

Beyond Dichotomies: the Semantic Gradient in a Picture-Word Stroop Task

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In the verbal Stroop Task, the interference induced by irrelevant information was observed to have a graded impact on the Stroop Effect, dependent on the strength of semantic relationships between relevant and irrelevant stimulus dimensions (i.e., Semantic Gradient). While some studies have shown the predictive power of continuous similarity measures at the item level, others have oversimplified semantic processes neglecting their continuous nature. Typically, this involves dichotomizing semantic similarity by merely contrasting weakly related words with strongly related ones or manipulating membership within a semantic category. However, to fully understand the graded impact of conflicting semantic information, it is crucial to employ continuous measures of semantic similarity. To address this gap, we used text-based distributional models to extract a continuous measure of semantic similarity between concepts and explored its effect on vocal response latencies in a Picture-Word Stroop Task, where participants name pictures while ignoring the superimposed words. Remarkably, our preliminary findings unveiled a negative linear effect of continuous semantic similarity on naming performance, even after controlling for orthographic and association similarities as well as other low-level confounders at both the word and picture levels. Understanding this gradient of interference through continuous measures, while controlling for other variables, can enhance our comprehension of linguistic mechanisms and shape the development of more precise theoretical frameworks, depicting word meanings as distributed representations within a continuous mental space.

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