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Cross-modality matching of loudness and whole-body vibration strength

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In every day live humans are often exposed to noise and vibration simultaneously. Regarding comfort issues inside a car, it is of interest to know, whether the simultaneous perceptions of noise and vibration interfere. Laboratory tests have been carried out with temporally overlapping, partially overlapping and non overlapping presentations of acoustic and whole-body vibration stimuli. Sitting on a rigid chair on a vibration test bench, participants are asked to judge the strength of the excited whole-body vibrations in comparison to the loudness of noise presented via closed headphones. An adaptive method is employed to determine the subjective point of equality (PSE) between both sensory channels. The acoustic stimulus is a 1/2-octave band-pass noise centred at 100 Hz with a fixed noise level, the vibration stimulus is a narrowband noise, also 1/2-octave broad with a centre frequency of 31,5 Hz. The signals have an equal duration of one second. The signal parameters are chosen with respect to specific situations in a car. The PSE's of the loudness and the vibration strength as a function of the temporal order of the acoustic and vibration stimuli exhibit no dependency on the degree of temporal overlap of the stimulus presentation.