Configural Processing Consortium (CPC) 2011

Sunday, November 6, 2011

Sheraton Seattle Hotel (Willow room)

Seattle, WA

Webpage: http://www.indiana.edu/~psymodel/CPC/index.html

Contact person: Ami Eidels, Ami.Eidels@newcatsle.edu.au

Meeting's schedule:
14:00 – 14:15 Welcoming
14:15 – 15:45 Session I
15:45 – 16:30 Coffee break (not provided)
16:30 – 18:00 Session II and concluding remarks
18:00 – Dinner (not provided)

Organizing committee:
Ami Eidels, Joseph Houpt, Ruth Kimchi, Mary Peterson, Jim Pomerantz, Jim Townsend.

Participants (listed alphabetically):
Joseph Austerweil, James Bartlett, Ami Eidels, Brad Gibson, Leon Gmeindl, Robert Hawkins, Andrew Heathcote, Joseph Houpt, Kimberley Orsten, Krista Overvliet, Steve Palmer, Mary Peterson, James Pomerantz, Melissa Prince, Viktor Sarris, Anna Stupina-Crain, James Townsend, Peter van der Helm, Cheng-Ta Yang

Sponsor:
The Psychonomic Society

Learning orientation dependence of ambiguous images through feedback

Joseph L. Austerweil, Thomas L. Griffiths, and Stephen E. Palmer
Department of Psychology, University of California, Berkeley

The visual system constructs reference frames (much like coordinate axes in geometry) to encode the shapes and orientations of objects in retinal images. Object shapes are perceived as orientation-independent when their intrinsic axis implies a unique object-centered frame (e.g., "5"; Wiser 1981) but not when multiple frames are possible (e.g., "×"; Rock 1982). How do perceivers learn the difference? We find that perceivers can learn reference frames through top-down constraints provided by environmental feedback. Participants answered arithmetic problems containing perceptually ambiguous operators whose solutions are implicitly determined by the reference frame inferred for the operator (e.g., given the operator image "×" between two 5s that are oriented either aligned with or diagonal to the vertical axis of the page, they answer 25 or 10, respectively). Their solution indicates which reference frame they inferred based on the surrounding numerical configuration. We then studied people solving math problems with novel operator images and gave feedback that was consistent with either one (unambiguous) or two (ambiguous) arithmetic operations. In both online and lab experiments, people easily learned novel operators that were unambiguous (i.e., orientation-independent) but learned novel operators that were ambiguous (i.e., orientation-dependent) only when the operator had no clear intrinsic axis.

A General Recognition Theory Study of Race Adaptation

Leslie M. Blaha
Air Force Research Laboratory, Wright-Patterson AFB, Ohio

Noah H. Silbert
Center for Advanced Study of Language, University of Maryland

James T. Townsend
Department of Psychological and Brain Sciences, Indiana University

The present work focuses on adaptation to cues to the racial categories of faces. The cues of interest here are facial features and skin tone cues to African-American and Caucasian faces. We employ the General Recognition Theory framework in order to simultaneously investigate distinct perceptual and decisional adaptation effects while also analyzing possible perceptual interactions between facial features and skin tone.

Configuration as a Source of Information

Joseph Houpt, Robert Hawkins, James Townsend
Department of Psychological and Brain Sciences, Indiana University

Ami Eidels
School of Psychology, The University of Newcastle, Australia

Michael Wenger
Department of Psychology, The University of Oklahoma

In this talk, I will discuss modelling configuration as a source of information. I will do so in the context of results from an experiment that follows from the Portillo & Pomerantz studies of dot configurations. Using a modified version of their task, we replicated the configural superiority effects that they had found. We used this new task to measure workload capacity in the presence and absence of pertinent configural information. Participants were highly efficient when a configural feature could be used to determine a response and inefficient otherwise. I will discuss how these results restrict the possible models of information processing in this task and future experiments to further hone in on the appropriate model.

Configural processing and Gestalt formation in haptic perception

Krista Overvliet, Ralf Krampe & Johan Wagemans
Laboratory of Experimental Psychology, University of Leuven (K.U. Leuven), Belgium

In this presentation I will discuss the importance of investigating configural processing in other sensory modalities than vision, for instance, in the haptic modality. Quite a few differences exist between the visual and haptic modality. First, regarding the sensors: two retinae that are in a fixed position relative to each other for visual perception as opposed to two hands with five individually movable finger pads in haptics. Second, the way in which an object is explored is quite different: in vision one samples huge parts of the visual world in short snapshots (spatially extended, temporally limited samples), but in haptics spatial information is limited (e.g., the small bit of the world at your fingertip) and has to be gathered and integrated over time, in a serial manner. The work we do in haptics aims to answer the question whether Gestalt formation takes place in similar ways across modalities. If it takes place in a similar way in haptics as it does in vision, the origin of the Gestalt principles will be in the external world itself (or in the kinds of functions we perform in everyday interactions with it) and not a product of the nature of the proximal information at the senses. I will present some ideas and questions concerning this topic.

A Bayesian Model of Context Effects Reveals a New Ground Cue

Mary Peterson, University of Arizona

Using State-Trace Analysis to Identifying Featural and Configural Dimensions

Melissa Prince & Andrew Heathcote
School of Psychology, The University of Newcastle, Australia

Experimental psychologists have had a longstanding interest in determining how and why the perception and memory for faces is "special". The effects of inversion are central to understanding and testing this "special" status of faces. It has been proposed that upright faces can be encoded in terms of their constituent features (i.e., a featural dimension) and in terms of the configuration of those features (i.e., a configural dimension) whereas non-face stimuli and inverted faces can only be encoded on the featural dimension. Typically the existence of separate featural and configural dimensions is provided by a dissociation quantified by an interaction test comparing the decrement in performance caused by inversion for faces and for non-face stimuli. However, such dissociation logic has repeatedly been shown to be flawed for bounded response measures (e.g., accuracy) due to confounding floor and ceiling effects. State-Trace analysis (Bamber, 1979) offers an alternate graphical approach, which makes only ordinal assumptions and therefore avoids the problems that plague traditional dissociation methods. We will illustrate the use of state-trace analysis using data from a series of experiments that aimed to determine whether multi-dimensional face encoding only occurred when the face was retrieved from memory.

Comparative Gestalt psychophysics: the case of transposition

Viktor Sarris
Institute of Psychology, Frankfurt University

Transpositon (TP), a key-concept of Gestalt theory, is a basic type of perceptual transfer. In earlier TP investigations on the infant chicken´s relational choice behavior, the role of a context-dependent test-series change was studied in the light of Gestalt psychophysics (Sarris 2006; Hauf et al. 2008). In more recent follow-up work, with the use of a very hard successive/within-design task for infant chickens, the theoretical implications of the respective ("noisy") findings were discussed anew (Sarris et al. 2010; cf. also Wright et al. 2010). In my talk I shall raise some critical methodological and theoretical issues concerning the "Gestalt" approach of the past and suggest a couple of intriguing questions for the future of research in comparative relational psychophysics (e.g., Kourtzi 2009, Sarris 2010, Wagemans 2011).

On evolutionary rationales for vision models

Peter A. van der Helm
Radboud University Nijmegen

It is tempting to sustain vision models by rationales promoting the evolutionary survival value of incorporated mechanisms and resulting effects. Such rationales often presuppose that the evolution involves a gradual tuning to the environment, yielding a visual system comprising many special-purpose mechanisms. In this talk, I argue that the Gestalt motto that "the whole is something else than the sum of its parts" rather suggests that the evolution yielded, by trial and error, a visual system comprising a few general-purpose mechanisms. Such a mechanism reflects an evolutionary package deal: it has both advantages and disavantages, but as a whole, it yields sufficient survival value. I exemplify this by theoretical and empirical findings, particularly in symmetry perception, which suggest that species tune their environment to their visual system rather than the other way around.