

Title:

Accuracy of Voice-Recognition Technology in Collecting Behavior Diary Data

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Abstract

Diary is one of the commonly used methods in collecting behavioral data, e.g., physical activity, nutrition, time use etc. Collecting and analyzing the diary data, however, can be both subject- (e.g., write down every hour on what had been done or eat) and researcher-burdensome (e.g., type in the data collected and score them). As a result, diary method is only used as the criterion measure in research. To eliminate the limitation, an *E*-diary system had been developed in which the data will be collected using voice-recognition technology and analyzed using automatic scoring or text classification methods. The purpose of this study was to evaluate the accuracy of voice-recognition used in the system. A total of 40 adult participants were recruited for the study. After going through training modules of the Dragon Naturally Speaking software, each participant read 6-7 activity diary records into the voice-recognition application develop for this study (total records = 271). They then corrected errors in the files that were entered by voice recognition. Both files (i.e., voice entered and corrected) were analyzed using Hresults, a Hidden Marko Model Toolkit performance analysis tool and the % correctness was computed. The % correctness is determined by: $100 \times H/N$ ($H = N - S - D$), where H = the number of correct labels, N = the total number of labels, D = deletions, and S = substitutions. The mean of the % correctness is 91.13, with a SD = 8.33. The highest % correctness is 98 and the lowest one is 54. It is concluded that satisfactory accuracy was obtained for the voice-recognition application developed for the *E*-diary system. Future study should examine the accuracy of the application in the noisier environment.