Usability of a gamified spatial release from masking test

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Keywords

Psychoacoustics, gamification, spatial release from masking

Abstract

Objectives

The objective of this study is to describe the user experience (usability) of a gamified psychoacoustic task via the Portable Automated Rapid Testing (PART) iPad application among participants ranging in age, hearing-level, and Traumatic Brain Injury history (TBI).

Design

Two Spatial Release from Masking (SRM) tasks were delivered over calibrated headphones via the PART iPad application. The SRM tests used target and masking sentences from the Coordinate Response Measure (CRM) speech corpus (Bolia et al., 2000). 32 participants completed a gamified version of the SRM and a non-gamified version in random order. All participants completed the usability survey, assessing their experience with the gamified task. A subset of participants (n=24) provided open-ended feedback. Quantitative and free-response data were analyzed to identify potential patterns in factors such as age, hearing loss, and TBI history.

Results

The difference between the colocated and separated conditions (SMR) on the two tests was similar (r=0.66, p<0.001). No significant associations were identified in terms of participants' experience and their age, TBI history, self-reported hearing loss, or objective (audiometric) hearing loss. Survey data revealed that most participants enjoyed their experience playing the game (M=3.51, SD=1.07) and most reported they felt engaged with the story of the game (M=3.43, SD=1.07). Positive correlations between survey items indicated a potential relationship between reported enjoyment of visual elements of the game and positive user experience. The most common free-response experiences reported were that the gamified SRM task had unclear instructions (n=14), distracting elements (n=5) and that it was challenging (n=6).

Conclusion

The data in this study will help inform future iterations of gamified psychoacoustic tests by optimizing a human-centered design process, particularly when including populations, such as those with various disorders or TBI.