The modulating role of saccadic and oculomotor behavior during a temporal reproduction task

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Visual signals play a crucial role in shaping our subjective experience of time. Brief visual interruptions, such as spontaneous eye blinks, can disrupt perceptual continuity and potentially alter our judgment of time intervals. In this study, we examined the relationship between oculomotor behavior and time judgments in a temporal reproduction task, both with and without visual feedback during the reproduction phase. Our primary focus was on how different aspects of eye movements during the presentation of the temporal reference stimulus influence the reproduced duration of this. A total of 34 participants completed the task while seated 120 cm away from a monitor, with their head position stabilized using a chin rest. Participants were asked to reproduce half the duration of presented time intervals (1600, 1800, 2000, 2200, and 2400 ms) by pressing and holding the spacebar. Eye movements and blinks were recorded using the EyeLink 1000 eye-tracking system. The results show a positive predictive effect of the blink duration percentage of the interval (Adj. Marginal-R^2: 0.362, ΔAdj. Marginal-R^2: 0.0222, p=0.0008, β: 2.651), in the stimulus and response phases, in pre-test, on the error percentage of the reproduced durations. These findings support the hypothesis that oculomotor behavior contributes to subjective time perception. Blinks may lengthen perceived duration by disrupting temporal integration. Overall, our results highlight the dynamic role of visuomotor behavior in internal timing and underscore the value of eye-tracking measures in the study of time perception.

Keywords: Time perception, eye-tracking, oculomotor behaviour, blinking, fixation, feedback, duration reproduction