

**Title:** Does working memory mediate self-reported difficulties in noise for older listeners?

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Older adults with and without hearing loss experience central changes to their auditory temporal processing abilities, which can contribute to difficulties understanding speech in noise. These changes may be further modulated by cognitive factors such as working memory. In the clinical setting, speech in noise measurements and self-reported difficulties understanding speech in noise are often administered during treatment and counseling. Prior research has shown that normal-hearing older listeners who perform poorly in noise tend to report more communication difficulties. However, older listeners with hearing impairment who perform poorly in noise tend to report *fewer* communication difficulties, possibly due to reduced sensitivity to the effects of hearing loss. Currently, it is unclear to what degree working memory impacts self-reported difficulties in communication under adverse listening conditions. This analysis of three inter-related measures from a large database was conducted to determine if working memory capacity mediates the relationship between speech in noise performance and self-reported communication difficulties in noisy situations.

Participants were recruited in three listener groups: young normal-hearing (YNH), older normal-hearing (ONH), and older hearing-impaired (OHI). All participants scored  $\geq 26$  on the MoCA cognitive screening assessment (Nasreddine, et al., 2005). Each participant completed the NIH Toolbox cognition battery; we report standardized List Sorting Test scores to measure working memory capability. Participants also completed the Speech subscale of the SSQ questionnaire and the QuickSIN speech-in-noise measure. The present analysis includes SSQ questions 4-12, which focus explicitly on self-reported difficulties in noisy environments.

Preliminary mixed effects linear regression modeling shows OHI listeners rate themselves significantly lower on the SSQ and have poorer QuickSIN scores than YNH listeners; no such pattern was observed for ONH listeners. There was a significant interaction between standardized List Sorting scores and QuickSIN performance *across* participant groups. This indicates that among listeners with poor speech in noise performance, working memory capacity significantly impacts self-reported communication difficulties. Conversely, listeners who are excellent speech in noise performers rate themselves higher on the SSQ despite variation in working memory capabilities.

The current findings confirm that a cognitive measure of working memory predicts self-reported communication difficulties, particularly for listeners who are poorer performers in noisy listening environments. This information may be useful in the clinical setting when counseling patients and their families on the effects of hearing loss and potential outcomes with hearing devices.

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