Color Me Surprised:
Stimulus-Specific Differences in Stroop Interference

The Stroop Effect is the decreased accuracy and increased response times observed when participants are asked to indicate the printed color of a word that is itself a conflicting or incongruous color-word (respond "blue" to RED printed in blue), compared to color-naming of congruous words or control stimuli (BLUE or XXXX respectively, both printed in blue). Congruous trials (matching word colors and word meanings) typically show facilitation in accuracy and response times. Since the original report of the color-word interference (Stroop, 1935), the effect has been studied thousands of times but has never been explained adequately (MacLeod, 1992). One challenge in explaining Stroop effects is that, although interference from incongruous stimuli is highly robust, the magnitude of that interference seems quite variable. For example, previous research in our laboratory shows that individual performance on the Stroop task does not correlate with performance on other Stroop-like tasks. The purpose of the current study was to investigate the stimulus-specific effects that modulate interference. We recruited students to participate in the classic Stroop color-word task and two functionally similar Stroop-like tasks: a task requiring numerical judgments about arrays of congruous or incongruous Arabic numerals, and a task requiring spatial judgments about stimuli that are congruous or incongruous spatial words. Our sample was representative of the Georgia State University student population. Replicating many earlier reports, we observed significant differences in response times and accuracy for incongruent trials and congruent trials across tasks. However a new result was also obtained, as preliminary analyses of these data indicate different degrees of interference as a function of the specific stimuli. For example, there are significant differences in response time between the words RED and YELLOW when both were presented in blue (and thus required a "blue" response). Similarly, response times were significantly faster on incongruous Numerical Stroop trials in which the difference between the stimuli was relative large (5 vs 1) than small (3 vs 2). Such effects are not directly predicted by many common Stroop explanations, and may elucidate the reason for the modest intercorrelations among Stroop-like tasks.

Keywords: Cognitive Psychology, Executive Attention, Stroop Effect, Color-Word Interference, Response Time, Accuracy, Incongruous Stimuli Differences.

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