The Effects of Digital Hearing Aids & Cell Phones on Phone Use

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Introduction

Approximately 15-40% of individuals are unable to wear their hearing aids (HAs) while on the phone (Morris, 2000; Kaye, Terry & Sweeten, 1992). A variety of problems may contribute to this — poor speech understanding, inadequate volume, feedback, distortion and difficulty coupling a phone to a HA. Some of these problems may be worse with digital HAs and cell phones (MHS et al., 2008).

This research project addressed the following questions with a questionnaire:

- How often do cell phones and digital HAs impact the problem experienced by hearing-impaired individuals on the phone?
- Do individuals using cell phones with digital HAs experience more difficulties than users of older technologies?
- Are certain groups of HA users more successful with phone use than other groups?

Most individuals wore digital HAs that were < 4 years old. Newer digital HAs were more likely to be worn during phone use.

Methods

- 342 wearers of HAs in the Minneapolis (MN) and San Francisco (CA) metropolitan areas completed a 48-item questionnaire mailed to them.
- Participants that used a cell phone > 5% of their calls answered the questions for their cell phone, others completed the survey for their primary phone.
- Hearing loss and HA information in our research database augmented the data analysis.

Notes:

- The Spearman Correlation Coefficient quantified the correlation between numeric and ordinal variables, and the Chi-square test of independence tested for a relationship between categorical variables.
- In graphs segmenting devices by age, data for individuals using analog HAs were collapsed into one group due to the small sample size.
- Percentages did not add up to 100% due to respondents missing some questions.

Results

HA use on the phone was less for those experiencing a problem

Fewer problems were reported with digital HAs

- 13% of individuals used a cell phone as their primary phone
- 62% used a cell phone for ≥ 5% of their calls
- There were no significant differences in the type or degree of problems experienced by users of different phone types

Newer digital HAs were more likely to be worn during phone use

- Fewer problems with newer digital HAs may be resulted from advanced algorithms (e.g. feedback cancellation, noise reduction and environmental distortion).
- There were not any significant correlations between the ages of the devices and participants’ ages or pure-tone averages (PTAs).

The remainder of this poster focuses on individuals wearing digital devices

Individuals wearing custom HAs experienced the most feedback; they were also the least likely to wear their HAs on the phone

Conclusions

Modern HA technology is improving the telephone experience for wearers of HAs. By significantly reducing the problems of feedback, auditory distortion and insufficient volume, newer technology has allowed more people to use their HAs successfully on the phone. If technological advances continue to target the remaining challenges encountered by wearers of HAs, especially insufficient volume and difficulty understanding in noise, then we can look forward to further improvements in the user experience.

References
