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User Experiences When Testing a Messaging App for Communication Between Individuals who are Hearing and Deaf or Hard of Hearing

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Abstract

This study investigated deaf and hard of hearing (DHH) and hearing (H) individuals' user experiences when testing a prototype messaging app with automatic speech recognition (ASR). Twelve pairs of participants, where one individual was DHH and the other H tested the app with a standardized decision-making task, displayed on either Android smartphones or tablets with full keyboards. Regardless of hearing status or type of device used, respondents were generally satisfied with the app. These findings indicate that ASR has the potential to facilitate communication between DHH and H individuals and that the technology merits further investigation.

Background

People who are DHH sometimes participate in small groups with individuals who are H. DHH individuals may face barriers to full functioning in these groups due to limited access services (e.g. sign language interpreters or real-time captioning), resulting in limited contributions. ASR holds exciting promise for making spoken content accessible for DHH individuals in these situations. Current ASR, however, is imperfect, especially in the noisy and complex environment of multi-party meetings.

Conclusions

There were few statistically significant differences in user experiences with the prototype messaging app. Regardless of hearing status of the participants or the type of device used, participants were generally satisfied with the app. These findings indicate that ASR has potential to facilitate communication between DHH and hearing individuals in small groups and that the technology merits further investigation.

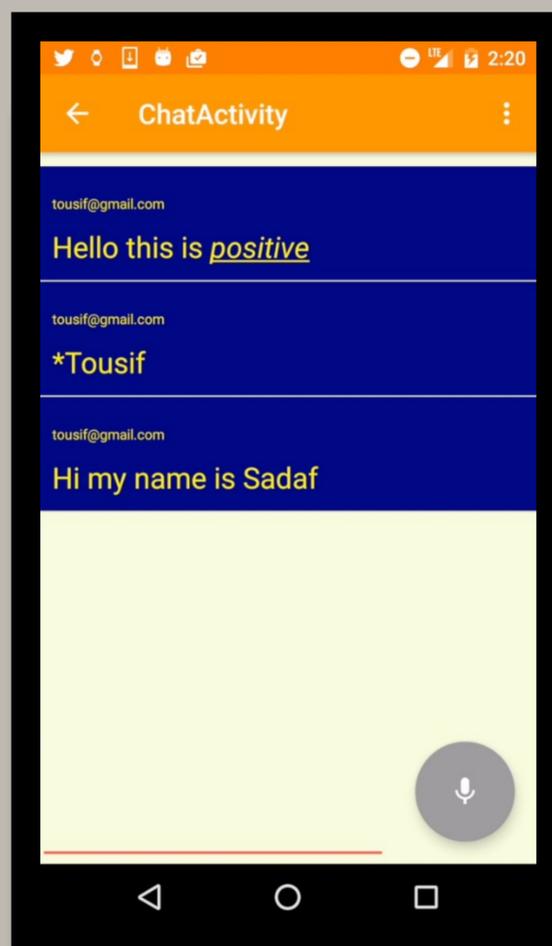


Methods

Participants: Twenty-four postsecondary DHH (n=12) and H (n=12) students in 12, 2-person (DHH/H) teams.

Materials: Prototype messaging app with an ASR feature that displays markup for words with less than 75% confidence; Android smartphones and tablets with full keyboards; 19-question online user-experience survey, (multiple choice, Likert-type, open-ended)—topics: collaboration, ease of use, errors, and message comprehension

Procedure: 15-minute app training; 20 minute "Lost at Sea" decision making task; user-experience survey



Quantitative Results

- *Ease of Use-H participants* found it easier to send a message with the app than the DHH did ($p=.046$, $F=4.477$).
- *Comprehension-Individuals using tablets* were more likely to report that their partners understood them enough to do the experiment task ($p=.000$, $F=20.087$).
- *Collaboration-Individuals using tablets* agreed more often that errors produced with ASR made it difficult to understand the information exchanged during the experiment task ($p=.043$, $F=4.632$)

Qualitative Themes and Comments

Collaboration: *It allowed us to communicate thoroughly.* (H)

Comprehension: *It was basically like having a normal conversation and we were both laughing a little bit.* (DHH)

Ease of use: *It was helpful as the app has voice recognition which makes it easier to communicate* (H)

Errors: *Was able to detect my voice well* (H); *It underlines the errors* (DHH)

Speed: *Made me able to send messages much faster than typing* (H)

References

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