

Walter H. Ehrenstein, Gabriele Heister and Peter Schroeder-Heister:
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Spatial visuomotor compatibility as a function of retinal eccentricity

W H Ehrenstein, G Heister ¶, P Schroeder-Heister # (Institut für Arbeitsphysiologie,
Universität Dortmund, Ardeystrasse 67, D-4600 Dortmund 1, FRG; ¶ Abteilung
Neurophysiologie, Universitätsspital Zürich, CH-8091 Zürich, Switzerland; # Fachgruppe
Philosophie, Universität Konstanz, D-7750 Konstanz, FRG)

Reaction times of choice responses depend on the spatial relationship between stimulus (S) and response (R), eg left-left (compatible) S-R pairing tends to be faster than left-right (incompatible) ones. It has been proposed that the stage at which these spatial S - R compatibility effects are generated is that of response selection rather than that of stimulus encoding. To test this proposal we varied the location of a stimulus light. Twelve subjects responded with their left or right index finger to a small light, presented left or right of a fixation point, at one of six eccentricities: 0.5, 2.5, 5, 10, 20, or 40 deg. There was a clear dependence of response time on strength of S-R compatibility. The compatibility effect (incompatible reaction time minus compatible reaction time) was 29.5 ms at 0.5 deg, increased linearly to 43 ms at 10 deg, and decreased again at higher eccentricities to 33 ms at 40 deg, resulting in an inverted U-shaped (quadratic) function for eccentricities between 2.5 and 40 deg. The results provide evidence that the perceptual stage of stimulus encoding may determine spatial S-R compatibility to a large extent, and may thus interact with that of response selection.