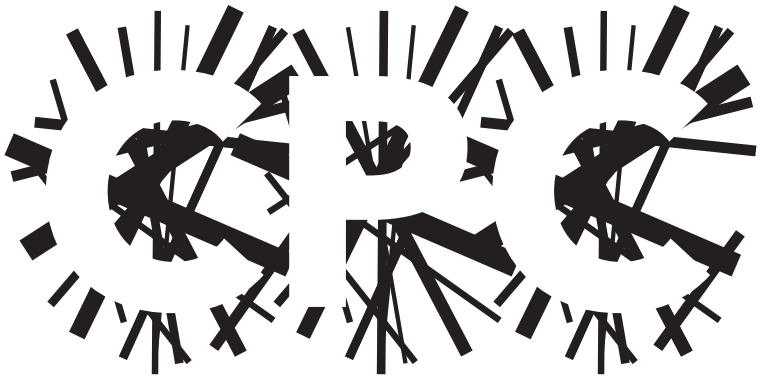
HYATT REGENCY NEW ORLEANS

New Orleans, Louisiana, USA



2018

Configural Processing Consortium

www.configural.org

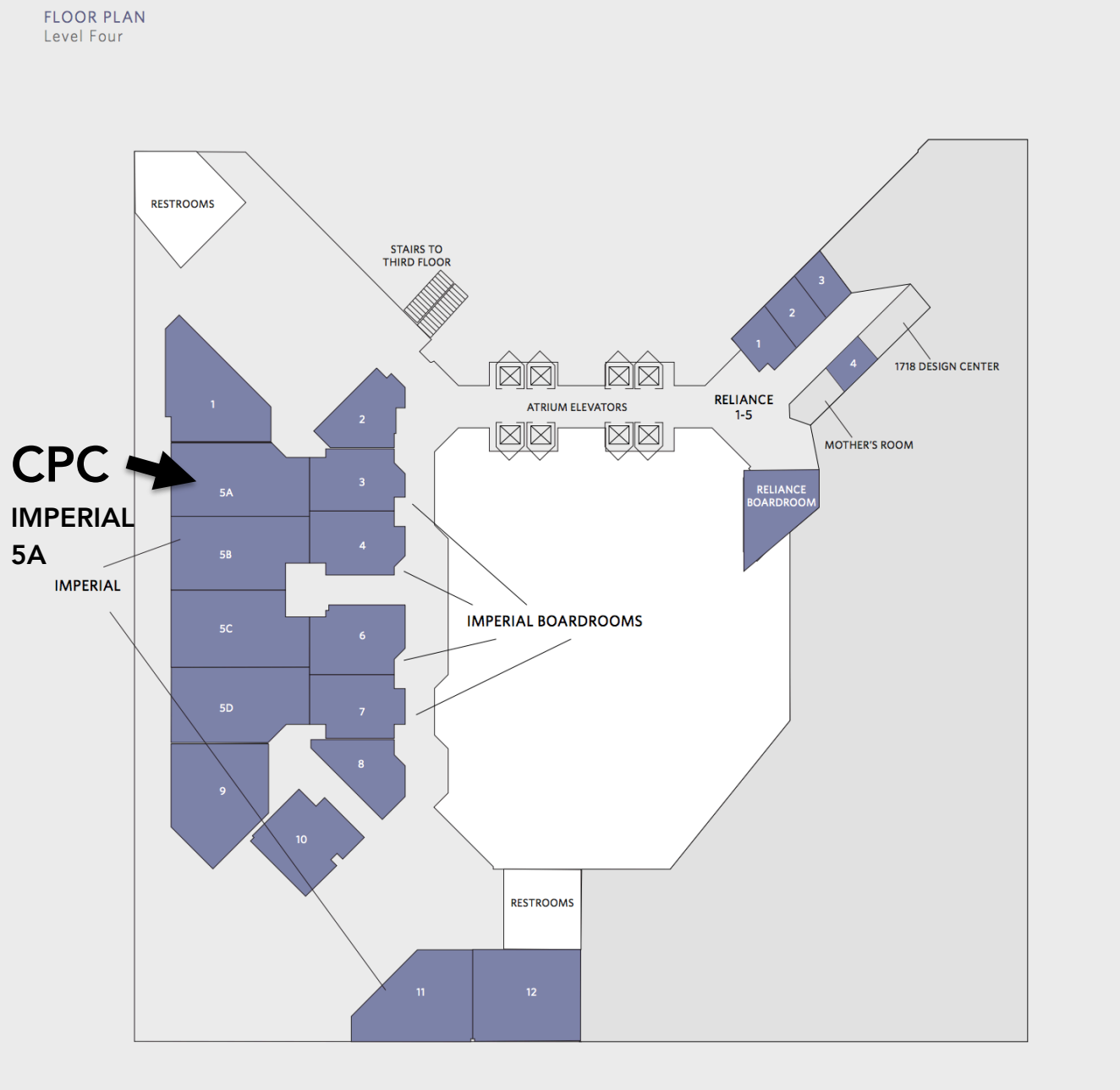
Wednesday, November 14, 2018

8:30am – 4:45pm

Room Imperial 5A

4th floor

HYATT REGENCY NEW ORLEANS
4TH floor



Meeting Overview

MORNING

8:30 – 8:55 Arrival

Coffee and tea

8:55 – 9:00 Opening Remarks

9:00 – 9:55 Keynote I: Cathleen Moore

What you see is what you parse and what you don't you don't: Some consequences of perceptual organization in dynamic vision

9:55 – 10:00 Brief break

10:00 – 11:00 SESSION I

10:00 Mental representation of familiar and unfamiliar numerals

Murray Bennett, Paul Garrett, Cheng Ta Yang, and Ami Eidels

10:20 Mechanisms of Motion-Based Figure-Ground Segregation

Duje Tadin, Woon Ju Park, Kevin C. Dieter, Michael Melnick, Joseph S. Lappin, and Randolph Blake

10:40 Semantic Priming of Figure-Assignment: Unmasked Primes, Masked Primes, and Task Set Effects

Mary A. Peterson and Rachel Skocypec

11:00 – 11:10 BREAK

11:10 – 12:10 SESSION II

11:10 Linking general recognition theory and observer models to study representational separability and configurality

Fabian A. Soto

11:30 Studying the Configural Dimensions of Rectangles with the Unified Attack of SFT + RTGRT

James T. Townsend, Yanjun Liu, Ru Zhang and Michael J. Wenger

11:50 Systems factorial technology provides new insights on the other-race effect

Mario Fific, Cheng-Ta Yang, and Daniel Little

12:10 – 2:00 LUNCH BREAK

AFTERNOON

2:00 – 2:55 Keynote II: Julie Markant

Emergent effects of selective attention and perceptual learning interactions during infancy

2:55 – 3:00 Brief break

3:00 – 3:40 Session III

3:00 Configural processing: Is visual awareness necessary?

Ruth Kimchi, Dina Devyatko, and Shahar Sabary

3:20 Are there multiple mechanistic pathways to holistic processing?

Kim M. Curby, Denise Moerel, and Mengjie Huang

3:40 – 4:00 General Discussion

4:00 – 4:45 Business Meeting

6:30 Dinner at Carmo
527 Julia Street
New Orleans, Louisiana
www.cafecarmo.com

CPC 2018 Meeting Information

ABOUT CPC

The Configural Processing Consortium (CPC) is an annual workshop bringing together researchers in the field of configurality research. We aim to tackle deep issues underpinning perceptual organization, cognition, and action as well as the most cutting edge theoretical and experimental research on configural topics. Although vision typically dominates, our interests include all modalities. Each year, we seek to both define the major problems underlying the field of configural processing and to develop more unified ways of approaching these problems.

CPC ORGANIZING COMMITTEE

Mary Peterson University of Arizona, *CPC President*
Julie Markant Tulane University, *Local Host*
Karen Schloss University of Wisconsin–Madison, *Secretary*
Ami Eidels University of Newcastle
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Ruth Kimchi University of Haifa
James Townsend Indiana University Bloomington
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CPC is grateful for generous support from the Psychonomic Society and Tulane University, as well as the University of Arizona, Rice University, and the Wisconsin Institute for Discovery at the University of Wisconsin–Madison.

Abstracts

KEYNOTE I

What you see is what you parse and what you don't you don't: Some consequences of perceptual organization in dynamic vision

Cathleen Moore
Psychological and Brain Sciences, University of Iowa

Processes of perceptual organization, such as those that result in phenomena like grouping, surface completion, and figure-ground assignment, have been a central focus in vision research from the very beginning of its time as a field of study. One reason for this focus—besides the appeal of the phenomenology—is that perceptual organization is considered foundational; it parses the retinal image into the building blocks out of which more complex visual representations are built. Research has naturally focused on understanding the rules of organization, such as "similarly colored items tend to be grouped together", "aligned discontinuous edges tend to be represented as continuous" and so on. In this talk, I will consider some of the functional consequences of perceptual organization in visual processing as it unfolds over time. Specifically, I will suggest that perceptual organization serves to establish temporary representations that determine how later sampled visual information is integrated (or is not integrated) within existing representations of the visual world, and how this in turn determines what we see and what we do not see.

KEYNOTE II

Emergent effects of selective attention and perceptual learning interactions during infancy

Julie Markant
Psychology, Tulane University

Infants visually explore the world around them to gather information about their environment. This visual attention in turn affects the information that infants internalize and remember. Previously learned information can also subsequently bias infants' attention in favor of familiar stimuli. In this talk I will present research demonstrating that selective attention and learning are functionally coupled early in development. I will present results that show that 1) selective attention engagement promotes more effective learning, and 2) previously learned information influences subsequent attention orienting. I will also discuss the implications of this coupling for the development of face processing. Specifically, I will discuss I-MAP, the Interactive Model of Attention and Perception, to illustrate how bidirectional attention – perceptual learning interactions may support the development of increasingly mature face processing, including holistic face processing and the emergence of face processing biases such as the other-race effect. Finally, I will present preliminary results from a study examining 5- and 11-month-old infants' bottom-up orienting to own- and other-race faces to highlight the utility of this model.

SESSION I

Mental representation of familiar and unfamiliar numerals

Murray Bennett[1], Paul Garrett[1], Cheng Ta Yang[2], and Ami Eidels[1]
[1]University of Newcastle, Australia, [2]National Cheng Kung University, Taiwan

The ability to assess and express quantities is important to many aspects of everyday life (Dehaene, 2011). We express quantities via numbers, using a remarkably small set of only ten basic units – digits. Confusing digits could be costly, and not all confusions are equal; confusing a price tag of 2 dollars with 9 dollars (or 2 million vs 9 million, for a more dramatic effect), is naturally more costly than confusing 2 with 3. To some extent, we are 'better off' confusing 2 with 3, 3 with 4 etc, than we are to confuse 2 with 9 or 1 with 8. Confusion patterns are intimately related to the distances between mental representations, which are hypothetical internal symbols said to stand for, or represent, 'real' external stimuli. The distance between the mental representations of two digits could be determined by their numerical distance. Alternatively, it could be driven by other kinds of similarity, based on visual properties. We investigated the mental representations of familiar and unfamiliar numerals (4 sets: Arabic, Chinese, Thai, and non-symbolic dots) in a set of identification experiments, using Multi Dimensional Scaling and Cluster Analysis. We control for undesired effects of response bias using Luce's choice model.

Mechanisms of Motion-Based Figure-Ground Segregation

Duje Tadin[1], Woon Ju Park[2], Kevin C. Dieter[1], Michael Melnick[1], Joseph S. Lappin[3], and Randolph Blake[3]
[1]Brain & Cognitive Sciences, University of Rochester, [2]Psychology, University of Washington, [3]Psychology, Vanderbilt University

Segregation of objects from their backgrounds is a fundamental visual function and one that is particularly effective when objects are in motion. Theoretically, suppressive center-surround mechanisms are well suited for accomplishing motion segregation. This longstanding hypothesis, however, has received limited empirical support. We report converging correlational and causal evidence that spatial suppression of background motion signals is critical for rapid segmentation of moving objects. Motion segregation ability was strongly predicted by both individual and stimulus-driven variations in spatial suppression strength. Moreover, aging-related superiority in perceiving background motion was associated with profound impairments in motion segregation. This segregation deficit was alleviated via perceptual learning, but only when motion segregation training also caused decreased sensitivity to background motion. Thus, the same center-surround mechanism produces both perceptual insensitivity to motions of large patterns and perceptual segregation of moving objects.

Semantic Priming of Figure-Assignment: Unmasked Primes, Masked Primes, and Task Set Effects

Mary A. Peterson and Rachel Skocypec
Psychology and Cognitive Science, University of Arizona

Past experience with objects is a prior for figure assignment: Figures are more likely to be perceived on the side of a border where a familiar configuration lies. Moreover, both the shape and the semantics of familiar objects suggested along a border are activated even when the figure is assigned on the other side. Can

semantic expectations produced by a word prime affect figure assignment? Subjects viewed test displays that suggested a familiar object on one side of a central border and a novel object on the opposite side. Before the test displays, either the basic level (BL) name of the familiar object or the name of an object from a different category (natural/artificial; DC) appeared. The prime word was unmasked in Exp.1 and masked in Exps. 2–4. In Exp. 1 subjects were aware of the prime and reported its semantic category (natural or artificial) before the test display. Semantic priming effects were observed: the figure was perceived on the familiar side of the central border more often after BL than DC primes. For masked words, however, specific effects of the prime (e.g., BL > DC) were unreliable at the same prime-target SOA and could be affected by task set. At longer SOAs, non-specific effects of masked primes emerged: familiar configurations were perceived as figures more often on primed than unprimed trials, but BL = DC. These results suggest that category-level primes can aid figure assignment, but task set and SOA determine (a) whether priming effects are observed and (b) if they are, whether effects are specific to the category of the prime. These results set a boundary condition for predictive models of perception.

SESSION II

Linking general recognition theory and observer models to study representational separability and configurality

Fabian A. Soto
Florida International University

An important issue in the study of configural processing is what kind of theory allows researchers to appropriately define configurality and develop valid ways of testing for it. General recognition theory (GRT) has been proposed as a candidate for such task, but because this theory reduces the representation of each stimulus property to a single "perceptual evidence" variable, it cannot provide insight on exactly how the representation of two or more properties is configural. Here, we propose linking GRT and two "observer models" to allow for the study of representational separability and configurality. First, we link GRT to the linear-nonlinear observer model that is the basis of classification image techniques. We define template separability as a form of separability at the level of the perceptual templates assumed by this model, and link it to perceptual separability. We show that their relation depends critically on stimulus factors, which should be taken into account when making conclusions about separability and configurality. Some, but not all existing tests of holistic and configural processing control for such stimulus factors. Second, we link GRT to an encoding-decoding observer model from computational neuroscience. We define encoding separability as a form of separability at the level of neural representations, and link it to perceptual separability. We show how tests of neural independence from the neuroimaging literature can be re-interpreted within this framework, and propose new, more valid tests. The resulting extended GRT framework facilitates the integrative study of configurality using a theoretically-coherent research approach.

Studying the Configural Dimensions of Rectangles with the Unified Attack of SFT + RTGRT

James T. Townsend[1], Yanjun Liu[1], Ru Zhang[1] & Michael J. Wenger[2]
[1]Psychological and Brain Sciences, Indiana University, [2]Psychology, University of Oklahoma

Townsend & Wenger (Townsend, J. T. & Wenger, M. J. (2015). Chapter in J. Wagemans (Ed.) On the dynamic perceptual characteristics of gestalten: Theory-based methods. The Oxford Handbook of Perceptual Organization. [PDF] propose that configural objects should evidence certain patterns of perception when

observed through the meta-theoretical lenses of General Recognition Theory (GRT) and Systems Factorial Technology (SFT). GRT is most redoubtable in uncovering gestalt-associated dependencies while SFT is most adroit in discovering attendant architecture and allied dimensions. In one of the first experimental programs to combine the individual powers of these two theory-driven methodologies, we will explore these early intriguing results.

Systems factorial technology provides new insights on the other-race effect

Mario Fific[1], Cheng-Ta Yang, and Daniel R. Little[2]
[1]Grand Valley State University, [2]School of Psychological Sciences, The University of Melbourne

The other-race effect refers to the difficulty of discriminating between faces from ethnic and racial groups other than one's own. An ample research evidence showed that Caucasian observers may find it difficult to recognize Asian faces, and similar findings have been demonstrated for Asian observers. Researchers mostly agree that a major culprit behind the other-race effect is the inability to utilize a fast holistic face perception. It is hypothesized that perception of other race faces uses a slow analytic perception of facial features. In the cross-cultural study we compared both Asian (Taiwanese) and Caucasian (US) participants' face discrimination of both own-race and other-race faces (Taiwanese and Caucasian woman), according to their nose-to-mouth separation and eye-to-eye separation. In the first part of the study, we adjusted individual participants' facial feature discriminability using psychophysical methods and created face sets so that the facial perceptual effects are constant, for both the own- and other-race faces. In the second part, we employed factorial design using the psychophysically adjusted configural facial features in a face categorization task. We applied a parametric system factorial technology (SFT) analysis of the response times and choice preferences for the full factorial stimulus set. That results of the computational modelling showed that almost all of the subjects used the parallel processing of the facial features. The Caucasian participants showed an increase in facial feature facilitation when processing their own-race faces, which is consistent with the cross-race holistic hypothesis. Interestingly, the Taiwanese showed a reverse trend, thus challenging the other-race holistic effect.

SESSION III

Configural processing: Is visual awareness necessary?

Ruth Kimchi, Dina Devyatko, and Shahar Sabary
University of Haifa

Does one need to be aware of a visual stimulus for it to be perceptually organized? Here I focus on the process of configuring that determines the appearance of grouped elements as a whole based on the interrelationships of the elements. We examined line configurations and hierarchical patterns, using a priming paradigm and two invisibility-inducing methods, CFS and sandwich masking. The primes were lines organized into configurations (collinear - based on closure, good continuation, and symmetry, or noncollinear - based on closure and symmetry alone), and hierarchical patterns. Target-prime congruency could be in global configuration or in elements. During CFS, no significant response-priming was observed for invisible primes. When masking induced invisibility, a significant configuration response-priming was found for collinear and noncollinear primes, both invisible and visible, with larger magnitude for the latter. An element response-priming of equal magnitude was evident for visible and invisible noncollinear primes. Only element response-priming was observed for invisible hierarchical patterns. Our results suggest that a) configuring of line elements can be accomplished in the absence of visual awareness when stimuli are rendered invisible by

sandwich masking; b) configuring benefits from visual awareness; c) there is sensitivity to the available grouping cues in unconscious processing; and d) organization of local shape elements into a global shape requires visual awareness.

Are there multiple mechanistic pathways to holistic processing?

Kim M. Curby, Denise Moerel, and Mengjie Huang
Macquarie University

What is the nature of the mechanisms that underlie holistic processing? Some existing accounts of holistic processing, especially with respect to holistic face processing, assume it is a unitary phenomenon. However, there is growing evidence that the same behavioral markers of holistic processing can emerge after extensive experience with other stimulus classes, prompting experience-based accounts of holistic processing. There is also evidence that such markers can be present in the absence of experience for specific types of non-face stimuli, namely those with strong perceptual grouping cues, prompting stimulus-based accounts of holistic processing. I will present a series of studies that probe whether these two apparent sources of holistic processing represent two distinct pathways, namely a stimulus-based and an experienced-based pathway, or instead whether they are overlapping pathways to holistic processing. These findings will be discussed in the context of current accounts of holistic perception of faces and objects of expertise.

NOTES