

RUNNING HEAD: BRINGING FAMILIES CLOSER

– DESIGNING A GAME FOR A COMPLEX SOCIAL SITUATION

Bringing Families Closer

- Designing a Game for a Complex Social Situation

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Abstract

This paper describes the design process of the Location Based Mobile Game (LBMG) Kenarduma that tackles the problem of loneliness among Danish teenagers. It demonstrates a research through design process. Literature and methods from design practice, HCI and interaction design are used to develop a game that is relevant to the problem addressed. Considering the complex and heterogeneous nature of the problem a transdisciplinary and creative design approach is used to bring in research from various fields to gain detailed understandings of disparate aspects of the design situation. Qualitative interviews were used to gain insights into the lived and felt experiences of the people and the everyday life situations where problems occur. The present situation and future possibilities are explored through the practice of framing and reframing. Data based research such as qualitative interviews are open for interpretation and new understandings This made it possible to draw in the research in a way where it contributed to an advancement of this process of framing and reframing. We suggest that when designing games for complex social problems, it can be advantageous to bring in stories from lived and felt experiences to get a broad understanding of the situation within which the problem occurs. We further recommend letting such a study inform a critical examination of the properties and ideologies inherent in the platform and technology the game is based on. This can open up for an exploration for spaces of playful moments as well as an investigation of how games can relate to the issues that people experience in their everyday life.

Keywords: Design Research, Social issues, Location based mobile games, Transdisciplinarity, Teenagers, Game Design

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Introduction

The location based mobile trivia game Kenarduma¹ takes the problem of loneliness among Danish teenagers as a starting point and aims to strengthen social ties between the teenagers and their families. The game is played on mobile phones and interlaces with the families everyday activities (Ling & Donner, 2009). The game takes advantage of the “connected presence” (Licoppe, 2003) afforded by mobile media to strengthen and maintain relationships by making way for ongoing and playful communication in busy family lives. When the family members ask questions about themselves and each other they play with truth and secrets as they make up correct and alternative answers. The questions are placed on a map and coupled to GPS locations and family members unlock questions along the paths (de Souza e Silva & Frith, 2010) of their everyday movements.

Design researchers have demonstrated a need for research examples that use Research through Design (RtD) as a methodology (Stolterman, 2008, Zimmerman et al., 2010). The game was developed using the methods and practices of design practice, interaction design and Human Computer Interaction (HCI). Research about the families ‘lived and felt experiences’ (McCarthy and Wright 2004) was integrated into the design process in order to make a game that was ‘relevant’ in the sense that it had potential to change the existing situation into a preferred one (Zimmerman et al. 2007). The article presents a design process and a game concept to demonstrate how methods and concerns from the above design disciplines can inform game design. These methods support investigations of how spaces for play can emerge and work within their everyday context. This creates possibilities for playful communication in busy lives, and thereby opportunities for developing close relationships. The article argues that this makes research from these design disciplines not only valuable for understanding the complex dynamics and activities that are involved in a design process (Kuittinen & Holopainen, 2009) but also particularly informative and generative when designing games that deal with heterogeneous social issues. The article further demonstrates a particular way of

¹ The name is pronounced like the Danish sentence ‘Kender du mig?’ meaning ‘Do you know me?’.

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integrating data from social research, in this case qualitative empirical data, into the design process. This way of working avoids a condensation of data into a ‘list of implications for design’ (Dourish 2006), as it takes advantage of the rich and sensitive characteristics of qualitative data. This allows designers to explore not only the design possibilities but also concurrently explore the field.

In the following we will present an overview of the design theories that make up the base of the design process, as well as the foundation of research that this paper contributes to. Second we introduce aspects of the issue and the teenagers everyday family life, gained from the interviews, as well as statistics and various youth researchers, followed by the method for the qualitative study. Descriptions from the design process illustrate how this user study was worked into the design process. Lastly potentials and relevance of the game will be evaluated, first by an experience prototype and then in reference to relevant theories.

Background

It has been noted that literature within game design only implicitly acknowledges the numerous aspects that are involved in the design process, and that game design research can learn from literature within HCI, design and interaction design to recognise the design process as an evolving process that includes numerous actions and activities in the making of a good design (Kuittinen & Holopainen, 2009). We additionally argue that game design research that deal with complicated social issues can gain from these discussions and methods as they address the notion of relevance. A relevant design is evaluated by its potential to change an existing situation into a preferred state (Zimmermann et al., 2007).

T.L. Taylors’ notion of the ‘assemblage of play’ encompasses “the range of actors (system, technologies, player, body, community, company, legal structures, etc.), concepts, practices and relations that make up the play moment” (Taylor, 2009 p. 332). As such, an interrelation of a variety of actors and nodes are involved in the ‘lived play’ of computer games. Jane McGonigal has described how an immersive multiplayer game had radical potential for creating ‘multiple social

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formations and interaction’, and for changing subjective experiences, which had impact on the players ‘shift to real-world, collective actions enacted through the same ubiquitous networks’ (McGonigal, 2003 p. 8).

Games dealing with issues similar to the one addressed in this project such as RePlay: Finding Zoe (METRAC, 2007), Blabbing Blobs (DDams, 2009), At Risk (Kognito Interactive, 2009) and Reach Out Central ([Inspire Foundation](#), 2007) browser-based games, and console based Bully (Rockstar, 2008) uses simulations of the difficult situations to let the teenagers or the adults experiment and learn in ‘safe’ environments. Kenarduma is designed to let the play moments take place in the situations where the problems occur, and bring the constellation of actors and interrelations around the problem into the play. The qualitative study provided a broad picture of the issues in the families’ everyday lives and activities, as well as detailed understanding of their lived and felt experiences (McCarthy & Wright 2004) are considered in the design process.

Social problems are characterized as heterogeneous and indefinable (Halkier 2001, Rittel & Webber, 1973). Hence the situation to be designed for cannot be comprehensively stated, and this understanding develops throughout the design process. The experience of loneliness and weak relations in the lives of Danish teenagers involves disparate issues and people with varied goals, interests and internal dilemmas. It is not possible to delineate these types of problems in order to come up with a single set of requirements to design towards. Wolf et al. have argued that a creative design process is suited for understanding and dealing with such issues (Wolf et al., 2006). Schön has described the design process as one in which the ‘problem’ is engaged and explored through a ‘reflective design process’ (Schön, 1983). This contrasts with Herbert Simon’s view where design is seen as essentially a problem solving practice and the designer solves problems that can be delineated and broken down into sub problems (Kuittinen & Holopainen, 2009). Schön however describes design as a constant seeing-moving-seeing where there is no clear definition of the problem from the beginning but the designer constructs the design gradually meanwhile gaining “a new understanding of the phenomenon” (Schön 1983). Design therefore involves framing and reframing of the design

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situation (ibid.) and is an exploration of the problem. Any social situation can be framed in different and even incompatible ways, and any frame calls for a particular type of solution (ibid.). When framing and reframing the designers investigate possible ways in which elements are prioritised, and how the relationships between these elements are considered (Löwgreen & Stolterman 2004) in order to come up with a framing that addresses the problem in an appropriate and relevant way (Zimmerman et al., 2007). With this explorative attitude the data about the design situation is brought into the framing and reframing activity, and can work as fuel to further opening up the design possibilities.

Within the social sciences it has been argued that it is proper to look at social issues from many different angles, using different disciplines and theoretical approaches to discover diverse but relevant aspects of the field (e.g. Halkier, 2001, and Wallerstien et al., 1999). In the design discipline Stolterman and Blevis have brought in this perspective by referring to Nicolescus transdisciplinary perspective:

“...a transdisciplinary understanding of research is suitable for design research. Design as a way for humans to approach and act in the world is based on a “broader goal” where methods are involved on an “as needed basis.” (Blevis and Stolterman, 2008 p. 62)

Transdisciplinarity involves all relevant disciplines in the purpose to grasp the complexity of a situation (Stolterman & Blevis 2008). This is a high ideal for any design project, however the design process was inspired by this approach and the concepts and design situation were considered from perspectives of such various disciplines as sociology, psychology, philosophy, communication, media and game studies, technology studies, art, music, literature, biology, software development, mechanical and electronically engineering. Understandings gained from these disciplines contributed to the process of making a game that would work within the families’ everyday lives, but this article will primarily demonstrate how research from qualitative interviews and experience prototyping (Buchenau & Suri, 2000) was brought into the design process. It has been argued that research and design are two distinct disciplines (Fallman, 2003, Dourish, 2006, & Yee 2007). Yee argues “design

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acquires new knowledge in order to innovate while research seeks new knowledge in order to further the discipline” (2007, p. 5). These can be seen as divergent goals, and asking research questions require rigour, transparency and repeatability which can be contrasted to design investigations which are often hidden and varied. A transdisciplinary approach goes beyond these goals and allows us to combine methods and approaches from different disciplines while working towards the broader goal (Blevis and Stolterman 2008) of changing the existing situation of loneliness among teenagers in Denmark.

Nicolescu’s transdisciplinary approach also includes the recognition of an ‘included middle’. That is the *‘idea that owes to intuitionism that there is at least one state between or which subsumes that the states of knowing that something is or something is not’* (ibid.). Sketching, acting and brainstorming are experimental activities, design-thinking enablers helping designers to investigate this ‘included middle’. We can see sketching (Buxton, 2007) and prototyping (Buchenau & Suri, 2000) as a way of exploring this “included middle”. Lim et al. have called prototypes a filter and ‘manifesto of design ideas’ that helps the designers to imaging the situations possible futures (Lim et al., 2008, p. 9). They take a ‘role in a middle ground between thought experiment and real thing’ (Fallman, 2006 p. 197). The following shows how the interviews and research from different disciplines helped us gain an understanding of the existing situation while the design practices of sketching and prototyping allowed us to explore its possible futures. At the same time our process shows that considering future situations as part of the problem solving , and critiquing design ideas and concepts reframed and brought out new aspects of the data creating a more nuanced understanding of the design situation.

Introduction to teenagers’ family life in Denmark

Danish families commonly play board games, card games, quizzes, strategy games etc. but as the children grow up these games are often abandoned in favour of other activities. They are extremely busy, and parents spend less than one waking hour a day together with their teenagers

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(Bonke, 2009). This is reflected in the statistics of loneliness and self harm among teenagers where every fifth teenager describes themselves as regularly feeling lonely (Simonsen & Hansen, 2006) and every fourth girl in high school has practiced self harm, as for example cutting (Zøllner, 2002). Social ties within Danish families are often weak, leaving little possibility for confidence and closeness within the family sphere. This is illustrated by statistics that shows that even though 90% of the self-harm happens in the home, only 10% of the parents are aware of their children's difficulties (ibid.). Use of alcohol and socializing until late hours almost every Friday and Saturday is often necessary to be part of social life (Gundelach & Järvinen, 2006); it is normal to start drinking alcohol at around 14 to 15 years of age and many teenagers are also introduced to tobacco and cannabis in these years. Many teenagers also have their sexual debut during these years.

Teenagers spend a lot of their time with their peers, both in institutions and during social activities, which stands as a contrast to the statistics of loneliness. Youth researchers point out that loneliness among Danish teenagers cannot be understood by the amount of people the teenagers are surrounded with in their everyday but rather the quality of the teenagers social relationships and should therefore be understood as showing a lack of close and longer lasting relationships with people they can open up and confide in (Simonsen & Hansen, 2006 & Bechman Jensen, 2006).

The lack of close relationships in the home must be seen in relation to the fact that Danish teens are generally expected to move out from home when they turn 18 when the security net of the welfare system secures the teenagers their own income and homes. Maturity and independence is highly valued in Danish culture and is seen as an indication of a successful childhood and education. According to youth researcher Bechman Jensen it is attractive to be 'cool, calm and collected' and showing uncertainty and doubt in Danish society is considered a weakness, even a taboo, so showing these kinds of feelings requires a lot of confidence and trust.

Interviews in this project showed that family took up a special status and that teenagers clearly valued a good and close relationship to their parents and siblings. Sociologists have suggested that having close social relationships and being seen and understood by those people is a necessary for humans to

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get to know their own capabilities and be able to tackle the complicated and unstable situations in life (Honneth, 2005).

Qualitative study

In total 18 semi-structured single person interviews were carried out in two phases with parents and teenagers of which 4 teenage informants were repeaters. These consisted of 8 introductory interviews and a second phase of 9 in depth interviews with 6 teenagers and 3 parents. The user study initiated and set the focus and the reason for the design process. The focus of the introductory interviews was broad, and aimed at setting the focus for the next interviews. Accordingly the second round of interviews aimed at understanding the daily lives of the teenagers and the communication situation in their close relationships. The research was carried out over a period of three months. Qualitative interviews were chosen for their sensitive nature that makes it possible to come close to intimate and emotional aspects of the informants (Hastrup, 2003), as well as how the family members recount and make sense of their everyday life, including thoughts, reflections and feelings related to it (Halkier, 2002). Most of the interviews were carried out in the respondents homes, either in private rooms, or at times when the respondent was alone in the house. During the visits we often met the other family members, and observed how the family communicated and interacted together. The designers both speak both English and Danish, and one is a native Danish speaker. The interviews were audiotaped and carried out in either of the languages depending on the informants English skills. During the design process the data was referred to in both English and Danish, in order to be sensitive to various translations of the phrases. For this paper quotes are translated into English by a native English speaker who is also fluent in Danish.

Half the informants were recruited through a combination of personal network and snowball sampling, and the rest through the local school. The teenage informants who ranged in age from 14-18 can be divided into two main groups, one consisting of teenagers who still go to elementary school and the others who go to high school. This age range represents age groups where statistics shows

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that self-harm and loneliness is most prevalent. There is a mixture of teenagers from divorced and cohabiting families, and there was also a variation in the sibling groups. The reason for choosing teenagers from different kinds of families was because it was important for this project to obtain as many perspectives as possible on the target group, as statistical data showed that teenagers from various backgrounds experienced loneliness. According to recent research on Danish youth, the teenagers' loneliness cannot be attributed to living circumstances but has more to do with the individual abilities of each teenager (Simonsen & Hansen, 2006).

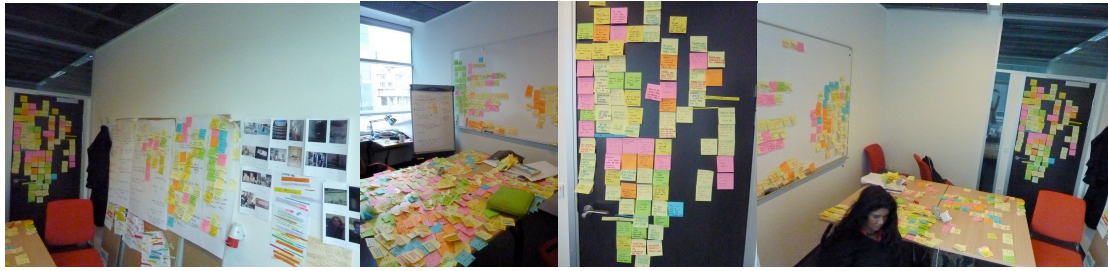
The interviews resulted in 19 hours of audio, which were listened separately by both designers. Keywords to capture the conversations, interesting quotes, as well as our thoughts reflections were noted down on post-it notes. Post-it notes were arranged and rearranged in the process of an inductive analysis that generated themes from the interviews. Also major issues and concerns from each individual informant were made clear and visible at a glance. During the design process the post-it notes were regularly rearranged and new categories generated. The interviews were re-listened up to three times to make sure the new categories and understandings reflected the original interviews. The qualitative interviews provided the game design with rich, detailed data, though we do not assume this data to be definitive and generalizable for all teenagers and families in Denmark.

Bringing Everyday Life into Design Practice

This section describes the design environment and gives examples of how data and understandings of the families' everyday situations were brought into the design process.

The workspace was arranged to facilitate the process of integrating the data into the concept development. Visual presentations of empirical data on post-it notes and posters allowed for overviews which made it easy to draw in the relevant data.

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The very short presentation of the data (limited to a few words) kept the data rather open for interpretation. They worked as references to our first-hand experience with the families. The way the notes could be rearranged was a tool for to work with our tacit knowledge and explore relationships between the different phenomena in the field. As mentioned before, the interviews were re-listened during the process to ensure that the reinterpretations were kept close to the original interviews.

Brainstorm ideas, descriptions of certain design considerations and concepts were also arranged on the walls, so they could be referred to later. An archive of ideas was therefore available to be drawn upon when needed, and considered in relation to the present understanding of the situation. This way of storing the ideas allowed for synthesis as connections between ideas and concepts could be pointed out easily and developed upon to generate further concepts. All this information ready-at-hand made it easier to communicate design ideas as well as the different understandings of the field gained throughout the process. This ability to communicate ideas and trains of thought explicitly was valuable, especially when bringing in people from different fields to discuss, sketch with or brainstorm.

As the data was brought in to evaluate design decisions, it was incorporated into the problem solving and problem seeing activity. The data from the families everyday life inspired evaluation and understanding of many aspects of each concept and its potential to change the existing situation. But also evaluating the concepts in relation to the data brought out new perspectives of the situation as the data was reworked during the discussions and design practices. It allowed us as to come to a detailed and nuanced understanding of the present and possible future situations. These activities can also be understood as what Blevis and Stolterman (2008) describe as designers moving from critical design to design criticism. Critical design is about considering what a desired situation could be, while design

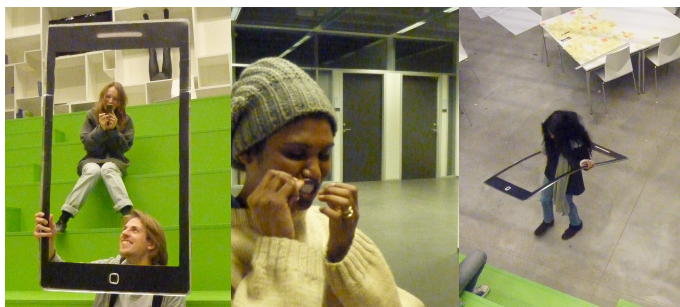
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criticism is about reflecting on the present situation in order to evaluate the effects of the proposed concept. These reflections were generative of more solutions, as then we had to consider not just the areas which the concepts were made to affect but also those areas that the concepts would potentially have an impact on.

This process can be illustrated by the following description. The user study showed that even though both teenagers and parents expressed that they valued and longed for good and serious communication at home, dominant barriers often hindered these moments. Two of the three parents said felt that they did all they could to ask into their children's lives, whereas all the teenagers felt it like they were interrogated and asked to report about their life. All the teenagers in the user study expressed that they wanted their parents to know about what they do and feel, but they also felt that many of the topics that most concerned them in their everyday lives were often difficult to talk to them about. Instead of being met with understanding and support, six of the teenagers said that they were disciplined and told off if they involved the parents in the challenges and difficulties they faced in their life.

To help the families deal with this dilemma a game was sketched out that used a digital 'mask' as the input and output. The mask should be worn over the mouth during confrontations, so that it could filter their verbal communication. Strict rules for communication could be built into the mask, and breakage of the rules would cause punishment of 5 seconds of censorship.

Through sketching, prototyping and acting and critiquing our ideas we realised that time was an interesting factor to work with as being forced to slow down the conversation, enforces reflections and more present and thoughtful utterances. These considerations and critical ideas were also noted and stocked on the walls.



The idea of a mask made associations to masquerade parties where people played with roles or masked

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theatre. Looking back at the walls we saw examples of how the family members consciously acted to communicate in their everyday. For example all the teenagers wanted their parents to know how they were feeling, but emotional topics were often considered uncomfortable or awkward to explicate. A girl says:

”It is important that they know how I am feeling, whether I am happy or sad. It’s a bit like... I think that parents should know that without me telling about it.”

Instead of talking about their feelings she preferred to ‘perform’ her feelings to let their parents know. She describes such:

“Maybe I look down at the table a lot, and answer in an annoyed tone ... if they ask me anything, and so ... can’t be bothered to do the things that they say I should do.”

We also saw that the family members had very fixed roles including habits and expectations of how to behave towards each other. These roles sometimes made it difficult to bring up the issues the teenagers really wanted to talk about.

A girl expresses how the communication in her home is often rather habitual and un-reflected. In this quote she is asked about how she talks about boys with her parents and she expresses that she does not talk about boys even though she actually wants to.

“... it is just that way ... I don’t know. I am just not used to talking with my parents about it. I just think ... I think if I came and told them everything, then I think it would be really great actually ...”

Later in the interview she realises that she actually would like to talk to her father about sex: “I think my father is totally cool with it. He is ... he will be like, totally cool about it, like...” The quotes illustrates how reflections, as these in the interview, can lead to considering each other in different ways and seeing new possibilities to challenge existing communication patterns and habits in the home.

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Being able to break these roles and communication habits seemed to be a key issue as the teenagers' concerns, activities and relationships change a lot in these years.

The Danish families' everyday is busy and by the time the teenagers start in high school the pressure increases with more social and educational activities. Participating in social life not only means school activities, but also other activities on afternoons and evenings. As described in the previous section many new issues are brought into their lives. This change in the teenagers schedule means that they rarely see the rest of the family. One 14 year old interviewee expressed that she feels like she has isolated herself, whereas another 17 year old expresses that he misses the old days when the family was together watching TV during the evenings and weekends.

The constrained communication channel, delayed time, playing with roles, breaking habits and encouraging reflections were all elements that were considered valuable. They were noted down and stocked on the wall, so that they could be considered into the later process. During discussions and evaluation assumptions and ideologies behind the ideas brought up more fundamental and ethical questions such as: should parents be recognized as part of the problem? And should the design act to discipline the families to have proper communication? How provocative can a game be and still work efficiently to the situation?

Critiquing the mask-game, it was seen that it was designed only to prepare for confrontations between the parents and the teens, and again looking at the wall it was seen how 4 of the teenagers had complained about the parents preparing serious chats with them about subjects such as sex and alcohol. Many of the teenagers from the study had special relationships with their siblings, and especially elder siblings were often the closest relation for confidence and advice. 6 of the 11 teenagers in the user study expressed that they somehow missed one or more siblings when the elder siblings moved from home. When siblings move away, it seemed difficult to make calls, send messages or emails that requires a change from the non-verbal, co-present and casual everyday way of communicating, and the cost of initiating contact (Herbsleb & Grinter, 1999) is higher. Similarly, they do not find out what is going on in each other's lives as it can be awkward to 'update' each other,

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when before they could read each other's behaviour and 'just know'. A similar situation was apparent in divorced families. They communicated separately with each parent making it crucial to update both of them about their lives.

A casual game for the whole family was thought of to accommodate a need for the whole family to be together when in everyday situations. Diverse platforms such as analogue board games, screen-based computer games, digital playing cards, cross media games and augmented reality were considered. Both teenagers and parents were concerned about the fact that they rarely spent time together, and expressed in various ways how they missed the casual time watching TV Friday night, playing card games, and reading stories together. A teenage boy says:

"I usually go out on Friday night, so I sleep until late in the morning, then my mother and (mother's partner) often go to the gym on Saturday morning. So I manage to just see them before they leave ... then I go to football practice."

So it was considered that one of the major challenges was to develop a game that could fit into these busy family lives. On the walls in the studio were pictures of the teenagers' mobile phones, which were pictures they had sent as a response to the questions 'what do you never leave your house without?' An augmented reality game on the mobile phone was sketched out, this was done in different locations to take into account the fact of being mobile. The game was a quiz where players added pictures of objects for other players to guess the owner of the object. This game should encourage the family members to share objects that the other family members did not know of. Again the concept drew out new perspectives on the data. The quizzing aspect made us reconsider how the teenagers dealt with truth in their everyday life. One girl proudly says that the parents should be happy that she at least did not lie to them – as opposed to what her friends do. But she also said "I don't tell them anything if I know beforehand that it will become unpleasant. So I do not think that there is any reason to talk about it". Even though she wanted her parents to know about her life, she rarely brings up risky issues if she expects to be disciplined by her parents or if she thinks the topic can conflict with her parents' expectations. A quiz game gives the teenagers possibility to play with

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truth and risky subjects to see how they are received and understood without having to justify for it afterwards.

Giving the teenagers the possibility to communicate through storytelling, and the excuse to bring up secrets and risky topics through playing with the truth were other aspects that were noted down and posted on the wall for later work. Also the aspect of telling stories through associations and the history of objects was considered interesting. But considering the data and the teenagers everyday situation the game did not seem flexible enough to encompass the need for communication and feeling of togetherness. The families had so many stories to tell, involving many details and nuances that using objects to carry the information seemed somewhat clumsy. Reconsidering and listening to the interviews again made us realise how much the families enjoyed telling stories about themselves and each other. They found it hard to talk about their lives to each other everyday but we had seen that with the right frame –for example in an interview situation – and encouragement, they energetically told stories about themselves, each other and families.

Family stories seemed incredibly strong for maintenance of their social relations and gave the family members a feeling of belonging together despite conflicts and busy lives. The design process continued working with verbal communication instead of communication through objects. The final concept is presented in the following section.

What is presented above can only be understood as short snapshots of the design process, however it is presented to demonstrate the practical work of bringing in data about everyday lives and design ideas into the design process. We found that there is a potential in this way of integrating research activities of design and ethnography. Both the understanding of the problem at the moment and the design understanding of possible concepts and possible futures were on the walls and this allowed us to constantly reexamine the ideas generated as well as our understanding of the teenagers' situation. We tried to question the inherent assumptions in design ideas by going around the concepts and critiquing and examining them from different angles including those brought up by newer design ideas. Looking at the problem through possible situations created by the concepts imagined use

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reframed the understanding of the problem. Having our concept ideas and considerations around us on the walls kept multiple paths open for dealing with the problem and was generative in that it facilitated abductive thinking and synthesis. Meanwhile having data around us kept us immersed in the problem space. Because we had done the interviews ourselves we had empathy and understanding of the teenagers personal situations helping us understand the context of the problem.

The Game Concept

The game developed to tackle these problems is a simple quiz family members can play on their mobile phones as they go about their everyday lives. The players are asked to enter questions about themselves and their family and place the questions on a map over their local area. Each question should have three possible answers, where only one is correct. In the course of their everyday routines, players unlock questions others have dropped as they pass within a radius of 10 meters of the GPS position of its location. When a question is unlocked it is sent to all family members who do not own the question. Each question will be marked with who created it, so that other players can answer them accordingly.

The questions should match one of eight categories. These are: ‘Adventures’, ‘Risks’, ‘Fears’, ‘Habits’, ‘Wishes’, ‘Leisure’, ‘Values and Opinions’, and ‘Stories and Histories’.

Players receive points for every question they ask and answers they have right. For every question a player answers within an hour, she receives one bonus point. For a complete set of questions (one question for each category) the players receive 3 bonus points.

For every question entered or answered, the players receive a feedback message with point status and tips for how to improve their score. When a player answers a question, the answer is sent to the person who owns the question.

Players receive points for correct answers and the number of questions they have contributed. The winner of the game is the player with the most points. When a game has been completed, the

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game and all the questions that have been answered by all participants will be saved and can be seen by all the players.

The players have to decide to play the game for an agreed duration. The duration can vary from three days to two weeks. At the end of the decided period of time, the players' points are added and a winner announced to all the players.

For each game, all questions and answers are saved in a database and can afterwards be accessed as a collection of family stories.

Evaluating the Game Kenarduma

Experience Prototyping was used to evaluate the relevance of the game concept. As change of a social situation was the reason for a design process, the object of the prototypes was how the game concept was experienced within a social context (Buchenau & Suri, 2000). The prototypes used sms to simulate the experience of the game. The game was tested on one family, who played the game for 24 hours during an otherwise ordinary day. . This was followed by a group interview with the family.

The aim was not to generalise from the findings, but rather to investigate the relevance of the game concept and how and where it fit into their lives.

Buchenau and Suri describe Experience Prototyping as an attitude that allows the designers to focus on the whole experience of playing in a specific context, more than the game itself. The fact that the family was actively playing allowed the designers to explore 'the doing' and let the social situation take place and evolve.

Findings From the Experience Prototype

The Experience Prototype of the game was carried out with a family with two children and two parents. A 15 year old girl lived with her brother aged 12, and her mother. The parents were

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divorced, but lived in the same neighbourhood. The children lived with the father approximately two days a week. The whole family participated in the experience prototype. The children were staying with the mother throughout the game, and did not meet the father in person during this period

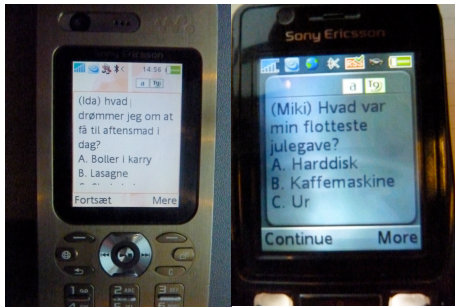
The experience prototype showed that family members used the game to tell stories about themselves and each other showing curiosity and interest in each other's lives. The siblings who were at home together during the afternoon and evening visited each others room to comment on the game. They teased and provoked each other and tried to read each others faces to find the right answer. The day after they talked about the questions while shopping with their father, who said that he would have liked to talk more with his children about issues brought up in the game. Some questions brought up discussions or made the family laugh and recount about funny stories from the family's past.

The play offered a different optic through which the family members could experience mundane details, such as when the daughter asked a question about her favourite food to let her mother know that she was hungry and what she wanted for dinner. The family found the play very engaging and the mother was so caught up that she was unwilling to cook dinner that night. While at work she 'went to the bathroom' twice to play the game and the children were allowed to stay up longer than usual just to play.

The game not only made communication engaging, but also made it easier to let slip rather serious issues. The son asked a question about a traumatic experience of a boy jumping out of a window from 2nd floor and landing next to him. He asked about how close to him the boy landed, highlighting for the others just how terrible the experience must have been. Also the daughter used the change of a new media to experiment with the new possibilities of communication. She for example used the game to test how much attention the others paid to her, especially the father. She was very relieved to find out how much her father knew about her. Also the situation and dynamics of the family was somewhat tense, and the players used the game to navigate some of these tensions.

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In this case the family was divorced and the mother had more time together with the children daily than the father. The competitive aspect of the game was a provocative element here, revealing very clearly the structure and dynamics within the family.



The children seemed very aware of the parents' difficult situation and made questions about things that concerned them as an attempt to bring them equally into the game. They told stories about good moments they had had with their father, and questions about the mother's distant family and culture. Both attempted to show that they cared and that the parents meant something to them.

Also the mother was aware of how to tackle the father's difficult situation and made questions from the children's early years before the divorce. As it can be a difficult situation when uncomfortable family dynamics are revealed, the example of this prototype shows how the game also gives a possibility to act on it. A reference to draw on here is how the teenager from the interviews through reflections became aware of the family structure, which made her able to see new possibilities for interaction. However it seemed crucial to make a balance between making the game dynamic and provocative but still light and playful.

The mother and the daughter expressed that they were surprised that the family members knew more about each other than they expected and that they became aware of the closeness in the family.

The family had a very busy everyday life and only the son played games daily, mainly console games. The daughter and the mother talked about games as something they would never spend their time on, and the daughter commented that she appreciated that it was not a 'computer game', which she saw as something she did not identify with. The fact that it was played over the mobile phone made it easier to accept. The mother who was usually very busy said that she did not usually have time to enjoy herself and have fun in her everyday. She was grateful for the change that the game gave her for integrate fun and playfulness into her everyday life.

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The experience prototype also suggested aspects of the game to be reconsidered. Alternative input possibilities such as a web page and speech-to-text software were considered to allow for elder and disabled family members to participate in the game. More categories were added as the players used them for inspiration and details in the placement of questions on a virtual map were redesigned. Also some features were taken out as the game was considered dynamic and provocative enough in the form it was tested.

Considering the Relevance of Kenarduma

“In a game, things are not what they seem.” (Juul 2005, p. 19)

There is a difference between having to ‘report’ about your day at the dinner table and the interactive character of making questions and answers, and answering them while playing the game and competing with each other in a playful way.

“When it is sometimes suggested to be a problem that games are competitive, it is a basic misunderstanding of how the game works: The conflict of the game is not antisocial; rather it provides a context for human interaction” (Juul, 2005, p. 19).

The competition in the game is a motivation for expressing oneself, and this communication takes on a playful and fun character. People encounter each other through a collection of facts and stories allowing a certain kind of freedom of in the way they express themselves, and the game brings elements from the teenagers’ leisure culture into the family space and allows the close family members to participate in creating an understanding of themselves in relation to each other.

Playing on the mobile phone

From the user study it was clear that the teenagers most commonly communicated with their families using their mobile phones and the game builds on this existing practice. In contrast to landlines the mobile phone is a personal medium and allows for *individual addressability* (Ling &

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Donner, 2009). This makes the game dynamic and allows players to feel connected to each other when they answer or ask a question, or ‘drop’ a question onto the map. Players are made aware that the other person is accessible.

Players can perceive themselves as being of a lower priority than what is happening in another player's immediate physical surroundings (Licoppe, 2003) and this could become a problem. On the other hand, the inherent ambiguity of this threat also offers players the ability to limit communications. If a brave (or maybe cowardly) player decides to use the game space to broach an issue that could possibly cause a confrontation with another player, the player can use this ambiguity of availability.

Most mobile phone communication is between family and close friends, it is a technology of the intimate sphere and is about practical everyday affairs like quick messages about meeting, shopping etc. (Ling & Donner, 2009). It is this kind of everyday mobile communication that creates a continuous conversation (Licoppe, 2003) and adds to a feeling of closeness in the everyday. The game adopts the ‘places’ and form of these short messages, not for practical purposes or coordination, but to play together and get to know each other's lives in a different way.

Mobile phone communication allows for involvement in physically separate locations or *interlacing of activities* (Ling & Donner, 2009) and asynchronous communication (Preece, 2003) so playing the game can be put on hold until it becomes convenient. Although players are rewarded for answering questions promptly, the game allows for a window of an hour for the early answer bonus so play can fit in between activities in daily life. This aspect of the game makes it convenient for the whole family to participate putting each person in control of how and when they decide to play and does not require much time, coordination or organization.

Storytelling and recounting

Making the questions and answers requires that the player create narratives about real experiences and also make up fictional ones. Bruner claimed that: “Thinking and talking about experiences changes it, and that experience in turn shapes our expression of it” (McCarthy & Wright,

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2004, p. 118). Entering questions and answers about a fact or an event is a way in which the player can recount their direct or indirect experiences, and so allows them to enter a changing and dialogic relationship to their experiences.

According to McCarthy and Wright the narratives we use to recount experiences play a pivotal role “not only in the way in which we make sense of our experience but also for the way in which they can shape our felt, lived experience” (ibid, p. 119). Framing this recounting within the game therefore not only changes the way these facts are communicated among the players, but also the way they consider their own experiences.

There is a ‘double consciousness’ in experience, in that people live “with one eye in the past and one eye in the future” (ibid. p. 120). People experience things in relation to what they have already lived through and in relation to how they will recount the experience. One could imagine that a player may look upon a certain event or fact in terms, not only of their past and present or immediate situation, but also in terms of how they would recount it within the game context for example when the daughter became hungry and incorporated that into a game question. To formulate a question players also have to make sense of not only their experiences but of themselves in relation them, and to the others and their experiences because they have to consider the how the questions and answers may be understood by the others.

One of the main barriers to bringing up topics for discussion was fear of awkward situations or expectations of censure from adults. The temporal and spatial distance between the players when not playing co-located can make it easier to bring up ‘risky’ stories, as the questioner doesn’t have to deal with the others immediate reactions. Players can also try out new or risky topics, by putting them as incorrect answers to test the others reaction.

Different understandings of situations can also hinder communication. The experience prototype, showed that some stories led to discussions and negotiations about real versions and understandings, showing that the game can start conversations about such issues.

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Breaking habits and encouraging reflection

Andersen et al. explain games as “a way to create another reality and allow people to enter that reality” (Andersen et al., 2003, p. 153) and refer to Mateas and Coleridge and the idea of ‘suspension of disbelief’, where people playing a game can accept the internal logic of the game, even if it deviates from real world logic. Here the teenagers can experience communication in a different sense than within everyday life.

British anthropologist Gregory Bateson developed a theory about how communication is framed within meta-communication as cues showing how actions or statements should be interpreted (Nielsen et al., 2008). The playing, competition, rules and categories, look, spaces, visuals all act as frames for communication that affects how the players interpret in game actions or information. The sociologist Erwin Goffman further develops Batesons’ idea of frames in terms of situated experience, that is to say, that frames of meaningful experience can be cognitive (‘a matter of mind’), social (‘organized activity’), material (‘physical, spatial, temporal’), and ‘worked out in ongoing social activity’ (Reed 2003, p. 68). The players are actively creating and negotiating the relationships of the game to everyday ethics and norms while they play the game (Consalvo, 2005).

Video game theorist Jesper Juul says that a multi player game “... is nominally a limitation of what players are allowed to do, but it is a limitation that allows for interesting social interaction” (Juul, 2005, p.19). Only a certain form of communication is possible within the game interface. However, constraints are a recognized creative method (Coyne et al., 2007). The categories given in the game can be seen as constraints in this sense, as the players have to find more and more questions that can fit them. This gives players the opportunity to be resourceful like when the daughter examined her surroundings for inspiration to create questions. To do well in Kenarduma, the players have to actively look for information from their lives that they can use in the game, which may motivate them to communicate and bring up facts that they may not normally have done.

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A location based mobile game

Kenarduma is a location based mobile game (LBMG) (de Souza e Silva & Hjorth, 2009) that can be played anywhere in the world that can be tracked by GPS. In the experience prototype the daughter valued the way the location based aspect allowed for the family members to show awareness about each other, by leaving messages at locations for each other. If the questioner chooses a special position deliberately, for a particular person they can decide ‘where’ to play with the other person. The questioner can offer a certain interaction, some particular thoughts, at a certain place and time. Players’ experiences and feelings in the physical spaces of their everyday lives are re-framed and recounted during the game.

Kenarduma works in the same space as a locative mobile social network (LMSN) like Loopt, Brightkite or Google’s Latitude. What these do is they make not only the places they place things visible, but they make the paths that people take social, by the fact that players are continuously tracked. De Souza e Silva and Frith argue that traditionally the time spent in transit is not regarded as social time, while when “a user is logged into Loopt, however, all time is potentially social time” (de Souza e Silva & Frith, 2010, p. 493). Kenarduma allows players to play within these paths taken by family members in their everyday lives. The game communications are designed add to the sense of immediate connection and others’ presence and participation in the game, for example in that the players know that the answers to a question are immediately sent to the person who posed the question making their paths visible and maybe the person feel more available.

Kenarduma needs to be tested further and refined. Issues that may become problematic include surveillance, co-present play and non co-present play, and differing dynamics and technological literacy among different families. Furthermore, as de Souza e Silva and Frith (2010) point out, LMSN technologies designed to enhance communication may create new types of tensions and communication issues in public spaces. Like players of Mogi feeling stalked, for example. They also suggest that these applications may even decrease verbal or textual communication rather than enhance it, as findings from the game CatchBob indicated (de Souza e Silva & Frith, 2010).

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Nonetheless, play space offers Danish families a chance to interweave play and getting to know each other into their busy lives.

Conclusion

This project has demonstrated a design process developing a game for serious social issues. The experience prototyping and the above analysis show that a simple game concept developed in relation to the families' everyday experiences has potential for changing problematic cultural and social situations. For games to deal with social issues, it is considered advantageous to let the play take place in the situations where the issues occur. It is shown how games have qualities that are especially pertinent for changing subjective experiences and social situations among the players, and it is argued that these have impact on communication and social interaction in the families also in situations that goes beyond the game. To take advantage of this it may be important to investigate possible play spaces within people's everyday lives. Similarly it is important to be able to explore different the potentials and characteristics inherent in technological choices as this raises normative reflections and problematises which characteristics should ideally be built into future technology. Technology in its materiality and constraints are seen as actors that can initiate and shape everyday actions (Latour, 1992). It is therefore important to be able to examine the '*materialized ideologies*' and systems implicit in technology as an integral part of the design rationale. In this way various platforms or new technologies can be considered and the ethics and assumptions behind design ideologies can be questioned. In the context of this game, the mobile phone was a suitable platform as the play could be easily integrated into the families' busy lives.

It has been argued that most game design literature focuses primarily on the design of gameplay and only implicitly acknowledges the numerous aspects that can affect the design situation (Kuittinen & Holopainen, 2009). One of these could be the communication within design teams and ability to work together on multiple possibilities at the same time. Visibility of design ideas, concepts and data can contribute greatly to this working together in a team. Further research can be done into how teams

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that include different skill sets can work on games in a similar way that recognises the various kinds of activities inherent in the different ways of design thinking.

Furthermore, in the context of this project, interview data, along with investigations into the technologies and the consideration of diverse approaches and disciplines using different design methods contributed to developing and investigating the actual problem throughout the design process. Looking at the data through design proposals and concept ideas gave further nuanced understandings of the data and the interview experiences. This explorative attitude is brought into the framing and reframing activity, and can work as fuel to further opening up the design possibilities. This kind of data-driven research may be particularly suitable for design as it lends itself to reinterpretations and development of understanding of the situation throughout the design process.

Data from qualitative interviews are open to various interpretation and analysis depending on the perspective from which they are considered, and any presentation of anthropological research work is a result of the researcher's pragmatic choice of overall themes from the field (Hastrup, 2003). Furthermore a field researcher cannot articulate and communicate all the bodily knowledge, as it involves the construction of a coherent narrative (storytelling). This is especially true and relevant in relation to the communication of nuanced feelings, moods and impressions (ibid.). Schön describes using this tacit knowledge as 'knowing in action', what is often referred to by designers as intuition (Yee, 2007).

The majority of research conducted in design practice constitutes exploring and understanding the context of use and the target audience before the actual design work begins. Yee has suggests that design projects should include "methodological investigation of the problem posed by the design brief throughout the design process" (2007).

In this project we the designers were also the researchers doing the interviews, and visiting the families, it was possible to connect the design practice of 'knowing in action' to the tacit knowledge of the research data. This allowed for easier communication of tacit knowledge, through references to data and events as they were experienced, promoting reflection and awareness of the underlying

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design process. This suggests that designers can gain from learning research skills in order to get the most out of the research, and to critically choose appropriate design and research methods. The challenge of this concerns the quality and breadth of the research as has been problematized in criticisms of interdisciplinarity (Bleviss & Stolterman, 2008).

As the field data is further analyzed through the design process, it could be interesting to further investigate the contribution of the design activity to understanding the field. Can design practices be considered as an appropriate analysis method of empirical data? The article has suggested that designers of games that deal with serious issues can gain from using data based research to get a thorough understanding of not only the problem, but also the situations within which the problems take place. This can allow detailed consideration of how to build games that can motivate people and affect attitudes and behavior by letting the game unfold in the actual situation where the issues occur.

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Appendix 1

Teenage-informants in the introductory research				
Age	Sex	Parents status	Education	Siblings
15	Girl	Divorced	Primary school	1 older brother
15	Girl	Cohabiting	Primary school	1 older brother
14	Boy	Cohabiting	Primary school	2 younger brother
14	Boy	Cohabiting	Primary school	1 younger brother
17	Girl	Cohabiting	High school	1 older brother
17	Girl	Cohabiting	High school	1 younger brother
18	Boy	Divorced	High school	none
17	Girl	Living abroad	High school	1 older brother

Teenager-informants in the second round of research					
Age	Sex	Parents status	Education	Siblings	Continuing from first round
15	female	Divorced	Primary school	1 older brother	Yes
15	female	Cohabiting	Primary school	1 older brother	Yes
17	female	Cohabiting	High school	1 older brother	Yes
17	female	Cohabiting	High school	1 younger brother	Yes
16	female	Divorced	High school	1 older sister	No
18	male	Cohabiting	High school	1 younger sister + 1 older brother + 1 younger brother	No

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Parents		
Sex	Occupation	Description
Female	Doctor	Mother to two daughters of 16 years + 21 years
Male	Dentist	Father to two daughters of 15 years + 21 years
Female	Biologist	Mother to two daughters of 15 years + a son of 18 years

Experience prototype		
Role	Years old	Occupation/education
Mother	50	Pedagogue
Father	50	Teacher
Daughter	15	Primary school
Son	13	Primary school