

V. YOUNG, A. MIHAILIDIS. *An automated, speech-based emergency response system for the older adult*. *Gerontechnology* 2010;9(2):261; doi:10.4017/gt.2010.09.02.218.00 **Purpose** Despite the fact that using a personal-emergency response system (PERS) has been shown to ease caregiver, and user, anxiety, support aging-in-place, and decrease overall healthcare costs¹⁻³, a very small percentage of the older adult population actually owns a PERS⁴ and less than half of PERS owners use their systems^{2,3}. One of the greatest barriers to using a PERS involves the use of the traditional push button activator which must be worn on the body at all times. Wearing the button often leads to accidental button presses and feelings of stigmatization or burden. The goal of our research is to develop an alternative user interface; one that is simple, hands-free and intelligent, that will improve overall PERS efficiency, effectiveness and usability. Specifically, we are developing and testing a communication and response module (CRM) that has the ability to automatically recognize key-words and older adult speech, recall previous requests for help, cancel false-alarms, and help manage calls based on the type of emergency. To develop system specifications, we are exploring emergency response call centre procedures and call recordings to determine the most common types of user responses to call-taker questions (e.g., word types and phrases). We are also examining the time it takes for a request for assistance to be initiated; to better understand what types of emergencies might occur; and to examine the type and quality of older adult speech in an emergency situation. **Method** Existing personal emergency call recordings were obtained from an emergency response provider, Philips Lifeline Canada. The call recordings included false alarms, actual emergency calls and other miscellaneous calls (e.g., translation and equipment setup calls). The call recordings were divided into two caller types, older adults and care providers; three emergency levels: low risk (i.e., false alarms), medium risk (i.e., not-life threatening but needs attention), and high risk (i.e., possibly life threatening and needs attention quickly); and two emergency types, medical and falls. Eighty-three emergency call recordings were transcribed using SALT v9.0. The conversational dialogue and call structure was analyzed to assess the number of speaker turns before a response to a request for assistance was made (e.g., before an ambulance or responder was called); the frequency and types of words and phrases used in response to call taker dialogue; and caller rate of speech. **Results & Discussion** Statistical differences were assessed using the Mann-Whitney U test. All false alarms were identified in less than 5 speaker turns. High risk emergencies tended to require fewer speaker turns than medium risk emergencies ($p < 0.001$). Excluding false alarms, calls made by the care provider were resolved more quickly than calls made by the older adult ($p < 0.05$). Calls involving medical emergencies were not resolved significantly faster than fall emergencies. Call dialogue consisted mainly of 'yes' and 'no' user response variations to call-taker questions. Older adult speech was found to be more variable in speed than care provider speech. In conclusion, the CRM designed must consider both younger adult care provider speech as well as the more variable older adult speech.

References

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