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Binaural loudness summation in and out of the laboratory

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Textbooks state that a tone presented binaurally is louder than the same tone presented monaurally. This is called Binaural Loudness Summation, BLS. Recent data and classroom demonstrations of BLS using speech stimuli from a visually present talker yield much less BLS than previously reported. Are conclusions about BLS drawn from tones presented via earphones in the laboratory applicable to live-voice speech in a room? To answer this question, eight normal listeners were presented three types of stimuli [monitored live voice (MLV) spondees, recorded spondees, and tones] monaurally and binaurally across a wide range of levels. The same stimuli were presented via earphones and loudspeakers. Loudness was measured using magnitude estimation. Results show that the amount of BLS was significantly less for MLV spondees than for tones or recorded spondees. It was also significantly less for loudspeaker presentation than for earphone presentation. The amount of BLS was least for MLV spondees presented via loudspeakers. Results indicate that BLS in loudspeaker conditions is significantly less than BLS in typical laboratory test conditions using earphones. A new phenomena-called "Binaural Loudness Constancy"-will be described that may result from expectations about loudness of a visually present talker. [Work supported by NIH-NIDCD grant R01DC02241]