

# Attention and Learning through the Eyes of the Emotional Brain

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## Abstract

The present thesis consists of four articles that address cognitive-emotional interactions as measured through eye movements and pupil dilation.

Social facilitation-inhibition is an effect that describes changes in performance (enhancement or impairment) when individuals complete tasks in social presence compared to when they perform the same tasks in solitary conditions. Along this line, Paper I and II focus on the effect of social presence in low and high-level tasks, such as eye movements and learning, respectively. These are the first evidence showing that social presence influences the attentional control of eye movements.

The locus coeruleus is a brain structure that is active during arousal and stress, as well as during cognitive and attentional processes. In addition, this structure is almost the sole network mediating pupil dilation in conditions of constant luminance. Therefore, the activity of the locus coeruleus can be indirectly traced through changes in pupil size. In Paper III we investigated the role of the locus coeruleus, as measured through fluctuations in pupil size, during the process of emotion recognition. The results of this paper indicated that pupil dilation reveals the time course of decision making on emotional tasks. In Paper IV, the role of the locus coeruleus was investigated in the context of selective attention. The results revealed that pupil size predicts the efficiency of selective attention in conditions of low perceptual load (i.e., tasks few stimuli and/or simple stimuli) but not in conditions of high perceptual load (i.e., higher number of stimuli and/or more complex stimuli).

Finally, since no single theory has emerged that can account for social facilitation-inhibition, I argue in the introduction of the thesis that the locus coeruleus may be involved in mediating cognitive-emotional functions, including social facilitation-inhibition.

## Keywords

Visual selective attention, Social effects, Emotion recognition, Locus coeruleus.