Title: Effects of aging and cognitive effort on talker familiarity benefit in a complex listening environment.

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Abstract: Older adults have greater difficulty understanding speech in noisy environments as compared to younger adults, due in part to a reduction in cognitive capacity. When older listeners are in a challenging environment, their reduced cognitive resources (e.g., working memory and inhibitory control) can result in increased listening effort to maintain speech understanding performance. One cue that has been shown to improve older adults' speech understanding in noise is their familiarity with the target talker (e.g., spouse). A potential mechanism for this benefit is that the familiar voice (FV) captures the listener's attention and improves that listener's ability to segregate the target FV from the background. This, in turn, results in less consumption of the older adults' cognitive resources, and requires less effort from the listener to understand the speech. It is unknown whether the role of the FV (target vs. masker) in a complex auditory environment can impact cognitive resources and effort allocation during speech perception, and also whether it can impact resource allocation differently in younger versus older adults. This study evaluated whether a FV improved speech understanding and reduced listening effort in a simulated cocktail-party environment. Couples recorded sentences from the Boston University Gerald (BUG) corpus and completed a battery of cognitive measures from the NIH Toolbox. At a second visit, listeners were presented with sentences where the FV was either the target or a masker, and were instructed to report what was said through a closed set of word choices on a touchscreen monitor. Speech understanding performance was measured when the target and a single masker were routed to the same ear (monotic), and when the target was presented monaurally and two maskers were presented dichotically. Listeners were also prompted to identify whether the target talker was familiar or unfamiliar. Accuracy scores and response times were measured for both the speech understanding and talker identification tests. Preliminary data suggest that speech understanding improves when the FV is the target and is reduced when it is the masker, compared to an unfamiliar target and masker. Additionally, speech understanding performance was reduced when the FV masker was in the same ear as the target talker, compared to when it was presented to the non-target. The effects of participant age, hearing sensitivity, cognitive performance, and years of cohabitation on speech understanding performance for familiar and unfamiliar talkers in a background of familiar and unfamiliar maskers will be presented.

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