

## **Can the diffuseness of sound sources alter speech perception in young and older adults?**

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The variety and nature of auditory scenes have changed significantly over the years due to electronic amplification. It is important to understand how these changes affect speech perception across the lifespan. When amplification is used, each sound source is often presented over multiple loudspeakers, which can alter its timbre, and introduce comb-filtering effects. Increasing the diffuseness of a sound by presenting it over spatially-separated loudspeakers might affect the listeners' ability to form a coherent auditory image of it, alter its perceived location, and may even affect the extent to which it competes for the listener's attention. In addition, it can lead to comb filtering effects that can alter the spectral profiles of sounds arriving at the ears. The current study aims to systematically study the effects of different amplified acoustic scenes on speech perception in young and older adults.

In this study, 24 young adults and 24 older adults were asked to repeat nonsense sentences presented in either noise, babble or competing speech maskers. Participants were divided into two experimental groups; 1) A Compact-Target Timbre group where the target sentences were presented over a single central loudspeaker (compact target), while the masker was either presented over three loudspeakers (diffuse) or over the same single loudspeaker (compact); 2) A Diffuse-Target Timbre group, where the target sentences were diffuse while the masker was either compact or diffuse. The sentences presented under each of the four timbre

conditions were played in 4 different SNRs for each type of masker (Noise, Babble, Speech). The correct repetition of the three target words in each sentence was recorded and the 50% correct corresponding SNR thresholds and the slopes of the psychometric functions were calculated and analyzed.

The current results show that in the absence of a timbre-contrast between target and masker, when both the masker and the target were either compact or diffuse, the results in both conditions were similar. However, when there was a timbre-contrast, the signal-to-noise ratios needed for 50% correct recognition of the target speech were higher (worse) when the masker was compact, and lower (better) when the target was compact. In addition, older adults had higher SNR thresholds than the young adults under the different timbre conditions. The possible implications of amplification, and how they may differ depending on the listener's age, will be discussed.

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No financial or nonfinancial consideration or relationship relevant to the authors' presentation content compromises or has the potential to compromise their professional judgment.

**\*\*Either Poster or Podium\*\***