

# Arousal and Time Perception: Unravelling the Effects of Negative Stimuli Through Pupillometry

*Friday, September 12, 2025 5:40 PM (10 minutes)*

Emotional states can alter our perception of time. Although this is explained by an increase in arousal, the literature that controlled the arousal state physiologically is scarce. This study aims to investigate the complex relationship between emotion-induced physiological arousal and timing abilities. We examined whether variations in arousal levels in response to negative stimuli were associated with observable changes in pupil dilation. Additionally, we aimed to determine if these fluctuations could predict the extent of temporal distortion experienced during emotionally intense events. Forty participants (20 F; age 18-25) performed a time reproduction task; emotional stimuli were selected from the International Affective Picture System varying in perceived arousal levels (neutral, negative-high, negative-low). Participants' pupil dilation was tracked using an EyeLink 1000 Plus system. Data were analysed using generalized linear mixed models to assess the impact of negative stimuli on pupil dilation and temporal perception. The results revealed that greater pupil constriction was linked to the negativity of the stimuli, with more negative images causing larger pupil constriction. Regarding time perception, participants exhibited a greater overestimation of time for negative-high stimuli compared to neutral ones, and an underestimation for negative-low stimuli in comparison to neutral ones. In conclusion, these results underscore that physiological arousal induced by negative-high stimuli, reflected in a greater pupil constriction, significantly affects how we perceive time.

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No

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