Method Design

3.1 Utilizing a board game to conduct research

A part of gamification that has been utilized in research is board games which can serve as a facilitator for conversations. In Banerjee et al. (2016) the game consists of two teams competing over wasting or preserving energy in a household. The game aimed to teach families and especially children about which devices utilize electricity, the different amount of electricity devices use, and the fact that devices use electricity even when they are turned off. The researchers found that the board games could help stimulate conversations over electricity consumption in the real world. Similarly, Hafsa Essop (2018) argue that the board game to help students learn course material can stimulate critical thinking, and that it contributed to the learning of students by stimulating discussions or present an engaging way to repeat previous material. In a similar way, a board can be utilized to stimulate critical thinking on screen use as well as facilitate discussions between participants. A design study involving a board game about screen use might be relevant, because it can be an engaging way to interact with the material and make sure participants are motivated to partake in the conversations. Similarly, it can provide a safe framework for discussing potentially contentious issues by framing them in the context of a game. In this way, it might be an effective tool to bring up, discuss and solve issues which might otherwise have been ignored.

3.1.1 The Board Game

Before the game begins, the families divide themselves into two teams. Preferably they are at least two players on each team. Next they drew one of 4 scenarios (Appendix U). The scenario specify where a set of pieces are placed on the board. The pieces consist of one piece representing each team plus pieces that serve as *trophies* which the teams compete for. Some scenarios describe a specific order the trophies have to be obtained in while others are structured around a best out of three principal. Finally, the teams draw two *bonus-cards* and selects one. The bonus-cards specify an advantage which can be used during the game like for example being able to move to an optional room on the board or take a short cut. The board displays a house with 20 rooms (Appendix U). The teams move between each room by rolling a dice which has from one to three on each side. The teams can move their piece from room to room up to the number of rooms specified on the dice. Whenever a team has moved their piece, they receive one of three types of questions. Either an *estimate*, a *rank* or a *write* question. The estimate-questions ask the team to estimate how much time one of the opponent players has used on the phone or a certain app at a certain day, for example: “How much time has the oldest opponent spent on Facebook today?”. The questions only concern mobile use and the answers are verified through the Screen Time app which tracks the user’s screen use. After the team has made their guess, the opponent checks whether the answer is correct in the Screen Time app. A "write" question asks the team who amongst their

family members best fit the description on the card. The cards describe who has the highest or lowest consumption of a certain device or app, for example: “Who spends most time on Facebook?" Two players on the team writes down who they think it is. If they write the same name, the team wins. A "rank" question is similar to a "write" question, but instead of writing the name of one family member, the players have to write all the family members in the order of how they fit the description. If a team provides a wrong answer, they loose their turn, and if they provide the right answer, they can draw an *event-card*. The event-cards give either an advantage or a disadvantage to the team like taking another turn or having to move to a specific room like the "kitchen". A team aims for rooms which contain the trophies and when a team lands in a room with a trophy, they draw a *duel-card*. A duel-card consist of a question which both teams have to answer and in addition, they have to guess what the other team will answer as well. The questions are centered around opinions on screen use, for example: “How much time are you allowed to spend on your phone each day?” The winner is determined by how well the teams estimated the other team’s opinion where the closest estimate wins. In case it’s a tie, the challenging team receives the trophy. The teams compete for trophies and complete the scenario by collecting them in one form or the other.

3.1.2 Theoretical Considerations in the Board Game Design

A framework for Gamification

Nicholson (2015) has developed a framework for game development. His framework consist of *play*, *exposition*, *choice*, *information*, *engagement*, and *reflection*, forming the anagram RECIPE. Play is the voluntary engagement with the game just for the fun of it. Nicholson (2015) points out that play should be optional and that players therefore need the opportunity to adjust their experience if it is no longer fun. Exposition is a way to make the player feel connected to real-world settings. This can be achieved through a narrative which integrate elements from the real world. Choice is closely linked to autonomy implies that players have to make meaningful choices within the game. Information is characterised as a way to inform the player about the considerations and thoughts behind the game. Engagement can mean both social engagement with other in-game players or engagement through interactions with the game mechanics. Related to social engagements are considerations regarding whether players should compete or cooperate where both can result in an increased sense of enjoyment for the player. An engaging game experience depends in part on whether the mechanics are adapted to the player. If the difficulties are too easy or too difficult, the experience will likely not feel engaging over a sustained period of time. Reflection denotes opportunities for the players to step back and think about their game experience.

We have incorporated aspects from all elements of the RECIPE framework in our game design. The game contains some options for adjustments which can facilitate the sense of voluntary engagement that is a part of play. Players can choose their own teams in case

certain installations are unfair or some family members are not available for a game session. Since the game contains a large variety of scenarios, bonus-, event- and challenge-cards, any that seem unfit or unwanted by the family can potentially be filtered out as well. Exposition is provided by the scenarios which frame the player's actions within a broader narrative. Exposition is also included in the framing of event cards as its own little narrative like for example: "The others are busy taking selfies. Take another turn!". Rather than just awarding the player with a new turn, the card includes a vivid description of why a team is awarded a new turn. Choice is incorporated in the strategic decisions the players can make throughout the game. It starts with the selection of the bonus-card and continues in decisions on routes, targets and when to utilize the bonus-card. The game seeks to foster engagement by including game elements which support a fun gaming experience like the four scenarios which aim to hinder a feeling of repetitiveness, and additionally, the colors on the board game are bright and the language on the cards is vivid and playful. The players learn information about their own and their family's screen usage patterns. They also gain insight into the other's opinions on screen usage and habits, including their thoughts on each family member's usage patterns. Reflection is utilized in the questions that prompt the players to consider aspects of screen use which they might not have considered before. Hopefully, the questions can stimulate new perspectives which can be transferred into the player's day to day engagement with screens.

Designing for Flow

Csikszentmihalyi (2014) defines flow as a merging of action and awareness in the sense that a player is aware of her actions but not the awareness itself. The player's actions during the state of flow happen in an automatic way in the sense that the player does not need to expend any energy on thinking the action through. A game which seeks to evoke a sense of flow needs to avoid unnecessary stimuli in order to allow players to narrow their focus to vital tasks. In addition, Csikszentmihalyi (2014) points out that a game must demand actions from players and provide clear feedback. By structuring the game in the right way, game designers can ensure that the players are more likely to experience a state of flow and thereby feel an increased internal motivation to engage with the game. One vital element of such a structure is the perceived difficulty of the challenges. Too difficult challenges and the player might feel overwhelmed and frustrated, whereas too easy challenges might result in boredom and apathy (Csikszentmihalyi 2014). The competitive element regarding the players' screen use attitudes and habits had to be constructed in a way which provided a clear winner each round in order to establish clear feedback. We chose to arrange the challenges so players had to guess the opinions of other family members. Guessing made it easy to establish a right and wrong answer while at the same time gain insight into the participants' opinions on screen use. Some of the challenges automatically become harder as the players improve

since they are competing against other players who are also improving which can prevent the game from becoming too easy. One challenge we faced regarding the difficulty level was the fact that the game is aimed at both adults and children. We solved the challenge by having the families divide themselves up into two teams before the game starts so families can create fair teams where parents can guide the children, if they find the game too difficult on their own.

Competition from estimations rather than Non-use

We chose to have the players guess each others data instead of their own data. In order to guess their own answers, they would have to open their screen time app to read the correct answer which meant they most likely would see the answer to other questions as well. We also considered having challenges where teams competed or were rewarded based on their screen usage data, but we chose against it since it could decide the winner every time and therefore make the game too uneven. We feared that some participants would end up always losing these challenges due to high screen use levels across multiple platforms like Facebook, Messenger and YouTube. We also did not want to seem like we were moralising by implying that players with low consumption levels were better than ones with high consumption levels. All these factors could discourage the enjoyment of the game and could discourage the participants from playing it.

In-game mediation of each other

I wanted to investigate whether the game can spark conversations on screen rules or work as a means to facilitate active mediation for the parents. By bringing attitudes on screen use forward, the parents might attempt to influence their children's opinions and in this way, the game can work as a means for evaluative monitoring. The game also provides opportunities for factual monitoring where parents can educate their children in cases where they do not know what a question entails. The discussions can, however, also shape themselves as a two-way conversations where children educate parents. The habits and interests of young smartphone users might not be easily understood by parents but these insights could be gained throughout the game-play. An aim in the development was to have the individual game elements compliment each other. Estimations in the "estimate" challenges could help the participants pick out the right family member in a "write" challenge. These are further explored through the *duel* questions where gaining an understanding of each other's opinions might make participants more able to accept or challenge each other's use habits. In this sense, the game is centered around the potential for discursive activities where screen use opinions and habits are discussed and negotiated.

3.1.3 Developing prototypes

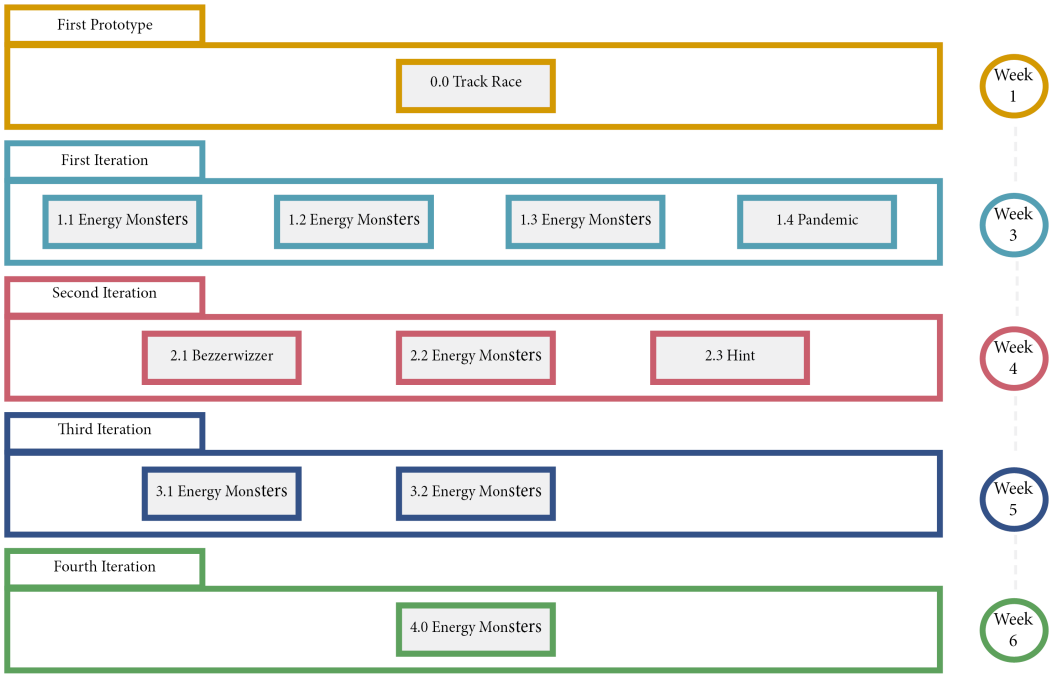

Figure 3.1: Flow chart of iteration periods specifying which game each prototype was inspired by.

We developed the game iteratively. We wanted to incorporate user interactions with smartphones and usage data, and we quickly came up with a track race design (0.0) where players could progress based on their ability to answer questions about screen use. We figured that the questions could revolve around the users' estimation of their usage data compared to their real data. Subsequently, we were inspired by a game called "Invasion of the Energy Monsters" developed by Banerjee et al. (2016). Especially the set up of the game was appealing with a board displaying rooms in a house where two teams move from room to room in order to solve obstacles. Around this point, we tasked all researchers to come up with a game design. One prototype was inspired by the "Pandemic" game (1.4) whereas the three other prototypes were all inspired by the "Return of the Energy Monsters" game (1.1, 1,2, 1.3). Elements like a board designed like a house and taking turns to move between rooms were elements that we incorporated in all prototypes. The games differed by how you moved around the board like moving along fixed paths across the rooms by rolling a dice or by moving one room at a time. The types of questions also differed where some games only revolved around screen usage estimates while others also included questions regarding

opinions and perception of other family members. We drew inspiration from our prototypes with the aim of merging the best ideas and then develop it into a better game (2.2). We also came up with two prototypes based on Hint (2.3) and Bezzerwizzer (2.1). The questions in the two games would be replaced by questions regarding screen use but other than that, the majority of the game mechanics would be kept from the original designs. We chose to focus on the game format inspired by "Invasion of the Energy Monsters". Banerjee et al. (2016) have tested the format against several other game designs and found the game format to be the most engaging and showing the most promising results and we hoped that basing our game design on a similar format might increase the likelihood of creating an engaging and effective board game. We also considered the game to be best suited to our research topic. We would like the families to compete in two teams, include a board which looked like a house and provide challenges around their opinions and screen usage. We also thought that the prototypes inspired by Bezzerwizzer (3.1) and Hint (3.1) might feel less engaging than an original design since the players just moved in a circle like in the track race design (0.0). We wanted the basic game mechanics to be engaging while at the same time provide ample opportunities to ask questions and provoke discussions between the family members. We therefore chose to focus the challenges around questions of estimations and opinions in the hope that it could stimulate discussions (3.2). Another issue with our earliest prototypes was that they felt repetitive after a few trials so we agreed to include scenarios so the game play was different each time. Another part of the problem was that movement in the game was predictable since the board only had 10 rooms and the players could only move to the next room in case they answered a question correctly. This led to teams sometimes being stuck in the same position for several rounds and in addition, there was often only one route to trophy room which meant players did not have to make many strategic decisions. We solved the issues by increasing the number of rooms on the board and included multiple routes to reach a trophy. We also tested an option with charades type questions (3.1) but quickly abandoned the idea since it did not provoke the desired discussions relevant to our research focus. We subsequently made further changes to the movement on the board so teams can move up to three rooms at a time by rolling a dice (4.0). Answering a questions correctly instead triggers an event-card which often gives the team another turn. Lastly, we also introduced bonus-cards which give the players the opportunity to obstruct the other team's efforts. With a bonus-card the teams can move to any room on the board, lock a door on the opponent's path or take their turn. By adding this functionality, players continually have to assess whether it's an advantageous moment to utilize a bonus card in order to interfere with the opposing team. We also added "answer" cards which specified where to write answers to "write", "rank" and "duel" questions in order to avoid any misunderstandings. In this way the teams would be less likely to forget.

3.1.4 Pilot-testing

Due to the Corona pandemic, testing the game was difficult. We wanted to conduct test internally in our group as well as external pilot tests with families but had to compromise by using virtual tools and our immediate surroundings as test cases instead. Initially, we tested our designs in person but at the point where the outbreak led to widespread isolation, we switched to using Google Images to simulate a play session which we could participate in while staying isolated. We separately conducted a number of play sessions with our family members and partners, often with an shortage of players, in order to gain feedback on the game. We ended up testing every type of scenario, sometimes multiple times, as well as all game mechanics. The initial test sessions were focused on getting the dynamics of the games right like the size of the board and how you move the pieces around. At a later session we exclusively tested new features we considered adding like "duel" questions with the multiple-choice format.

3.2 Research Design

3.2.1 Finding participants

We had the opportunity to ask families from a previous project (Hansen et al. 2019) to participate, but we chose to find new ones that suited the new project. We aimed for families with at least two children and each child owned a smartphone. We used a convenience sample of families which we were put in contact with through an acquaintance. We had planned to make subsequent posts on Facebook, internet groups and possibly hang up fliers, in case they did not agree to participate. Luckily, three of the four families in question agreed to participate in the project.

3.2.2 Developing our Research Design

The study primarily utilizes qualitative methods and we hoped to conduct both observations and interviews. Since a vital component of our project is to investigate conversations during game play, observations could provide insight into spontaneous reactions as well as how and what families discuss during a game. Interview sessions would allow us to ask about certain occurrences during the game sessions, their reflections on questions posed by the game and whether they felt anything changed in their approach to screen use. Interviews would also provide the opportunity to ask about potential play sessions between observations and if they had discussed anything new in the meantime. We aimed to conduct a longitudinal study of at least four play sessions spread out with about a week apart in order to leave the opportunity for interactions and discussions between games. Gathering the whole family at the same time could also be a difficult task for the families and we felt requesting a play

session once a week was a reasonable demand. The longitudinal perspective also provided the possibility of tracking how thoughts and behaviour developed as the number of play sessions increased.

Due to the Corona pandemic, our research design had to be accommodated to consist of long distance interactions which meant that all communication had to be virtual. Interview sessions took place on Skype, Google Hangout and Facebook Videochat which we recorded and subsequently transcribed. Instead of observation sessions, we asked the participants to record their play sessions and send them to us for transcription and analysis. We also asked participants to send screenshots from their screen use tracker app in order to contrast statements from interview sessions with actual data. The screen use data would serve as a form of triangulation where participants estimations of their own screen use could be contrasted with the actual recorded use data and reveal possible discrepancies between the two. With the screen use data, we could gain a better insight into their use habits and their potential misconceptions of their own screen use.

3.2.3 Conducting the Research

The families participated in the initial interview and their first play session at different times due to scheduling issues. The Poulsen family were not available until the 4th of May whereas we conducted the initial interview with the Jensen family on the 13th of April and with the Larsen family on the 23rd of April. After the interview, we asked the families to send us screen shots of their Screen Time app which we would typically receive a few days later. We also walked the families through the game and explained the rules, except for the Jensen Family who did not receive the game until a few days after the initial interview. By the time they were available for a second interview, they had already played the game once. They did not record the session, so we only received their second, third and fourth game. Since they had already played the game, we let the family present any questions about the game instead of a walk-through-session. In hindsight, we probably should have demonstrated the rules instead. In the first recording we received, it was clear that they had misunderstood parts of the game. They misinterpreted the mechanics around the "write" and "rank" questions where they would compare their answer to the opposing team like in a duel session instead of between two players on the same team. Because they were unavailable for a period of time, we subsequently explained the rules in a lengthy email, but by the time they saw it, they had already finished their third game session.

In the recording of the fourth game from the Larsen Family, the audio disappears around the 4th minute mark which meant the family subsequently recorded a fifth game session for us. Due to shared custody, the Poulsen Family had a hard time gathering the family for game sessions and interviews. They would often not reply to requests for a week or two which meant we ended up cancelling the last two interviews and game sessions and instead

replaced them with one interview where we merged questions from the second and third interview guide (Appendix T2, T3). In the end, the Jensen Family played 4 times where we received 3 recordings, the Larsen family played 5 times where we received 4 full recordings and 1 with missing audio, and the Poulsen family only played the game 2 time where we received both recordings.

3.2.4 Interview Design

We conducted three interviews with the Jensen and Larsen Family and two with the Poulsen Family where the last one was an amalgamation of the second and third interview guide. All interviews were semi-structural in order to explore answers and topics brought up during the interviews (Bryman 2012). The initial interview was meant to inform us about the families' current screen use habits and thoughts about it. We used the same interview guide for all families but posed different probing questions based on their answers (Appendix T.1). We asked about which devices they owned, how much they use them and for what. We also asked about any in-home rules, how they talk about them and how they enforce them. Because the interviews took place during the isolation period, we also asked them about whether their consumption levels and rules had changed due to the additional hours they were spending at home. Finally, we also wanted to hear their thoughts about their habits and rules, if they wanted to change something and whether they were currently doing anything to control their habits. The second interview was an opportunity to pose follow up questions to the first interview as well as the first game sessions. We therefore chose to customize parts of the questions to each family in addition to a common template (Appendix T.2). The customized questions asked about specific instances during the games in order to clarify their thoughts on and experience of the situations. The template mainly consists of questions regarding their experience of playing the game and how they had responded to it. We asked if they felt they had gained insight into each other's opinions and habits from the "write-", "rank-", "estimate-" and "duel-questions". We also asked about what they felt the overall effect of playing the game had been and whether they had experienced any changes to their habits, thoughts or dialogue about screen use. The third interview served as a follow up to the second interview and as a final insight into the participants' experience. The structure of the interview was similar to the second one with customized questions and a common template (Appendix T.3). Like in the second interview, the questions mainly surrounded reflections, discussions and effects from playing the game. Afterwards we asked them which game elements they preferred and which could be improved as well as how they experienced playing the game at the end compared to the beginning. We also asked about how they would evaluate the game and how they experienced participating in the research project.

3.2.5 Coding

I started coding about half way through the research period. I used the Nvivo12 program to code both interviews and play sessions. The program allows users to code multiple files with the same codes while retaining an overview of where each code is used. I decided to code the interviews and game sessions with different codes in order to keep interactions during the game distinct from conversational pieces during the interviews. By keeping them separate, it was easier to analyse any potential discrepancies between what was reported during the interviews and what took place during the games. I coded inductively and developed my first set of codes after reading through the transcripts at least once. I chose to create broad codes, like only one code for mediation activities, in order to have a broad overview rather than a distributed set of condensed information. In case a piece of a transcript was ambiguous and could be interpreted as belonging to two codes, I would place them under both in order to retain a broad overview when reviewing the individual codes. There were not any situations where the ambiguity involved more than two codes at a time and after reviewing the first round of coding, I decided the ambiguity in the transcripts did not suffice changing the codes. The codes were broad enough to provide an overview while at the same time particular enough to separate the texts into focus areas for analysis. I therefore only conducted one round of coding and did not iterate over the codes.

I wanted to divide the game session transcripts into the the type of challenges that occurred during the game. This meant that I established codes for *write*, *estimate*, *rank*, *duel* and *bonus-cards*. In this way, I could quickly analyse how frequently each challenge appeared in the session as well as how each type of challenge was solved by the families. One aspect that I wanted to investigate was mediation during the games. Upon reading through the initial sessions, mediation practices did not seem frequent and therefore I chose to only include one code for the topic simply called *mediation*. Some of the mediation terms like active mediation and discursive practices cover similar practices so by only including one code, it was easier to analyse events with multiple concepts. I wanted codes which helped analyse the different interactions during the game. I added a code called *discussion* which covered all arguments that appeared as a result of the game, excluding discussions of the game rules. I also included a code called *reflection* which covered thoughts and reference to screen use which were not part of a discussion. I also added one for *tension* which covered any expressed tensions with a family member's screen use. There were examples where part of the transcript could be coded as both tension and reflection or discussion, and in response I included them under both. The discussion code did not include discussions about how to define a concept like "device" and instead, I included a separate code called *definition* for these events.

In the codes for the interviews, I included codes called *apps* and *devices* to get an overview of their preferred platforms for screen use. Regarding potential restrictions and how they

discussed and negotiated the restrictions, I included two codes called *rules* and *mediation*. The term mediation was once again used broadly to include all types of screen use mediation except for restrictions which the rules code covered. In cases where part of the transcript could be included in both like for exampled dynamic gatekeeping practices, I included it under both codes. I also included codes like *habits* and *opinions* to get insight into their consumption patterns and their opinions about them and screen use in general. *Tension* and *strategy* were meant to designate any potential areas of tensions regarding screen use, both from other family members and themselves, and the strategies they use to deal with their own unwanted habits. Strategies did not include tactics to influence other's media use, these examples were included under the mediation code. I also included a *corona* code to list all examples of changes due to the isolation period. In the end, I also included *game* and *changes* codes for direct references to the game and any changes in thoughts, discussions and screen use they felt had occurred during the research period.

3.2.6 The Families

The Jensen Family

The family consist of the parents Maria and Andreas and the three children Steffen, age 18, Frederik, age 15, and Felix age 10. Maria is a school teacher for children with learning disabilities and Andreas is a music composer and teach music at a school as well. Steffen is in his second year of high school and Frederik is in the 9th grade while Felix is in 4th grade. They all have their own personal laptop and smartphone. The family does not own any tablets or smartwatches and only has one TV. The TV is also connected to a PlayStation. In their free time, the children mainly use their devices for social media. Steffen and Frederik uses Instagram and Facebook while Felix spends most of his time on Snapchat and TikTok. Maria reports that she mainly uses her devices for news and Facebook. Andreas has similar habits but uses a range of applications in his work as a music composer as well. Steffen and Frederik also create music in their free time while Felix sometimes play Fifa on the family's playstation. They all gather around family programs like X-factor which they watch together on their family TV. The Corona-pandemic has brought changes to their screen use since the children are now participating in virtual classroom, but except for Frederik, they don't think their consumption levels have changed significantly in their free time. Maria and Andreas used around 2 hours a day on their phone while Steffen and Felix used around 1 hour. Frederik was normally attending a boarding school where he rarely used his phone, but now that he was isolated at home, his phone use had increased to around 3 hours a day (Appendix S.1).

The Larsen Family

The parents in the Larsen family are Alfred and Nora, age 48 and 45, whom are both teachers. They have two children, William age 13 in 7Th grade and Olivia age 10 in 3rd grade. They all have a smartphone and each of the children have an iPad as well. Nora also has an iPad which is only used by Alfred and William has a PlayStation and a Chromebook for school work as well. Alfred has a stationary PC and both him and Nora have a laptop they use at work. The family has three TVs, one in the living room, one in William's room and one in the parents' bedroom. The family no longer has a subscription for a TV package but has online subscriptions to TV2 play, Viaplay and Netflix. William spends a lot of his time on YouTube, Netflix and Viaplay. Olivia plays Minecraft and BloBlock, watches YouTube and TikTok and talks with her friends over Facetime. Alfred uses his computer for work tasks, streaming football and occasionally playing video games as well. He is a member on the board for the local handball club and uses Facebook and Messenger to communicate with the other board members and he frequently plays games on Nora's iPad, often when seated in the living room. Nora mainly uses her phone and only rarely use the computer for anything else than work. Due to the pandemic, the family has experienced an increase in their daily use. Especially Olivia talks about how her consumption level has increased up to four times as much as before the outbreak. Nora and Alfred have also experienced an increased online workload which resulted in screen time increasing two or three fold. They also experience feeling less interested in engaging with screens afterwards. The Larsen Family reported that Olivia and William would spend around 2-3 hours on screen time on a normal weekdays, but due to the isolation this has increased to around 7 hours for Olivia and 5 for William according to their screen shots (Appendix S.2). Nora would spend 2-3 hours on her phone while Alfred only spend 1,5 to 2 hours a day on the phone, but his screen use is likely significantly higher since we could not obtain screen shots from the iPad he frequently used.

The Poulsen Family

The Poulsen Family consists of the two parents Vibeke, age 42, and Rasmus, age 38. They have two children, Laura, age 16 and Esben, age 10. Vibeke and Rasmus are both elementary school teachers while Laura is in 9th grade and Esben is in 3rd grade. All family members have a computer and a smartphone. In addition, Vibeke, Rasmus and Esben have an iPad each. They also have a TV in their living room and the parents bedroom as well as in each of the children's room. Rasmus mainly uses his phone to read news on sites like The New York Times and Ekstrabladet as well as sports updates on NFL.com. Esben mainly plays mobile games and watches YouTube and sometimes he and Laura also use TikTok. Laura mainly uses Snapchat and other social media applications like Instagram and Messenger and spends most of the time communicating with friends. Vibeke spends a lot of time on Facebook where she trades different household appliances and she also uses Messenger a lot to communicate

with friends and colleagues. Vibeke and Rasmus also use Aula a lot in relation to their jobs and during the research period, Rasmus and Vibeke spent a lot of time teaching online classes due to Corona outbreak. The family watches TV in the living room where the TV is on from around 6 to 11 on weekdays. It is mainly the parents who watch together and sometimes Esben joins them. Laura estimates she watches between 3 and 4 hours a day and mostly by herself in her room and often while using her phone simultaneously. The family members did not believe their consumption levels had increased significantly for recreational activities during the isolation but did concede it probably had increased a little bit. We could not obtain screen shots from the family, but asked about their daily screen time, Rasmus and Esben estimated that they used a couple of hours on their phone a day while Laura and Vibeke estimate they theirs around 5 to 6 hours a day.

Chapter 4

Results

4.1 Mediation before the Game

Restrictions before and during isolation

The children age 13 and under had restrictions whereas those age 15 and up controlled their own screen use. The Jensen Family only restricted the youngest child, Felix, who was allowed around one and a half hours of screen time on weekdays and with some additional time on weekends. The parents did, however, manage the time restriction with some freedom and would often allow him to finish any activities he is in the middle of even when they stretched over the time limit. The Larsen Family has rules regarding where they charge their devices. Olivia and William had to charge them in the kitchen in order to make sure they were not tempted to use them at night. Before the Corona outbreak, the parents would be more conscious of limiting screen use after dinner and until Olivia's bedtime. They acknowledge that it was important for her to stay in contact with her friends and since she would often Facetime with her friends at night, they did not wish to enforce a limitation.

In the Poulsen Family, Laura managed her own screen time while Esben had restrictions, primarily on weekdays. Esben had to ask for permission and was often not allowed to use screens after dinner. During the weekend, he had more freedom and could sometimes spend most of the day playing computer games like CS-GO. Esben was restricted from using certain features on Snapchat and was only allowed to communicate with family and a few friends in the app. The parents would also grant more screen time during the isolation period.

> Vibeke: They might be a bit light, the rules, i think. Esben is used to coming home late and now he is suddenly home at 12 every day. And then I might have a meeting until 3. Then I'll let him play unless he has friends over or something like that.
>
> Vibeke Poulsen (Appendix G: 5)

Gatekeeping was relaxed in order to make the day to day schedule work, but Rasmus and Vibeke also acknowledged that allowing more screen time during isolation could help ensure that the children stayed in contact with their friends.

Unspoken agreements not to use screens

Unspoken agreements were a part of the families' approach to mediating screen use. Some habits or behaviours did not have to be restricted by concrete rules but were instead upheld through a common understanding.

> Frederik: I think I am aware that my parents wouldn't like it if I spent the entire day on a screen for example. So I just try to not do that then. I think it's more like, it's sort of common sense which is the rule.

Frederik Jensen (Appendix B: 2)

The Jensen Family did not have rules for the two oldest boys but had an unspoken agreement to refrain from using devices too much in each other's presence. All the participant families also had unspoken agreements not to use their devices during dinner time.

> Alfred: It's actually pretty simple... At meals screens are hidden far away. We don't have a TV in the kitchen, we don't have anyone who uses screens at meals, except William, when he gets home from sailing and eats by himself.

Alfred Larsen (Appendix E: 1)

Common for the families was that they did not restrict all transgressions of the rule and allowed family members to check their phones once in a while.

Gatekeeping as a fluent activity

Regarding screen rules, the Larsen Family responded that they at times would enforce stricter rules than at other times. Alfred and Nora would bring it up if they felt the screen use was getting out of hand but also pointed out, that they were all involved in agreeing on screen rules.

> Alfred: Yes, we have problematized it, if we were thinking that something has taken up too much time, that somebody has been too much on a screen, or that someone in the middle of a meal has to get up and check what on the phone and stuff like that. Then we have of course problematized it and said how we want it to be. And then we are usually in agreement, or we have at least reached to where we are now through dialogue. Or before Corona at least.

The Larsen Family (Appendix D: 5)

The initiative is usually taken by the parents and then the children are involved in discursive activities in order to reach a common understanding. In the Poulsen family, the Rasmus and Vibeke reported that they were the ones deciding the rules. Like the Larsen Family, they would also react to the circumstances so if they felt Esben spent too much time on screens, they would enforce more limiting restrictions for a period of time.

> For example, we have told Esben, gaming is actually ok as long as he practices his sport, a team sport, and as long as he still has been good at play dates and going outside to play. And if we like could feel that it took up too much time and that he would rather sit in front of a screen, we would pull back again a bit.

Vibeke Poulsen (Appendix G: 5)

The parents in the Poulsen Family are also aware of the social dimension of screen use and are less likely to restrict access for activities where he socializes with his friends.

> At least I have a feeling that something social is happening for him (Esben). They meet in CS-GO and I almost feel like, it would be to take something away from him by restricting it too much.
>
> Vibeke Poulsen (Appendix G: 5)

Similarly, the parents in the Larsen family report that they are more likely to extend screen use time for some activities rather than others.

> If we go into the living room and YouTube-videoes are streaming on the TV, then we might feel like it's as much of a waste of time as if you were in front of a screen doing it. But if it's a movie you are watching then... Then we might be able to live with it in a different way. And I don't know why. It must be a something generational.
>
> Alfred Larsen (Appendix E: 12)

The families' gatekeeping activities depend in this sense on the content where they have different preferences for their children's screen use as well as their own. The Jensen Family would also restrict the access for Felix in a dynamic way and would often let him exceed the time limit if he was in the middle of something. In contrast to the children in the other two families, his screen use level was consistently around 1,5 to 2,5 hours a day and did not increase two or threefold during isolation or during weekends which made it less pressing to enforce gatekeeping activities.

Encouraging off-screen activities

The Jensen Family reported that they did not interfere in their two oldest children's screen use but would sometimes use diversionary activities in relation to Felix.

> Andreas: We can sometimes, toward Felix at least, point out, that we think there has been a lot of screen time, but it's not like it gets any real consequences or anything. It's just pointed out and such...
> Maria: But then you are actually good at saying "yes, that's true, Ill go outside". He spends more time outside playing football than sitting in front of a screen and do other things. But sometimes we will say, "now you have to do something else".
>
> The Jensen Family (Appendix A: 3)

Since Felix show a propensity to regulate his own use as well, the parents have not felt that additional restrictions were necessary. The diversionary activities were applied in a dynamic

way as a response to how much the parents felt Felix was using and were sometimes just meant as encouragements to make Felix take action himself. Diversionary activities were also used by children as well as the parents in the Larsen Family.

> Olivia: It's only you guys who tell us to put it away.
> Nora: Ahr, I actually think you will some times say, "now you're on your phone again, or now dad is playing again on his iPad". I actually think you say it quite frequently, Olivia.
> Olivia: That's because you use it all the time.
> Nora: At least you think that some times.
> Alfred: All the time is a bit harsh, I think.
>
> Larsen Family (Appendix D: 5)

The desire to intervene in screen use habits was not only found among the parents but also the children who would often utilize the same mediation tactics as the adults. Like in the Jensen Family, the diversionary activities were mainly used to decrease the amount of time someone spent on screen use rather than removing the screen use all together. The activity might be used as a strategy to deflate tensions from family members not being present.

Children included in investigative activities

The two oldest boys were part of the Jensen family's mediation strategy. Since they are more up to date on how young people use screens, the parents would often counsel with them before mediating their youngest screen habits. The boys were in this sense used as part of an investigative strategy where they provided insight into potential issues or safe forms of screen use. The parents did not use many social media platforms and only had limited knowledge about them, while the two oldest sons had experience with a large variety of platforms or knew about them through their social circles. They would in that sense provide factual and evaluative monitoring by explain how it works and whether they were suited for Felix. Maria Jensen also pointed out that Felix had been involved in research on which apps were inappropriate for him.

> Maria: We have actually put a pause on TikTok for a long while. Because there were all kind of writings, you (Felix) also heard things in "Børneavisen" and "Ultranyt" about how the chinese government is surveilling TikTok and stuff like that.
>
> Maria Jensen (Appendix A: 5)

The investigative activities are in that sense not only conducted by the parents but also the children themselves. In the Poulsen Family, the experience with Laura made the parents feel more comfortable with platforms they used to have more concerns over. They were more

strict with Laura than with Esben, because they only had limited knowledge of for example the applications she requested to install. She has both directly and indirectly helped increase their understanding during the years, where they have addressed their doubts through a number of investigative and discursive activities where Laura gave her feedback on their restrictions. They still felt that it was important to keep an eye on Esben's habits and Vibeke would sometimes monitor him on his devices.

> Vibeke: We keep an eye on, or I keep an eye on YouTube. He, when he is on his iPad, where he's on YouTube, then I will often sit down next to him to be around. So when he watches something, then I have a feeling of what he will go to watch. I think I would be more aware if he withdrew himself and wouldn't sit next to me when he is on his iPad and watched these things. So in this way, there is some supervision but in a calm way.
>
> Vibeke Poulsen (Appendix G: 7)

Vibeke engaged Esben in participatory learning, where she could learn from his actions on the screen while she could also show and engage him in content on her own platform. By watching Esben's behaviour, Vibeke used an investigative strategy to gain insight into his use habits but can simultaneously mediate his behaviour actively by passing factual or evaluative judgements over the media content.

4.2 Experience of Game Play

Finding a common understanding of concepts

Families would often agree on the implications of a question before answering it. At times it would lead to a new common understanding of a concept like for example devices.

> Nora: No but I'm thinking, it is also computers, PlayStation and that type of stuff? TV and... Or is it just phones and iPads? We have to agree on that.
> Alfred: Okay, but I guess it is everything where you can access the internet?
> Nora: Yes, of things which can access the internet, that's what we are talking about.
> Alfred: Yes.
>
> The Larsen Family (Appendix L: 5)

Reaching the same definition could subsequently provide a foundation for discussions. The Larsen Family reported that it proved to be valuable to have a shared definition of devices when they were negotiating screen rules in the home. The children would at times complain if they felt that the rules were not fair or that a sibling had more access to devices than

themselves. By agreeing on what constituted a device, it was easier to reach an understanding of what devices were included in the screen use restrictions since they might grant more or less access to platforms like TV or PlayStation depending on whether they counted as devices alongside iPads and smartphones. The participants also became aware of how difficult some screen behaviour or platforms can be to define.

> That thing about how much you call is a wide term because what does it mean, is it Facetime or Skype or what is it really
>
> Rasmus Poulsen (Appendix H: 2)

Similarly, families would debate whether platforms like YouTube or gaming with team talk counted as a social media. The confusion around defining screen behaviour and concepts was something that could have a consequence for how parents would mediate the screen use. All parents reported that they were more likely to grant more access if the screen use for example included a social dimension.

Different incentive structures lead to increased debate

The Jensen Family had game sessions where "write" and "rank" questions were answered by both teams, so to answer correctly, the team depended on matching the opponent's answer. One issue with this format was that the opposing team had an incentive to distort the truth or pick somebody the other team would not expect in order to stop them from completing the challenge. This problem seemed to play out during the game session in the Jensen Family where every answer was hotly contested. Answering the question, who has the hardest time putting the phone away, the boys all objected to the parents' answer.

> Felix: And it's just mom.
> Steffen: It's mom.
> Frederik: It's mom. You also just agreed to it.
> Andreas: No.
> Maria: No at first we wrote him (Steffen)
> Steffen: Are you serious?
> Maria: Yes.
> Felix: What!
>
> Jensen Family (Appendix I: 4)

The challenging team would often suspect the opposing team of lying when answering the questions since the opponent could steal their turn by producing an unexpected answer. This would sometimes lead to second guessing the sincerity of each other and a feeling of resentment from unjustly losing ones turn.

Pointing out family members the most contentious challenge

The most contentious game elements throughout all the game sessions were the "write" and "rank" questions which asked the players to name the family member which best fit the description on the card. Players often felt the need to explain why they chose somebody which might be in order to prevent any offense from being singled out. The chosen player would also often comment on the decision himself. This could be in the form of a challenge or as a rationalisation for why he was singled out.

> Nora: What did you answer?
> Olivia: Mom.
> Nora: I've actually also written myself but that's because I'm quick to...
> Olivia: You are always searching.
> Nora: I'm quick to check if we discuss something or some facts or what's the weather forecast.
>
> Larsen Family (Appendix M: 2)

Explaining yourself also seemed to prevent tensions from getting the question wrong. At times when the players pointed to a different family member and therefore lost their turn, the players would often explain their reasoning to each other which might be a way to prevent blaming each other. In addition, it reveals their reasoning which might help them better estimate each other's answers to subsequent questions.

> Nora: Yes. I had many doubts whether I should write Alfred or myself, but I ended up writing myself.
> William: I wrote Olivia because we also just talked about how she uses - she gets distracted so easily.
> Nora: Yes, but when dad is not talking on his phone he plays something while we're talking or everybody else is-
> William: No, that's the iPad!
> Nora: He also does it with his phone once in a while.
> William: Not that much.
> Alfred: I'm in agreement with my oldest child here.
> William: I have to say, dad almost always uses his iPad.
> Olivia: He uses the iPad.
>
> The Larsen Family (Appendix L: 4)

Finally, the opposing team would sometimes also question the decision. These instances might stem from an opponent disagreeing with the choice or feeling like the team earned another turn unfairly.

Improving abilities from game to game

All participants reported improving their abilities to estimate each other's answers and consumption levels. The participants did in that sense gain a better understanding of each other which improved the awareness of what everybody thinks about these issues.

> When were on the same team against the kids, then I think there is a tendency for us to think we allow more, and the kids think we are more strict. We think we allow more screen time and they think we are more in the opposite lane.
>
> Alfred Larsen (Appendix E: 5)

The players increased their understanding of how each family member view each other so Alfred more and more aware of how the children perceived the rules in the household.

> When I'm playing against Olivia for example, I'm starting to consider adjusting it downwards, when I'm guessing, what she thinks I will say.
>
> Alfred Larsen (Appendix E: 5)

Alfred could use his insight to adjust his own answers based on how he knew Olivia perceived him. The game did in that sense also help improve the participants estimate of how others perceived them.

The discussions during the games could also increase the reflections from participants since they were confronted by arguments they had not heard before or because they were prompted to justify their answers. During a discussion of who had the highest screen use, Steffen realised that his team had given the wrong answer and that they should have placed Andreas higher on the list.

> Steffen: Honestly, when I think about it, during the morning, it's often we don't see you (Andreas), then you're just on your screen.
> Frederik: Well, we wrote mom, Steffen, Felix, dad and me.
> Steffen: It's actually... It's wrong now that I think about it.
>
> The Jensen Family (Appendix I: 7)

The players could have their assumptions disproven and thereby gain more awareness of themself and each other. By each game, the players might then accumulate more and more insight into the family's screen use.

Bringing up tensions during the game

Throughout the game sessions, players would at times references habits which they found frustrating. The "write" and "rank" questions in particular were effective to prompt participants to reference screen use which caused tensions since players would more often inquire about the reasoning behind an answer or justify the answer by referencing real life situations. Players were also confronted by how other family members view their screen use habits which sometimes contrasted the player's self-image. Discussing who has the highest screen use, Steffen is confronted by the surprising opinion that his parents think he has the highest consumption levels.

> Steffen: No I'm not. It was only just because I did it that one time and because we were playing then. And I swear, I'm just not.
> Frederik: You swear? [laughs].
> Maria: But you are.
> Steffen: I'm provoked by that. I'm seriously provoked by that.
>
> The Jensen Family (Appendix I: 5)

The game could also provide opportunities to bring up undesired habits which seemed to be easier to reference in a game context than in real life situations since the player in question were sometimes met with these criticisms for the first time during the game sessions and responded with surprise.

> Maria: Because you always have to show us something, play something for us, and it's just like, "not now Frederik, not now".
> Frederik: You've never said that. You always want to...
> Felix: You've never said that.
> Maria: That's because we are nice and friendly people.
>
> The Jensen Family (Appendix I: 4)

Frederik did not realise that his parents found some of his interruptions unwanted before it was brought up during a game session. The game could then help air tensions which might not otherwise have been brought up.

Active mediation during game play

Often family members would not directly challenge each other's opinions with the aim to change them during the game sessions but rather just seek clarification. The tensions brought up during the game were likewise rarely solved during game play. Even though the players would bring up tensions during discussions during the game, the families would rarely debate

them for a long time and instead return to the game. There were, however, also examples of discursive practices taking place during the game. Interestingly, they did not always take place between a parent and a child but also between the children. Sometimes the children would express evaluative or factual statements addressed to one of their siblings like when Snapchat was brought up during the Jensen Family's first game, where both Frederik and Steffen discouraged Felix from using it.

> Steffen: Ok. You've nailed our answer. We said 10. That's how old we think you at least have to be. Felix thinks 8. He doesn't think there is anything wrong with it...
> Frederik: I think so, there can happen many, many different things. It's not a good social media.
> Felix: Yes it is.
> Steffen: No it's not a good social media.
> Frederik: No.
> Steffen: You (Felix) will discover it yourself. One day, when you're wise, when you're 18.
> Felix: (shakes his head).
>
> Familien Jensen (Appendix I: 8)

Even though Frederik and Steffen did not elaborate about the factual or moral issues with the platform, they did attempt to influence Felix through evaluative judgements of the application. Even though it was not common among the participants, the game can afford opportunities to mediate between each other.

Ambivalent attitude to consumption levels

The Jensen family expressed some ambivalent feelings towards using media. Especially Steffen and Maria would sometimes experience feeling guilty from using screens.

> Steffen: Honestly, I some times feel like I want to just learn some thing.
> Frederik: You're so smart.
> Steffen: Then it has to be screen where I'm learning something. I can get a bad conscious when I'm watching, I really can...
> Maria: I know that feeling well.
> Andreas: I get that.
> Maria: I know it really well.
>
> The Jensen Family (Appendix I: 6)

Some of the parents expressed that they sometimes considered if they should use screens less. Rasmus Poulsen did, however, point out that attempting to reduce screen use in their household would be difficult unless they had a special motivation to do it.

> Sometimes you would like it to maybe be different, but it wouldn't work for us. Because we, for example you could wish that we weren't so much on our devices, but we are. So unless we want to change it, then we also have to accept some rules which actually make sense for the consumption level we have.
>
> Rasmus Poulsen (Appendix G: 6)

He did not feel like screen use was as important as other parenting concerns or improving other habits and he therefore did not feel motivated to change it. A lack of motivation to change compared the difficulty of changing could be a key reason why families do not implement changes in their consumption levels.

Connection between screen use and opinions

There appeared to be a connection between how much screen use a family used and their opinions on acceptable consumption levels. During the game, the Jensen Family consistently agreed a lower number of screen use hours as the appropriate amount compared to the other two families. The Jensen Family responded to question of how many devices an adult is allowed to own with between two and three compared to between four and five in the Larsen Family and answered that you should not spend more than between 1,5 and 2,5 hours on screens if you had a friend over compared to between 4 and 5 hours in the Poulsen Family. The Jensen Family had the lowest screen use in the study and a family's screen use habits could in that sense have an effect on what they think ought to be the norm (Appendix T).

Given that parents exercise gatekeeping activities regarding the children's screen use, one might expect that parents would display more conservative opinions than the children. This did not turn out to be the case as parents and children often showed similar opinions. Asked about how old a user should be before installing Snapchat on their phone, both the children and parents in the Jensen Family answered 10 years old. Frederik and Steffen would also sometimes show more conservative attitudes towards social media like when asked about the age of when you should be allowed to install Instagram on your phone. Here the two boys answered 12 whereas their parents answered 10. They also advised Felix not to use Snapchat despite the parents having granted him permission to do so.

4.3 Effects from Playing the Game

Encouraging out of game talks

The opinions displayed in the game would at times facilitated out of game interactions. Both the Jensen and Larsen Family expressed commenting on each other's screen use more often after having played the game. The comments would often originate in the "write" questions where family members had disagreements over who really had the highest screen use in the family. Both the Larsen and the Jensen Family reported that the comments were made in a teasing tone. Family members would tease each other if they felt that a disagreement had not been resolved during the game. Especially at times where somebody would ignore their unspoken agreements. They would often make a point out of highlighting that they were in fact right and that the person on their phone was demonstrating it right now. The additional comments could indicate an increased awareness of family members' screen use habits but they could also be interpreted as increased tensions around the subject. Both agreed, however, that the comments were made in jest and did not lead to any conflict. The Poulsen Family did not experience talking more about it or commenting more on each other's habits. They only played the game twice and were not as engaged in it as the other families but did point out that the game could be a good way to start conversations. It could work as a more subtle and informal way to approach screen use issues which might otherwise create tensions.

Increased awareness of screen habits

The Jensen Family did notice a subtle effect on their attitude to screen use after having played the game one time.

> Steffen: I have just thought about it a bit more. And then I might have juuuust when I have thought about it then I might have turned it off. And then I might have turned it on shortly after. But I have been a bit more aware of it.
> Frederik: But I also think that if you're really bored or something or you're just doing nothing on your phone, then you might get thoughts like maybe I should actually just do something else instead.
> Steffen: Yes. Agreed.
> Maria: I think I feel the same way.
>
> The Jensen Family (Appendix B: 6)

Steffen, Frederik and Maria felt they were more likely to question their own habits after having engaged in the game. They were also more likely to abstain from using their phones if they questioned why they were using it in the first place. Vibeke reported that she did not

believe their habits had changed significantly but recognized she did feel differently aware of her habits.

> As soon as you've said it, it becomes something new. So communication does have an effect that way, then it sits in your conscious and then it has a different meaning the next time you are on your phone and think, "it's time to go to bed", because now you've said it, so it makes it different.
>
> Vibeke Poulsen (Appendix H: 3)

Expressing her opinions during the game made her more likely to subsequently think about the opinions when she was using her phone. She would contrast her opinions with her actual use patterns and would detect the differences between the two. This meant that she would question whether she actually should be using her phone and then subsequently abstain from using it. The game can in this sense help stimulate reflections on why and when to use screens which can be translated into actions. The game also provoked reflection before a game session. Steffen and Andreas reported that they were more likely to consider abstaining from using before a game and Maria expressed sometimes feeling the need to excuse her consumption levels before they started playing. When her screen use was revealed on the tracker, she would often feel a sense of guilt and would point to how it had accumulated because of work tasks. Having her consumption levels exposed in front of the other family members provoked her to reflect more on how it increased. Similarly, Andreas and Steffen considered reducing their consumption levels so they did not appear to have a large consumption level.

There were also numerous examples of family members showing surprise from each other's answers, especially in the "write" and "rank" challenges. One example was the recurring interactions between Maria Jensen and the three boys in the family. Maria Jensen estimated that she was the one who was easiest to talk to while being on her phone, used it the least at the dinner table and was the least attached to her phone. In contrast, the three boys all agreed that she was the most difficult to talk to, spent the most time on her phone during dinners and was most attached to her phone. After having played the game, the boys would increasingly point out the behaviour to her when it occurred. By doing so, the boys felt vindicated from the discussions during the game, and Maria gained more self-awareness about how the others perceived her habits. In this way, the game can both help bring up behaviour which cause tension and help family members point it out to each other. It can help confront users with behaviour they are unaware of and the effect it has on the other family members.

Vibeke Poulsen experienced how increased reflection led her to more acceptance of their current consumption levels. She felt more aware of the tensions she experienced from worrying over the children's screen use and started to question whether it was worth it. After

having thought it through, she came to a new understanding that it might not be as big a problem as she originally thought. Even though she thinks the children have a relatively high screen use, she acknowledged that they benefit from the social engagements on screens as well.

Alterations in Screen Use

The game inspired some players to interfere in their current use patterns and try something new. Andreas Jensen reported during the final interview that he had kept his phone on mute for the past week. During the first interview, the parents described how they found all the sounds from other family members' phones annoying and silent mode was a way to mitigate this issue. He felt that the change ultimately did not suit him since he would now check his phone more frequently, but he was still open to try changing his habits.

> In general, I think we've all become a bit more aware about how much we, and when... [...] And I don't think it's just now that we played the game, I think it will continue. We might get some new habits for it.
>
> Andreas Jensen (Appendix C: 2)

The parents in the Jensen Family also reported that they would keep their screen tracker switched on after the research period. The family did not have the screen tracker turned on previously but felt that it was a useful alteration in the their habits and that it helped them be more conscious of their screen use. Despite having shown aversion to the idea in the beginning, Maria Jensen felt that it helped her gain more awareness and stay on top of her consumption levels.

The Larsen Family restricted Olivia to two hours screen time a day during the research period. When asked about their motivation, the parents answered that they had talked about it before the start of the research period and now that Olivia had gone back to school, she did not have to rely as much on screens to stay in contact with her friends. They wanted to discourage her from using her devices all afternoon after school so they initially discussed it with her. They made an evaluative judgement by expressing how they were motivated by a desire to spend more time with her during the day. The talk can be seen as an attempt to use active mediation in the form of diversionary and discursive activities to dissuade her from using screens, and since the active mediation failed, they subsequently turned to restrictive mediation and enforced a time limit. The parents said that the motivation did not stem directly from playing the game, but did concede that participating in the study made them reconsider their current screen use which might have prompted them to consider and apply the changes. The prospect of playing the game and being confronted with their screen use might then still be a motivating factor for the changes they applied.

Chapter 5

Discussion

5.1 Mediating Family Members' Screen Use

Mediation not only a parental activity

According to Valkenburg and Piotrowski (2017), mediation is used by parents to govern the children's behaviour, but in the participating families, it was not only directed from parent to child but also the other way around. The children would sometimes comment on the parents' use in an attempt to gain their attention or encourage them to abstain from using. Diversionary activities were in this sense also directed from child to parent. The same can be said about the discursive activities in the family (Jiow et al. 2017). During the game, children would at times comment on behaviour they found frustrating like Steffen and Frederik Jensen criticizing how difficult Maria was to engage in a conversation when she was on her phone. The comments highlight the tensions created by the behaviour and take the form of an evaluative statement which seek to change the habit. The game then provides opportunities for both parents and children to bring up screen use behaviour which they would like to change. Children would also take the initiative to comment on each other's habits or preferences without parental involvement. Frederik, Steffen and Felix in the Jensen Family would at times discuss why an application or a habit was undesirable. Siblings are also attempting to influence each other's approach to screen use by making factual or evaluative statements. Active mediation did in this sense not only occur in the relationship between child and parent but potentially across all family relations. Mediating screen use might then be conceived as a dynamic relationship between all members in the household.

Children were themselves an important part of the parents' mediation strategy. Some of the families would trust the opinions of the oldest children in regards to what platforms to restrict for the younger children. The children might use or discuss social media with their peers more often than the parents and are therefore considered to have more insight into potential issues relating to them. Children can in this sense form part of the investigative activities that the parents undertake in order to better mediate their children's screen use. Some families would also use the experiences from mediating the oldest children to inform how to approach the youngest children. Valkenburg and Piotrowski (2017) points out that the dynamics between parents and children change as the child become more mature, but does not touch on how parents learn and apply mediation for younger siblings after gaining experiences with older ones. The Poulsen and Jensen Family experienced mediating their youngest children as easier due to the insights they gained from experiences with their oldest children. They had obtained more insight through investigative and discursive practices and had the experiences of older children to rely on as well. Issues that occurred with the oldest child were easier to anticipate and potentially regulate before it happened and it was likewise easier to judge which concerns might have been overblown the first time around.

Unspoken agreements as mediation

One thing that was common for the families in relation to screen use mediation was unspoken agreements. The unspoken agreements were a way the families could establish common expectations to screen use and avoid tensions from an unclear understanding of when and where it's acceptable to use screens (Hiniker and Kientz 2016). Contrary to restrictions, unspoken agreements do not have to be regulated by the parents, but is upheld by all involved. It might, however, be difficult to characterize how exactly unspoken agreements emerge and function as a mediation tactic. Current mediation theory revolves around deliberate actions from parents to mediate their children's screen use (Jiow et al. 2017). Unspoken agreements might consist of more indirect actions and emerge from norms established in the household by the parents. The parents' own use habits might influence the children indirectly, and the example set by parents could then be considered a type of approach to mediate screen use in the family. It is also unclear which role active mediation has played in establishing norms (Valkenburg and Piotrowski 2017). It is very likely that parents over a period of time let their views be known through discursive practices. These discursive practices might not be directed to the children, however, but picked up by them indirectly in the household. They might not consist of conversations directly about screen use, but might also include non-verbal communication or subjects indirectly related to screen use like when you are expected to do homework or help out with housework.

Valkenburg and Piotrowski (2017) points out that both restrictive and active mediation can be useful strategies, but does not outline in which situations one can be advantageous compared to the other. Unspoken agreements, which mainly rely on active mediation, might be more effective when possible, since they avoid potential tensions from restrictions (Hansen et al. 2019). The children might also benefit from this approach in the sense that they have more freedom to regulate themselves and can potentially influence the common agreement during family talks. Restrictions can, however, be an effective alternative when a family member no longer complies with the shared understanding. Nora and Alfred had previously spoken with Olivia about wanting to spend more time with her, but because the discursive activities did not have the desired effect, they decided to impose restrictions. Tensions from not having a shared understanding when to be present are then alleviated by restricting screen use at certain hours of the day (Hiniker and Kientz 2016). In this sense, the mediation could be interpreted as an example of restrictive mediation being utilized where active mediation failed to have an impact. Restrictive mediation and unspoken agreements might then be optimal under different circumstances where restrictions can be seen as an effective alternative when active mediation tactics does not work.

5.2 The Game as a Mediation Tool

The Game as Participatory Learning

The discussions within the teams can be beneficial for understanding each other and can be conceived as a type of mediation itself. The child discusses with an adult what they think are acceptable levels of screen use and gets to compare the opinion with that of another team. The discussions might in itself work as a type of evaluative monitoring where the adults can influence the child with moral judgements on different types of screen use (Valkenburg and Piotrowski 2017). The parents would, however, rarely directly comment on a child's opinion during the game which could suggest that the "duel" challenges might not be effective in evoking mediation. It could also be due to the parents not feeling a need to interfere in the children's opinions. The parents did not report any current issues in the initial interview and so they had less of a motive to mediate compared to families with ongoing disagreements. In cases where the parent wish to influence their child, the game might still provide a useful structure and opportunity to do so. The game can also be conceived as a type of participatory learning (Clark 2011). Players reported that they would get better at estimating each other's opinions and consumption level as they progressed in the game. In this way, both children and parents learn about attitudes and behaviour related to screen use from other family members. Children also have the opportunity to point out when the adults have a skewed perception of screen use and provide insight into what they view as acceptable screen use which might lead the parents to reconsider their original position.

Current mediation literature does not touch upon how media concepts like a device might be understood in a variety of ways and what relation there is between a families understanding and mediation (Valkenburg and Piotrowski 2017). The game could provoke participants to reflect on their current understanding of a concepts by prompting them to discuss how to interpret a question before attempting to answer it. All participants experienced that many concepts were surprisingly hard to define and that many of them had recently taken on a new or ambiguous meaning. The game can in that sense help provoke players to reconsider some of their previous assumptions about screen use. During discussions on how to interpret questions, children can also influence how the family understands the different screen use concepts which can affect how they are mediated. It can also be important for children to help parents understand how a platform affords for example socialization since parents might be more inclined to grant more access to screen use that has a social dimension. The fact that players reach a common understanding of the concepts might further help avoid any potential tensions from unclear expectations (Hiniker and Kientz 2016). The definition reached in the game can serve as a blueprint for how the family understands a concept moving forward.

Solving tensions during game play

Starting discussions on a comprehensive topic during a game might be difficult since it breaks up the flow of the game (Csikszentmihalyi 2014). The families would often push a discussion to the side in order to continue with the game. The game might instead serve as a distraction whenever an issue is brought up and so t game might not invoke solving tensions during the game itself and Instead, discussions on tensions might be more suited to periods after the game play. The game does provide the opportunity for both parents and children to bring up thoughts on tensions which might serve as the foundation for a discussion later on. Players were sometimes confronted by views that contrasted their self-perception or criticised their habits which might have been more awkward to highlight outside of the game context. Instances in the game can in that sense function as the first step in attending to an issue by inspiring out of game discussions and does in that sense still have the potential to help solve tensions. The interactions during game play might also be a consequence of how the families dealt with screen use. A family who experience more tensions might engage with the game in a different way and be more likely to engage in longer discussions.

5.3 The Game stimulating new habits

Increasing awareness among family members

The game can stimulate a sense of awareness and reflection on ones own screen habits. The "estimate" challenges provide insight into actual use data while the "write" and "rank" questions present the participants with how other's view their consumption habits. It can make the user aware of consumption levels, applications she uses more or less than estimated which might reveal use patterns she wishes to reduce the frequency of. The game can in that sense potentially help a user realise where he might be lagging resistance (Baumer et al. 2013). Especially the "write" and "rank" challenges produced a strong response from other players in cases where they considered an answer to be wrong. Maria Jensen was pointed out by the children as the one who used her mobile phone most frequently in other family member's presence and the one who is most difficult to talk to when using her phone as well as the one who uses it most often during dinner time. Maria rejected the characterisation so the children made a point out of demonstrating that Maria really was the right answer to the questions and would highlight whenever she for example used her phone at the dinner table. The game might then help family members point out blind spots in other family members' self-perception. A newfound self-awareness can be the first step to go from lagging resistance to active resistance since he now knows where to make an effort (Baumer et al. 2013).

Using screens differently than expressed during the game might expose a user to increased commenting or teasing which can function as a form of discouragement. Whenever a family member uses screens in an inappropriate situation, reminding them about what they said is

a way to point out a discrepancy between their actions and opinions. In this way, the user might come to realise that they consume more or differently than they originally thought. It provokes the user to consider whether he wants to stick to his actual use patterns or attempt to live up to his own stated self-perception. To avoid teasing, the user has to match what is said during the game with how she subsequently consume it and the opinions stated during the game might then come to work as an ideal the user will subsequently attempt to fulfill. Teasing might also be a consequence of tensions from screens being used in other family members' presence where the game can help bring up the issue (Blackwell et al. 2016). It might be easier for family members to air tensions from screen use in their presence by relating it to the context of the game session. Commenting on each other's screen use might then also be interpreted as a form of diversionary activity (Jiow et al. 2017).

There is a risk of teasing and commenting lead to tensions itself by singling out family members or fostering a sense of competitiveness where family members feel the need to prove each other wrong. Users might experience frustration if they feel increasingly judged or having to defend their use habits more often. Such considerations might lead to families feeling discouraged from participating in subsequent discussions or game sessions. The game challenges do, however, stimulate a general awareness of each other's use, including when family members are not using screens in each other's presence. In this way, it might help alleviate tensions by better estimating and appreciating when other family members are present (Hiniker and Kientz 2016). When everybody is more alert to each other, it might also be easier to discover or start discussions on potential issues which can help solve underlying tensions.

Blackwell et al. (2016) theorize that having insight into other family members' interactions with their phones might be a way to reduce tensions. The game provides the opportunity to learn more about each other's consumption patterns, especially through the "estimate" challenges. Here, players can obtain an accurate image of how much a family members use of the different apps on her phone which can provide insight to what the user is likely to be engage with subsequently. It might not help reduce tensions as insight into the specific interactions potentially would, but in cases where players don't know what family members usually do on their phone, it can provide some clarity. Having insight into specific interactions would mean that other family members could more easily understand, why the phone is used in their presence (Blackwell et al. 2016). The game can instead help shape expectations to what somebody is occupied with so family members might increasingly be able to detect when the phone use is important and when it's not. This might help reduce tensions by making other family members more accepting of some screen use in their presence.

Inspiring Non-Use

A heightened awareness might not lead to any changes in consumption habits. Some participants did display an ambivalent relationship with some of their screen use habits so in this sense, there were examples of lagging resistance among the participants (Baumer et al. 2013). There were also a few instances of players being inspired to transition into active resistance (Satchell and Dourish 2009). Andreas Jensen tried out different settings on his phone to see whether they changed how intrusive messages and notification felt and all members of the Jensen Family except for Felix reported sometimes avoiding using their phone at times where they previously would have. It seemed to be especially successful at helping the user realise at what points they had a tendency to use their phone even though they actually did not want to. In these cases, the game can work as a nudge to confront undesired screen use habits or as an inspiration to try out new ways to approach ones use patterns. The game might then help decrease some of the tensions felt from the expectation to constantly being available on your phone by helping the user realise when to take a break (Blackwell et al. 2016). In this sense, the game can help stimulate a user into non-use and move from lagging resistance to active resistance where reflections and awareness of one's own habits might be the first steps in the process (Satchell and Dourish 2009).

The alterations experienced in the study were not major changes in consumption patterns and seemed to mainly consist of temporary non-use where users did not want to use their phones anyways (Lee et al. 2014). Not all participants reported the game having an effect on their behaviour. The Larsen family did not feel like they had changed their habits, but they did not express that they wished to change their habits either. In this sense, the game did not inspire active resistance where there was not lagging resistance beforehand (Baumer et al. 2013). The Larsen Family did, however, concede that they reevaluated their approach to screen use in the beginning of the research period. Being confronted with the task to present their use patterns and opinions on screen use did itself stimulate reflections in the family. In this way, the game might inspire users to reconsider their current habits and can help reconfirm their approach or point out areas which can be improved. The result might again have been different, had the participants felt a stronger desire to change their habits. Active resistance was like lagging resistance a rare phenomenon among the participants where the users would rarely do anything to change their habits (Satchell and Dourish 2009). Users who wish to adopt a stance of active resistance might experience a stronger effect from participating in the game.

5.4 Game Improvements and Further Research

Optimal incentive structures

The incentives in the game might affect the discussions as was seen in the example with the Jensen Family. Having the two teams compare answers to "write" and "rank" questions might be beneficial for provoking interactions and a similar game structure could be utilized for "duel" questions as well. There could, however, be downsides to such an arrangement since the discussions might result in tensions instead of solving them. The opposing team has an interest in misrepresenting their real answer in order to ensure the other team loose their turn so even though they answered honestly, the other team will always suspect an ulterior motive whenever they loose their turn. It could, however, also be argued that players are more interested in finding the truth this way since they are motivated by winning the game. The potential of loosing ones turn could provide a strong incentive to argue why your answer is correct.

Another consideration is that tensions that arise during the game might ultimately discourage families from playing the game. Having to constantly argue over who's right can decrease how fun the game experience is and drive down engagement (Nicholson 2015). Any further improvements of the game have to take both the experience of game play and the potential benefits from discussions into considerations. One way to improve all of the above concerns might be to make it easier to discover the real answer. The Larsen Family expressed a desire to figure out who the right answer was to some of the "write" questions since the discussions were difficult to resolve. Providing a real answer would be a way to find a logical conclusion to arguments as well as improve the insight of the players. Except for mobile phone use, it could, however, be difficult to get the data from other devices. It is possible to include data from iPads and it might also be possible to find a desktop solution, but it will be difficult to include devices like TV and PlayStation. Maybe a solution where the users self-report how much they have used in the previous week or days before the game could be an option. The data will not be completely accurate, but it would represent the participants' best estimate of their screen use (Abeele et al. 2013). A solution could potentially benefit from being digital since the solution involves calculating multiple variables for multiple players which would probably break up the flow of the game if done in an analogue way. Alternatively, the analogue version could have more simplified variables.

Opinions provoking more discussions

One reason why the "duel" questions did not provoke a lot of discussions might be because the players shaped their answers to the game. Instead of expressing their honest opinion, they tailored their answer so they are more likely to win. Another reason could be that players had to reach an agreement within a short time period and because it was complicated to reach

an agreement without discussing their views out loud. This might have coerced the players to reach an agreement that did not express their honest views in order to progress the game. The players were also likely aware that the answers did not represent any one player's actual opinion but rather a compromise. The more obscure opinions which potentially could inspire discussions were likely adjusted by the internal conversations on the team so the answers that were discussed between the whole family no longer seemed obscure. Opinions might therefore have stimulated more discussions if they were individual. One solution could be to have the players fill in their answers separately and then calculate an average. We considered this possibility when shaping the game but felt that it was too demanding and would break up the game flow since players already have to calculate the differences between two variables in the form of their answer and the estimate of each other's answer. One possibility might be to calculate the averages internally on each team before revealing the them. Another possibility could be an app where the players filled in their answers individually so all numbers were calculated automatically in order to speed up the process.

Encouraging reflection through visible data

Some of the participants reported feeling a sense of guilt or a need for excusing their phone use if they had a high consumption level. Some would also think more about their use in the days up to the game because they expected other family members to see their use data. The game could potentially be designed to encourage more reflection or potentially non-use through steps that utilized the players' response to the data. One example could be to publicize the data from previous games on a screen which is visible for all family members. During the games, there were examples of players wanting to be seen as the one with the lowest screen use as if it gave a sense of status. The family members might then respond more competitively if the data is visible. In order to not be the family member who uses the most, the players might be increasingly likely to critically assess and change their current screen habits. Whether the solution is successful in provoking reflections could depend on the attitude and make-up of the family. The desire to limiting screen use differed from family to family and was not visible in the youngest children so it might only be a solution for some adults.

5.5 Limitations

The results might have included more instances of alterations in screen use as a consequence of playing the game if the participants had been more motivated to change their habits. Most of the participants did not report wanting to change their habits at the outset of the research period which could have affected the impact of playing the game. It would likewise have been relevant to include families who experienced more tensions from screen use. The

lack of reported tensions could be a contributing factor for why families did not experience more instances of mediation or alterations in screen habits. The low amount of reported tensions might also be partly due to a lack of restrictions and it could therefore be relevant to include a set of families who enforce more restrictions. This could be related to the age of the children where three of the children were fifteen and above and therefore controlled their own screen use. The results might therefore have included more instances of parental mediation during game play or discussions regarding tensions if all the children had been below fifteen.

The game had only been tested internally and could have benefited from more test cases before being utilized in the study. Testing the game was difficult due to the isolation period but a future study could draw inspiration from the game mechanics used in the current game design. A more extensive development process could have helped find a more effective way to include the opinion-based duel questions to generate discussions between the participants. Similarly, it could have found a way to ensure that families discuss an issue to the end. It could also have been beneficial to find a way to involve issues or discussions which are adapted to the particular families, since they have different experiences and therefore resonate with different challenges. The Corona outbreak which resulted in the families isolating themselves for the majority of the research period meant families were required to use screens more for work and school. The alterations in screen use habits might have affected the results by skewing the participants' perception of their consumption levels. We attempted to adjust for the circumstances by asking the participants about their consumption levels both before and after the outbreak. We also encouraged them to answer questions in the game both for periods before and during the isolation.

Chapter 6

Conclusion

6.1 Conclusion

Mediating screen use might not only be a parental activity but rather something that can take place between all family members. Children can also attempt to influence their parents or siblings to use screens in different ways. Older children can even form part of the parental mediation strategy of younger children by giving advice or sharing experiences from having previously been mediated by the parents. The game provides an opportunity to reflect on what screen use behaviour and rules actually mean and prompts the players to reach a shared definition for a range of concepts related to screen use before answering a question. A shared understanding reached during a game might prove useful in subsequent real life situations where family members have to reach a common understanding of what, how and when to use screens which might cause less tensions than regulating through restrictions. By exposing players to real screen use data, the game can increase self-awareness and insight into other family members' use patterns, and by prompting the players to share their opinions, the players gain more knowledge about each other's thoughts on screen use. The game can also increase a player's understanding of how other family members perceive his and every other family member's screen use by asking them to rank or name the user with the highest screen use. The awareness can help prompt questioning and reflecting over current habits which can serve as a motivation for changing or interfering in current use patterns. The most common alteration of habits was to abstain from using the phones at times where participants questioned if they actually wanted to be using it, but there were also examples of participants who actively attempted to change their habits in order to control unwanted aspects of their screen use. Another common response was highlighting outside of the game who in the family had the highest screen use after disagreements during the game. The family members would comment on each other's screen use in an attempt to prove that they were in fact right about who had the highest screen use. Pointing each other out during the game was in that sense the most effective game mechanic at provoking players to voice their disagreements in real life situations which could subsequently facilitate discussions on current screen use habits. Discussing screen use in the context of playing a game might not be an effective way to solve tensions since the game serves as a distraction from finishing conversations. It might, however, still be effective as a situation to bring up or highlight issues which can later form the basis for a discussion.

Chapter 7

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