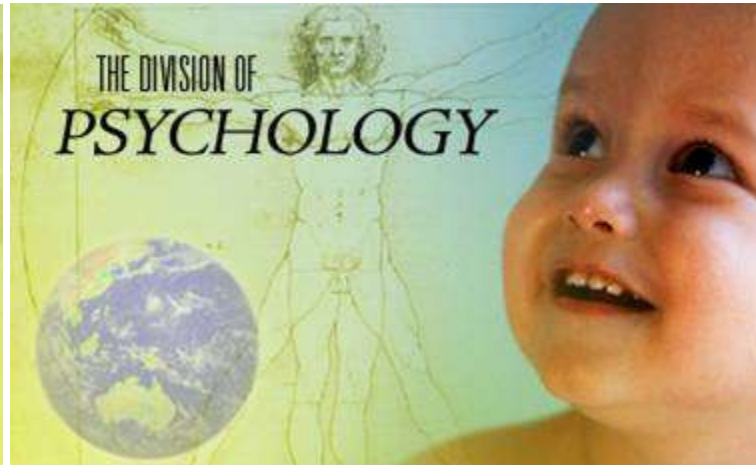


***Research
Seminar
Series***



Adaptation across cortical hierarchy:

Low-level curve adaptation affects high-level facial expression judgments

Dr. Hong Xu, Ph.D.

Columbia University, Department of Neuroscience, New York

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HSS Conference Room (S3.2-B2-42)

Abstract

Can our judgment of facial expression be biased by looking at a simple curve? Adaptation has been used to study the perceptual changes after we are exposed to a certain type of stimuli. By adapting subjects to a concave curve and test with a face on facial expression judgment (cross-adaptation), we found that subjects reported happy faces more often, namely, a neutral face seems happy after adapting to a concave curve. It is a surprising finding since nobody has studied the association between them directly, which further renders implication about the cortical hierarchical processing along the visual pathway. Moreover, we found a strong local component in face perception, which challenges the traditional holistic view of face processing (Xu et al., Journal of Neuroscience 2008). Further studies dissociating these two aftereffects suggested that the face aftereffect is not a simple inheritance of the curve

aftereffect generated by the same adapting stimuli (Xu et al. Society for Neuroscience abstract 2008). Does luminance and contrast play a significant role in the face aftereffect we observed? We studied the interaction between motion defined face by moving dots (second-order) and luminance defined (first-order) cartoon faces. Interestingly, we found that adapting to a motion defined face can bias facial expression judgment of cartoon faces, only if they are of similar backgrounds. Therefore it suggests that background statistics may play a significant role in the adaptation effect we observed in motion defined faces. In my own laboratory, we will investigate higher level cognitive functions and the effects of visual awareness and attention on face perception will be discussed. A further extension of the cross-adaptation approach to motion pathway from simple translational motion perception to heading direction judgment and its neural correlates via imaging techniques like fMRI is also a future direction in my laboratory with a large amount of projects.

Biography

Dr. Hong Xu graduated from Department of Psychology at Beijing University in 2000, and then she went to the University of Chicago, pursuing a Ph.D degree in Perception and Integrative neuroscience. She worked with Dr. David Bradley to investigate the neural correlates of heading direction perception by extracellular recording neural activities of single neurons in dorsal medial superior temporal area (MSTd) in monkeys. At the same time, to gain more theoretical training, she enrolled in the Statistics Department for a Master's degree and worked with Dr. Zhiyi Chi on developing an automatic classification model based on hidden Markov process for EEG waves recorded from sleeping birds. After obtaining her Ph.D from Chicago, she then joined Dr. Ning Qian's lab at Columbia University to study face perception and adaptation collaborating with Dr. Peter Dayan from University College London. By using adaptation in a novel way, they are able to make inferences about the hierarchical processing of visual input in the cortex.

Her research interest is to study face perception and heading perception via both psychophysical experiments and computational modeling, with further extension to functional MRI to investigate the neural substrates underlying perception and cognition. On the other hand, she is enthusiastic to teach statistical courses like mathematical statistics and data analysis, generalized linear models, multivariate data analysis for incomplete dataset and experimental design, in addition to the sensation and perception course in Psychology.

~~~~~ All Are Welcome ~~~~~