



AB056. Multisensory stochastic facilitation: effect of thresholds and reaction times

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Background: The concept of stochastic facilitation suggests that the addition of precise amounts of white noise can improve the perceptibility of a stimulus of weak amplitude. We know from previous research that tactile and auditory noise can facilitate visual perception, respectively. Here we wanted to see if the effects of stochastic facilitation generalise to a reaction time paradigm, and if reaction times are correlated with tactile thresholds. We know that when multiple sensory systems are stimulated simultaneously, reaction times are faster than either stimulus alone, and also faster than the sum of reaction times (known as the race model).

Methods: Five participants were re-tested in five blocks each of which contained a different background noise levels, randomly ordered across sessions. At each noise level, they performed a tactile threshold detection task and a tactile reaction time task.

Results: Both tactile threshold and tactile reaction times were significantly affected by the background white noise. While the preferred amplitude for the white noise was different for every participant, the average lowest threshold was obtained with white noise presented binaurally at 70 db. The reaction times were analysed by fitting an ex-Gaussian, the sum of a Gaussian function and an exponential decay function. The white noise significantly affected the exponential parameter (τ) in a way that is compatible with the facilitation of thresholds.

Conclusions: We therefore conclude that multisensory reaction time facilitation can, at least in part, be explained by stochastic facilitation of the neural signals.

Keywords: Stochastic resonance; reaction time; tactile threshold; multisensory; crossmodal

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