Etiquette and Effectiveness: How Should a Smart Home Interact?

Christopher A. Miller & Peggy Wu	Kathleen Krichbaurm	Liana Kiff
Smart Information Flow Technologies	University of Minnesota	Honeywell Laboratories
Minneapolis, MN	Minneapolis, MN	Minneapolis, MN
cmiller; pwu@SIFT.info	*krich001@umn.edu*	*Kiff_Liana@htc.honeywell.com*

Summary

We explore whether a model of politeness in human-human interactions can be used to develop medication reminders for an automated system to deliver. Both the effectiveness and the politeness of various reminders are examined. Our data examine whether perceptions of politeness differ between elders and baseline populations, and between human-human and human-machine interactions for this application.

Introduction

There is increasing evidence that even moderately complex automation evokes ìsocialî responses from humans who use it (Reeves and Nass, 1996). It is, therefore, not hard to believe that these social responses can either enhance or inhibit not just the human experience of interacting with a machine system, but also the overall effectiveness of the human + machine system (e.g., Miller, 2002; Norman, 2002). What is largely missing is data about how to design human-machine interaction ìetiquetteî so that it evokes appropriate, accurate and effective behaviors, actions and intuitions in human users. In this study, we report the results of an attempt to use a model of human-human politeness to guide the design of spoken and textual reminders provided to elderly clients by a medication reminder system.

Method

Extensive cross cultural sociolinguistic work has been used by Brown and Levinson (1987) to produce both a theory of the role of politeness in human-human interactions, and specific model of how to construct utterances that will be regarded as more or less polite in context. We have used this model to construct several alternate utterances (with associated predictions for their perceived politeness) for an automated medication reminding system to issue when it detects (perhaps erroneously) that its human ìclientî has missed a dose of medication. A series of questionnaires will pose these alternatives to a variety of audiences in a variety of contexts including: elders familiar with a specific medication reminding system, elders not familiar with automated medication reminding systems, a baseline population of individuals in ranging from 20-50 years of age with no specific familiarity with the system, and the systemís engineers themselves. For the most part, we will examine responses to these utterances as coming from a machine reminding system, but at least one alternative presentation will check our use of Brown and Levinsonís model by posing the alternative reminders as coming from one human to another. Finally, data was gathered by questionnaire, focus group and in-home sensing devices from a small group of elders who used one such

medication reminder system (the Honeywell I.L.S.A. system) for a period of up to 6 months and will be used to compare to the questionnaire data from the other groups.

Results

Initial results, primarily from program engineers, indicate that Brown and Levinson's model provides an accurate indication of perceived politeness for all but one class of utterances which are highly indirect and context dependent, and may therefore be difficult or impossible for a machine to accurately produce. Future data will be analyzed to support comparisons between the different subject populations. Data on medication compliance and its change during the use of our reminder system will provide some evidence on the effectiveness of one type of reminder utterance.

Discussion

Our anecdotal and focus group data imply that at least some elders are very likely to personify home automation and reminding systems of this sort. Elders are also sometimes less comfortable with advanced technological systems. A polite system may therefore enhance and elder's interaction experience. On the other hand, compliance with reminders might or might not be enhanced more by an impolite (or at least more commanding) one. At any rate, we suspect that the perceived etiquette of the reminding system will be an important variable in its successful design. Nevertheless, we find this to be an extremely understudied topic, especially with regards to elder interaction with technology. The results of this study should be a first step in addressing that deficiency.

Conclusion

We will conclude with recommendations for designing and incorporating appropriate etiquette into reminder systems for the elderly.

References

Brown, P. and Levinson, S. (1987). Politeness: Some universals in language usage. Cambridge, UK: Cambridge University Press.

Reeves, B. and Nass, C. (1996). The Media Equation. Cambridge, UK.: Cambridge University Press.

Miller, C. (Ed.) (2002). Working Notes of the AAAI Fall Symposium on Etiquette for Human-Computer Work. November 17-19: North Falmouth, MA.

Norman, D. (2002). Emotion and Design: Attractive things work better. Interactions, July/August, 36-42.

Acknowledgements

Portions of this work were jointly funded by Honeywell and a NIST ATP contract.