The effect of degraded auditory input on memory

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INTRODUCTION

• Cochlear implants (CI) restore hearing capabilities to patients with profound hearing loss and allow them to develop successful spoken language skills.

• However, studies have shown that CI users have a reduced short-term memory capacity compared to their normal hearing (NH) peers. For all subjects, the total score is similar across all conditions in the forwardwards direction (fig 8, 9, 10, 11, 12, and 13).

METHODS

• PARTICIPANTS: The participants were aged 18-24 years old and were native English speakers with normal hearing and eight capacities.

• STIMULI: The digits 1-9 were verbally recited then were recorded and degraded digitally through a CI simulation 4-channel vocoder. The digits were presented aurally, visually, or both.

• PROCEDURE: Participants were presented with the digit span test, a measure of short-term and working memory.

HYPOTHESIS

• The degraded auditory signal conveyed through the CIs will limit the amount of cognitive resources available for interpreting the accompanying visual information.

• For two subjects, performance was better in the audio only or visual only conditions compared to the degraded audio condition in both the forward and backward digit span tests (fig 4 and 5).

• For two subjects, performance was better in the visual only condition compared to the degraded auditory condition in both the forward and backward digit span tests (fig 4 and 5).

• Mean span was lower under the degraded audio/visual condition than under the clear audio-visual condition, which suggests that the degraded audio signal impairs memory assessments that feature both auditory and visual signals.

• Current trends suggest that mean span is a better measurement of memory span than total score. This may be due to the fact that the hit rate term within the mean span calculation amounts for the number of times a particular list length was given.

• The mean digit span in the backwards direction was highest under the audio-visual condition, indicating that information presented both visually and auditorily is processed and stored more easily.

• Mean span was lower under the degraded audio/visual condition than under the clear audio-visual condition, which suggests that the degraded audio signal impairs memory assessments that feature both auditory and visual signals.

REFERENCES


ACKNOWLEDGEMENTS

I would like to thank Jasenia Hartman and the other members of the Binaural Hearing and Speech Lab for supporting this research. I would like to thank all the normal-hearing college students for participating in my study.

Work supported by NSF-GRFP DGE-1256259, NIH-NIDCD (R01 DC003083 to RYL, R03 DC015321 to AK) and NIH-NICHD (P30HD03352 to Waisman Center)