**INTRODUCTION**

- Many cochlear implant (CI) listeners show word-learning deficits relative to their normal-hearing (NH) peers. 
- CI listeners face challenges in phonetic processing which may contribute to their word-learning deficits. 
- Viewing a talker’s lips move can also improve speech perception for NH and CI listeners. 
- Additionally, learning from multiple talkers improves word learning by allowing listeners to extract that acoustic cues that are relatively constant, leading to robust representations of word forms. 
- Little is known whether learning from multiple talkers improves word-learning for CI listeners and whether CI listeners fixate to the mouth of a single talker more than NH listeners when learning new words.

**PURPOSE OF STUDY**

*Aim 1:* Assess whether CI listeners fixate to the mouth of a talker more than NH listeners when learning new words. 

*Aim 2:* Determine whether learning from multiple talkers improves word learning in adults CI listeners.

**METHODS**

*Participants:* 17 adult CI listeners: ages 19-70. 8 age-matched adult NH listeners (data collection still in progress).

*Stimuli:* 8 English nonwords paired with novel objects.

*Procedure:* 
- **Learning phase:** Participants were taught novel word-object pairings form a single talker or from 6 different talkers (multiple talkers).
- **Test phase:** Participants were tested on the ability to learn word-object pairings in a two-alternative forced-choice task.
- **Easy trials:** Target and distractor object labels differed by several speech categories (e.g. ball vs form). 
- **Hard Trials:** Target and distractor object labels differed by a single feature (e.g. ball vs gila).

*Measurement:* High-speed eye-tracking (SR Eyelink 1000 Hz) was used to measure eye movements to target and mouth over time.

*Aim 1: Gaze behavior during learning (learning phases)*

Proportion of looks to the mouth = proportion of time spent looking at target or distractor for learning trials only.

*Aim 2: Learning from multiple talkers (test phases)*

Proportion of looks to the target = proportion of time spent looking at the target object for test trials only.

**PREDICTIONS**

*Aim 1: Gaze behavior during learning* 

The visual domain provides more reliable and salient cues for CI listeners than the auditory domain.

*Aim 2: Learning from multiple talkers* 

Learning from multiple talkers vs Learning from a single talker.

**RESULTS**

*Fig. 1: Proportion of looks to target (Accuracy) for a) NH group and b) CI group after learning from a single talker or from multiple talkers. Error bars represent standard error (SE).*

**SUMMARY & CONCLUSIONS**

- During the learning phases, the majority of fixations were to the mouth for the CI listeners compared to the NH listeners, suggesting that CI listeners rely heavily on visual domain to extract relevant linguistic information.
- On average, CI listeners tend to fixate less to the mouth when learning from a single talker than from multiple talker. This suggest that when the talker remains constant, CI listeners may become attuned to the speaking characteristics of a talker and thereby, rely less heavily on visual cues. Further analyses will use growth curve analysis to examine differences in time course data for the proportion of looks to the mouth in the learning phase.
- On average, there was no benefit in learning from multiple talkers for both CI and NH adult listeners. However, this might be attributed to the fact that adults have reached proficiency in their native language and do not require variability in their acoustic environment to form robust representations of newly spoken words.

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