

Public Abstract

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Title:Prepulse Inhibition of the Post-auricular Reflex

It is well established that a weak lead stimulus will inhibit the startle response to a more intense subsequent stimulus, given an appropriate lead time (i.e. 80-400 ms). This effect is termed prepulse inhibition (PPI), and is a widely used method for studying attention. PPI of the post-auricular reflex (PAR), another startle response, has yet to be directly tested in human participants.

Purpose: The present study tested whether the post-auricular reflex (PAR) exhibits prepulse inhibition (PPI).

Methods: Participants were prompted to indicate the number of target stimuli they saw amid non-target stimuli while listening to trains of six white noise bursts. Reflex amplitude for the PAR was recorded for trials with and without a visual prepulse. Responses for each of the six acoustic startle probes were quantified separately using electromyograms (EMG) from the left and right post-auricular muscles.

Results: Planned comparisons indicated the presence of PAR inhibition for trials with a visual prepulse, compared to trials without a visual prepulse (control trials). This effect was observed when the lead time was 100 ms. A sustained facilitation effect was observed at later lead times for trials with a visual prepulse when compared to control. Supplementary analyses indicated an absence of habituation across 3,600 reflexes per subject.

Conclusions: The post-auricular reflex does exhibit prepulse inhibition, albeit brief in duration. Potentiation of amplitude was observed at intermediate and long lead times, likely due to an arousal effect. Similar to other oligosynaptic reflexes, the PAR is also resistant to habituation. Therefore, this could serve as an effective translational paradigm in testing PPI at short lead times. Future research investigating PAR modulation could potentially identify certain neural mechanisms that underlie cognitive processes such as attention in humans.