Departmental Seminar

Modulation of Disparity-defined Depth Perception by the Natural Relevance of Objects

4:30 p.m. – 5:30 p.m. │June 5, 2019 (Wednesday)
Rm 813, 8/F, The Jockey Club Tower │ Centennial Campus │The University of Hong Kong

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Abstract

In two experiments, we tested whether depth perception is modulated by the natural relevance of objects. In Experiment 1, we derived random-dot stereograms (RDSs) depicting faces (upright and inverted) and curvature-matched random shapes. We measured depth discrimination thresholds when participants were judging (1) the coarse depth position of target when the signal-to-noise ratio (SNR) varied between 0% and 100% (SNR task), or (2) the fine depth differences (within 150 arcsec) between two consecutively presented targets (feature difference task). In Experiment 2, we examined fMRI responses when participants were performing the SNR task. We found that depth discrimination thresholds in both tasks differed across object types.   Further, retinotopic (V3, V3A), dorsal (V7), and ventral (V4 and FFA) regions were involved in the discrimination of object types during depth judgments, as revealed by multivoxel pattern analysis (MVPA). The findings show that behavioural and neural sensitivities to disparity-defined depth are dependent on an object's context. We suggest that depth perception might involve the integration of stereo and object recognition mechanisms, which shed light on the importance as to studying depth perception in the natural contexts and understanding the functional integration of the perceptual system.

~All are Welcome~