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# Commonalities and differences between effects of attention and emotion control during early visual perception: behavioral and psychophysiological evidence

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## Abstract

Recent neurophysiological findings suggest that not only selective attention, but also affective state may gate early and late stimulus processing in human visual cortex. In a series of behavioral and ERP studies we tested (i) whether attention vs. emotion control mechanisms lead to comparable changes in early sensory perception, and (ii) whether different types of affect modulation (self-efficacy challenge vs. threat exposure) can mimic effects of cognitive load at the behavioral and/or psychophysiological level. Healthy participants were tested using a dual task, enabling a parametric modulation of perceptual load for the primary task, while accuracy for the spatial encoding of visual stimuli shown at different locations in the upper visual field was measured (secondary task). Results show a decrease of accuracy (secondary task) when either load at fixation increases (Experiment 1) or state anxiety was transiently enhanced (Experiment 2). However, self-efficacy challenge vs. threat exposure led to different effects for the processing of the primary task stimuli (Experiment 3). Whereas attention and affect produce similar changes in visuo-spatial perceptual abilities, different effects of state anxiety on goal-related stimuli may be observed depending on the nature (either self- or threat-related) of these state anxiety modulations. Additional analyses focusing on early ERPs showed lower C1 amplitudes for high load or negative affect, compared to the control condition, indicating that attention and affective state each can modulate early sensory processing. Altogether, these findings suggest that concurrent attentional and emotional control mechanisms can exert top-down modulatory effects during early stages of visual perception.

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