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Understanding Occlusion Inhibition: A Study of the Visual Processing of Superimposed Figures

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This dissertation has been moved to the following series:

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Abstract

This study investigates a phenomenon that I have termed occlusion inhibition. This research and a small number of earlier studies suggest that, in some experimental conditions, when an attended (target) object is partially occluded by a distractor object, there is less attention allocated to the occluded region of the target object than to the visible parts of that object. In the literature, there are mixed results concerning this attentional effect. Some studies find it and others do not. This study investigates the differences between those conflicting studies with the goal of identifying the factor or factors that govern when occlusion inhibition occurs. Evidence is presented to rule out a number of potentially relevant factors such as depth perception, figural complexity, set size, the use of real world vs. abstract geometric objects, the position of occlusion, the number of overlaps in the display, and the adoption of the attend-object paradigm over the spatial cueing paradigm. After all these factors are ruled out, Experiments 3 and 4 provide evidence for a factor that does determine whether occlusion inhibition occurs or not. These two experiments differ only in the fact that participants are required to report the border color of the target object in Experiment 3 and not in Experiment 4. This task was designed to ensure that participants fully attend to the target object. Occlusion inhibition occurs when the target color is reported, but not when no target color report is required. Removing the target reporting task was found to be an effective means of turning occlusion inhibition on and off. The results of these experiments suggest that, if occlusion inhibition is to take place, attentional selection of overlapping figures requires the target object to be fully processed. This conclusion in turn suggests that attention does not automatically exclude the irrelevant portions of occluded objects, but that attention selects the entire location of the object and then, through reiterative feedback mechanisms, fine tunes the information to inhibit areas that do not belong to the object.