‘It’s Like if you Opened Someone Else’s Letter’ – User Perceived Privacy and Social Practices with SMS Communication

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ABSTRACT
This paper presents a study examining users’ perceptions of privacy relating to mobile phone usage, and more specifically on the use of short message service (SMS) messages. The study also looks at the reasons for mobile phone ownership, and user perceptions on possibilities for added privacy with mobile messaging communication. The user study consisted of a written survey of 119 people and ten interviews. Results confirm that most respondents feel mobile phones are private and personal devices, and that SMS messages are perceived as more private than normal calls. This research found user privacy is guarded by widely accepted, unwritten rules of treating phones and messages as confidential.

Categories and Subject Descriptors
H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms: Human Factors.

Keywords: Mobile Communications, Privacy, Messaging.

1. INTRODUCTION
With ever increasing penetration rates, the usage of mobile communication technology has integrated into our society. The usage of mobile phones has created social norms related to acceptable user behaviour and habits, e.g. turning the tones off during movies or lectures. However, the normative behaviour and limits of personal territories are still evolving, and may vary between users and user groups. Privacy issues have lately gained lot of attention in future development trends related to mobile computing, see e.g. [5]. Understanding users’ perceived privacy boundaries and their behaviour with mobile phones as personal devices is important for further development of mobile applications and helps to shape our ideas of the new mobile society. As mobile computing with different mobile functions and applications is a strongly evolving field, this information is needed when acceptance and usability issues of application development are considered.

Mobile phone usage has created its own culture especially among heavy user groups, e.g. teenagers, where the patterns of usage have created models of behavior and mobile phone usage is a significant part of maintaining social networks and forming group identity [3], [4]. Mobile messaging applications have become especially popular. Grinter and Eldridge [2] report that teenagers use text messages as they find them quicker, cheaper and easier than making a call. In addition to short message service (SMS), or informally – text messaging, the usage of multimedia messaging service (MMS) is now evolving among large user groups. Previous research has been carried out on the usage of SMS and user’s motivations for using the service. The research so far has focused on exposing patterns in SMS based communication, including the identification of which user groups use text messages and for what (social) practices [1], and on how the communication within text messages is formulated. The written forms used in text messages, e.g. abbreviations, shortening and ‘SMS slang’, have been investigated e.g. in [2].

We seek to provide more information on the user perceived privacy issues related to text messaging. In our study we consider the perceived level of privacy that people associate with mobile phones and text messaging. We investigate the reasons for owning a mobile phone, and chart attitudes and behaviors related to the device in order to assess how personal and private the users perceive their mobile phones to be, and to chart social practices related to text messaging.

2. DESIGN OF THE STUDY
The study consisted on two phases: a survey with 119 participants and interviews with ten people who had not participated in the survey.

The survey was conducted among Australian university students participating on information technology courses, selected as a focus group that potentially consists of a high number of active mobile phone users. Altogether 119 participants filled out a written questionnaire. The respondents were mostly under 30 years old: 39.5% under 20 and 56.3% between 20-29. 115 of the participants reported to have a mobile phone, while only four did not own one. No one reported to share a phone with someone, e.g. a family member. After the survey results were analyzed, in-depth interviews were conducted. The interview questions included the original survey questions and more focused questions investigating the subtler privacy concerns of users while using text messages. As we focused on users’ privacy perceptions of
SMS communication, the criterion for selected participants was that they were active SMS users. The interview participants are described in Table 1. Participants 1-5 were Australian, and 6-10 Finnish. The participants were not offered any financial compensation.

### Table 1. Interviewed mobile phone users, their field of study or work, and their approximation of sent SMS messages per week and estimations on the portion of private SMS messages of all sent messages

<table>
<thead>
<tr>
<th>No.</th>
<th>Gender</th>
<th>Age</th>
<th>Professions</th>
<th>SMS’s/week</th>
<th>Private SMS’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F</td>
<td>20-29</td>
<td>Arts (student)</td>
<td>20</td>
<td>15%</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>30-39</td>
<td>Sales Manager</td>
<td>25-30</td>
<td>25%</td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>20-29</td>
<td>Chemist</td>
<td>20</td>
<td>75%</td>
</tr>
<tr>
<td>4</td>
<td>F</td>
<td>50+</td>
<td>Lecturer (IT)</td>
<td>30</td>
<td>25%</td>
</tr>
<tr>
<td>5</td>
<td>F</td>
<td>20-29</td>
<td>IT</td>
<td>30</td>
<td>5%</td>
</tr>
<tr>
<td>6</td>
<td>F</td>
<td>50+</td>
<td>Social worker</td>
<td>20-30</td>
<td>75%</td>
</tr>
<tr>
<td>7</td>
<td>M</td>
<td>20-29</td>
<td>Electronics</td>
<td>35-45</td>
<td>100%</td>
</tr>
<tr>
<td>8</td>
<td>M</td>
<td>30-39</td>
<td>UI Designer</td>
<td>60</td>
<td>50%</td>
</tr>
<tr>
<td>9</td>
<td>F</td>
<td>20-29</td>
<td>Languages (student)</td>
<td>70-100</td>
<td>70%</td>
</tr>
<tr>
<td>10</td>
<td>M</td>
<td>20-29</td>
<td>IT</td>
<td>70</td>
<td>100%</td>
</tr>
</tbody>
</table>

### 3. RESULTS

In the following, the survey results are presented in a quantitative manner, with some added quantitative outcomes or qualitative feedback derived from the interviews. These are presented in sections 3.1 and 3.2. The more in-depth interview questions are reported in sections 3.3 and 3.4. Generally, the answers gained from the interviews were very consistent with the survey results.

#### 3.1 Reasons for Ownership

The reasons for owning a mobile phone were asked in two steps by using alternative options provided in survey. First, participants were asked to identify one primary reason why they had a mobile phone. After this, they were asked to name secondary reasons for their ownership. The given options are listed in Table 2 together with the results showing the percentage of people selecting each choice as a primary or secondary motivation. Since nine users identified more than one primary reason, and as participants were encouraged to select more than one secondary option, both totals exceed 100%. Clearly most popular reason for owning a phone was for social reasons (71.4%), with security (16.8%) identified as the next most popular.

During the interviews, the reason(s) for owning a mobile were questioned, but no categorization was presented to the participants. In all interviews, the main reasons for owning a mobile phone were described as for social communication. In addition, other reasons related to social communication were convenience (4 participants); accessibility and availability (3), ability to do multitasking, e.g. calling while doing something else, (2). As a secondary motivation, work was mentioned by four, security by two, and economical reasons by one respondent.

#### Table 2. Primary and secondary reasons for mobile phone ownership; survey results

<table>
<thead>
<tr>
<th>Reasons for having a mobile phone (N=119)</th>
<th>Primary reason (Σ≥100 %)</th>
<th>Secondary reasons (Σ≥100 %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social reasons – contact with your friends, family etc.</td>
<td>71.4%</td>
<td>26.1%</td>
</tr>
<tr>
<td>Security/Emergency Contact – if something happens, you can call help</td>
<td>16.8%</td>
<td>48.7%</td>
</tr>
<tr>
<td>Work – my work requires me to have a mobile phone</td>
<td>8.4%</td>
<td>23.5%</td>
</tr>
<tr>
<td>Fun – Music, games, interactive features</td>
<td>2.5%</td>
<td>19.3%</td>
</tr>
<tr>
<td>Image – Personal expression / style</td>
<td>1.7%</td>
<td>10.1%</td>
</tr>
<tr>
<td>Information Access – Internet, News, and wireless services</td>
<td>0.8%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Something else</td>
<td>3.4%</td>
<td>9.2%</td>
</tr>
</tbody>
</table>

#### 3.2 Perceptions of Mobile Phone Privacy

As a background question, the respondents were asked how private they considered a mobile phone. 82.3% indicated that they considered a mobile phone to be a private device (23.5% indicated ‘Very Private’, and 58.8% responded ‘Somewhat Private’). 14.3% did not consider a mobile phone to be a private device. Three survey responses were left blank. The interviews results tell a similar story. All except one of the respondents indicated that their mobile device was a private device, with comments like ‘You don’t want people to know who you’re calling’, or comments related to other mobile phone functions, such as ‘you have your calendar there’ or ‘you can have notes such as “Marc owns me €20”, and it might be embarrassing for them, or embarrassing for you as they saw that you worry about such things’. Four participants compared the mobile phone to be similar as a letter, and one as a wallet. The comments gave strong indications on widely accepted norms of treating other people’s phone as their intimate gadgets:

‘Mobile phone is as private as a letter. You can show it to someone if you want to, but you have to stay in control. For instance, if my girlfriend receives a [text] message, I can take the phone to her but I never look the sender.’ (#8)

‘The thing is that nowadays nobody likes to give their phone into someone else’s hands. Text messages, phone calls, photos, emails, all your life is there.’ (#10)

The respondent who did not perceive a phone as a private device made reference to her perceived insecurities of Internet and phone communication: ‘Anything on the internet, whether its email or blogging is not private. Anything that goes through a router isn’t secure.’ (#1)

To map privacy related behavior, the following scenario-based question investigating their mobile phone usage and private space was asked:

*Imagine you are at a friend’s party, and somebody’s mobile phone is on the table. The phone starts to ring, but nobody is*
reacting to answer the call. Do you answer to it? (Yes / No / Only a friend’s phone)

Only 18.5% of the survey participants indicated they would answer a phone of someone they didn’t know, while a further 47.5% indicated they would answer a friend’s phone. A third of the respondents (33.6%) indicated they wouldn’t even answer a friend’s phone. Seven of the ten subjects interviewed responded that they would not answer to the phone in any situation:

‘Absolutely not. I think that no-one [calling] in the other end does not expect to find anybody else other than the phone owner who is the person he or she is aiming for. It is a personal communication device.’ (#10).

One participant reported that she would answer to a friend’s phone if she noticed that the caller was someone they both knew. Two of the ten interview participants indicated that they would answer a ringing mobile phone if they don’t know the owner, one of them indicated they do so, even though they recognize how personal a phone is. This respondent further noted that he never answers another person’s text message, and he commented ‘If you pick up the phone the person knows who’s on the other end. Text messages are pre-sent with a specific person in mind.’ (#3)

Participants were then asked whether they would allow other people to answer their phone, see table 3. One third of the survey participants indicated that they would ‘never’ (32.8%) or ‘hardly ever’ (27.7%) let anyone answer their phone. The interview results indicated that the phone owner has to be heavily engaged and not be able to answer their phone in order to let someone else answer. Four interview participants specified the situations: in shower (1 participant), when driving a car (2 participants), or when being too far and not able to get to the phone (1 participants). Again, we saw signs of commonly agreed behavior of mobile phone usage: ‘Why would someone want to answer my phone?’ (#8) Two participants mentioned that it was possible within a defined, close group: other family members could answer the respondent’s phone if the caller was a family member.

Table 3. Privacy perceptions of mobile phones; survey results.
Question A: Do you allow other people to answer your phone?
Question B: Would you allow other people to read an SMS you have received before you have read it?

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>7.6%</td>
<td>32.8%</td>
</tr>
<tr>
<td>Hardly ever</td>
<td>22.4%</td>
<td>27.7%</td>
</tr>
<tr>
<td>Sometimes</td>
<td>50.4%</td>
<td>31.9%</td>
</tr>
<tr>
<td>Often</td>
<td>17.6%</td>
<td>7.6%</td>
</tr>
</tbody>
</table>

The questionnaire next examined the subjects’ perceptions on the privacy of short messages (SMS), see table 3. This study found the subjects considered SMS to be much more private than phone calls. The interviews were consistent with these results: six people answered ‘never’ and four ‘hardly ever’. Five respondents compared text messages to letters, and noted the ‘privacy of correspondence’ related to letters were valid for SMS messages.

‘There cannot be such a situation [that someone reads your message before you]. If someone opens your message, he or she must be extremely interested in your doings and does it on purpose. It is a violation of privacy; it’s like if you opened someone else’s letter’ (#7)

Again, two respondents answering ‘hardly ever’ specified that it was acceptable among a very close group of people if the message sender was noticed to belong to the same social group.

3.3 SMS Culture and ‘Unwritten Rules’
The interviewed mobile phone users were asked if they thought there exists any unwritten rules or norms among text messages users, and, if so, what they were. The most common response referred to the use of text message abbreviations and ‘smiles’ (8 participants). This was described to be more common in certain groups, e.g. teenagers, kids, or heavy message users, but the phenomenon was generally perceived as a common practice, so that everyone ‘knew it was there and at least some of the basics’:

‘Everybody knows the shortened forms and so on’ (#9)

‘[The SMS slang] is something which you don’t read [to learn] from anywhere, you just have to know it, and the newcomers are explained what they mean if they don’t know’ (#10)

‘[There exists] shortened words (text-to-speak) and emoticons that have expanded from email etiquette. These are standard across the texting population, except for certain slang words specific to certain social groups’ (#4)

The two respondents that disagreed talked about the current lack of text message etiquette. One respondent commented that ‘there is very little SMS etiquette these days’. They talked about the varied methods of using text messages and the conflict in messaging styles that often exists. SMS communication has evolved to an informal communication method that is adopted in many different ways. The privacy of individual text messages was another perceived norm that emerged throughout the interviews. Five users identified that they considered their messages private, and talked directly about the privacy expectations they had while using text messages. Other respondents described strategies that they used to ensure their privacy through text messages, like using slang or code words. User comments describe the expectations of the privacy of their mobile phone:

‘A [mobile] phone is a private gadget … there is no one [calling] around someone else’s phone’ (#9)

‘You don’t open other person’s phone – it is like your own desk drawer, almost as secret as your wallet.’ (#6)

To determine the influence of sending text messages on user communication, respondents were asked the question ‘How has the use of text messages changed your interaction with your phone, and with your friends?’ User responses described text messages as useful as an instant communication device, for ad-hoc type communications where you have to quickly communicate something, or as a message service (like email). Generally, respondents reported that use of text messages had made their communication more frequent; as they sent short notes, which they previously would not have bothered to call to relay it to the recipient. Also flexibility of use compared to calling was mentioned: the accessibility and ability to communicate anytime and anywhere. One respondent felt that text messaging is making people anti-social, with people messaging in public or while with friends. Two recipients identified that the use of text messaging had not changed their interaction with their phone or friends.
3.4 Perceptions of Added Privacy

The perceptions of the privacy of a text message varied between users. Interview subjects sent between 20-100 text messages a week, see table 1, and described anywhere between 5-100% of these as private messages. They accepted that text messages aren’t a private forum, and thus rely on the recipient’s discretion. One respondent indicated that they delete messages to ensure their friends’ privacy. Another respondent indicated they use a second language for increased privacy amongst selected recipients, and another that he ensured his privacy by not allowing other people to touch his phone. Two participants also indicated that they used codes and slang to reduce the risk to their privacy. However, seven participants reported that they did not use any strategies but relied on the recipient who they trusted to understand the privacy level of the message. Five participants responded that they were really not interested in added privacy, as their practices already employ the assumption that the messages are private, and saw that the general SMS culture respected this rule.

Finally, the interviewees were asked two questions exploring ideas for improving text message privacy. The first asked whether they thought it would be useful to be able to sends additional privacy information with the message. The example given was an icon next to the message in their message inbox that indicated how private the message is. Three participants responded they saw it useful, whereas the remaining did not see it being necessary, as the phone was already understood to be a personal device.

The second question asked if they use of encryption to secure a text message would be useful. The responds for this were mixed. Four users, all of which were from Australia, agreed that this would be a valuable service. Interestingly none of the Finnish respondents were interested in encryption of their messages. One user did comment that they saw value in authentication of the correct receiver; for instance with PIN code, fingerprint sensor or voice authentication. The five participants doubting the encryption commented that it would not improve the current practice – that is, it is on the receiver’s control if the message remains private, and (s)he could still show it to someone. The encryption would not change their behavior with SMS messaging, as existing social practice are sufficient to ensure user privacy. In addition, three respondents expressed concern over additional input methods: they would not like to have additional steps or extra dials when they wanted to send or read a message. Three people commented that if encryption was possible it might change the use of text messages, e.g. for confidential business purposes, but not for their own practices. Instead of encrypting, one participant suggested authentication of the correct receiver before opening the message for instance with PIN code, fingerprint sensor or voice authentication, and one suggested that automated deletion of the message could be supported. One respondent was suspicious of new features which could mean extra expenses.

4. DISCUSSION

Although the survey was conducted among university students only, which may bias the results thus prevents strong claims from being made from these results, some general trends rise from the data. The interview answers were very consistent with the survey results. Thus we assume that the interviews successfully charted reasons behind and gave correct and relevant information of the deeper aspects and reasons behind the survey answers.

The vast majority of respondents indicated social reasons as the most significant reason for owning a phone. Palen et. al. [4] report that the usage of the mobile phone evolves from user’s expectations as they become familiar with the usage of mobile phones, and as the functionality related to social interaction strengthens in comparison to security and emergency needs, which have been in many cases the reasons for buying the phone.

None of the survey participants reported they shared the use of a mobile phone, which also reflects the idea of as a very personal device. This view was strongly supported by the interviews. Moreover, the participants were reluctant to allow other people to answer their phone. The subjects were twice as reluctant to allow others to answer their text messages (60.5%), compared with normal phone calls (30.0%). Users’ privacy is guarded by widely accepted, unwritten rules of treating mobile phones and messages as confidential. Text messages in particular are considered very personal, as the lack of any ‘context of privacy’ sent with a message ensures most users treat all messages as private. These strong social norms indicate that text messaging is not comparable with any other electronic communication medium, e.g. emails (which are commonly forwarded without the sender’s permission), but are more comparable with traditional letters.

This research suggests that existing SMS etiquette treats messages as private, and people expect the receiver to understand the level of privacy from the message context. This phenomenon is quite interesting, as SMS is technically insecure: anybody can read them if they get your phone. This finding highlights a novel aspect on mobile culture, as previous research has concentrated on social functions and expression style related to text messaging. The interviews demonstrated some support for the use of encryption or for visual privacy information to be sent as part of a text message. However these tools were rejected by many respondents in favor of the social norms that currently preserve user privacy.

Responses indicate that most user groups use text message etiquette, with the use of emoticons and text shorthand the most widely experienced. The use of text message slang was seen as an integral part of SMS communication, but this seemed to relate more to an individual’s writing style than to any privacy concerns. Although some respondents felt there was little to no etiquette being displayed by new users of this technology, this can be seen as a sign of differing social practices, and perceiving text messaging as a relaxed and informal method of communication.

5. REFERENCES