



Sensory Attenuation (SA) is the reduction in perceived intensity of self generated sensations.

Theoretical accounts of SA

- **Cancellation Account:** SA is restricted to expected action outcomes due to the cancellation of predicted sensation (Blakemore et al., 1998).
- **Dual-Process Account:** SA is caused by the deployment of attention to the action consequence and the subsequent facilitation of the unpredicted sensation over the predicted sensation (Yon & Press, 2017).
- **Active inference account:** SA is caused by the withdrawal of attention from the action consequence (Brown et al., 2013).

Present Study

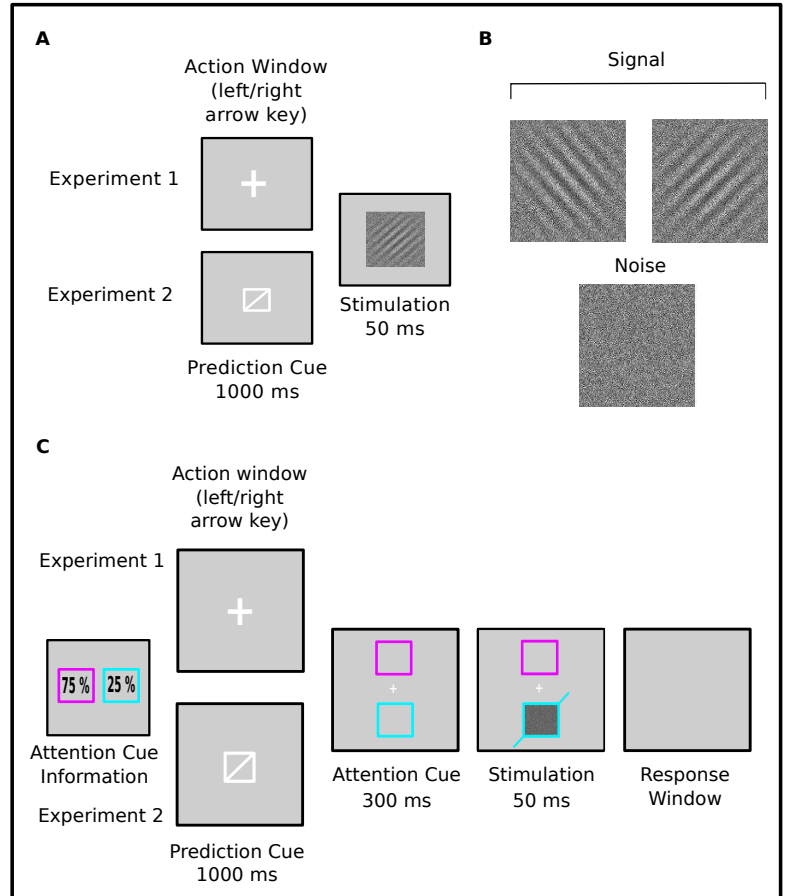
To reconcile the contrasting views on the effect of attention and prediction on sensory attenuation, we adjudicate between the three theoretical accounts of sensory attenuation through the orthogonal manipulation of attention and (motor and non motor) prediction.

Method

Participants performed a Gabor detection task. The prediction associated with the stimulus feature (orientation) and the focus of attention was manipulated independently by orthogonal cues. (A) In Experiment 1, participants performed a Gabor detection task on self-generated stimuli, and in (C) Experiment 2, the visual stimuli were externally-generated. Exp 3A and 3B were replication Exp 1 and 2 respectively but with uninformative attention cue.

Results

SA was found in the Exp. 1 (self generated) only when the attention was withdrawn from the sensation, $t(15) = 2.52, p = 0.02, d = 0.25$. When attention was deployed on the action outcome, SA was not observed. In Exp. 2 (externally generated) SA was observed when the sensation was attended, $t(15) = -2.41, p = 0.02, d = 0.28$. Predicted signal was facilitated at the unattended location, $t(15) = 2.38, p = 0.03, d = 0.49$. Both Exp 3A and 3B yielded null effects.



Discussion

The findings of Exp 1 is inconsistent with the dual process account that explains SA as an effect caused by the deployment of attention. Exp 2 suggests that attention enhances the prediction-error, resulting in higher detection sensitivity for unpredicted stimuli at the attended location. However, no single account could sufficiently explain all the effects observed in the present study. This highlights the criticism that these accounts indeed make paradoxical proposals about perception-action interaction.

