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# The effect of contextual cues on goal-directed reaches to visual and somatosensory targets

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## Abstract

When reaching for an object on a crowded table, visual information about the position of other objects must be factored into the movement plan. Previous studies have found that movements to visual targets were more accurate when non-target visual information (e.g. contextual cues) were present in the reaching environment compared to when reaching in a dark environment. Although visual contextual cues play a role in movement planning to visual targets, it is unknown if this information is also used when planning movements to somatosensory targets (e.g., body positions). The goal of this study is to determine if the presence of visual contextual cues influences movements to somatosensory targets. Ten neurologically-healthy participants performed upper limb reaches to unseen somatosensory targets (e.g., fingers on the non reaching hand) and seen visual targets. Participants performed movements to both target modalities with and without contextual cues. To assess the impact of contextual information, radial error, angular error and temporal kinematic variables (e.g. time to peak velocity) were computed. Results indicated that the presence of contextual cues did not influence radial error when reaching to somatosensory targets. Movements to somatosensory targets also had a higher time to peak velocity than movements to visual targets indicating that planning processes differed between target modalities. These results provide evidence that contextual information may be less relevant when reaching to somatosensory versus visual targets. Thus the findings of this study argue that environmental sensory information may be weighted differently depending on the task and sensory conditions.

**Keywords:** Reaching, somatosensory, visual, multisensory integration.

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