Using Mobile Technology to Bring Families Together: The Design of a Family History Concept to Motivate Face-to-Face Communication

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ABSTRACT

Increased use of digital technology, such as social media or individual entertainment systems, may lead to less face-to-face communication between family members. This paper presents a two-phase design research study on a novel use of technology that could help reconnect co-located family members. The authors present the design qualities for a domestic technology that can increase the level of social interaction within a family. These design qualities provide a guideline for the second phase, in which a novel system concept, FAMEX, is designed to support discussion about family experiences. FAMEX is based on the concept of family history, and involves the creation, finding, and discussion of family memories, which are represented as virtual notes around the home. The design emphasizes ludic values in the form of playful stimulants to face-to-face discussion. Mobile devices, together with augmented reality and embodied interaction, are utilized within the home context: this combination has the potential to raise curiosity and interest, and therefore, encourage ongoing use of the system. In an iterative user study, with prototypes of various fidelities, the participants rejected the features of formal game play, but gave positive feedback to the main features of FAMEX.

Keywords: Augmented Reality, Embodied Interaction, Family Communication, Family Experiences, Ludic Design, Mobile Devices, User-Centered Design

INTRODUCTION

Relationships between parents and children affect both the physical and mental well-being of family members (Gauze, Bukowski, Aquan-Assee, & Sippola, 2008; Wills, Vaccaro, & McNamara, 1992). Communication between family members is an effective way to strengthen relationships within the family and at the same time influence aspects of children’s self-development, such as self-expression, self-esteem, and decision making (Bohanek, Marin, Fivush, & Duke, 2006; Noller & Bagi, 1985). Effective communication is a positive approach for coping with disagreements and conflicts that occur within a family context (Jackson, Bijstra, Oostra, & Bosma, 1998; Gauze, Bukowski, Aquan-Assee, & Sippola, 2008). Moreover,
Booth-Butterfield and Sidelinger (1998) have suggested that good communication within the family influences children’s attitude and behavior toward sensitive topics, such as sex and drug use, even when the children are moving toward adulthood.

Technology has a pervasive presence in the everyday lives of most people, and is used to support their work and lifestyles (such as staying in touch with remote friends or family through MSN Messenger or Skype), and also for individual entertainment (with devices such as PlayStation® Portable, Nintendo DS, or mp3 players). As people take advantage of technology, they may become so engaged with it that they forget about things that are going on around them (Nyland, Marvez, & Beck, 2007). Thus, co-located people may end up being ignored. A decrease in physical-social involvement was seen with the introduction of television (Kraut, Patterson, Lundmark, Kiesler, Mukopadhyay, & Scherlis, 1998; Brody, Stoneman, & Sanders, 1980). Brody et al. (1980) found that people who adopted TV tended to have less engagement in face-to-face social participation.

Some technologies and applications, such as the mobile phone and instant messaging services, are intended to be used to supplement relationships and social interaction between people. However, the ways such systems are actually used frequently diverges from their original purpose. People do not only use the technology to keep up their relationships with others, but they also use it as a tool to pass time when they have nothing to do (Nyland, Marvez, & Beck, 2007). Moreover, the pattern of technology usage differs depending on the ages of the users. Adults tend to use technology to ease their lives and enhance their interpersonal communication. Teenagers also use it for communication, but emphasize entertainment (Boyd, 2008; Kraut, Patterson, Lundmark, Kiesler, Mukopadhyay, & Scherlis, 1998; Nyland, Marvez, & Beck, 2007). This technology is not often used across generations or with people who share the same space (Grinter, Palen, & Eldridge, 2006).

A co-located family is a heterogeneous unit and family members often create personal spaces with technologies. This may eventually increase the psychological distance between co-located family members. In the presented research, our aim is to explore how mobile technology can be used to decrease the distance among family members who are living together by supporting good family experiences.

RELATED WORK

There are many commercial and academic applications of technology that attempt to connect remote family members and make them feel closer together. Examples of those systems are The Family Window (Judge, Neustaedter, & Kurtz, 2010), ASTRA Awareness System (Romero, Markopoulos, Baren, Ruyter, Ijsselsteijn, & Farshchian, 2007), Huggy Pajama (Teh, Cheok, Peiris, Choi, Thuong, & Lai, 2008), and Virtual Intimate Object (Kaye, Levitt, Nevins, Golden, & Schmidt, 2005). Research about family awareness has also been undertaken: both in-house, such as Whereabouts Clock (Brown, Taylor, Izadi, Sellen, Kaye, & Eardley, 2007) or HomeNote (Sellen et al., 2006), and between houses, such as Connector (Danninger, Kluge, & Stiefelhagen, 2006). Many of these applications use mobile technology to realize the connection between remote family members. Whereabouts Clock (Brown, Taylor, Izadi, Sellen, Kaye, & Eardley, 2007) identifies the approximate current location of family members using the mobile phone that each family member is carrying. Huggy Pajama (Teh, Cheok, Peiris, Choi, Thuong, & Lai, 2008) is a mobile and wearable hug system, which enables parents to give their children hugs from a remote location. This allows parents to express their emotions, and provides haptic feedback for the children.

Remote family communication has been investigated extensively, whereas co-located interaction has received less attention. Some examples of the latter are discussed.
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