# Balancing processing efficiency and optimized discrimination in visual perception.

It is our hypothesis that increased efficiency of visual processing with increased workload comes at the cost of degraded discrimination of visual events. To test this hypothesis, a series of innovative experiments are planned, where at times a single line is presented, and at other times two lines are presented simultaneously at different locations. The participant's task is to press a button when one or two lines are presented, but otherwise withhold responding. In providing two as compared with one line the workload on the perceptual processing system is increased and, so, by comparing response times to single lines with those when two lines are presented together, workload capacity can be assessed.

Furthermore, the brightness of the lines may be manipulated systematically, because it is known that reaction time is shorter for brighter than dim stimuli. This allows for the determination of our ability to differentiate (discriminate) lines from the constant background illumination. Of particular interest is that people tend to over-or underestimate the magnitude of one visual stimulus in comparison to another, and this tendency is known to depend on the relative position and brightness of the stimuli. Furthermore, it is believed that these systematic asymmetries arise as a result of mechanisms that maximize our ability to discriminate between stimulus magnitudes. Comparison of the reaction times to one line, as compared to two lines can therefore provide a physical measure of perceptual processing capacity, and by systematic manipulation of the brightness of the lines clues may also be obtained concerning the discrimination optimization of visual magnitude, which may take longer. In this way, this project aims to provide new knowledge about how the human brain weighs perceptual processing capacity against optimized discrimination.

For further information about this project contact

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