CROSSMODAL CONGRUENCY BENEFITS FOR TACTILE AND VISUAL SIGNALING

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ABSTRACT:

Using our purpose-developed prototype tactile display we conducted an experiment in which tactile messages were created based on five US Army arm and hand signals for the commands: “Attention”, “Halt”, “Rally”, “Move Out”, and “Nuclear Biological or Chemical event (NBC)”. We compared response times and accuracy rates of novice individuals responding to visual and tactile representations of these messages, displayed either alone or in congruent or incongruent combinations. Analyses were conducted on trials where tactile and visual signals messages were presented either individually or concurrently. Results indicated beneficial effects for concurrent, congruent message presentations with both modalities showing a superior response time when compared to individual presentations in either modality. Accuracy also improved when both the tactile and visual presentation were given concurrently as opposed to separately. These results confirm the promise for tactile messages to augment visual messaging in challenging and stressful environments where visual messaging may be preferred but may not always be possible.

KEYWORDS: Tactile displays, crossmodal effects, multimodal displays, tactile signaling

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