

Summary: Previous work showed a strong correlation between IQ and low-level suppression. We expanded testing beyond IQ to include other higher-level tasks. Our data suggests no common mechanism between low-level suppression and any of these cognitive abilities, but supports the usability of a novel numerical Stroop task to measure suppression.

Hypothesis: Perceptual suppression of stimuli presented in a low-level visual task should correlate with higher level abilities including intelligence quotient, higher-level suppression in a numerical Stroop task and a working memory task, and working memory ability.

Background: A long hypothesized common mechanism for both low-level perception and higher level cognitive abilities has found moderate support.^[1] Suppression, or the ability to ignore background information that is distracting to the task at hand, may be an important component connecting all of these cognitive abilities.^[2] A strong link has been found between intelligence and a low level perceptual task involving visual suppression^[3]

Stimuli:

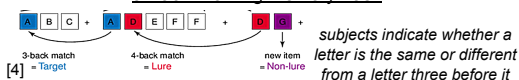
Intelligence Tests

K-BIT: verbal and nonverbal Raven's: general intelligence

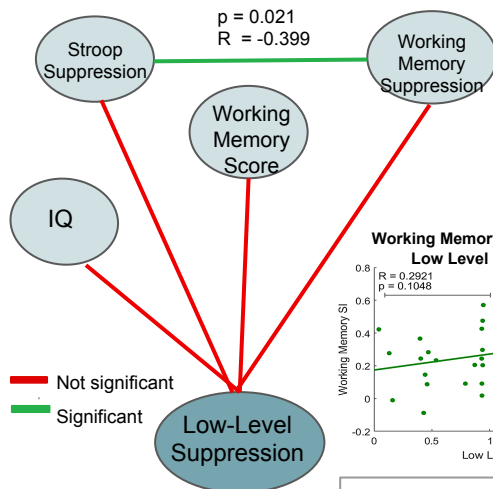
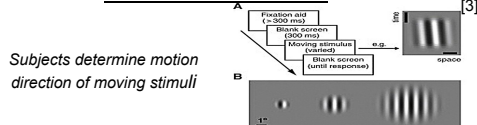
Numerical Stroop Task

	1	11	111
Subjects indicate number of digits shown			
Congruent: Digits match # of digits	2	22	222
Incongruent: Digits do not match	3	33	333

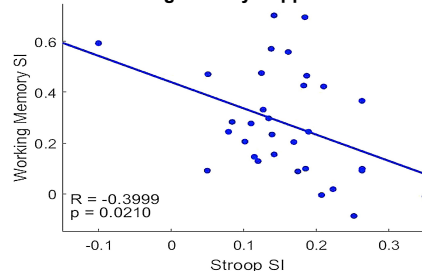
3-Back Working Memory Task



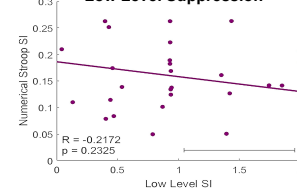
Motion Discrimination Task



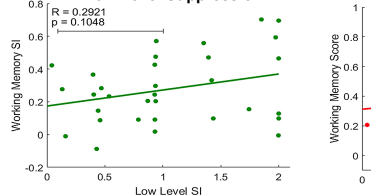
Stroop Suppression vs Working Memory Suppression



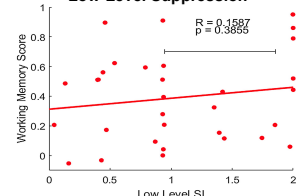
Stroop Suppression vs Low Level Suppression



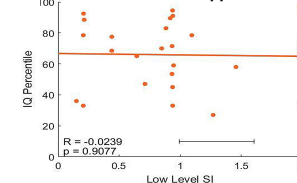
Working Memory Suppression vs. Low Level Suppression



Working Memory Score vs Low-Level Suppression



IQ vs Low-Level Suppression



Acknowledgements:

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Conclusion: No significant correlations between the participants' low-level suppression and their higher-level cognitive abilities were found. A correlation between the two higher level suppression indices was shown, which is indicative of a possible common mechanism for higher level suppression.

Discussion: The previously found correlation between low level suppression and intelligence may be less robust than previously found. Low level suppression also does not appear to correlate with other higher level suppression abilities or working memory. Alternatively, variability from lack of sleep after practice on the low level may have obscured any existing correlation. A correlation between suppression indices from working memory and numerical Stroop may suggest a common mechanism for higher level suppression.