

# Oral Presentation

Lecture Hall

Saturday, 27<sup>th</sup> September 2014

13:30-13:50

## **1. Conditions under which affine representations are also Fechnerian under the power law of similarity on the Weber sensitivities**

Yung-Fong Hsu, *Department of Psychology, National Taiwan University*

In a recent paper, Hsu, Iverson, and Doble (2010) examined some properties of a (weakly balanced) affine representation for choices, showing that using the Fechner method of integrating jnds, one can reconstruct the scales in the representation from the behavior of (Weber) sensitivities  $\xi_s(x)$  in a neighborhood of  $s=0$ . In this paper we impose a power law of similarity on the sensitivities and study its impact on the affine representation. Especially, we specify the conditions for the first- and second-order derivatives of  $\xi_s(x)$  with respect to  $s$  (and evaluated at  $s=0$ ) under which the affine representation is degenerate to a Fechnerian one. We also link the results to the solutions in Iverson (2006) that were solved for the more general law of similarity within the Fechnerian framework.

13:50-14:10

## **2. Temporal characteristics of the collinear masking effect in visual search**

Li Jingling & Ching-Wen Chiu, *Graduate Institute of Neural and Cognitive Sciences, China Medical University*

A salient target is usually easier to find in visual search. However, perceptual grouping, collinearity in particular, can reverse this observation. The phenomenon, called the collinear masking effect, was observed for a search display that was filled with horizontal bars while a column of bars were vertical (the collinear column). This collinear column thus is salient and well-grouped. The task was to discriminate a small oriented bar either in the collinear column or in other columns in the background. The collinear masking effect refers to the phenomenon that discrimination was slower for a target on the collinear column comparing to that in the background. Since feature saliency affect visual search in relatively early (e.g., 40 - 70 ms) while feature conjunctions late (e.g., 150 -300ms) in information process stages, we examined the time course of the collinear masking effect in this study. With limited presentation durations (40, 70, 150, or 300 ms), different masks lead to different results. Nevertheless, the collinear masking effect was observed at the time point when the target discrimination was above chance level. Further experiment showed that if the search display was presented preceded the target, reliable collinear masking effect was obtained as early as 40 ms. Our results imply that the collinear masking effect occurred as fast as saliency was calculated, suggesting that collinear grouping interferes with visual search very early in the information processing stream.

14:10-14:30

### **3. Specialization and generalization in developing the other-race effect**

Sarina Hui-Lin Chien<sup>1</sup> & Tsung-Ren Huang<sup>2</sup> & Jing-Fong Wang<sup>1</sup>, <sup>1</sup>*Institute of Neural & Cognitive Sciences, China Medical University* & <sup>2</sup>*Department of Psychology, National Taiwan University*

It has been a longstanding debate whether perceptual development is primarily a pruning or branching process. While the developmental literature on perceptual narrowing emphasizes declined sensitivities to rarely exposed stimuli, research of perceptual learning highlights improved sensitivities to frequently exposed stimuli. By examining infants' developmental changes in processing own- and other-race faces, studies of the other-race effect provide a unique window into understanding the dominant form of experience-shaped neuroplasticity and have favored the pruning view (i.e. perceptual narrowing). However, here we reveal the branching aspect of perceptual development (i.e. perceptual learning). Using the familiarization paradigm, we investigated 4-, 6- and 9-month-old Taiwanese infants perceptual discriminability with oval-masked faces of three ethnic groups (Taiwanese, Caucasian, Philippine) and each with three levels of discrimination difficulty. Our results showed that the infants exhibited an own-race advantage at 4 months and improved rather than declined discriminability for other-race faces between 4 and 9 months. This race-generalized improvement of face recognition implies a more specialized neural representation of the facial features shared by own- and other-race faces. Our study and other studies that used unmasked faces complementarily suggest that, during perceptual development, the neural representations of familiar and unfamiliar perceptual features may compete and undergo branching and pruning processes, respectively.

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#### **4. Male observers perceived female facial parts more attractive than the whole face**

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To investigate potential differences in the use of configural and parts-based information for facial attractiveness judgment, in this study, we examined how the attractiveness rating of female facial parts (eyes, mouth and nose) and whole face would differ between male and female observers. Observers (16 males and 20 females) saw the eyes, mouth, nose and whole face of 58 Asian female facial photographs in 4 separate sessions and evaluated how attractive they were with a 7-point scale with no time constraint. The results showed that, with the present set of female photographs, the male observers evaluated the whole faces as less attractive than the female observers, while there was no difference in attractiveness evaluation for each facial part. In order to examine how the attractiveness rating for each facial part would predict the attractiveness rating for the whole faces, we performed multiple regression analyses. There was no significant difference in coefficients of each facial part between the female and male observers, indicating the female and male observers combined the information from each facial part for attractiveness rating for the whole faces in a similar way. However, there was a significant difference in the constant between male and female observers, with constantly lower attractiveness ratings made by the male observers. These findings suggested that (a) the influence from each facial part on the attractiveness judgment of the whole faces was similar between female and male observers, and (b) the attractiveness ratings for the whole faces made by male observers might be influenced by facial configuration, skin texture, etc. Although the results may be confined to the present set of photographs and observers, the present findings imply the possible gender difference in contribution of configural and parts-based information to facial attractiveness judgments.

14:50-15:10

#### **5. Order Effect and Time Varying Category**

The main purpose of this study is to examine how people learn time-varying categories as well as whether order effect exists in such learning. To this end, we design three types of category structures, in which the stimuli vary along trials in an ascending, descending, and quadratic trend. Also, tendency to repeat preceding category label as current response is regarded as evidence for order effect. The results show a clear order effect in these experiments. The modeling results reveal that GCM, which is modified to be sensitive to trial order and SDGCM, which relies on the similarity and dissimilarity to the exemplars for categorization, provide a good fit for all experiments. However, the rule-based model used by Navarro, Perfors, and Vong (2013), which changes the boundary trial by trial has difficulty accommodating the learning pattern in quadratic trend.