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EFFECTS OF STIMULUS PLACEMENT, SIZE, AND SIMILARITY ON RESPONSE COMPETITION

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Selective attention occurs when a person limits processing to only some of the perceptually available information. This is contrasted with automaticity in which processing occurs without direct conscious control. A failure of selective attention can occur when subjects are asked to attend to one characteristic of a set of stimuli, but other characteristics of the set are nevertheless automatically processed. When automatic processing activates a response tendency that is in opposition to the correct response this is called response competition. Response competition may appear as an increase in both reaction times (RT) and intrusion errors, namely those of the competing response. The best example of this is the Stroop effect in which subjects have difficulty naming the color of ink used to print a different color name (e.g. blue ink spelling the word red). The spelled word's name competes with the color naming, resulting in a marked increase in RT and errors. Several studies have indicated that similar effects may be obtained with color-associated words, such as grass and sky, typeface variants, and digit counting.

Two general theories of attention have tried to explain response competition effects. First, some theories have claimed that attention is focused on tasks in an all-or-none fashion. Other theories have argued that attentional processing can vary or be graded in strength. The present study tried to vary the strength of response competition using a digit counting task. In digit counting, the subject's task is to name the number of digits when the digits themselves may be different than the correct answer (e.g., counting three 9's).

This study attempted to answer a number of specific questions about the nature of response competition. (1) Does the placement of correct digits within a set of non-correct digits affect RT for counting set size, and if so, what placement will maximize this effect? (2) Does the proportion of correct digits in a set cause a proportional decrease in RT of set size counting? (3) Is there a proportional increase in RT with increases in set size? (4) As the similarity increases between the digits which make up the set and the set size itself, will the RT for set size counting change?

Results of the present study are compared to previous studies of response competition and to the two competing general theories of attention.