

The effect of cognitive strategy and working memory on haptic exploration of relief
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A recent psychophysical study (1) found that performance on a haptic spatial matching task improved with delay between stimulus exploration and response. In our haptic matching-to-sample delay task we introduced two cognitive strategies, a verbal and a haptic one, to control the way in which subjects remembered the orientations during the delay. We hypothesized that subjects would reproduce an orientation more accurately when the orientation was remembered verbally rather than haptically.

Seven volunteers (1 male, 1 left-handed) participated in the present study. Blindfolded subjects explored with their left hand the orientation of a relief on a reference turntable. During a delay of 0.5, 3, 6 or 9 seconds, six different orientations (0°, 30°, 60°, 90°, 120° and 150°) had to be remembered using a verbal or haptic strategy. After the delay a test turntable had to be oriented with the right hand in such a way that the relief became parallel to that of the left turntable. To obtain control values, each subject performed several additional tasks. Cognitive strategy and length of the delay had no significant effect on the accuracy of the reproduction. The orientation of the relief, however, did. The 60° orientation was significantly less well reproduced than the other orientations. Supplementary tasks performed before and after the matching-to-sample task, showed that a vertical orientation was reproduced more accurately than a horizontal orientation. Subjects showed a clockwise deviation using their right hand, and a counter-clockwise deviation using their left hand. Furthermore, subjects performed better before than after the task. When subjects were asked to indicate the orientation they thought they had felt, it appeared that they were able to reproduce correctly the orientation they had indicated. However, what they thought to have felt, deviated significantly from the real stimulus-orientation.

(1) Zuidhoek, S. et al.(2003) Exp. Brain Res. 149: 320-330

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