

Designing for Identity Change

Investigating aspects to be aware of when designing
for women in the postpartum period

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ABSTRACT

Becoming a mother causes a dramatic and overwhelming change in women's inner lives (Stern, 2000). In spite of this, it is seldom a topic of discussion. At the same time, technologies are playing an increasing role in the experience of pregnancy and motherhood. This article investigates how motherhood influences women's identity development and what role digital technologies play in this process. It is motivated by the fact that only through understanding this under-explored life phase, we will be able to design good, enjoyable, suitable solutions for mothers. Based on a literature review, some central themes emerged regarding technologies' role in the transition to motherhood. These were; Technologies positively improve confidence and contribute to be more than 'just a mother', and technologies negatively distance mothers from their intuition and contribute to the fear of being judged. Informed by the findings, the study explores and discusses how future technologies and systems should be designed to ease the transition into motherhood, culminating in a set of implications for future design. The research sets out to contribute to improved future healthcare services, resulting in an improved and empowered experience of motherhood.

KEYWORDS: motherhood, identity change, HCI, digital motherhood, human-centered design

1. INTRODUCTION

Motherhood is a complex life phase that brings with it great joy and happiness, physical changes, changing relationships and new responsibilities. There is an abundance of research looking into the challenges that individuals face when transitioning into their new role as mothers, e.g. (Gibson & Hanson, 2013; A. Prabhakar et al., 2018; A. S. Prabhakar et al., 2017). The postpartum period is commonly referred to as the first six weeks following childbirth, and is according to the World Health Organization the most neglected period for the provision of quality care. The risk of developing depression is heightened in this

period, with research suggesting that in Norway approximately 3000-9000 new mothers will develop postpartum depression (PPD) (Eberhard-Gran, 2011). However, despite these studies there is still relatively little understanding of how women modify several areas of their identities when they become mothers, and also how this identity change affect their challenges, possible development of PPD, social connectedness and vulnerability. A 2013 workshop at The ACM Conference on Human Factors in Computing Systems (CHI) argued that motherhood is an under-explored transitional life phase that could be better supported by digital technologies (Balaam et al., 2013).

Technologies are playing an increasing role in all aspects of life, also the experience of pregnancy and motherhood. One aspect of this is how mothers increasingly seek information on influential websites, like mumsnet.com, and community groups on Facebook. Another aspect is how technology has enabled women to track the pregnancy and growth of the baby to a greater extent (Balaam et al., 2013). At the same time, reduced state budgets and streamlined services are increasingly leading to the need of certain types of care to be facilitated by support networks and technological support. In this space, entrepreneurs begin to develop applications, like Peanut, a matchmaking app for mothers (Toombs et al., 2018). With this, it becomes apparent that it is critical with a deep understanding for personal vulnerability and identity change, to be able to make tactful solutions.

This article will be used to gain a deeper understanding on how the transition of becoming a mother affect identity, what role digital technologies and systems play in this process, and how future technologies and systems should be designed, contributing to an improvement of services in healthcare.

1.1 METHOD

The article is based on a literature review within the fields of healthcare, psychology, HCI (Human-Computer interaction) and Human-Centered and Service design in the healthcare sector to gain theoretical insight. The search was conducted through general academic databases, design specific databases, through references in relevant articles and textbooks on mothering and design. The literature was chosen based on several criteria, like relevance to the topic, comparable context, and number of citations. The article is structured as follows: first a background section including theory on identity and the role of technology, followed by findings on how the transition of becoming a mother affects identity and digital technologies' role in this process, a discussions section with implications for

future design, and lastly finishing off with a conclusion.

2. BACKGROUND

Motherhood and mothering are fundamental aspects of life, and as a consequence, every culture has knowledge, values, practices and expectations related to the role (Balaam et al., 2013). Therefore, to be able to understand mothers as users, one must be able to situate them in relation to their contextual surroundings (Schlesinger, Edwards, & Grinter, 2017). This article will look into the role digital technology play in mother's identity change, and since differences in culture result in variations in technology use, it emphasizes the importance of context. Although this study is a literature review, it must be read in light of its circumstances to be fully understood. The study is taking place in Norway, where 54 432 women gave birth in 2018 and the average age for first time pregnancy was 29,5 years for mothers and 31,8 years for fathers (Statistics Norway [SSB], 2019). A study conducted by Eurostat in 2016 proved that Norwegians are among the most digitally skilled in Europe (Fjørtoft, 2017), and Skranes et.al. found that the internet is the main source of child health information for Norwegian mothers of young children (Skranes, Løhaugen, Botngård, & Skranes, 2014).

As with many other European nations, there is a growth in population combined with reduced state budgets, which is making the healthcare services face big challenges in the years to come (Central Norway Health Authority, 2016). As manual services in the healthcare sector are reduced or cut entirely, the role of technology strengthens. Historically, the design of computing systems has taken a technology-driven approach, assuming that users will change their behaviour to match the dictates of modern technologies (Oviatt, 2006). The field of Human-Centered Design has emerged the last few decades, arguing that an understanding of human thought process,

emotions, and behaviours needs to guide the design (Searl, Borgi, & Chemali, 2010). This study is motivated by the fact that only through understanding mothers' identity change, and the ways it intersects with technology, we will be able to make enjoyable, pleasant and sustainable healthcare solutions addressing mothers and infants. The article seeks to answer: In what ways does the transition of becoming a mother affect their identity?; What roles do digital technologies and systems play in this process?; How should future technologies and systems be designed to ease this process?

2.1 IDENTITY

Identities are defined as understandings of ourselves as *specific objects* that can be named or classified (e.g., Frank, an atheist, a gardener), while "self-esteem" is an understanding of one's *quality* as an object (e.g., how good or bad, valuable or worthless one is) (Thoits, 2013). As almost all approaches in psychiatry view individuals' mental health as influenced by self-esteem and identity, one is dependent on understanding mothers' identity change to be able to understand their user needs. Motherhood, which often is an intensive and lifelong relationship for women, can have a significant impact on women's identity (Laney, Hall, Anderson, & Willingham, 2015). Women must reevaluate how their autonomy, physical appearance, sexuality, and occupations influence their identities differently than they had prior to motherhood (Nicolson, 1999). Furthermore, this process is of great importance for the infant's developmental course. Studies have shown that the mother's mental health can affect the mother-infant bonding process, and it is also associated with a number of difficulties for children, both socio-emotional, cognitive and social difficulties (Eberhard-Gran, 2011).

2.2 ROLE OF TECHNOLOGY

The potential for technology to provide interaction, information and support is immense. To figure out how technology

affects mothers' identity change, it is necessary to identify where technology and motherhood actually intersect. A study conducted in 2014 found that 96% of mothers with young children in Norway use internet on a daily basis (Skranes et al., 2014). The same percentage of mothers used Google to find health related information, 88% used social media, like Facebook, and 70% used different kinds of forums. The technology is used for informational support, like online information seeking, and emotional support, like retaining social connections and forging new ones. It is reported that the Internet serves the needs of mothers better than any other form of media, particularly in relation to relaxation with 48% saying that their time online often is the most peaceful part of their day (Gibson & Hanson, 2013).

According to Statistics Norway, 91% of Norwegians own a smart phone. As new mothers are generally younger and more tech savvy it is reason to believe that this number may be even larger for new mothers. In relation to this, Gibson and Hanson found in their study that the ownership of a mobile phone, specifically a smart phone, was one of the best tools for a modern mother (Gibson & Hanson, 2013). Caring for an infant provides restrictions to desktop or laptop access, and mobile devices offer another opportunity to regain access. They also offer the potential to connect to the world in the middle of the night, offering the opportunity to feel more productive, stay awake or unwind.

Technologies change the landscape of health communication. While historically the public mainly consumed information, people are now being engaged in the production of information for themselves and others (Balaam, Comber, Jenkins, Sutton, & Garbett, 2015). We see this trend in social media, forums and blogs, like [mammatilmichelle.no](#), [pilotfrue.no](#), [forum.mammanett.no](#). This opens up the support for personalization of healthcare, but at the same time it won't necessarily agree with official evaluated advice.

3. FINDINGS

3.1 HOW THE TRANSITION OF BECOMING A MOTHER AFFECTS IDENTITY

Identifying with the status of being a mother does not happen in a defined instant, but rather in the many months before and after the actual child birth (Laney et al., 2015). In the book, *The birth of a mother*, Daniel N. Stern describes the process of becoming a mother; “[...] a woman develops a mental way of thinking which is fundamentally different than her previous one. She enters a world of experience, completely unknown for non-mothers. Regardless of her previous motives, vulnerability factors and emotional responses, she will act based on a completely new way of thinking.” Despite this often dramatic and overwhelming change in mothers’ inner lives, it is rarely a topic of discussion. As a society, we more often discuss breastfeeding, morning sickness, the timing for returning to work and maternity leave. But as Stern argues, mothers will act based on a new way of thinking, which we will have to be aware of to be able to design good solutions for mothers.

3.1.1 From daughter to mother

All of women’s lives, part of their identity is being someone’s daughter. After giving birth, women eventually start perceiving themselves as a mother, rather than a daughter, and they’ll never be able to identify *just* as a daughter again (Stern, 2000). With this fundamental change comes the feeling of losing something combined with a feeling of wonderful reward. Women incorporate a psychological identification with their infants (Laney et al., 2015), developing heightened awareness of and concern for their infants. Mothers (and fathers) have the full responsibility for another human’s life, which in itself often is a frightening thought. This often causes feelings of vulnerability and insecurity, leading to the need of improving confidence as mothers. As a result, acknowledgement and social support from

networks play an important role in mothers’ well-being (A. Prabhakar et al., 2018).

3.1.2 Self-loss

Whether or not the transition to motherhood comes naturally, most women feel a sense of self-loss when they become mothers (Laney et al., 2015). As a result of caring for the infant at all times, women have to set aside much of their own needs. Gibson and Hanson found that as the world seemed to revolve around the child and the woman’s role as the mother, a strong feeling and need to preserve the woman’s identity as a person in her own right evolved (Gibson & Hanson, 2013). While Toombs et.al. found that some mothers freely admit that “being a mom” is their primary identity, more often mothers feel a strong need for not being defined by their children and motherhood.

3.1.3 Intuition

When becoming a mother, most women experience to act without thinking. The maternal instinct develops a set of intuitive reactions and behaviour previously unknown (Stern, 2000). An infant brings spontaneous, new events, that call for an immediate, appropriate reaction. Some women easily adjust to this change, while others struggle to adjust to this new way of living. Regardless, intuitive reactions will be part of mothers new identity (Stern, 2000).

3.2 DIGITAL TECHNOLOGIES’ ROLE IN THE PROCESS

The technology development the last few decades has completely altered the everyday life. In numerous ways, the internet is intricately enmeshed at home, e.g. one can retain social connections through social media, order food and clothes, pay bills, read news, use online banking and seek information. With technologies’ upheaval, women’s experience of pregnancy, birth and mothering is altered (Balaam et al., 2013). As a result, the technology plays a significant role at what can be a disorientating time of changing identity. There were some central themes emerging from the literature; positively improving confidence and

contributing to be more than 'just a mother', and negatively distancing mothers from their intuition and contributing to the fear of being judged.

3.2.1 Improve confidence as a mother

Gibson and Hanson found in their study that women use technology to improve their confidence as mothers (Gibson & Hanson, 2013), specifically through information seeking, breaking into new communities and technology for parenting. Leaving the hospital after birth is for many women linked with a feeling of being alone, with questions and insecurities regarding breastfeeding (Hamper, 2014). Concerns around breastfeeding undermine women's confidence in their bodies' ability to ensure their baby thrives (Balaam et al., 2015). Hamper found that women use breastfeeding videos on Youtube.com and information on Ammehjelpen.no to improve their confidence (Hamper, 2014). Even though the women in this study had been handed a DVD about breastfeeding from their health clinic, they chose the internet for information as it was more convenient and the information was more personal, e.g. forums and blogs. Others have reported that they choose to use the internet as an information tool as it provides a less embarrassing place to ask 'silly' questions, and it is reassuring to find others in similar situations (Gibson & Hanson, 2013).

In the process of establishing a mother identity, the need for establishing support networks naturally arises (Stern, 2000). A support network of family, friends and other mothers can improve mothers confidence, by providing psychological and practical support. Lack of a support network is linked with postpartum depression (Eberhard-Gran, 2011). Previous studies have shown that many mothers sought support through various internet sources, like Facebook, SnapChat and Twitter (Andersen, 2017; A. S. Prabhakar et al., 2017). The sources were used to update family and friends through videos, pictures and chats, plan social events and establish new networks by joining

Facebook groups. The mothers reported that social media made it more achievable to share advice and experiences. Based on this, social media can contribute to the experience of social support, thus more well-being and less degree of depression among first-time mothers (Andersen, 2017).

3.2.2 Be more than "just" a mother

A study from 2018 found that some parents do not post images of their child online in fear of losing their own identity, and one father explained; "I would never put a picture of my kid up on Facebook [...]. I just see these people who just become professional parents and I just don't want that to be me at all. It's like all they are is their kids" (Toombs et al., 2018). Instead, social networking sites are by many mothers used as a mean to their preserve their identity as a person in their own right (Gibson & Hanson, 2013). Sites like Facebook and Instagram provide women with a place to post and share *their* thoughts. This purpose is in contrast to N. Jomhari et. al.'s findings, reporting an increasing number of young mothers actively taking pictures of their babies and posting them on the Internet.

Furthermore, mothers report a disconnection from 'the outside world', and technologies enable mothers to connect to the world outside their bubble (Gibson & Hanson, 2013). Through asynchronous communication tools, such as Facebook and email, mothers are able to have grown up contact, and through news sites mothers are able to stay up to date on current affairs in the world. As a result, technologies have a significant role in letting mothers reclaim their identity and connection within the world, increasing their emotional and maternal wellbeing, as emphasized in several studies (Gibson & Hanson, 2013; Madge & O'Connor, 2006; Toombs et al., 2018).

3.2.3 Fear of being judged

Parents hold several tensions, including the desire to be independently capable and to be a super parent (Toombs et al., 2018). These desires are often linked to critical and judgmental behaviours – both receiving

another's judgment or criticism, and exhibiting those critical and judgmental behaviours. Parents perceive that they are being judged for their parenting abilities and that there is a competition to reach infant milestones as early as possible (Andersen, 2017). Social media creates a space for mothers to compare themselves and their infant to other mothers and infants, both consciously and unconsciously. In that sense technology plays an instrumental role in the surfacing "competition". Andersen found in her study that mothers often discuss and make crass, insensitive comments in Facebook groups, and as a result, one participant in her study had left Ammehjelpen's Facebook Group (Andersen, 2017).

Mothers' fears of being judged are entangled in their identities. There are a few smartphone apps that let mothers meet others like them in their local area, e.g. Peanut and Mush. Theoretically, these apps provide usefulness by facilitating for support networks. However, Toombs et. al. found that mothers felt awkward using them, because their insecurities about whether or not they would be chosen by someone else was intimately tied to the vulnerability of their shifting identities as parents and as individuals (Toombs et al., 2018). This illustrates how socio-technical systems must be more sensitive to the vulnerabilities and insecurities mothers face.

3.2.4 Alienating intuition

While technology provides a less embarrassing place to ask 'silly' questions, it does not come without consequences. Women in the postpartum period are using mobile phones to read about the new-born baby, which physiological changes in the body that are normal after birth and to ask questions. Some parents even use apps to log breastfeeding times, the infant's excreta and amount of diapers throughout the day. This trend have midwives asking; "maybe new parents should use more common sense and intuition, to better understand the baby's signals?" (Kosberg & Dahlø, 2018). When

excessively using technology to answer questions, as illustrated by this mother; "Maybe I use Google too readily and should start listening to my instinct but well, to be honest, I like the confirmation or reassurance it provides" (Gibson & Hanson, 2013), it puts mothers at risk of missing the signals the infant sends her. While it distances mothers from their intuition, it can also affect the attachment and bonding process between mother and infant (Kosberg & Dahlø, 2018). It is important with a strong and good bond from birth to secure the infant good physical, mental and social development.

4. DISCUSSION

4.1.1 Paradox of technology

This study's findings has shown that technologies have potential to ease mothers' identity change in many ways, e.g. by providing accessible information helping to improve confidence as a mother and by providing mothers with a space to preserve their identity. Paradoxically, the findings are also pointing towards how technologies negatively affect confidence and identity, by creating a judgmental space that alienates intuition. Designing solutions for mothers must be done with this paradox in mind. How do we navigate motherhood vulnerabilities, and equally important, promote and design for healthy usage of technologies? As studies have shown that mothers' increased usage of technologies can affect the infant, both cognitive and emotional (Kosberg & Dahlø, 2018), designers are automatically put in a responsible and powerful position. We want to put technologies' positive potential into use, without estranging and impairing a fundamental aspect of life, that is motherhood.

4.1.2 Designing for the greater context

The findings show that technologies provide a place for mothers to ask 'silly' questions, which can be viewed as positive, as the mothers are provided a space that enables them to improve their confidence. On the other hand, it raises questions around what the actual challenge is. If it is easier to google

something than to actually ask, does that not imply that there is not enough openness in the society? Designing for the female body and women's health is troublesome, and the female body as a site for research is claimed as taboo (Balaam et al., 2017). Like previous studies, this emphasizes that designing for mothers and the postpartum experience is complex and context-sensitive, as it sits at the intersection of numerous factors (D'Ignazio, Hope, Michelson, Churchill, & Zuckerman, 2016). Social pressures, legislation, political realities, societal and cultural expectations and stigmas of motherhood are all aspects that are in play. It is crucial that designers have a deep understanding of some of these aspects in order to create technologies that will be widely adopted.

4.1.3 Applicable for other populations

Designing for mothers vulnerabilities could provide an avenue for understanding how to design for other populations as well (Toombs et al., 2018). A woman's journey from pregnancy to stages of motherhood faces numerous physical and emotional challenges that requires support from diverse sources, depending on the stages of the journey they are in. Similarly, a patient going through a cancer journey will possibly face comparable vulnerabilities and identity change (A. S. Prabhakar et al., 2017).

4.1.4 Empowering mothers

No theory can ever fully capture the varied nuances of motherhood or what it means to become a mother, but an important factor in altering myths about motherhood is the subjective experiences of mothers (Laney et al., 2015). This vulnerable and identity changing-phase in women's life is unique for every mother, dependent on the relationship with herself, people, technology and the surrounding context. Based on this, we should not design for a "rhetorical cipher", but rather a nuanced individual (Schlesinger et al., 2017). By including mothers in the design process, it enables us to focus on various dimensions of identity, while it also empowers women. Mothers have

experienced and thought deeply about their needs and often have great ideas for improving the postpartum experiences. D'Ignazio et. al. found that when developing the app FeedFinder and inviting and listening to mothers' ideas, some expressed feelings of gratitude and empowerment for being in the "predicament together" (D'Ignazio et al., 2016). In one of the previous examples, mothers chose the internet for information about breastfeeding instead of a DVD they had been handed. As great as the DVD might have been, it was a solution that overlooked mothers' needs, like convenience. With a Human-Centered approach, listening to individual voices, the designers might have yielded this insight.

4.2 IMPLICATIONS FOR DESIGN

This research set out to understand how becoming a mother affects identity and what role technologies play in this process. Based on this follows some proposed implications for design of future technologies and systems, contributing to more enjoyable, pleasant and sustainable healthcare solutions.

4.2.1 Invitation to participate matters

Essentially, only women who have experienced to become mothers can fully comprehend the emotional changes that comes with it. They are the experts - not Western businessmen. Invite mothers to participate in the design process. Studies have shown that the involvement of women within the iterative human-centred design process is essential in identifying and understanding the design space and experiences (Balaam et al., 2015). This way we become caring partners in making things better, rather than distant engineering or design wizards (D'Ignazio et al., 2016). Following this, the topic and framing of the invitation to participate matters. In a study looking to improve the breast pump, the users were positioned as creators of new ideas, rather than just someone who explains what they do not like. Toombs et. al. found that when engaging with parents in their study, parents were motivated by the

opportunity to meet other parents, as well as being able to vent to the interviewer (Toombs et al., 2018). This way, the study provided helpful, “healing” moments.

4.2.2 The platform

When designing technology for mothers, the platform is one of the most important considerations (A. S. Prabhakar et al., 2017). The needs of a baby can be particularly demanding and unpredictable, and therefore the platform must be versatile, accessible and convenient. This study found that 96% of mothers with young children in Norway use internet on a daily basis, and 91% of Norwegians own a smart phone. Furthermore, Gibson and Hanson found that new mothers would not have used online services as much if they had to go to their desktop computer or laptop. On the other hand, mobile devices offered the potential for access while caring for infants, even in the middle of the night (Gibson & Hanson, 2013). A suggestion based on this; Build interventions that can be easily accessed on multiple platforms, and bear in mind that mobile devices often are the best options after birth.

4.2.3 Breaking barriers

With research suggesting that mothers are scared to ask ‘silly’ questions, in fear of being judged as unsuitable mothers, technology could be a key into breaking these barriers. We need more research looking into how we can design systems to enable and empower women (A. S. Prabhakar et al., 2017). Already by involving mothers in the design process we facilitate for conversation and discussion around tabooed aspects of motherhood. How can we design mechanisms for women to share their experiences without feeling judged? One way is to give mothers the ability to hide their identity, but it is equally important to contribute to information about the postpartum experience so mothers know that their experiences are normal. Contributing to remove stigmas will make it less frightening to share experiences. In the space of sharing experiences and learning from each other

online, privacy is an incredibly important aspect which must be reflected in the design.

4.2.4 Personalized and enjoyable

Technologies cannot replace the importance of closeness and intimacy between human beings, but it can provide support. In doing so, it should be personalized and enjoyable. In one study it was suggested that parenting apps and websites could benefit from incorporating humour to mitigate some of the felt vulnerabilities and insecurities (Toombs et al., 2018). This strategy could reduce the potential for judgmental and competitive interactions. Another study took a playful and humorous approach to engage mothers in their study, by saying “Make the breast pump not suck” (D’Ignazio et al., 2016). It raised overwhelming interest and enthusiasm among mothers.

5. CONCLUSION

The transition of becoming a mother influences identity in many ways. It is an individual, unique and vulnerable process, where technologies potentially play a substantial role. Designing for mothers in the postpartum period is particularly context-sensitive, as it sits at the intersection of factors like social pressures and political realities. By providing some implications for design, the study aims to inform and help navigate vulnerabilities in future design processes.

The findings show that; If we want to help women feel more empowered as they become mothers then women themselves must be central in deciding whether and how they use technologies (Gajjala & Mamidipudi, 1999). It is inevitable that technologies’ in the years to come will impact the transition to motherhood, but with an understanding of identity change and technologies’ role, the solutions will hopefully be a contribution to mothers’ and infants’ well-being.

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