A Longitudinal Field Study on Kiss Mediation Interface for Long Distance Relationships

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Abstract. In this paper we present a longitudinal field study of "kiss messaging interface" designed and developed for people in long distance relationships (LDRs). Mediators of intimacy are a novel class of telecommunication systems that enable people in LDR to express affection and intimacy despite being non co-located. To better understand how people experience these interfaces in the realistic and outside the lab environment, and how they blend in the users context, longitudinal field studies are required. To address the need of studying the mediators of intimacy in their natural usage context, a longitudinal field study is performed and design insights are explored under actual daily contexts over a three-weeks period. Also the study on the mediator of kiss technological probe, provided us with the user expectations from the mediators of the kiss which could also contribute towards the design of other similar technologies.

Keywords: User experience · Telepresence · Affective computing

1 Introduction

Technologies designed and tested only in laboratories commonly fail when they are deployed to the market and used in their natural setting. This issue is more likely to happen in ubiquitous computing technologies, since they are more closely tied to their context [2]. It could be due to some influencing factors such as, interruptions, noises, and multitasking, that could influence on the users' performance during the evaluation, which are not considered in laboratory tests. Besides differences between people's expected behaviors and their actual behavior in the complexity of real settings could be another reason for such failures. Moreover, issues such as privacy and adoption can only be evaluated in an environment where people live out their normal lives [5].

The issue of privacy is specially more prominent in testing technologies that are designed for the purpose of intimate communication. However, despite the private nature of intimate communications, and significance of field study in

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design of the prototypes, they are rarely evaluated in their natural usage context. This may be due to challenges of the field evaluation of such interfaces such as robustness of the prototypes, costs and time needed for reproducing multiple prototypes, and challenges of finding participants in long distance relationships (LDR) who agree to participate in such demanding social experiment and generally complications of data collection methods of field studies.

To explore the design space for mediators of the intimacy for couples in LDR, a three weeks field study is performed and design insights are explored within their natural usage contexts. The above mentioned objective is achieved by iterative design and development of an embodied media for mediating kisses within four main iterations and finally an evaluation in the real usage context. The development progressed from concept generation and evaluation to physical properties, and then to the interface properties which are detailed in our previous studies [3,4].

The kiss messaging system is composed of a couple of interfaces consist of touch sensors and haptic actuators. Each device is paired with another and the amount of force and shape of the kiss by the user is sensed and communicated to another device and is emulated using actuators. Figure 1 shows the kiss messaging technological probe used in a longitudinal field study.

Fig. 1. Kiss messaging technological probe in usage

2 Methodology

To perform the longitudinal field study a sample of 10 LDR people (N = 20) with a mean age of 26.4 years (SD = 4.60) and age range between 20 to 35 was recruited. The demographic information about the participants is detailed in Table 1.

Table 1. Demographic information of ten participant couples in the longitudinal field study

ID	Age (F, M)	Place of residence	Relationship duration in months	Intimacy level	Visit/year
C1	20, 23	Sweden, Malaysia	19	Committed, share financial responsibilities	1
C2	21, 21	Taiwan, Singapore	17	Serious	1
C3	25, 27	Spain, Singapore	22	Committed, share financial responsibilities	2
C4	35, 34	Serilanka, Singapore	15	Committed	3
C5	34, 26	UK, Turkey	3	casual	1
C6	29, 28	Japan, Netherland	10	Committed	1
C7	30, 28	Iran, Singapore	24	Engaged	1
C8	22, 27	Malaysia, Singapore	20	Serious	12
C9	20, 25	Australia, UK	24	Serious	2
C10	24, 29	China, Singapore	22	Committed	3

Then a set of Kiss messaging prototype and diary books were posted to them to log their daily experiences. The diary was also included qualitative open-ended questions, which gave hint to couples to narrate their daily usage and experiences with the kiss messaging prototype as a mediator of the intimacy. It helped participants to elaborate more subjective and unexpected experiences through verbal story telling. Other formats of logging, such as pictures, audio records or even video, were advised as a complementary to the text-based diary.

The user interactions with the device were also logged in this system as an objective measure. It could measure frequency of use, times and duration of each usage and synchronous or asynchronous interaction. The experiment was followed by a half an hour post-interview and debriefing session which was done within one week from the end of the experiment.

3 Results and Discussion

The interview data were recorded and transcribed. The interview data together with diaries were coded and analyzed by mining the key themes, and classifying them to infer patterns and similarities by looking at repeated categories. In total 397 experience diaries were collected and analyzed based on qualitative content analysis method. Content analysis is chosen since in our study coding categories

Table 2. Content analysis results in the familiarization phase in the first three days

Category	Theme	Examples
Positive reactions (N = 28)	Aesthetic (N=10)	This is so cute
	Joy of co-experience (N = 6)	Enjoyed configuring the system together
	Serendipity (N = 12)	The unexpected sound of the motors made them laugh
Negative reactions (N = 15)	Cultural reaction (N = 15)	Initially felt guilty using Kissenger

will be inferred directly from the text data [1]. We applied open and axial coding to transform the collected data into quantitative data.

In the open coding the words corresponding to the users perceived and desired experiences were selected. The choice of words were decided based on the participants' words with the aim of defining main themes without any predefined class. As a result, 40 loosely related codes refering to about 650 instances of the data emerged. Afterwards, axial coding was done. In this stage open codes with commonalities were put together and classified into 10 main categories referring to features such as: appearance, functionality, intuitiveness, etc.

According to the inferred temporal pattern and the collected semantic data, the 10 themes were distributed in 2 main adoption phases of familiarization and incorporation. Familiarization reflects to the first experiences that were due to the intense emotional reaction to a new technology which decreased drastically after three days of usage. The incorporation phase reflected on the data that showed users have accepted the interface and incorporated it in their daily life.

Table 2 summarizes the results of familiarization phase:

Table 3 summarizes the content analysis results in the incorporation phase.

Table 3. Content analysis results in the incorporation phase

Category	Theme	Subclass
Positive reactions (N = 64)	Temporal usability (N = 22)	Functionality (N = 7)
		Intuitiveness and ease (N = 15)
	Affectivity (N = 42)	Shape and appearance (N = 9)
		Joy of co-experience (N = 15)
		Uniqueness (N = 10)
		Multisensory connection (N = 8)
Negative reactions (N = 73)	Temporal usability (N = 42)	Privacy (N = 8)
	Affectivity (N = 31)	Naturalness (N = 10)

Table 4. Suggested improvements during the interview

Theme	N	Explanation
Initiations	6	Facilitating natural way of initiation such as eye contact
Portability	10	Smaller or wearable designs such as accessories
Usability in public	7	A design that does not attract the attention of outsiders
Association	4	A relation between remote partner and the kissenger appearance
Realness of lips	7	Use of soft or skin-like material
Delays	5	Delays should be minimized as much as possible

An analysis of the post-experiment interviews, indicated that at least 15 out of 20 participants found that Kissenger could potentially improve their communication habits. They reflected this indirectly in terms of physical connections, private channel, expressiveness and enjoyment. Also four of the couples asked if they could keep Kissenger and use it in the future.We also were interested to know what changes the participants prefer to be done in Kissenger. The results of the suggested improvements are classified in Table 4

Our field study suggested the possibility of meaningfulness of the Kiss messaging interface in the daily life of the remote couples. The field study has highlighted potential design pitfalls and user requirements that designers should consider when making similar devices. We hope that this kind of field studies will facilitate participatory design for remote couples to get involve in technology design.

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