

Automated Psychosocial Assessment in Oral Health Research

Cameron L. Randall¹, Daniel W. McNeil¹, Richard J. Crout¹, Robert J. Weyant², & Mary L. Marazita²



¹West Virginia University: Department of Psychology, Eberly College of Arts and Sciences; School of Dentistry

²University of Pittsburgh School of Dental Medicine



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Cameron Randall

INTRODUCTION

Assessing a broad range of behaviors and environmental determinants often is important in oral health research. As completing numerous questionnaires can be burdensome, technological tools may be utilized to ease the task for participants. In comprehensive research protocols such as this one, the battery of self-report instruments often is onerous and a burden to participants, given the number of different instruments and number of items per scale. Participant fatigue can adversely influence accuracy of responding and willingness to participate in future assessments in longitudinal designs. It was hypothesized that a technological tool, specifically a tablet-based personal computer (PC) with specialized visual and audio software that mimics questions being posed by a live interviewer, would yield differences in data missingness, compared to paper-and-pencil administration of a battery of 15 self-report questionnaires. We also anticipated differences between administration formats, based in part on literacy level, in response times and satisfaction.

PARTICIPANTS

- ❖ Participants were members of families in West Virginia and Pennsylvania participating in the Center for Oral Health Research in Appalachia (COHRA) study on determinants of individual, family, and community factors affecting oral diseases in Appalachian children and their relatives.
- ❖ These individuals and their families participated in a larger protocol involving interviews, questionnaires, oral health assessment, microbiological assessment, and DNA collection.
- ❖ For this analysis, 2067 adults and adolescents were utilized; ages 11-93 years ($M = 28.8$, $SD = 12.6$), 60.5% female, 92% white, 6% African American, all other races < 1% each.
- ❖ A subset of 180 participants completed a test of general literacy and satisfaction surveys; ages 14–55 years ($M = 30.9$, $SD = 9.8$), 61.1% female.

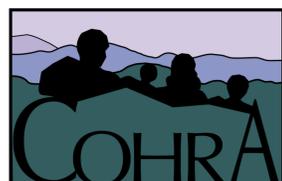


Figure 1. Tablet PC version for questionnaires.

METHOD

- ❖ In the overall sample, participants were assigned to questionnaire administration via either paper-and-pencil ($n = 716$) or tablet PC condition, ($n = 1351$; see Figure 1), generally depending on when they were enrolled in the study (with paper-and-pencil methods used prior to the tablet methodology)
- ❖ A subsample of 180 participants was randomly assigned to either the paper-and-pencil ($n = 90$) or tablet ($n = 90$) administration, using a sealed envelope system. General literacy was assessed in this subset using the Wide Range Achievement Test-4 (WRAT4; Wilkinson & Robertson, 2006).
- ❖ Participants with WRAT4 scores above the median were placed into a 'high-literacy' group; participants with scores below the median were placed into a 'low-literacy' group.
- ❖ Participants in this subset also completed 5-point Likert-type and 7-point Semantic Differential item scales reflecting satisfaction with the questionnaire administration.
- ❖ Tablet PC had specialized software, with both audio and video components.
- ❖ Participants completed 15 self-report health instruments with a combined total of over 300 items.

RESULTS

- ❖ Entire Sample
 - ❖ There were significantly more cases with missing data (i.e., intentionally or accidentally skipped items) for the tablet PC format (11%) than for paper-pencil format (6%), $\chi^2(1) = 13.7$, $p < .001$.
 - ❖ For participants who skipped any items, those with the paper-pencil format skipped significantly more ($M = 5.3$, $SD = .80$) than those with tablet PC format ($M = 1.1$, $SD = .09$), $t(189) = 9.8$, $p > .001$.
- ❖ Subsample (completing the WRAT-4)
 - ❖ Satisfaction ratings for the two administration systems were remarkably similar, with no differences detected between the tablet PC and paper-and-pencil formats.
 - ❖ High-literacy participants reported greater satisfaction ($M = 34.5$, $SD = 5.7$) than did low-literacy participants ($M = 31.8$, $SD = 5.4$), $F(180) = 10.7$, $p < .05$.
 - ❖ Time for completion between systems did not differ.
 - ❖ There was a significant difference in time, however, for completion between high-literacy participants ($M = 68.0$ min, $SD = 16.7$) and low-literacy participants ($M = 84.0$ min, $SD = 26.5$), $F(180) = 22.7$, $p < .001$.

FIGURES

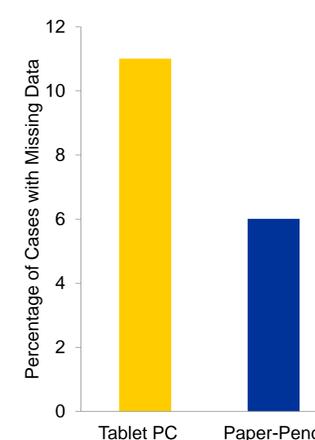


Figure 2. Overall data missingness across administration types.

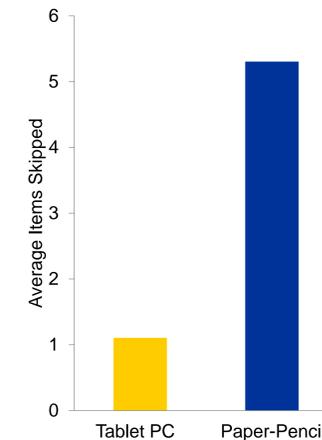


Figure 3. Average number of items skipped for participants with any missing data.

CONCLUSIONS

- ❖ Data missingness is associated with questionnaire administration type.
 - ❖ More tablet PC respondents may choose "I prefer not to answer," since it is a readily available choice.
 - ❖ More paper-pencil respondents may skip entire sets or pages of items.
- ❖ Overall, satisfaction with use of both the tablet PC and paper-and-pencil versions was relatively high.
- ❖ Patient literacy appears to be an important determinant of time for completion of and satisfaction with health-related questionnaires.
 - ❖ Degree of familiarity with computer technology may be a factor affecting results, as may possible anxiety in using such technologies.
- ❖ Results are promising in terms of the tablet-based PC with specialized software as a technological tool that can promote greater satisfaction, understanding in oral health, and less overall missing data.

CONTACT INFORMATION

Cameron L. Randall & Daniel W. McNeil, Ph.D.
Department of Psychology, West Virginia University
53 Campus Drive, Box 6040
Morgantown, WV 26505-6040
cameron.randall@mail.wvu.edu; daniel.mcneil@mail.wvu.edu