

One ear is better than two; but why and when?

Abstract:

Background

The magnitude of the human eye blink reflex to a strong startle-eliciting sensory stimulus, the pulse, is reduced if this is preceded shortly by a weaker stimulus, the prepulse. This effect, known as prepulse inhibition (PPI), is considered to index sensorimotor gating. PPI is stronger with monaural, than binaural, acoustic prepulses. It is presently unknown why monaural prepulses produce more PPI than binaural prepulses.

Aims of the study

To test the possibility that monaural prepulses produce more PPI because they might be more salient or attention-capturing (unambiguous to locate) than binaural prepulses.

Method

Monaural and binaural PPI was assessed under i) normal and ii) verbal and visuospatial attention manipulation conditions in 60 healthy men, including 30 experienced mindfulness practitioners (meditators) who are considered to have a stronger information processing capacity and be more efficient in allocating attentional resources (final N with usable data = 55, 26 mediation-naïve individuals and 29 experienced meditators).

Results

Attention manipulations abolished monaural PPI superiority similarly in meditators and meditation-naïve individuals, and this was most strongly evident for right ear PPI under visuospatial attention manipulation. Meditators performed better than meditation-naïve individuals on attention tasks (verbal task: more targets detected; visuospatial task: faster reaction time).

Conclusion

Spatial attention processes contribute to monaural PPI superiority, particularly with right ear. Better attentional performance, with similar attentional modulation of PPI, indicates a stronger attentional capacity in meditators, relative to meditation-naïve individuals.

Keywords

Human sensorimotor gating, EMG, Attention, Mindfulness

Published Work:

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