

Poor talker discrimination ability in adult cochlear implant users: the potential role of aging  
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Talkers' voices serve important social and linguistic functions during speech communication. Normal-hearing (NH) listeners are able to use talker-specific details encoded in the speech signal to identify who is talking along with individual talker traits, such as gender, age, or region of origin. Moreover, learning talker-specific details facilitates successful speech recognition by NH individuals in adverse listening conditions (e.g., noise or competing talkers). While overall poor talker discrimination has been reported for postlingually deafened adult cochlear implant (CI) users, the factors underlying limitations in talker discrimination ability are still relatively unknown. Previous research has demonstrated that CI users show poor discrimination of voice cues, like fundamental frequency. However, the contribution of age to talker discrimination ability has not been studied in this listener population.

The current study examined talker discrimination ability in experienced postlingually deafened adult CI users varying in age (39-86 years) and a control group of age-matched adult NH listeners. All CI users were relatively high performing in speech recognition, with isolated word recognition (CNC) scores in quiet between 70 and 96% correct. During a talker discrimination task, listeners indicated whether a pair of words was produced by the same talker or different talkers, while listening to word pairs produced either by the same talker, different talkers of the same gender, or different talkers of different genders. Overall, CI users showed less accurate talker discrimination than NH controls, with particularly poor discrimination of same-gender talker pairs. Within the CI user group, age was negatively associated with talker discrimination accuracy in all conditions, with older age associated with poorer discrimination ability. However, age was not correlated with word recognition (CNC) scores in quiet. For NH controls, age was not correlated with either talker discrimination ability or word recognition.

Taken together, preliminary results suggest that age may influence talker discrimination ability in postlingually deafened adult CI users, even if achieving high performance on isolated word recognition. One possible account of these findings may be that specific limitations in voice cue perception in CI users may lead to less efficient comparison of talker-specific details during the discrimination task. That is, for CI users, talker discrimination may be a more cognitively burdensome task, requiring greater attentional control to focus on the relevant stimulus properties (i.e. voice cues). As such, age-related changes in cognitive skills, such as selective attention, may contribute to poorer talker discrimination ability in older adult CI users.

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