

THE RELATIONSHIP BETWEEN VISUAL ACUITY AND WORKING MEMORY

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Background: Working memory (WM) is the ability to encode and temporarily maintain information. There is some evidence that early perceptual processes make an important contribution to successful WM performance. However, basic visual contributions to WM are not yet fully understood.

Aims: The aim of the study was to test the degree to which visual acuity can predict working memory.

Method: Twenty-six participants performed the Acuity-Plus test to measure visual acuity and contrast sensitivity. Participants also performed a visual lateralized change detection task, while we recorded EEG. This allowed us to test the degree to which visual acuity and contrast sensitivity can predict visual (P1 & N2) and memory related (contra-lateral delay activity (CDA) event-related potentials (ERPs).

Preliminary results: WM accuracy was significantly higher and reaction time lower for low load compared to high load trials. We also replicated previous findings of a larger N2 and a larger CDA load effect in response to contralateral compared to ipsilateral presented stimuli. Results show a significant positive correlation between visual acuity and CDA activity for both low and high memory load, and a significant positive correlation between contrast sensitivity and CDA activity for low memory load.

Conclusions: This study confirms a link between both visual acuity and contrast sensitivity, and neural measures of WM maintenance. Our results highlight the importance of controlling for visual acuity and contrast in all cognitive experiments, but it also points to the importance of visual acuity for being able to maintain information over the delay period.

Keywords: Perception, Working memory, EEG

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