

The Effects of Stimulus and Response Mappings on Identification Performance in Complex Environments

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Complex tasks in the world ranging across fields such as aviation, military and healthcare require operators to develop highly skilled and automatic levels of performance in response to critical stimuli in the environment. This research extends the findings from the dual-process theory of automaticity by considering two aspects that are common in realistic search-and-respond tasks: the consistency of responding and the conjunction of cues. Results revealed that inconsistent mapping of responses disrupted performance, and that the more variably responses are mapped, the worse is the effect on detection time. In addition, results showed that the mapping of each of the cues that confirm a target had an effect on the development of automatic behavior. When all the cues that defined a target were variably mapped, performance deteriorated, compared to situations in which at least one of the cues was consistently mapped. Potential implications for design and training of complex systems are discussed.