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Spatial visuo-motor compatibility with an orthogonal stimulus-response arrangement

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Eight subjects responded as quickly as possible with either the index or the middle finger of one hand to a bicolour light emitting diode according to whether it was red or green. The stimuli appeared randomly 5 deg to the left or right of fixation; their position was irrelevant for the subject's task but essential for data analysis. The response keys were oriented (i) right and left, parallel to the stimuli; or orthogonal to the stimuli in either (ii) the horizontal or (iii) the vertical midsaggital plane. Spatial compatibility effects of similar magnitude were found in each condition. In (i), responses were 54 ms faster when the stimulus and the responding finger were on the same side. Rotating the hands had virtually no effect: the finger that had previously responded more rapidly continued to have an advantage. This supports a spatioanatomical mapping hypothesis (eg the index finger of the right hand is mapped as spatially left irrespective of hand orientation). However, in a fourth condition, with response keys as in (ii) but inverted (subjects responding with the palm upward), the spatioanatomical stimuius/finger relationship was reversed, as if inverting the hand had caused its 'sidedness' to reverse, suggesting a modified mapping hypothesis.