Aalborg Universitet

AALBORG UNIVERSITY
DENMARK

Mediated intimacy in families: understanding the relation between children and parents

Dalsggaard, Thomas; Skov, Mikael B.; Stougaard, Malthe; Thomassen, Bo

Published in:
Proceeding of the 2006 conference on Interaction Design and Children

Publication date:
2006

Document Version
Publisher's PDF, also known as Version of record

Link to publication from Aalborg University

Citation for published version (APA):
Dalsggaard, T., Skov, M. B., Stougaard, M., & Thomassen, B. (2006). Mediated intimacy in families: understanding the relation between children and parents. In *Proceeding of the 2006 conference on Interaction Design and Children* (pp. 145-152). Association for Computing Machinery.

General rights
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal -

Take down policy
If you believe that this document breaches copyright please contact us at vbn@aub.aau.dk providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from vbn.aau.dk on: April 25, 2024

Mediated Intimacy in Families: Understanding the Relation between Children and Parents

Thomas Dalsgaard, Mikael B. Skov, Malthe Stougaard, Bo Thomassen
HCI Lab, Dept. of Computer Science
Aalborg University, Denmark
{thomasd, dubois, malthe, bo}@cs.aau.dk

ABSTRACT
Mediating intimacy between children and their parents is still limited investigated and at the same time, we find that, emerging technologies are about to change and affect the way we interact with each other. In this paper, we report from an empirical study where we investigated the social interaction phenomena that unfold between children and their parents. We used cultural probes and contextual interviews to investigate the intimate acts between children and parents in three families. Our findings show that the intimate act between children and parents share a number of similarities with other types of intimate relations such as strong-tie intimacy (couples cohabiting). However, we also identified several issues of intimacy unique to the special relation between children and their parents. These unique acts of intimacy propose challenges when designing technologies for mediated intimacy in families.

Author Keywords
Children, parents, cultural probes, mediated intimacy

ACM Classification Keywords
H.5.3 [**Information Interfaces and Presentation**]: Group and Organisation Interfaces - *collaborative computing*

INTRODUCTION
Emerging information and communication technologies are about to change and affect how we interact and coordinate with each other [12, 14]. These technologies will probably affect children in various situations even tough children are already emerging as a rather frequent and experienced user population. Thus, such technologies for communication can potentially influence social and emotional behavior of children as part of their family life [21].

Family life can be very stressful. Today, many families are very busy and often separated by time or distance. The time spent together with the family nursing family relations has decreased significantly during the last decades [8]. Growing workloads of parents and the fact that children spend much time outside the home imply a decreased awareness of other family members. Additionally, geographical separation of many families makes it difficult to maintain a feeling of intimacy [21]. Hence, in contemporary family life it is sometimes difficult to maintain strong social relations to other family members and reach a high feeling of intimacy.

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. To copy otherwise, to republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee.

IDC '06, June 7-9, 2006 Tampere, Finland
Copyright 2006 ACM 1-59593-316-6/06/07... $5.00

Despite for being designed for different purposes, emerging technologies are often adapted to help us feel connected with people that we care about [12, 20]. Such technologies include mobile phones, E-mail, instant messaging and SMS and they currently invade the domestic space. While these technologies were designed to support activities in work domains, a strong desire of establishing and maintaining social relations have pulled such technologies from the work domain into the domestic domain and shaped them for a social use. During the last years, mediated awareness and intimacy have been explored and investigated in a number of different research projects e.g. [13, 19, 20].

In this paper, we are specifically interested in uncovering phenomena of intimacy within families and in particular between children and parents. Mediating intimacy between children and their parents is still limited investigated and we believe that the design of information technologies for families with children requires a special attention. In particular, we investigate the social interaction phenomena that unfold between children and their parents. Based on an empirical study, we establish a grounded theory of intimacy acts between children and parents outlining unique themes of intimacy between children and parents. The paper is structured in the following way. After related work, we outline our empirical study. Secondly, we summarize the findings, and finally we discuss and conclude.

RELATED WORK
The increased interest in mediated intimacy proposes new and innovating development and research projects [1, 20]. An example of an awareness project is the ASTRA project. Here they addressed intimacy and inter-relations in family structures and they were specifically interested in awareness concerns of friends and family members [13].

They further develop a tailored questionnaire for evaluation with a nine-scale assessment referring to cost and benefits of awareness. The Intimacy project followed six cohabiting couples for seven weeks [20]. Based on their ethnographic study, they propose a schematic understanding of themes of intimacy. They found it reasonable to describe intimacy by dividing acts of intimacy into three categories; antecedents, constituents and yields. Other examples include the designs of The Feather, Scent and Shakers [18], designs for intimate relations often rely on evocative materials and tries to affect senses not typically addressed by technology [6]. The senses affected vary from, the very intense sensing in the design of the Sensing Beds [8] and Hug Over a Distance [15], emotional communication in the design of LumiTouch [2] to lightweight communication in the design of the Virtual Intimate Object [10].

We still need to understand the intimate relations between parents and children better. Vetere et al. identified that children do affect intimacy in strong-tie relations compared child-less couples, but they primarily focus on children's effect on intimacy between the two parents and not between the children and the parents [20]. Zuckerman and Maes sketch an awareness system for children in distributed families. This system called CASY can potentially enhance intimacy and connectedness using audio / video messaging, asynchronous communication, and context-based delivery [21]. However, very little research focuses on reporting of understanding on phenomena of intimacy between children and parents [9]. Therefore, in this paper we are primarily concerned with unfolding the social interaction of children and their parents in relation to intimacy.

RESEARCH DESIGN

Conducting research within families and studying aspects of intimacy is a delicate and sensitive matter [11]. Often family activities and events are very private, and knowledge is often tacit such as routines or habits. Individuals are often not able to reflect upon own interaction and communication patterns. As suggested by Bell et al. [1], defamiliarization can serve as a facilitator for revealing tacit knowledge. Therefore, we chose a strategy that the families could consider unobtrusive and that would invite them to share their knowledge [5]. Building on this, we designed and structured the empirical study based on the work of Vetere et al. [20]. Thus, we wanted our data collection and data analysis to be structured in a way that allowed us to relate and conclude our findings to [20].

Method

The purpose of this study was to understand and describe the ways that intimacy expresses itself within families and especially between children and parents. We chose cultural probes and contextual interviews in order to be unobtrusive and to reveal tacit knowledge. As suggested by Gaver, cultural probes can be used to generate inspirational responses and make the informants reflect, interpret and express upon the domain [4, 5, 11].

Figure 1: 1: Contents of the Cultural Probe. 2: Postcards. 3: Disposable camera with suggested ways of use. 4: Assignment in scrapbook

We designed our probe pack with the intension of facilitating the families in defamiliarizing their interaction patterns [1]. We wanted the probe pack to include objects that enabled them to reflect and express the way their family used social communication to maintain a feeling of intimacy between the children and their parents. Our probe pack included three cameras, one family scrapbook, small diaries, postcards with pre-posted address and postage, post-it notes, pens, paper, scissors and glue (see figure 1).

At the introduction of the probe pack, we described its content and gave ideas of suggested use. We wanted the probe pack to be a "family thing" which they could use and discuss as a family. We stressed that the suggested use was for inspiration only and encouraged them to use the objects creatively. Moreover, we encouraged the parents to include their children in the process of working with the probe pack. The disposable cameras were included with 'A picture is worth more than a 1000 words' in mind. We asked the families to use the cameras in family situations and to glue the pictures into the scrapbook with descriptions and reflections of the situations. We further asked the families to personalize their scrapbooks with a family picture and a description of their family. Furthermore, we introduced them to assignments included in the scrapbook. This, we hoped, would get them started and in addition create a feeling of a joint family project.

Participants

Three families from the greater Århus area, Denmark participated in our study. They all had children of primary school age (6-10). We recruited families from peripheral acquainted families of the researchers. They all volunteered and were highly motivated to participate in the study.

The Hansen Family
The Hansen family consisted of a mother (38), a father (40), and two sons aged six and ten. Both sons attended the same primary school and played soccer three times a week. The older son owned a mobile phone and primarily used it to text message his friends and family coordination. Both parents had mobile phones and used them as integrated parts of their daily routines. In a typical weekday, the family was separated by distance because of work, school, or leisure activities. The parents characterized their family as early technology adaptors and told us that they used technology as an integrated part of their lives.

The Jensen Family
The Jensen family consisted of a mother (43), a father (57), and a son aged six. The son attended primary school. The father had a mobile phone which was primarily used for professional purposes. He found phones inadequate for social communication due to the lack of eye contact and body language. The mother also had a mobile phone mostly used for test messaging for family coordination. The son did not have a mobile phone. Both parents worked full time and the father was often away from home on business trips. The family would normally be separated during the day because of work, school activities, or leisure activities.

The Nielsen Family
The Nielsen family consisted of a mother (38), a father (40), and four children; three sons aged one, four and seven and a daughter aged nine. In our study, we concentrated on the communication between the parents and the two eldest children. Only the older son and the parents had mobile phones used for family coordination and logistics. Further, they explained that they sometimes did not bother to call each other since their mobile phones were often on silent mode (switched off). The family was typically separated by distance because of work, business meetings, school, kindergarten, or leisure activities.

Data Collection
Two of the families used the cultural probe for seven weeks while one family used it for six weeks. The introduction of the cultural probes and the scheduling of the interviews were held with a difference of one week. This was done to reflect and interpret upon the results from the different meetings. For the duration of the cultural probe, we arranged three meetings in the homes of the families. Each meeting had a separate theme (and purpose), but they were all grounded in the material and information of the cultural probes. Two researchers participated as interviewers in each of the meetings. After each meeting, the interviewers discussed emerging themes and created a summary as documentation and joint reflection.

First Meeting – Introduction and Deployment
The first meeting aimed to introduce the empirical study and deploy the cultural probes. An introductory meeting was held in the homes of the families. We introduced the probe pack and project in general. The purpose was to explain what we were interested in and what our intensions were. It was important that the families understood that our interest and research was grounded in family intimacy and hence wanted them to reflect on this. Additionally, we interviewed the participants about their background, work, family structure and habits of communication. We left the probe pack at the families and asked them to finish the first camera before next meeting.

Figure 2: Interview and introduction of cultural probe

Second Meeting – Steering and Clarification
The purpose of the second meeting was firstly to steer the families in the right direction with their use of the cultural probe and secondly to answer any potential questions. This was held one week after the first meeting. Even though the families showed an understanding of the purpose of the probe their responses and questions at the second meeting indicated that they had problems in deciding which events that we where interested in and how to document the phenomena. By reviewing the information and results from the probe pack together with the families we tried to understand the information and indicate what areas and instances of information we were interested in. Especially the latter created a shared understanding of the probe pack.

Third Meeting – Reflection and Understanding
The third meeting aimed to understand the contents of the families' scrapbooks and to make them reflect about their daily interaction routines. At this meeting, we went through the gathered information from the probe pack together with the families. The work that the families had undergone with the probes had enabled them to reflect upon how the family maintained a sense of intimacy. The different themes and phenomena that we as interviewers could identify in the scrapbook were used as a foundation for the discussion and were thereby clarified and elaborated. In addition to the process of reflection, we asked the families to consider how they imagined information technologies evolve as tools for social interaction and intimacy within their family.

Data Analysis

The data analysis was conducted in two major steps. First, we used grounded analysis to identify and classify properties and relations in our data and secondly we applied a thematic representation of intimacy to classify our view of intimacy between children and parents.

In order to identify relevant themes in our data, we adapted coding processes from ground theory [17]. Grounded theory provides opportunities for generating theory from data through the use of systematic techniques and procedures to split up qualitative data into smaller parts and assemble them into a higher theoretic understanding [ibid]. Using this technique, we disassembled our data into smaller parts and reformed the parts into structured meanings and categories. From the three coding processes in grounded theory, we used open coding to split up our qualitative data into smaller parts (properties) and axial coding to analyze our data and restructure the parts into themes (categories). First, through open coding, we identified properties evident in our data. This process was conducted in a collaborative effort between three of the participating researchers and were based on collected cultural probes and the interview summaries. Identified properties were reported on post-it notes and placed randomly at a blackboard. Through this open coding process, we identified approximately 250 different properties. Secondly, through axial coding, we categorized the identified properties and built up structures of different categories and relations. This was again done collectively. Thus, we induced a schematic representation of intimacy between children and their parents.

Having identified and categorized our data, we adapted the schematic view of strong-tie intimacy in [20]. This view provides a simple yet powerful understanding of intimacy themes in strong-tie relations (couples cohabiting). Vetere et al. divide acts of intimacy into (1) themes that precede the experience (*antecedents*); (2) themes that comprise the act (*constituents*); and (3) themes that are seen as the result of the act (*yields*). As stressed by Vetere et al., this schematic division as an overlapping and interchanging categorization, but it is useful in describing and depicting themes of intimacy. We structured our categories in a way that enabled us to compare our findings of parent-child intimacy with the schematic view of strong-tie intimacy.

FINDINGS

Our empirical study showed a number of interesting results on parent-child intimacy. We compared our empirical data of parent-child intimacy to strong-tie intimacy. Figure 3 outlines the overall schematic view of our findings and the comparison. The first two columns, unique strong-tie themes and common themes, are adapted from [20] and denote themes in strong-tie intimacy whereas the latter two columns, common themes and unique parent-child intimacy, denote parent-child intimacy. We stress that this schematic view is one way of structuring the relations between strong-tie intimacy and parent-child intimacy.

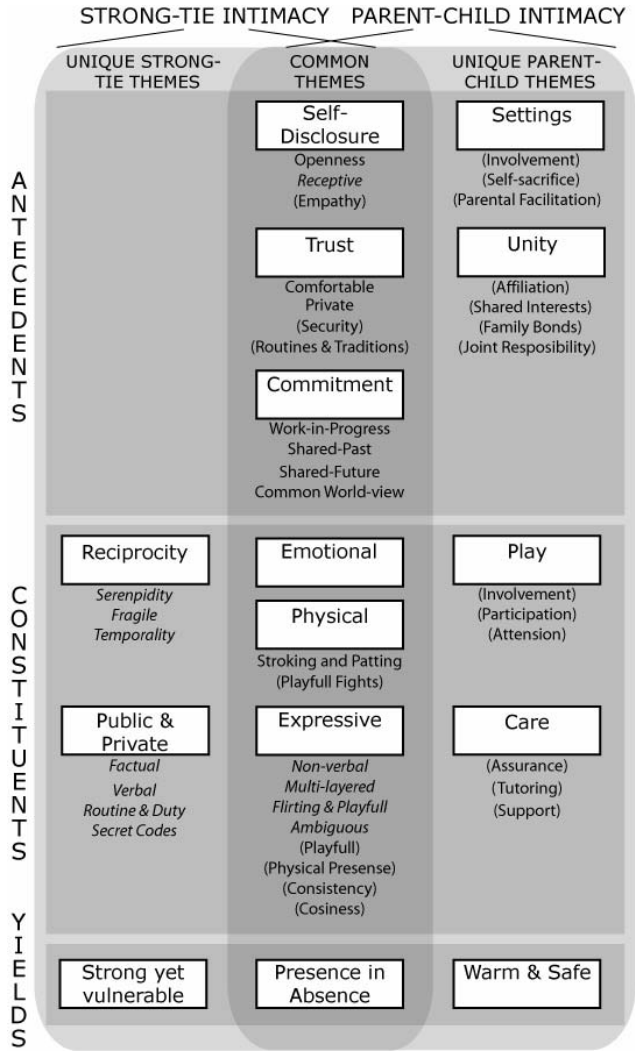

Figure 3: Schematic view of strong-tie intimacy (adapted from [17]) and parent-child intimacy

According to the level of abstraction, properties from both strong-tie intimacy and parent-child intimacy are placed below their respective categories. In figure 3, we have formatted common properties in normal; unique strong-tie properties in *italics*; and unique child-parent properties in (parentheses). In the following, we will outline our findings according to each of the 15 categories in the three themes.

Unique Strong-Tie Themes

We found a number of themes from strong-tie relations not evident in the data of parent-child intimacy. This included the two constituents reciprocity and public & private and the yields strong yet vulnerable.

Reciprocity (Constituents)

Reciprocity defines the importance of reciprocal binding in strong-tie relations [20]. We found no evidence in our data that this was a constituent for parent-child intimacy. The

acts of intimacy were typically not reciprocated or expected in the parent-child interactions partly due to the unequal relationship between parents and children. On the other hand, we did find that parents occasionally expressed needs or desires for extra reciprocity from the children. Furthermore, the lack of reciprocity sometimes leads to less parental assurance and worries. One parent noted *"…the mobile phone can help create assurance, but definitely also a lot of worries…"*. He gave an example *"Why haven't you called back?"* or *"You could have sent an SMS"*.

Public & Private (Constituents)

In strong-tie relationships, couple presents a 'face' to the public where the public expressions of intimacy between couples often are secret and highly coded [20]. We found no evidence for presenting a "family face" in public for parent-child intimacy and no evidence of use of secret or coded messages when the families were in public. None of the parents or the children expressed any need to send secret codes or messages when in public.

Strong yet Vulnerable (Yields)

In strong-tie relationships, the intimate bonds are, at the same time, both strong and fragile [20]. Our data showed that parent-child intimacy is often consistent, strong and not as vulnerable as strong tie-relations. The families would characterize bonds as strong and not easily broken. We also found that parents often tried to be consistent in their acts of intimacy towards their children. Our data showed that the relationships between parents and children are less likely to suffer from the same breakdowns as in strong-tie relations. We found no evidence of breakdowns between parents and children that could reverberate through the relationship for days or weeks.

Common Themes

We found several common themes in our data between strong-tie intimacy and parent-child intimacy, but we also identified new and different properties for some of the common themes; properties that characterized the particular theme in relation to parent-child intimacy.

Self Disclosure (Antecedents)

Self-disclosure is the revelation and willingness to open one self to the other [20]. We found that openness in a parent-child relationship is very important from the perspective of the parents. All parents in our study expressed interest in getting information from their children. One parent stated *"…when we talk we get closer, we come closer to each others lives"*. On the other hand, we found only minimal evidence of self-disclosure shown from the children. They were less willing to include the parents in all their activities. Typically, the parents wanted more information from their children during the day e.g. *"I would like to be a fly on the wall"*. In addition, to openness we found that the parents used empathy as a mean to get information from their children. They tried to decode and read the thoughts and feelings of the children e.g. *"…he's easy to read…"*.

Figure 4: Examples of the physical aspect of parent-child intimacy, which was important in all families

Trust (Antecedents)

Trust is the fundamental aspect that makes it possible for partners to risk one self and it often deep and resilient, which results in a robust relationship [20]. Trust between parents and children were expressed as an important aspect. Some parents and children stressed the importance of establishing the home as a *"trusted zone"*. Within the home, children should be safe, comfortable and private and thereby be open for intimate acts. One parent expressed that when *"…lying private and secure in bed my son opens up and talk about possible concerns"*. Furthermore, trust for the children included feeling secure and safe. We found that routines and traditions helped more children feeling trust. The routines and traditions created predictability that would cause stability and trust in the children's lives.

Commitment (Antecedents)

Commitment defines the on-going process of a relationship and it is the joint feeling of being on a shared journey [20]. We identified very strong evidence of commitment in the families. Both parents and children expressed how they did several "family stuff" such as going on holidays or going to dinner at the local church. Further, a participant mentioned how holidays could *"live in the family's mind"* as a joint expectation and how memories from events could persist in the family for a long time. Thus, the different events and happenings, which the family experience together, served as shared past, present, and future in the family.

Emotional (Constituents)

The emotional acts of intimacy in strong-tie relations are mostly expressed in terms of a message [20]. In families, the emotional bonding is often unsaid. The feeling of being the father or mother to a child or being a child of a father or mother contained deeper emotional reactions than the word itself. The parental feeling of watching your child in a deep sleep is an indescribable emotional feeling. Likewise, the children are emotional bonded to their parents in a more non-reflective way.

Physical (Constituents)
The physical interaction in strong-tie relationships is very important and especially stroking and touching can be seen as gift exchange between couples [20]. Parents would stroke or hold their children as a token of intimacy in order to achieve a feeling of closeness. All participating children liked to have physical contact with their parents. The interview also showed this aspect as the children would often sit on their parents lap or hang on their back (see figure 4). Several expressed that the goodnight hug and the way they tug their children in a night is an important routine of physical intimacy. As with strong-tie intimacy, the physical touching could act as a proxy during the night or day. Additionally, we found the aspects of playful fights a special kind of physical intimacy directly related to parents and children, e.g. expressed by one father *"I like to have a little fight; especially if they [the children] are a bit grumpy before dinner"*.

Expressive (Constituents)
In strong-tie relationships the expressive acts of intimacy is described as non-verbal and often ambiguous exchanges. Moreover, the ways that intimacy is expressed in couples with children are significant different from child free couples [20]. We found that the properties of the expressive acts of intimacy between parents and children were different from strong-tie relationships. Firstly, the expressions from parents to their children were exchanged consistently. Secondly, we found that the families often arranged their physical settings to be physical present. A mother expressed *"We like to sit in the same room. We are not doing anything together. Just being in each others presence"*.

Presence in Absence (Yields)
Presence in absence is the sense of the other despite a physical distance [20]. We found that presence in absence for parent-child relations was related the feeling of security and trust while being physically separated. The sense of connectedness between parents and children was present in the awareness of one another. One parent expressed how he would like to be able to see his son over a webcam during parts of the day. This need for assurance of knowing where their children were was an issue of concern for the parents. Some children used technologies for presence in absence like the older child in one family used instant messaging *"Sometimes I chat with my father when I come home from school"*. Additionally, one father expressed how he found the use of SMS cumbersome and difficult to use. On the other hand, he stressed the idealness of SMS when communicating while hiking in areas with unstable networks. The asynchrony of messages gave the children time to formulate messages and it enabled him to read the message whenever the network allowed it *"It's like the SMS lasts longer"*. One mother pointed out how the children felt like *"We have got an SMS from dad!" where SMS was* a one to many channel of communication between the parents and the children.

Figure 5: Examples of a play situation

Unique Parent-Child Themes
Having identified unique strong-tie and common themes, we will now illustrate themes that we found unique to the parent-child intimacy. During our analysis, we identified five categories with 13 properties for the antecedents, constituents, and yields of parent-child intimacy.

Settings (Antecedents)
Settings are the way that people deliberately choose to involve and sacrifice one self for meeting another on a common ground. We found that the surrounding environment and facilitation of the children were important on whether children would devote themselves to acts of intimacy. All parents explained how they arranged both the physical settings and how they spend time together with their children, such as the dinner table, the car, and the parent's bed to be the preferred settings of intimacy. They all noted how they used the dinner table for being together and talking. Two parents noted *"The car is where we talk the most. We try to arrange the time spent here"*. Moreover, one child stated that he felt close to the family when driving *"When we are all in the car singing along to a silly song"*.

Unity (Antecedents)
Unity is the sense of affiliation to a group with shared interests. It is the feeling of belonging to something that is more important than one self is. Families proved to be greater than the sum of its parts. Individual family members were bound together by blood so children automatically inherited a strong sense of unity. The family made up the backbone of the children's lives and created a strong feeling of affiliation. For example, the Nielsen family noted *"The older children enjoy bringing and getting their brothers in kindergarten. All of them like to help carry and arrange"*. Especially the children stressed the importance of unity and being together as a family. One child stated, *"When I'm home I like all the others to be home as well"*.

Play (Constituents)
Play is the childish immersion into an imaginative world or setting and it involves participation in the children's play. We found that parents played games with their children and they involved themselves on the children's premises. As an example, one scrapbook contained pictures and descriptions of a father with two children sitting on the floor building wooden houses and sculptures of small building blocks.

The father described the situation on the pictures *"I like to be involved in the play and it's a kind of a special and direct way of being together"* (se figure 5). Another father explained that he loved when he could play soccer with his son and his son's schoolmates in the schoolyard after collecting him at school.

Care (Constituents)

Care is the minding, caring, tutoring, and supporting of children. In contrast to play, care is constituted in the unequal relationship between parent and child. We found an implicit responsibility and dependability between parents and children since the children were dependant of their parents. The parents showed great need for assurance of their children's wellbeing. We also found that the parental act of passing on values to their children was very significant to the bonds between them. One mother said that her son asked questions about life and its meaning.

Warm & Safe (Yields)

We found the unequal relationship between parent and child to contribute to most of the unique parent-child phenomena. Many of the intimate acts in parent-child intimacy are related to the maintaining the children warm and safe. The children sought safety and unity and they were vulnerable and needed intimacy and protection from the family. Furthermore, the parents found it important to support their children through their childhood. They saw this as an important responsibility to make their children succeed in becoming good human beings. A mother stated *"It's important for us that our children acquire good social skills"*. This parental responsibility was not always directly readable from the scrapbooks or the interviews. Instead, it featured as an implicit theme that served as a foundation for much of parent-child intimacy.

DISCUSSION AND DESIGN IMPLICATIONS

Emerging technologies are likely to affect every part of the daily lives of children and parents. Existing technologies already support and promote social interaction to increase social presence and intimacy [12]. Our empirical study showed that while parent-child intimacy share similarities with strong-tie intimacy, parent-child intimacy holds several unique themes making this relation special.

Intimacy between children and parents consists of a strong unit defined by a shared background. We identified different aspects of this unit through the categories of unity, settings, and commitment. In strong-tie relations, the unity is not apparent in the same way as in parent-child relations where the sense of unity is mainly expressed through commitment to the relationship [20]. We found that unity is more than commitment in families. The family operates as an open system, strongly connected by their family bonds. Even though parents and children have to commit to the family/unit, we found that the family commitment is partly pre-defined and derived from the family bonds. The unique aspect of unity is not surprising in parent-child intimacy. Previous research has shown that unity is an important aspect in group relations such as families [3, 13]. The connectedness and affiliation to the group is important since interaction in a group is more than a one-to-one link. The sharing of photos between family members has been shown to increase the social presence and thereby support the unity of the family members [3]. Moreover, it is shown that the unity of a family is supported by awareness and group cohesion [13]. This indicates that designs for intimacy can support unity in families as an antecedent or a constituent.

Opposed to strong-tie relationships, we found that parent-child relationships are unequally balanced, as the parents are also the children's protectors or guardians. In strong-tie relations, the equality of the individuals is fundamental for the relationship. Thus, trust is slightly different from strong-tie relation as security and routines become important. Parents would also provide settings in which they would facilitate intimate acts and thereby take great responsibility for the relation. Other studies have shown that technology can increase children's responsibilities [19]. In parent-child relations, children were often not expected to reciprocate the act of self-disclosure. Many technologies for mediated interaction offer duplex control of sending and receiving communication, e.g. SMS, and hence invite for reciprocity.

Designing technologies supporting mediated intimacy in children and parents relation raises a number of challenges. Designers could address and take advantage of aspects of unity. Future technologies could potentially support interleaved and constantly changing communication patterns between the children and the parents. This suggests that families could use a 'family hub' that connects members of the family. This was partly done in another project where a system called *TxtBoard* supported communicating one-to-many which one family expressed as being *"a great way to communicate with your family"* [16].

The unequal relationship that characterizes the relationship between parents and children calls for additional design considerations. Parents and children need different kind of information in the acts of intimacy. Children need the intimate care provided by the parents. Future technologies could support the parental responsibility, provide security, and care for the children. On the other hand, the lack of reciprocity raises a question of whether to neglect this aspect or to design for added support of reciprocity in parent-child intimacy. This is probably an open question. Our study indicated that technologies could support delayed reciprocity between family members to accommodate the unstructured and non-routine behaviour of children.

CONCLUSION

During the last years, emerging technologies have created new opportunities for investigating mediated awareness and intimacy. However, so far very little research has focused on phenomena of intimacy between children and parents. Through an ethnographic study involving cultural probes and contextual interviews, we found aspects of parent-child

intimacy. We elucidated aspects that are different from the aspects of strong-tie intimacy and we found that key aspects of strong-tie intimacy were not evident in children and parents intimacy. This raises questions on how to design technologies that can support the unique aspects of intimacy between children and parents. In this paper, we provide only initial design considerations this regard. Currently, we are designing mobile and ambient interface that support some of the intimacy acts between children and parents.

Our study is limited in a number of ways. First, for practical reasons we included only three families in our study compared the six families in [20]. This could of course influence some of our findings as more families could have illustrated additional aspects of intimacy. Secondly, the three participating families were quite similar in many ways. They all consisted of a mother, father, and a number of children. Families with divorced parents or with single parents could perhaps exhibit different kinds of intimacy acts between the children and the parents.

ACKNOWLEDGMENTS

The work behind this paper received financial support from the Danish Research Agency (grant no. 2106-04-0022). We would especially like to thank all the participating families. Also, we want to thank several anonymous reviewers for comments on drafts of this paper.

REFERENCES

1. Bell, G., Blythe, M. and Sengers, P. (2005) Making by making strange: Defamiliarization and the design of domestic technologies. *ACM Transactions on Computer-Human Interaction*, ACM Press, Vol. 2(12), pp. 149-173.
2. Chang, A., Resner, B., Koerner, B., Wang, X. and Ishii, H. (2001) LumiTouch: an emotional communication device. *Extended abstracts on Human Factors in Computing Systems (CHI'01)*, ACM Press, pp. 313-314.
3. Counts, S. and Fellheimer, E. *Supporting social presence through lightweight photo sharing on and off the desktop.* CHI '04: Proceedings of the SIGCHI conference on Human factors in computing systems, ACM Press (2004), 599--606.
4. Gaver, B., Dunne, T. and Pacenti, E. *Design: Cultural probes.* interactions, ACM Press, 1, 6 (1999), 21--29.
5. Gaver, W. W., Boucher, A., Pennington, S. and Walker, B. *Cultural probes and the value of uncertainty.* interactions, ACM Press, 5, 11 (2004), 53--56.
6. Gaver, B. *Provocative Awareness.* Comput. Supported Coop. Work, Kluwer Academic Publishers, 3, 11 (2002), 475--493.
7. Goodman, E. and Misilim, M. *The Sensing Beds.* Proceedings of UbiComp, Workshop (2003).
8. Jacobsen, M. H. and Tonboe, J. *Arbejdssamfundet : den beslaglagte tid og den splittede identitet.* Hans Reitzel, 2004. ISBN: 87-412-2329-2. (In Danish)
9. Jensen, J. J. and Skov, M. B. (2005) A Review of Research Methods in Children's Technology Design. In *Proceedings of the 4th International Conference on Interaction Design and Children (IDC'05)*, ACM Press
10. Kaye, J., Levitt, M. K., Nevins, J., Golden, J. and Schmidt, V. *Communicating intimacy one bit at a time.* CHI '05: CHI '05 extended abstracts on Human factors in computing systems, ACM Press (2005), 1529--1532.
11. Kjeldskov, J., Gibbs, M. R., Vetere, F., Howard, S., Pedell, S., Mecoles, K. and Bunyan, M. *Using Cultural Probes to Explore Mediated Intimacy.* Australian Journal of Information Systems, 1, 12 (2005), 102--115.
12. Kostakos, V. and Little, L. (2005) The social implications of emerging technologies. *Interacting with Computers*, Vol. 17, pp. 475-483
13. Markopoulos, P., Romero, N., Baren, J. v., Wijn,, IJsselsteijn,, Ruyter, B. d. and Farshchian, B. *Keeping in touch with the family: home and away with the ASTRA awareness system.* CHI '04: CHI '04 extended abstracts on Human factors in computing systems, ACM Press (2004), 1351-1354.
14. Markopoulos, P., IJsselsteijn, W., Huijnen, C., and de Ruyter, B. (2005) Sharing experiences through awareness systems in the home. *Interacting with Computers*, Vol. 17, pp. 506-521
15. Mueller, F., Vetere, F., Gibbs, M. R., Kjeldskov, J., Pedell, S. and Howard, S. *Hug over a distance.* CHI '05: CHI '05 extended abstracts on Human factors in computing systems, ACM Press (2005), 1673--1676.
16. O'Hara, K., Harper, R., Unger, A., Wilkes, J., Sharpe, B. and Jansen, M. *TxtBoard: from text-to-person to text-to-home.* CHI '05: CHI '05 extended abstracts on Human factors in computing systems, ACM Press (2005), 1705--1708.
17. Strauss, A. and Corbin, J. (1998) *Basics of Qualitative Research – Techniques and Procedures for Developing Grounded Theory*. SAGE Publications, Thousand Oaks
18. Strong, R. and Gaver, B. *Feather, Scent, and Shaker: Supporting Simple Intimacy.* Proceedings of CSCW'96, New York, NY, USA (1996), 16--20.
19. Taylor, A. S. and Swan, L. (2005) Artful systems in the home. Proceedings of the Conference on Human Factors in Computing Systems (CHI '05), ACM Press, 641-650
20. Vetere, F., Gibbs, M. R., Kjeldskov, J., Howard, S., Mueller, F., Pedell, S., Mecoles, K. and Bunyan, M. (2005) Mediating intimacy: designing technologies to support strong-tie relationships. Proceedings of the Conference on Human Factors in Computing Systems (CHI '05), ACM Press, pp. 471-480.
21. Zuckerman, O. and Maes, P. (2005) Awareness system for children in distributed families. In *Proceedings of the 4th International Conference on Interaction Design and Children (IDC'05)*, ACM Press