

DISCRIMINATION OF SHIFTED CENTERS OF MOTION IN COMPLEX STIMULI ((S.A. Beardsley, C.W.G. Clifford, L.M. Vaina)) Boston University, Dept. of Biomedical Engineering, Brain and Vision Research Laboratory, Boston MA.

Purpose. Neurophysiological results in primates indicate that neurons in MSTd exhibit a non-homogeneous distribution of preferred responses to complex motion stimuli which is biased toward expanding stimuli (Graziano et al 1994). Here we examine psychophysically whether complex motion processing reflects this inhomogeneity by testing the discriminability of shifts in the center of motion (COM) as a function of the complex stimulus. **Methods.** Complex motion stimuli were represented by constant density coherent random dot kinematograms presented in a 12° aperture for 440±40 ms. Experimental stimuli corresponding to radial, rotational, and spiral motion contained directional and speed information imbedded in a speed gradient. Control stimuli consisted of directional noise and speed information embedded in a speed gradient (fixed random trajectory (FRT) and random walk (RW)) or directional and speed information without a speed gradient (random speed (RS)). At two base speeds (4.7 % and 15.6 %), 3 subjects performed a central fixation 2T AFC task on interleaved pairs of complex motion patterns with COMs shifted horizontally. For each left/right pair, subjects were instructed to select the stimulus whose COM was shifted to the right. **Results.** Discrimination thresholds varied as a function of the base speed and the type of complex stimulus presented. Across stimuli, thresholds decreased for the larger base speed. For both base speeds, thresholds for radial motion were significantly lower than for rotational motion. Experimental thresholds showed no significant difference from RS control when tested at the higher base speed. At both base speeds, FRT/RW controls were significantly different from radial but not from rotational thresholds. **Conclusion.** The similarity between rotational and control thresholds suggests that for rotational motion the discrimination of shifted COMs does not make use of the directional information but is instead based primarily on the speed gradient. Conversely, the significant difference between radial and control thresholds suggests that discrimination is based primarily on the directional information and does not make significant use of the speed gradient.

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None.