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Interface Metaphor Design and Instant Messaging for Older Adults

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Abstract

Instant Messaging is currently not widely adopted among older computer users. An investigation has therefore been conducted into the use of Instant Messaging by older computer novices, with particular emphasis on the use of an alternative metaphor in the user interface to try to produce a more usable and acceptable solution for older adults. Two messenger interfaces (a traditional one and an experimental alternative) were designed for the study and compared in use by older computer novices, through measurement and participant interview. Results showed that the alternative metaphor interface performed better overall and that the majority of the participants preferred it for future use.

Keywords

Older people, Instant Messaging, interface metaphor, accessibility, usability, inclusive design.

ACM Classification Keywords

H.5 INFORMATION INTERFACES AND PRESENTATION;
H.5.2 User Interfaces: *Graphical user interfaces (GUI), Screen design, User-centered design.*

Introduction

An important challenge facing HCI designers is how to design software with which a novice user can become proficient quickly, with minimal tuition, but which can also be used by expert users without the training aids becoming a burden. The solution most used is a metaphorical design. Metaphors have to be used carefully however, as they can have disadvantages. There may be features present in the source domain which are not present in the target domain and vice versa. Current research on metaphors focuses on creating metaphors [1] that are applicable across cultures, genders and ages. Researchers are also evaluating their impact on communication and their effectiveness [2].

Instant Messaging (IM) refers to the real-time communication between at least two computer users using text as the communication medium. It allows synchronous communication through quick and efficient transmission of messages.

A recent study [3] by UK media regulator Ofcom found that, while only 16% of adults over the age of 65 said that they used the Internet in their own home over a particular 30-day period, they used it for longer than any other age group who did use the Internet. Older adults tend to use e-mail for computer-based communication rather than IM. The current study aims to investigate if the lack of adoption of IM amongst older computer users is due to problems with the current interface design (and if so, would an alternative interface metaphor yield better results). Little prior research has been carried out in this particular field; previous work was limited by participant recruitment factors [4].

Research Questions

Work on metaphors has not always been well received [5]. The intention here, however, was to focus on older novice users as a particular group to see if benefits might be possible for them. The hypotheses formulated for the current work were that, with an alternative interface metaphor, older users would carry out messaging tasks more successfully and more quickly. They would also rate their performance more highly on a Likert scale.

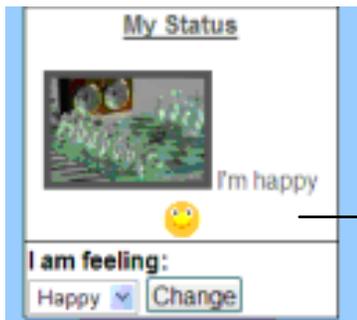
It was also hypothesised that when participants were asked which interface they would be more likely to use in the future, the majority would choose to use one with the alternative metaphor.

Participants

Twenty-six participants took part in the experiment: 14 males (aged 61 to 84 years (mean 74)) and 12 females (aged 61 to 82 years (mean 69)). All participants had at least three months of computer experience and were proficient with both keyboard and mouse. None had experience of Instant Messaging.

Traditional and Alternative Interfaces

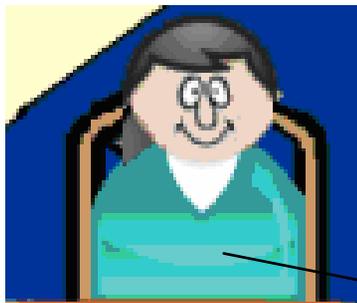
The experimental materials were two different IM user interfaces which operated with the same IM program. The underlying IM program was written in JSP and the two different user interfaces were written using HTML and Cascading Style Sheets (CSS). The use of one underlying IM program with both interfaces gave them a common basis for comparison. Both of the user interface designs allowed the user to send a message, send a file to the other user, use emoticons, select an avatar and exit from the system.



The users were represented on the traditional interface by an avatar (a user-specified image common in forums and chat programs). The mood of the user was conveyed using emoticons and a textual description.

Figure 1. Traditional-style Instant Messenger Interface

In the traditional interface the features were accessed using basic and traditional HTML form elements, with the design based on a conventional, typical Instant Messenger (IM) design (Figure 1). A “bespoke” interface was created incorporating features common to the main commercially-available IM systems, in order to avoid biasing the study through choice of one existing system over another.



The users were represented on the alternative metaphor interface by more lifelike characters. The mood of the user was conveyed using the facial expression of the character.



Figure 2. Alternative Metaphor Interface for the IM System

The alternative metaphor (Figure 2) was based around a café scene with the chat text being displayed as a speech bubble, the file browser being accessed by clicking on an icon representing the participant’s bag, and the mood of the participant being shown through a change of expression on the image that the participant had created to represent them. These were caricatures chosen by the participant that could share the facial features, hair style and skin tone of the participant. The system was exited, on the alternative interface, by clicking on the café door. Both of the interfaces used a minimum of 12-point Arial font for all textual information and were run on Mozilla Firefox version 2.0.06.

Experiment

Participants used both interfaces for 20 minutes; the order in which they used the two was pseudo-randomly assigned, with 50% of participants using the traditional interface first. The experiments were carried out within a laboratory setting with the participants separated by a screen to prevent direct communication between them. A facilitator was present throughout the session. Participants were asked to use the system to carry out a conversation with their partner. Success rates for the necessary tasks were recorded and timed with screen capture software. The extent to which participants explored additional options on the interface (e.g. changing an emoticon or sending a file) was also recorded. Individual participant interviews followed the experimental session; participants were asked to rate the interfaces on a 5-point Likert scale. Participants’ attitudes to both interfaces were also recorded as were their intentions regarding whether or not to use Instant Messaging in the future.

Results

Time to Log On

On the traditional interface the mean time taken from logging on to the system to sending the first message was 1.58 minutes. Faster times were recorded for the task of logging on to the system with the alternative metaphor interface (mean time 45 seconds).

Sending a Message

There was no significant difference between the interfaces for the time participants took to learn to send messages, but participants made significantly fewer errors on the alternative metaphor interface ($t=-3.8$, $df=25$, $p<0.05$).

In contrast to these results, however, participants reported that they found the traditional interface easier for this task, 34% reporting that they strongly agreed with the statement "It was easy to work out how to send a message" on the traditional interface, compared to 15% on the alternative metaphor interface. One participant strongly agreed with the statement "I became confused when trying to send a message" for the alternative interface.

Sending a File

Using the alternative interface, more participants successfully investigated the option of sending a file (11% on the alternative metaphor interface). None tried to send a file on the traditional interface, reporting that the button was off-putting. Participants recorded finding the sending of files easier on the alternative metaphor interface; this was shown to be statistically significant using Wilcoxon ($Z = -2.156$, $p<0.05$).

Changing An Emoticon

Significant differences in favour of the alternative metaphor interface in the objective measurements were found for the task of changing the emoticon. In this task, those users who attempted it managed to complete the steps on average 3 minutes 10 seconds earlier on the alternative metaphor interface than on the traditional interface. Participants also reported finding the changing of their emoticon easier using the alternative metaphor ($Z = -1.691$, $p<0.05$).

Conversations

Importantly, the nature of the conversations differed depending on the interface in use. Conversations using the traditional interface tended to be more formal and stilted. There were more lines of conversation guided by the facilitator. By comparison, non-guided, spontaneous conversation took place more often on the alternative interface ($t=-2.53$, $df=25$, $p<0.05$). Spontaneous conversation was often personal, enquiring (for example) about the other participants' hobbies and families. This could indicate that the participants were more relaxed when using the alternative metaphor interface as they felt more able to ask more intimate and personal questions than they did when using the traditional interface.

Participant's Opinions

Participants expressed a preference for the alternative metaphor: 61.5% preferred the alternative metaphor compared to 26.9% who preferred the traditional interface (the rest displayed no preference). 38% of the participants strongly agreed with the statement "The experience was enjoyable"; only 15% did so for the traditional interface. Participants reported finding the alternative interface easy to navigate with 92% of

participants agreeing or strongly agreeing with the statement "The language on the links is clear and easy to understand"; 77% responded similarly for the traditional interface.

Future Use

The preference for the alternative metaphor was seen to be even stronger amongst those participants who wished to use an IM program again in the future. 17 of the 26 participants said they would use IM again and of these 14 would use the alternative metaphor interface.

IM and E-mail

At the end of the study, most of the participants were recorded as now being aware of the benefits of IM and could see situations in which it would prove preferable to e-mail. At the beginning of the sessions 85% of the participants had been either unaware of IM or felt that they lacked the necessary skills or ability to use it correctly.

Of those participants who did not express an interest in using the IM system again at the end of the session, the main reason given for this was a feeling that their typing skills were not good enough for synchronous communication. They felt under pressure to type quickly when they were aware that there was someone waiting for a response. These users tended to use e-mail already and preferred to take time to review their text and correct errors before sending it.

Discussion

The hypothesis that the participants would prefer the interface with the alternative metaphor was supported, including that the majority would choose to use the alternative metaphor in the future. 14 of the 26 partici-

pants noted at the end of their session that they would be likely to use IM with the alternative interface again.

The hypothesis that participants would carry out messaging tasks more successfully and more quickly with the alternative metaphor interface was generally supported. Participants also exhibited more exploratory behaviour on the alternative interface, e.g. sending files, changing the emoticon.

The interface selected had an effect on the type of conversation that took place between participants. More formal, stilted and facilitator-directed conversation on the traditional system may have reflected participant lack of confidence with an unfamiliar interface; the increase in spontaneous conversation on the alternative interface is an encouraging finding and one that should be explored further in the future.

Preliminary discussions with the participants indicated that traditional IM interfaces are not the ideal platform for the older user to use when performing synchronous communication across the Internet. When first introduced to the system the participants became confused by many of the features of a traditional IM interface, such as the avatars. When participants were asked to describe the log-on and chat screens on the traditional interface many commented on the avatars available but noted that they were unsure what purpose they served and how they should be used. The concept of a picture representing them or their fellow participants confused many and the majority reported failing to see the point behind these images.

This was not reflected with the alternative metaphor interface, where the images of a person created by the

participants were recognizable to participants as being the person they were talking to. The participants were also more likely to make use of the features of the IM client with the metaphor interface when these features were linked to items they could relate to, such as finding a photograph in their hand-bag to send to the other participant, or leaving IM by exiting through a door.

Future Work

The results of this study indicate that the use of alternative metaphors can be of value when designing user interfaces for older, less experienced and unconfident computer users. It may help them to learn more rapidly how to use Instant Messaging and similar technologies. The outcomes would also suggest that the use of “fun” and “friendly” metaphors may encourage such users to continue to use the technology after the initial learning period.

As the number of older computer users continues to increase there is a need for further research in the field if they are to make full use of the communication technologies available on the Internet. Further investigation of the features which older adults feel are required in an Instant Messenger client, and the extent to which the multitude of features available on most modern commercial and freely available Instant Messenger clients helps or hinders older adults in their attempts to

grasp this technology would be of benefit to designers attempting to create new software for these users.

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