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Spatial stimulus-response (S-R) compatibility under head tilt: evidence for a factorial model

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Choice reaction times are shorter when the spatial positions (left, right) of the stimulus (S) and the response (R) are the same than when they are different. We investigated how this S-R compatibility is affected by head tilt, that is, when egocentric and environmental frames of reference are dissociated. Subjects responded with their right or left index finger to a light presented 10 deg to the right or left of a fixation point. In alternating blocks of trials responses were made on the same side as the stimulus or on the opposite side. In experiment 1 hands were held normally; in experiment 2 they were crossed. Three conditions were tested: (i) upright head position; (ii) head tilted 90° to the right; and (iii) head tilted 90° to the left. A spatial compatibility effect was obtained for all conditions in experiment 1 and for the head-upright condition of experiment 2. In the head-tilted conditions of experiment 2 the spatial compatibility effect significantly decreased but did not reverse. The data indicate that, under head tilt, stimuli are coded within the environmental frame of reference. For crossed hands, head tilt may weaken the factor of spatial coding and strengthen that of anatomical hand mapping. These findings, together with recent results for orthogonal S-R arrangements, favour a factorial model that modifies the coding hypothesis of spatial S - R compatibility.