Participants included 38 young adults (14 males, 24 females) between 18 and 31 years (M = 24.0, SD = 3.2) with normal hearing sensitivity. Participants completed three dichotic tasks (see below) under a protocol designed to evaluate interaural asymmetry (IA) laterality index (normalized IA values) was evaluated in a repeated measures ANOVA with ear (2), transducer type (2), and stimulus type (3) serving as experimental variables. Measures ANOVA with ear (2), transducer type (2), and stimulus type (3) serving as experimental variables.

**REFERENCES**


**RESULTS**

Response accuracy differed overall between stimulus types [F(2,74) = 245.19, p < 0.0001]. Highest accuracy was to sentences, lowest accuracy was to words. Response accuracy was overall better for stimuli presented under headphones than loudspeakers [F(1.37) = 105.03, p < 0.0001]. Response accuracy was overall better for stimuli presented to the right ear as compared to the left ear (i.e., REA) [F(1.37) = 17.04, p < 0.001]. Overall accuracy on each ear differed between transducer types [F(1.37) = 5.64, p = 0.023], indicating that headphones produced larger REAs as compared to loudspeakers.

A significant linear relationship existed in the magnitude of ear advantage observed between headphones and loudspeakers for dichotic letters [r = 0.42, p = 0.008] and sentences [r = 0.65, p < 0.0001] but not filtered words [r = 0.26, p = 0.118].

Normalized values of inter-aural asymmetry (IA index) confirmed ANOVA results obtained with raw accuracy scores. The degree of REA observed for headphones was overall greater than that found using loudspeakers [F(1,37) = 4.96, p = 0.047]; however, the magnitude did not vary significantly across stimulus types.

**CONCLUSIONS**

- Overall improved accuracy to dichotic stimuli under headphones likely reflects a reduction in temporal and spectral interactions between auditory channels as well as overall improved spatial segregation.
- Larger magnitudes of ear advantage (REA) using headphones may arise for the same reasons; however, robust REAs to stimuli presented via loudspeakers were also found. The use of loudspeakers in dichotic testing therefore appears defensible.

- Stimuli (by task) were equated for duration and intensity and presented at a comfortable level (loudspeakers: 65 dBa; headphones: 60 dB HL).
- Two versions of stimuli were created for the dichotic words and dichotic sentences tasks in order to offset learning effects; different letter combinations were used on the dichotic letters task.
- Accuracy (percent correct scores) was evaluated in a repeated measures ANOVA with ear (2), transducer type (2), and stimulus type (3) serving as experimental variables.
- IA laterality index (normalized IA values) was evaluated in a repeated measures ANOVA with transducer type (2) and stimulus type (3) serving as experimental variables.

**METHOD**

- Participants included 38 young adults (14 males, 24 females) between 18 and 31 years (M = 24.0, SD = 3.2) with normal hearing sensitivity.
- Participants completed three dichotic tasks (see below) under a divided-attention (free report, unforced) listening paradigm.
- Each task was presented twice; under headphones (EAR3A) and ear-level loudspeakers (Bose® 201V) positioned 1.5 m on either side of the participant’s head.

**BACKGROUND**

A right-ear advantage (REA) is a robust phenomenon on dichotic speech tests. Biases in speech perception and cognitive control are believed to produce ear advantage. Headphones are often used to deliver dichotic stimuli in order to isolate the two ears, however, similar outcomes have been found in behavioral and electrophysiological studies incorporating loudspeakers. The size of the REA is also known to be influenced by the level of perceptual difficulty (e.g., CV stimuli) and/or linguistic demands placed on the listener (e.g., sentences).

**Influence of Headphones versus Loudspeaker Presentation of Dichotic Speech on Ear Advantage**  
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