



Multi-modal Messaging Service: A design of voice mediated text-chatting via mobile phone

Special thanks to Judy Le Heron

Dr. Hokyung Ryu





Who I am?

- Hope to be a PSYCHOLOGIST
 - Since my dull MASTER DEGREE in ENGINEERING
- Hope to be a SOCIOLOGIST
 - Since my experimental PH.D in PSYCHOLOGY
- Now?
 - Hope to be a researcher in INFORMATION SCIENCE
- Human-Computer Interaction =
PSYCHOLOGY+SOCIOLOGY+INFORMATION SCIENCE





Why I want to present today?

- Psychological perspective
 - I misunderstood Carlo's email
 - Guessing his email was a just common invitation for IIMS seminar, not for presenting my stuff
- Sociological perspective
 - To show who I am and what I am interested in (A HCI researcher)
- Information science perspective
 - To get you feedback and comments of this work





What I have done since Feb.?

- Link between PSYCHOLOGY, SOCIOLOGY, and INFORMATION SCIENCE
 - Evaluation of the Ubiquitous Systems (Psychological perspective)
 - A grant from Telecommunication Technology Association
 - Heath (System software/Network)
 - Guan Yue (Service)
 - Java Interactive TV design (Information science perspective)
 - MURF
 - A collaboration with KAIST about Digital TV environment
 - An application in smart home
 - Mobile phone use (Sociological + Psychological)
 - Personal interest
 - Two smart phones from LG electronics



Shall I explain my humble research?

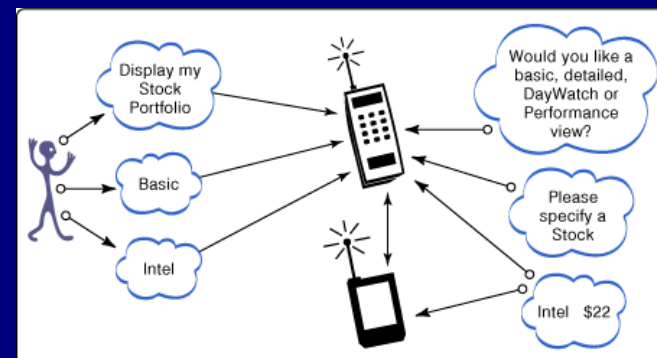


Multimedia vs. Multimodal

- MMS (Multimedia Messaging Services) in mobile phones
 - Text-messaging service in 2nd-generation
 - Picture messaging service in 2.5-generation
 - Video messaging service in 3rd-generation
 - Do people like this?
 - My question starts from this....
 - What about....



- Multi-modal application
 - Voice + Text, if this is preferred by people





Factors to be considered

Communication medium use

- Firstly, characteristics of each communication medium
- Second, how the technologies would change our attitudes in communication
 - Situational factors
 - e.g., urgency, distance
- Finally, people's use of technologies results in modification of technology itself
 - New design implications
- Technology-adoption lifecycle





Medium in communication

- Face-to-face
 - 93% of people's intent was conveyed by tone of voice and facial expression
 - Voice medium
 - Why?
 - Clear feedback from the responder (High *accountability*)
 - Multimedia may be appropriate
 - PXT, still image, video streaming





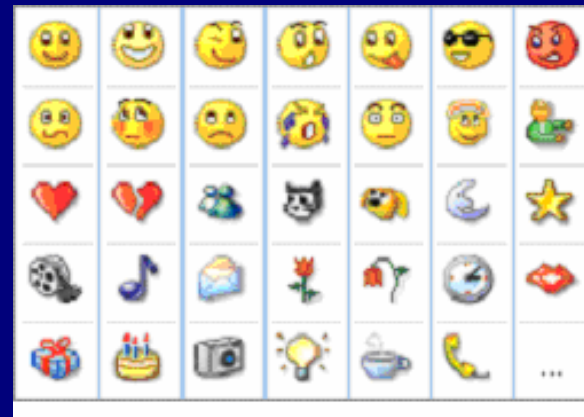
Medium in communication

- Computer-Mediated Communication (CMC)
 - Emails, SMS (Short Message Service)
 - Text medium
 - Asynchronous (slow feedback)
 - Loss of people's intent
 - The initiators in communicating have no way to link the content or tone of messages to the receiver's response so they cannot evaluate how their messages are being received (Low accountability)
 - Multimodal may be useful



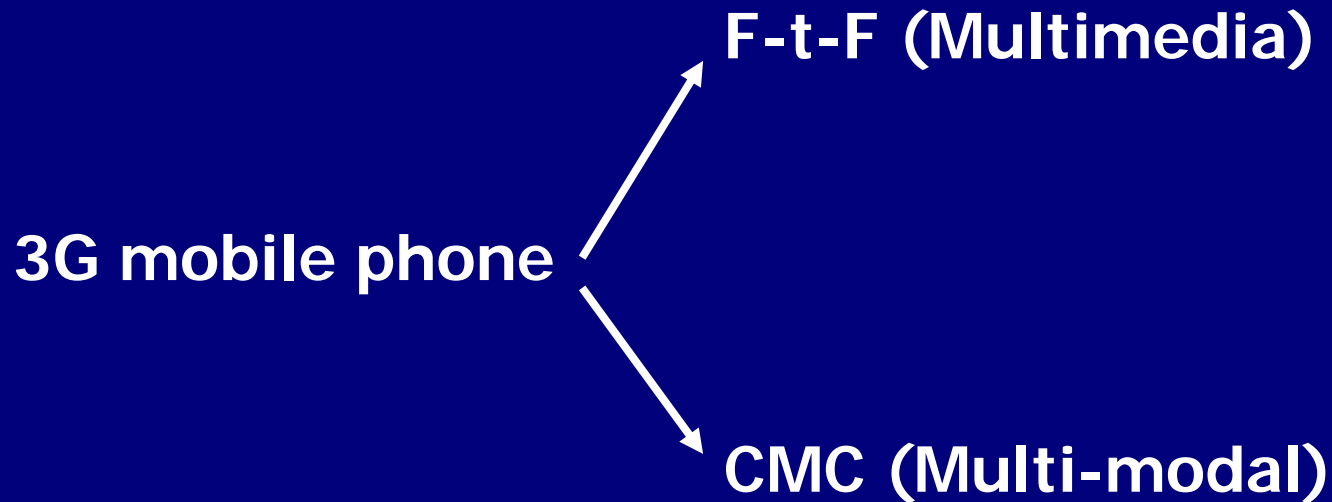
Medium in communication

- Instant Messaging Services
 - e.g., Microsoft Windows Messengers, ICQ
 - Synchronous text-based communication
 - Relatively high accountability
 - Emotional icon support
 - People's intents can be conveyed
 - Presence awareness
 - possible responders can be recognisable (Presence awareness)





Medium in communication





Research method

- Focus group
 - 6 Massey university students
 - 8 situations given
 - Contextual enquiries
 - Identifying characteristics of text-based communication
- Controlled experiment
 - 42 Massey university students
 - 16 situation given
 - Validating characteristics of non-verbal communication
- Deriving a design implication
 - Multimodal Messaging Service



Focus group interview

- 8 situation given
- Preliminary results
 - Casual situation: SMS use
 - further communication needed: Verbal use

No	Description of the situation
1	You had been contacted by one of your very close friends about her/his birthday party. You were very thankful that she/he has invited you for her/his party, because it was such a long time since you saw her/him last. The party will begin in an hour in the city centre. You are about to come to the birthday party; however, you mom calls to you, saying she is quite sick. So you have to see her right now. Now you want to let her/him know you are very sorry that you cannot come to the party.
2	Yesterday you were contacted by one of your very close friends. You have nothing from her/him for long. You were very pleased because it seems that you had lost contact with her/him. Now you want to respond so that she/he knows that you want to keep in touch, showing your gratitude of her/his contact.
3	You have a date with your boy/girl friend in an hour. However, your grandmother has just collapsed and been admitted to hospital and you have to go and see her. Now you want to let your boy/girl friend know you cannot meet up.
4	You have missed a couple of lectures. Now you want to contact a friend who is in the class to borrow her/his lecture notes and find out what happened in the lectures.
5	You had been contacted by someone from your class, whom you don't know very well, and invited to his/her party in the city in an hour's time. You had planned to go, but your boy/girl friend wants you to go with him/her to his/her friend's place. Now you want to let your class mate know that you sorry you cannot come, showing your gratitude of the invitation.
6	Yesterday you were contacted by one of the Massey Contact staff to see if you were having any problems with university life. Now you want to let him/her know about an unpleasant situation you became involved in today.
7	It is Monday. On Wednesday you and a class member, whom you don't know very well, have to co-present the assignment work you have been doing and this work is worth 50% of the course marks. Now you want to contact him/her to arrange a meeting to organise the presentation.
8	You have a group presentation next month. You and a class member, whom you don't know very well, have to co-present the assignment work you have been doing and this work is worth 10% of the course marks. Now you want to contact him/her to arrange a meeting to organise the presentation.





Focus group interview

Contextual enquiries

- Text contact leads to text-based communication

I normally do use the same style with the contact being made. That is, if someone texts me, I prefer to send a text to them.

- if people concern others, they intentionally change medium

For 'fun' messages, SMS (text message) is the preferred option. But...well, sometimes, if just passing on information but don't want a conversation, then normally text, even when I had a phone call.

- Text-based communication can be used when people want to be less involved into the communication, so that the fire-and-forget strategy of trivial information can be applied





Focus group interview

Contextual enquiries

- Text-favoured attitude (Nuisance behaviour in public)

I don't want someone to listen me, then text-messaging is much better. Especially, I like to send a message to my girl friend when I get bored in a lecture.

I think the text chatting..., like on computer, would be great. I love to see some message to read, rather than joining a conversation. In text chatting, if I don't like to say, stay in calm; but in conversation, at any time the other end asks me 'Hey! Hello! Are you there?'

I like to use text-messaging. It's trivial, but my friends can get more fun when the text are in their mobile; in particular, in my driving, if the message comes in, I am almost in panic to see the message.

- Text-based communication can partially guarantee privacy in public space
- Gift-giving
 - Effort vs. Meaning





Focus group interview

Contextual enquiries

- Lightweight to use and cheapest media

If you want a further conversation with a person, then call or maybe chat, not text message. If know the person very well, then text or chat. If don't know the person well, i.e. they don't recognize your voice or you are not in touch at least once a week, then call.

Well...I think cell phone use always involves financial constraints, that is, costs peak vs. off peak (she is a Vodafone NZ subscriber) for communication options so responses may differ according to what option is cheapest at the time the response is required, so that at off peak, when charges are lower, preferred choices are: call, chat or text. At peak, if chat and text are the same price, preferred choices are: chat or text, call.





Characteristics of non-verbal communication

- Focus group interview + other models of communication use - "Cost" factor
 - Low expectation of responders: presence awareness
 - WAP technology
 - High gift-giving: texts as gift (at the expense of efforts)
 - MMS
 - Low possibility of further communication: fire-and-forget
 - Conversation style
 - Low accountability of initiator's contact: acknowledgement from the responder
 - Asking reply
- It may be applicable to the new communication medium design on 3G mobile phone.



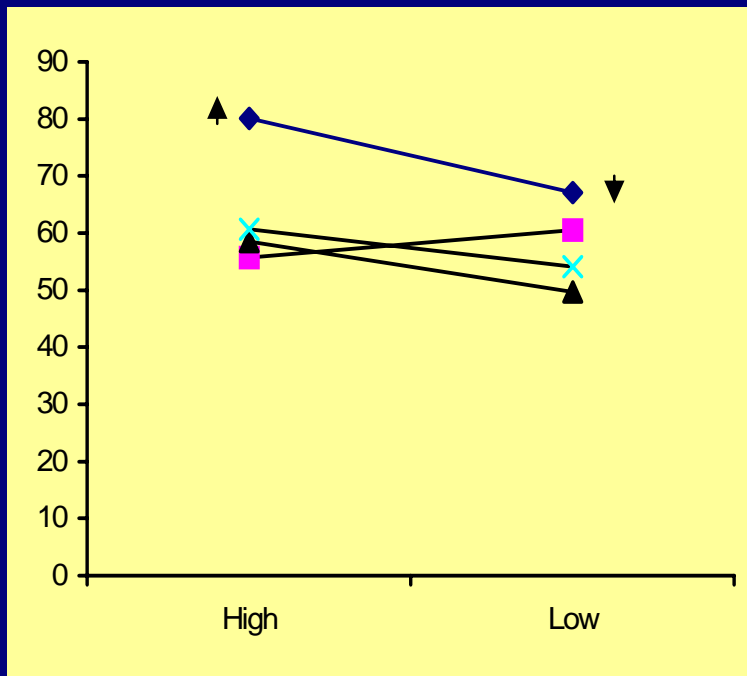


Controlled experiment

- 2^4 fully factorial within-subjects design with 42 participants
 - Independent
 - Presence awareness, Further communication, Gift-giving, Accountability
 - Dependent
 - Participants' preference on continuous scales (0-100)
 - Medium
 - Verbal chatting on mobile
 - SMS on mobile
 - Text chatting on mobile
 - Text chatting on computer (Control group)
 - Material
 - 16 scenarios were constructed by the combinations of the high and low levels on these four independent variables



Result – Presence awareness

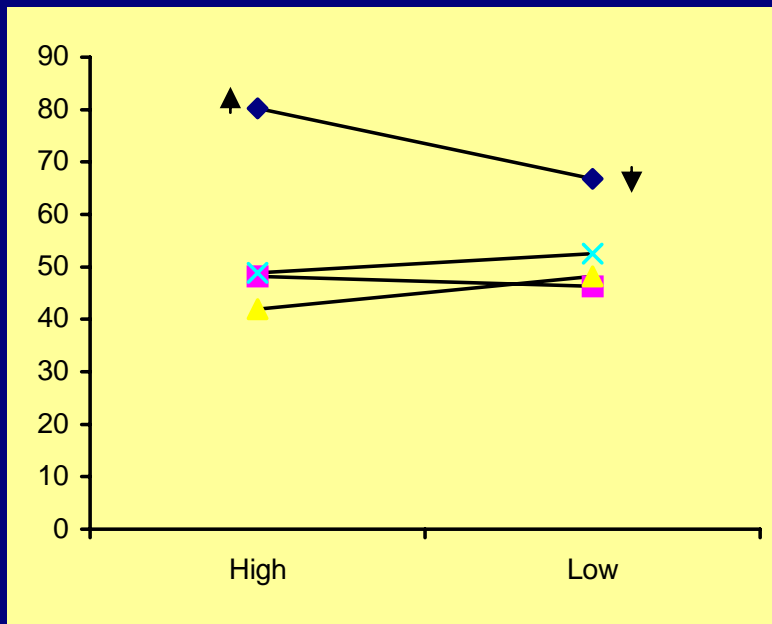


Mean ratings: Arrows indicate a mean is significantly different at .05 level, by 4 way within-subjects with repeted measure. SMS (■-■), TextChat-Computer (×-×), TextChat-Mobile (▲-▲), and Verbal communication (◆-◆)

- The initiators is highly expecting the responder in verbal communication (80.12 vs. 67.75), however not significant for others
- This implies non-verbal is not based on presence awareness, which is text-chatting over computers (IM) mainly assuming.
- Opportunistic interaction?



Result – further communication

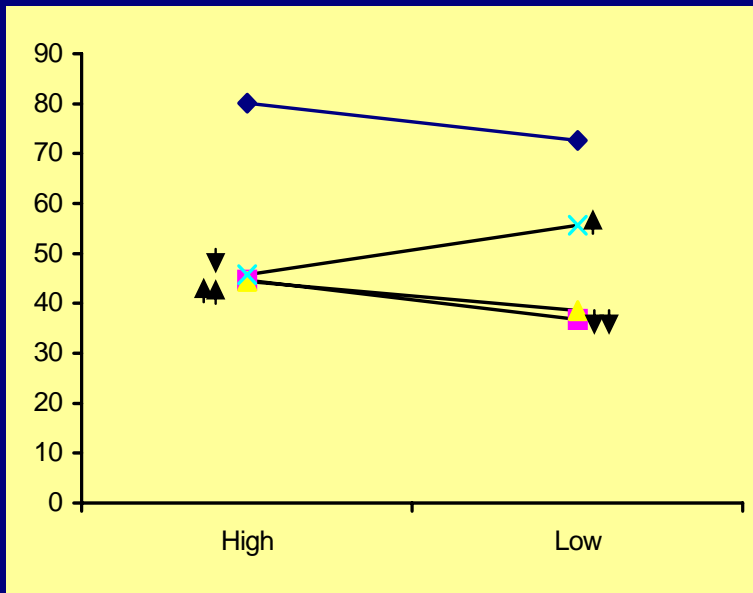


Mean ratings. Arrows indicate a mean is significantly different at .05 level, by 4 way within-subjects with repeted measure. SMS (■-■), TextChat-Computer (×-×), TextChat-Mobile (▲-▲), and Verbal communication (◆-◆)

- The initiators is highly expecting further communication in verbal communication (80.24 vs. 67.65), however not significant for others
- This implies non-verbal is not expecting further communication with the responder, which is text-chatting over computers currently supporting
- Text-chatting on mobile phone?



Result – Gift giving

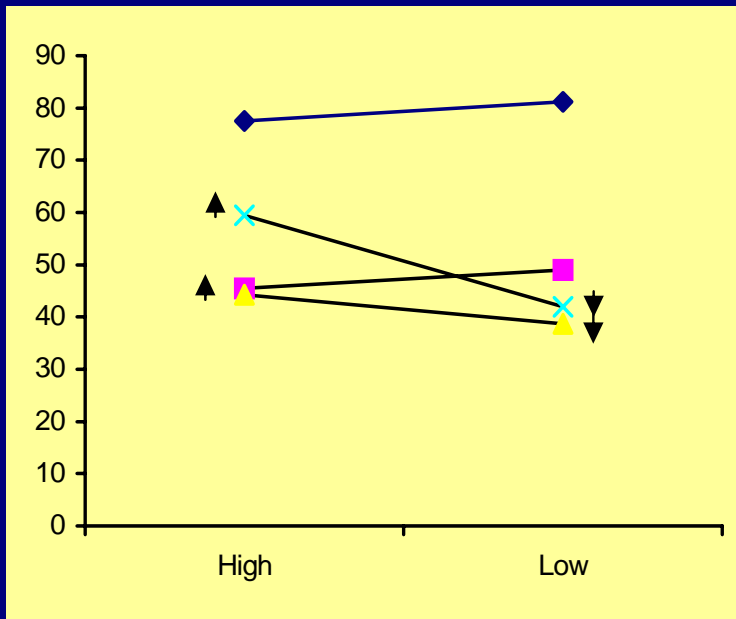


Mean ratings. Arrows indicate a mean is significantly different at .05 level, by 4 way within-subjects with repeted measure. SMS (■-■), TextChat-Computer (×-×), TextChat-Mobile (▲-▲), and Verbal communication (◆-◆)

- Gift-giving attitude in communication can facilitate text-based communication in mobile phone
- This implies non-verbal communication would be very worthwhile to use, at the expense of usability.
- A design implication
 - Any possibility to support usability of non-verbal communication
 - eye-tracking or pen-based input
 - Multimodal interaction



Result - Accountability



Mean ratings. Arrows indicate a mean is significantly different at .05 level, by 4 way within-subjects with repeated measure. SMS (■-■), TextChat-Computer (x-x), TextChat-Mobile (▲-▲), and Verbal communication (◆-◆)

- Text-chatting is more appropriate when the initiator asks reliable feedback from the responder, because it is synchronous
- This implies text-chatting in mobile phone (e.g., WAP-enabled phone) would be a fine medium to improve current SMS deficiency.



Conclusion (I)

- Characteristics of non-verbal communication

<u>Assumption</u>	<u>Experiment</u>
Low expectation of responders	Confirmed
High gift-giving	Confirmed
Low possibility of further communication	Confirmed
Low accountability of initiator's contact	High in TXT-CHATTING





Conclusion (II)

- Assessing the current technology in 3G mobile network
 - WAP-enables mobile phones consider presence awareness
 - Contact list would be less critical
 - MMS, SMS, Txt-chatting is good for gift-giving
 - Effortfulness for making a present
 - MMS needs accountability, in contrast, “Text-chatting” is already highly accountable for their actions





Text-chatting design on 3G

- Main challenge
 - Usability of text-based communication in mobile phone
- A design of Multi-modal Messaging Services
 - voice-mediated text-chatting mobile phone
 - with the support of LG electronics
 - For the testing purpose, developing a voice-to-text module with around 50 words.
 - Another experiment is upcoming in the next semester



Ending... Questions...

