CPC 2020

Configural Processing Consortium

www.configural.org

Wednesday, November 18, 2020

9:50am – 6:00pm

all times in Eastern Standard Time (EST)

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.

2020 CPC ORGANIZING COMMITTEE

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Virtual CPC Meeting Information and Rules of Engagement

Welcome to Virtual CPC 2020! In an effort to help us feel connected as possible even though we are far apart, we have established the following format and rules of engagement for our meeting.

Main meeting (Zoom)

The main meeting will take place over Zoom. Please DO NOT post this link on social media to avoid uninvited guests. When you click the link Zoom will ask you to register with your name and email.

Contact Karen Schloss (kschloss@wisc.edu) or Joe Houpt (joseph.houpt@utsa.edu) for details.

Lunch (Congregate.Live)

Lunch will take place at Congregate.Live. Congregate.Live is a platform that will enable you to "sit" at tables to socialize, and easily move between tables. You will be able to see who is at each table before entering by hovering over each chair, and the person's name will appear. Congregate suggests using Google Chrome (does not work with Safari). When you click on the link you will be asked to sign in with your google account or create a congregate account. The Congregate link is open, so feel free to familiarize yourself with the platform before CPC next week. CPC organizers will be in the Congregate room on Tues 11/17 from 3-4pm EST in case you want to try it out when others are present (or want to come say hi!).

Contact Karen Schloss (kschloss@wisc.edu) or Joe Houpt (joseph.houpt@utsa.edu) for details.

Presentations

Presentations will be live, and speakers will display their slides by sharing their screen. Talks will be 12 minutes long, followed by a few minutes for questions, and then a transition to the next speaker.

We ask all speakers to connect on Zoom on 11/18 at the following times before their session to iron out technical issues:

Session I speakers: 9:30am-9:40am

Session II speakers: 12:25pm-12:35pm

Session III speakers: 2:45pm-2:55pm

Video and audio

If it does not create an awkward (or bandwidth) situation for you, please consider keeping your video on. This can help us all feel a little more connected to each other, and to allow our presenters to see our smiles, nodding heads, or even our furrowed brows. Of course, use your judgment if you have concerns of privacy or otherwise feel the need to mute your video. We ask that you keep your microphone muted unless you are presenting, moderating, asking a question, or making a comment in the General Discussion.

Asking questions

To ask a question during the Q&A session, please type a single question mark in the chat box. The moderator will call on people in the order the chat messages arrive and ask you to unmute yourself to pose your question.

Meeting Schedule

all times in Eastern Standard Time (EST)

MORNING

9:50 – 10:00 **Opening Remarks**

10:00 – 10:55 **Keynote I: Wilson S. Geisler**

Identification and Search in Complex Backgrounds

11:00 – 12:20 **Session I**

Moderator: Mario Fifić

11:00 Representations of Familiar and Unfamiliar Objects in Visual Long-term Memory
Patrick Garrigan

11:20 Effect of Disrupting Inter-Letter Spacing on Word Processing Efficiency
Hanshu Zhang, Joseph W. Houpt, Peter Enneson

11:40 Parametric Models of Feature Processing in Preferential Choice
Gavin Cooper, Guy Hawkins

12:00 Independent Mechanisms for Processing Local Contour Features and Global Form
Nicholas Baker, Philip Kellman

12:20 – 12:40 **Break**

12:40 – 2:00 **Session II**

Moderator: Mary Peterson

12:40 A Holey Perspective on Venn Diagrams
Anna Bartel, Kevin J. Lande, Joris Roos, Karen B. Schloss

1:00 Brain Network Mechanisms of Visual Shape Completion
Brian P. Keane, Deanna M. Barch, Ravi Mill, Steven Silverstein, Bart Krekelberg, Michael W. Cole

1:20 Measuring the Dynamics of Configural Processing
Joseph W. Lappin, Kaleb A. Lowe, Jeffrey D. Schall, Herbert H. Bell

1:40 A Continuous-Flow Model for the Eriksen-Flanker Experiment
James T. Townsend, Michael J. Wenger

2:00 – 3:00 **Lunch Break**

Contact Karen Schloss (kschloss@wisc.edu) or Joe Houpt (joseph.houpt@utsa.edu) for details

AFTERNOON

3:00 – 3:55 **Keynote II: Joseph L. Brooks**

Characterising the Dynamics of Perceptual Organisation Processes with Multivariate Pattern Analysis of EEG Data

4:00 – 5:20 **Session III**

Moderator: Ami Eidels

4:00 Constant Curvature Segments as Building Blocks of 2D Shape Representation
Philip Kellman, Nicholas Baker, Patrick Garrigan

4:20 The Inseparability of Featural and Configural Visual Processing in Dyslexia
Bahareh Jozranjbar, Árni Kristjánsson, Heida Maria Sigurdardottir

4:40 Super-Recognisers Show More Visual Exploration and Less Focus on the Eyes During Face Learning
James D. Dunn, Victoria I. Nicholls, Michael Papinutto, Victor P. L. Varela, David White, Sebastien Miellet

5:00 An Investigation of the Characteristic Properties of Cognitive Processes with Perceptually Integral Stimuli
Yanjun Liu, James Townsend, Michael Wenger, Ru Zhang

5:20 The Role of Perceptual Organization in Visual Crowding
Cathleen Moore, Nicole Jardine

5:25 – 5:45 **General Discussion**

5:45 – 6:00 **Business Meeting**

Abstracts

KEYNOTE I

Identification and Search in Complex Backgrounds

Wilson S. Geisler
University of Texas at Austin

This talk will describe evidence for a new theory of covert visual search developed within the framework of natural scene statistics and Bayesian statistical decision theory. The theory is unique in several ways: (1) it directly takes into account the statistical properties of natural background images, (2) it takes into account the variation in neural processing with retinal location (i.e., limitations of peripheral vision), (3) it is constrained by measurable properties of the stimuli and known properties of the visual system, and hence contains almost no free parameters, and (4) it includes a principled attentional mechanism that optimally allocates "efficiency gain" across the visual field in a task-dependent manner. This latter mechanism was implicated by the results of an experiment measuring covert search performance in white-noise backgrounds, where the target could appear anywhere within a large search area. In a separate experiment, target detectability (d') was measured across the visual field when the target location was cued/known. The shape of this d' map was consistent with the theory. Overall performance in the covert search task was predicted quite well from this d' map, with no free parameters, assuming parallel unlimited-capacity processing. However, paradoxically, the detection error rate was high in the foveal region even though it was predicted to be zero. We find that this "foveal neglect" or "spotlight of inattention", together with near optimal overall performance, is predicted by a mechanism that optimally allocates a fixed total amount of efficiency gain across the neural population in primary visual cortex (V1).

KEYNOTE II

Characterising the Dynamics of Perceptual Organisation Processes with Multivariate Pattern Analysis of EEG Data

Joseph L. Brooks
Keele University

A major goal in the study of visual perceptual organisation is to understand the intermediate processing that occurs between stimulation of the sensory receptors and our perceptual experience of an organised visual world. This has typically been addressed using indirect evidence from behavioural measurements, computational modelling, or physiological measures which give only a rough approximation of the time course of the neural activity related to perceptual organisation. Multivariate pattern analysis (MVPA) of EEG data has the potential to provide a more direct and high temporal resolution account of perceptual organisation processes as they unfold across time. Furthermore, there are opportunities to understand the nature of intermediate representations and their informational content. After providing an introduction to this approach, I will describe some recent results from my laboratory which show how we are using this method to address theoretical questions about mechanisms of perceptual organisation phenomena including perceptual reversals and amodal completion.

SESSION I

Representations of Familiar and Unfamiliar Objects in Visual Long-Term Memory

Patrick Garrigan
Saint Joseph's University

Long-term memory for visually-presented familiar and unfamiliar objects may differentially incorporate image-level, configural, and semantic information. Here we investigate if better visual recognition performance for familiar objects is related to parts-based shape encoding in visual long-term memory (VLTM). First, we establish that VLTM representations of unfamiliar objects are more image-like than the VLTM representation of familiar objects (Exp. 1). However, we also find no evidence that VLTM representations of familiar objects rely more on holistic shape information than the VLTM representations of unfamiliar objects (Exp. 2). Instead, we suspect that, for familiar objects, invariance to image-level changes between study and test is bolstered by conceptual encoding in addition to visual encoding. To measure whether VLTM is sensitive to "meaningfulness", we attempted to generalize results showing that meaningful verbal stimuli are more likely to be incidentally encoded in verbal LTM. If this result holds for visual stimuli, previewing familiar objects should be more likely to produce incidental VLTM representations than previewing unfamiliar objects. Using an interference paradigm, we find evidence of this effect (Exp. 3). We conclude that VLTM representations of familiar objects are less sensitive to image changes between study and test in part due to encoding of conceptual information.

Effect of Disrupting Inter-Letter Spacing on Word Processing Efficiency

Hanshu Zhang[1], Joseph W. Houpt[1], Peter Enneson[2]
[1]*University of Texas at San Antonio,* [2]*Peter Enneson Design Inc*

The word superiority effect (WSE) refers to the phenomenon that people have better recognition of letters presented within words as compared to recognition of isolated letters. Although there has been only limited research on how the spatial relations between letters in words affect the perceptual processing of the words, a significant amount of effort goes into setting the default inter-letter spacing when designing new fonts. Our current research examines the effect of manipulating letter spacing on the capacity coefficient measure of the word superiority effect. First, we tested multiple different words instead of fixed word stimuli to show that measures of efficiency can be generalized; second, we disrupted default between-letter spacing by increasing, decreasing, and randomizing letter spacing to explore the extent to which the efficiency was sustained; additionally, we used the assessment functions to add accuracy information. Our results indicate that participants are limited capacity only in the extreme spacing scenario. Additionally, the principle component (PC) analysis shows that highest PC values occur at normal spacing with degradation with increased disruption—spreading or narrowing. These results appear to confirm the configural nature of perceptual processing with normally-spaced words between identifiable tracking and kerning boundaries, and agree well with the ideas about optimal spacing of by type designers and typographers implicit in general notion of "rhythmic spacing". This work is also notable in that we demonstrate the use of assessment functions as a standardized tool for assessing the capacity benefits and efficiency of configural processing.

Parametric Models of Feature Processing in Preferential Choice

Gavin Cooper, Guy Hawkins
University of Newcastle, Australia

When choosing a product or service, consumers must consider multiple features -- such as consumer rating scores, perceived quality and price. Decision strategies in the literature vary in their complexity and the assumptions about feature processing. Some are proposed as simple heuristics, most of which assume serial or parallel processing of individual features. Others are more complex strategies which assume early integration of features in a coactive architecture. In previous work, we have classified 15 extant theories into a smaller number of classes based on each theory's assumed processing architecture and stopping rules. We then discriminated between these classes using methods from Systems Factorial Technology thereby reducing the

number of decision strategies employed by individuals. I will present our current work that extends our previous experiments to a preferential choice setting. I will also introduce a parametric model of processing architectures built using systems of evidence accumulation processes combined in such ways as to model parallel or coactive processing. The goal of the parametric model is to draw inferences about processing architecture (and the associated class of decision strategies) from lower numbers of trials.

Independent Mechanisms for Processing Local Contour Features and Global Form

Nicholas Baker[1], Philip Kellman[2]

[1]York University, [2]University of California, Los Angeles

The human visual system has a robust capability of extracting the global form of an object from a variety of local contour features that often have very little physically in common. We propose a new hypothesis about separate systems for processing high frequency local information along a contour and for encoding global information about the contour's overall shape. We propose that these two systems are independent of each other and process information very differently. While the system encoding information about an object's form represents low frequency contour variations accurately, the local system encodes only a small set of summary statistics to describe typical features of high frequency elements along the contour. In Experiments 1 and 2, we compared people's sensitivity to changes to local contour features with their sensitivity to changes in global form. We found that participants were very sensitive to changes in the global form of an object but had almost no sensitivity to changes in its local contour features. In Experiment 3, we compared participants' sensitivity to new sets of contour features with matched statistical properties with new features that differed in frequency and amplitude. Sensitivity was higher when the statistical properties of the contour changed than when new features were generated from the same distribution. We directly tested our hypothesis that local and global properties of a contour are independent features in Experiment 4 using a visual search task. Though local and global shape differences popped out on their own, integrating them together required focal attention. Taken together, these findings support the notion that separate mechanisms process local and global contour information and that the kinds of information these mechanisms encode are fundamentally different.

SESSION II

A Holey Perspective on Venn Diagrams

Anna N. Bartel[1], Kevin J. Lande[2], Joris Roos[3,4], Karen B. Schloss[1]

[1]University of Wisconsin–Madison, [2]York University, [3]University of Massachusetts Lowell, [4]University of Edinburgh

When interpreting meaning from visual features in information visualizations, observers have expectations of how visual features map onto concepts, called inferred mappings. Interpreting visualizations is easier when encoded mappings in visualizations match inferred mappings. Previous research on colormaps demonstrated that inferred mappings are governed by two key biases: dark-is-more bias (darker colors map to larger quantities) and opaque-is-more bias (more opaque regions map to larger quantities). In this study, we tested whether the inferred mappings previously observed for colormaps would extend to a different type of encoding system: Venn diagrams. Colormaps and Venn diagrams differ in the type of information they encode, colormaps encode gradations of quantity whereas, Venn diagrams encode logical statements. However, there may be an underlying commonality. In expressing logical statements, Venn diagrams encode the concept of "non-existence," which can be thought of as the extreme opposite end point of "more." Thus, if the dark-is-more bias applies to Venn diagrams, people should infer that the lightest region maps to "non-existence" and if the opaque is more bias applies, they should infer that the most translucent regions map to non-existence. At its extreme, the least opaque surface appears entirely transparent, which can be perceived as a hole. Given that holes within surfaces indicate non-existing material, we propose the hole hypothesis: people will infer that regions perceived as holes map to non-existence when interpreting Venn diagrams. Results of three experiments support the hole hypothesis, emphasizing the importance of configural processing for interpreting the meanings of visual features in information visualizations.

Brain Network Mechanisms of Visual Shape Completion

Brian P. Keane, Deanna M. Barch, Ravi Mill, Steven Silverstein, Bart Krekelberg, Michael W. Cole
University of Rochester

Visual shape completion recovers object shape, size, and number from spatially segregated edges. The process has been extensively investigated but its underlying regions, networks, and functional connections are still not well understood. To shed light on the topic, we scanned (fMRI) healthy adults during rest and during a task in which they discriminated pac-man configurations that formed or failed to form completed shapes (illusory and fragmented condition, respectively). Task activation differences (illusory-fragmented), resting-state functional connectivity, and multivariate pattern analyses were performed on the cortical surface using 360 predefined parcels and 12 functional networks composed of such parcels. Brain activity flow mapping ("ActFlow") was used to evaluate the utility of resting-state connections for shape completion. We identified 34 differentially-active parcels including a posterior temporal region, PH, whose activity was consistent across all 20 observers. Significant task regions primarily occupied the secondary visual network but also incorporated the frontoparietal, dorsal attention, default mode, and cinculo-opercular networks. Each parcel's task activation difference could be modeled via its resting-state connections to the remaining parcels ($r=.62$, $p<10-9$), suggesting that such connections also undergird shape completion. Functional connections from the dorsal attention network were key in modeling activation differences in the secondary visual network and across all remaining networks. V1 completion effects were detectable via vertex-wise MVPA. Taken together, these results suggest that shape completion relies upon a distributed but densely interconnected network coalition that is centered in the secondary visual network, orchestrated by the dorsal attention network, and inclusive of at least three other networks.

Measuring the Dynamics of Configural Processing

Joseph W. Lappin, Kaleb A. Lowe, Jeffrey D. Schall, Herbert H. Bell
Vanderbilt University

What are the temporal processes for converting sensory information into observable responses? Response times (RTs) are frequently used to investigate this question, but the results depend on how they are measured. Effects of stimulus and task variables are often measured by macroscopic descriptions of mean RTs. But microscopic descriptions of the RT probability distributions reveal characteristics of the temporal processes. Experimental effects and processes are often measured in units of time — RT means, medians, variances, quantiles, etc. Alternatively, one can measure response probabilities as functions of time, effectively treating RTs as an independent variable. When we applied this approach to several previously conducted experiments, we found new and more detailed pictures of temporal processes and how they are influenced by configurations of visual information and response tasks. I will briefly review the theoretical rationale for this methodology along with some of the new results we found in previous experiments. Our findings include (a) temporal process rates can be evaluated (in bits/s) as a function of time, (b) component processes often exert simultaneous and independent influence on process rates at any given time, and (c) we can identify the selective influence of the stimulus configuration, attentional field, and response task on temporally changing response rates.

Continuous-Flow Model for the Eriksen-Flanker Experiment

James T. Townsend[1], Michael J. Wenger[2]
[1]Indiana University, [2]University of Oklahoma

Much progress has been made in the investigation of perceptual, cognitive and action mechanisms under the assumption that when one subprocess precedes another, the first one starts and finishes before the other begins. We call such processes “Dondersian” after the Dutch physiologist who first formulated this concept. Serial systems obey this precept (e.g., Townsend,1974). However, most dynamic systems in nature do not: instead each subprocess communicates its state to its immediate successors continuously. Although the mathematics for physical systems have received extensive treatment over the last three centuries, applications to human cognitionhave been exiguous. Therefore, the pioneering papers by Charles Eriksen and colleagues on continuous flow dynamics (e.g., C. Eriksen & Schulz, 1979; Coles, Gratton, Bashore, Eriksen, & Donchin, 1985) must be viewed as truly revolutionary. Surprisingly, there has been almost no advancement on this front since. With the goal of bringing this theme back into the scientific consciousness and extending and deepening our understanding of such systems, we develop a taxonomy which emphasizes the fundamental characteristics of continuous flow dynamics. Subsequently, we complexify the treated systems in such a way as to illustrate the popular cascade model (F. G. Ashby, 1982; McClelland, 1979) and use it to simulate the classic findings of Eriksen and colleagues (C. W. Eriksen & Hoffman, 1972).

SESSION III

Constant Curvature Segments as Building Blocks of 2D Shape Representation

Philip Kellman[1], Nicholas Baker[2], Patrick Garrigan[3]
[1]University of California, Los Angeles, [2]York University, [3]St. Joseph's University

How the visual system represents shape, and how shape representations might be computed by neural mechanisms, are fundamental and unanswered questions. We report investigations of the hypothesis that two-dimensional (2D) contour shapes are encoded structurally, as sets of connected constant curvature segments. In one line of research, human observers showed better performance in a path detection paradigm for constant curvature targets, as compared with locally matched targets that lacked this global regularity. In a different paradigm, we found that participants can learn to segment contours into two constant curvature parts but not into parts with two different linearly increasing curvatures (Euler spirals). We describe the basics of a neurally plausible model of contour shape representation based on constant curvature, using higher-order detectors built from oriented units known to exist in early cortical areas. These results and modeling efforts suggest that constant curvature segments are building blocks from which abstract contour shape representations are composed. They also provide an example of how more symbolic and abstract shape representations may be derived from neural coding in earlier cortical visual processing.

The Inseparability of Featural and Configural Visual Processing in Dyslexia

Bahareh Jozranjbar, Árni Kristjánsson, Heida Maria Sigurdardottir

While dyslexia is typically described as a phonological deficit, recent evidence suggests that ventral stream regions, important for visual categorization and object recognition, are hypoactive in dyslexic readers. If dyslexic readers' problems are visual, they could be restricted to visual word processing or they might generalize to other visual categories – all or only some, as face recognition is assumed to require domain-specific mechanisms. There are two different approaches to visual recognition; featural and configural processing. Featural processing is generally assumed to be important for word recognition while configural processing is often considered the hallmark of face processing. By manipulating featural and configural information in faces and houses, we investigated whether dyslexic readers are disadvantaged at recognizing certain object classes or utilizing particular visual processing. Dyslexic readers found it harder to recognize houses than typical readers, suggesting that visual problems in dyslexia are not completely domain-specific.

Mean accuracy for faces was equivalent in the two groups, compatible with domain-specificity in face processing. However, univariate analyses of accuracy miss that even though no overall group differences were found for featural vs. configural accuracy, this does not mean that the tasks were solved using similar representations or the same underlying mechanisms. Representational similarity analysis (RSA) that provides a fuller description of the information structure revealed separability of featural and configural processing in typical readers, while dyslexic readers appeared to rely on a single process. We speculate that reading deficits in some dyslexic readers reflect their reliance on a single process for object recognition.

Super-Recognisers Show More Visual Exploration and Less Focus on the Eyes During Face Learning

James D. Dunn[1], Victoria I. Nicholls[2], Michael Papinutto[3], Victor P. L. Varela[1], David White[1], Sebastien Miellet[4]

[1]UNSW Sydney, [2]Bournemouth University, [3]University of Fribourg, [4]University of Wollongong

Individual differences in face recognition accuracy are likely to be linked to the way visual information is sampled and processed. Here we compared visual sampling of super-recognisers (SRs) – individuals that achieve the highest levels of accuracy in face recognition tasks – to typical viewers, using a novel gaze-contingent technique. Participants performed a face recognition task in which they learned and recognised novel faces while their gaze position was recorded. The face on the screen was modified in real-time to constrict the information around the gaze position at different aperture sizes. Super-recognisers displayed superior recognition accuracy for all but the smallest aperture viewing sizes. Underlying this superiority are qualitative differences in visual sampling: (i) SRs exhibited greater distribution of fixations across face images, suggesting enhanced visual exploration; (ii) SRs focussed less on the eye region; (iii) SRs produced more fixations to the central region of faces. Importantly, these differences were most apparent in the learning phase of the experiment, suggesting that the superior accuracy of SRs was founded on enhanced encoding of faces into memory. Together, our results point to a process whereby SRs construct a more robust memory trace by accumulating samples of complex visual information across successive eye movements. Because super-recognisers display superior accuracy with restricted viewing – while also showing fixation patterns that are associated with holistic processing – SR's superior performance appears to achieved by combining both local and global sources of information in memory representations.

An Investigation of the Characteristic Properties of Cognitive Processes with Perceptually Integral Stimuli

Yanjun Liu[1], James Townsend[2], Michael Wenger[3], Ru Zhang[4]

[1]Vanderbilt University, [2]Indiana University, [3]University of Oklahoma, [4]Boys Town National Research Hospital

How people process multi-dimensional objects is one of essential interests among the field of psychophysics and cognitive psychology. Previous studies showed that in the presence of different sets of dimensions, cognitive systems employed different approaches (i.e., either following a dimensionally distinctive manner or an unitary gestalt manner). In this study, we probed important underlying properties of the cognitive systems that may produce perceptual integrality, applying the sets of methods theoretically derived from general recognition theory (Townsend & Ashby, 1986) and from systems factorial technology (Townsend & Nozawa, 1995). With the utilization of a set of dimensions, namely height and width of rectangles, which were conventionally shown to induce perceptual integrality (i.e., Macmillan & Ornstein, 1998), we examined various types of cognitive independencies including perceptual independence, perceptual seperability and decisional seperabiltiy, and detected fundamental characteristics of the underlying cognitive structures including mental architecture, logical stopping rule and workload capacity. Our results suggested that in the presence of rectangles, the underlying cognitive processes of height and width tended to interact with each other at both perceptual and decisional level. In addition, our results indicated that the cognitive processes of height and width tended to follow a parallel processing manner, and facilitated the processing efficiency of each other. Altogether, the findings of the current study provided strong evidence to support previous findings of

perceptually integral processing of rectangular stimuli, and elucidated essential cognitive properties associated with the underlying mechanism of perceptual integrality. Furthermore, the coherent inferences drawn from both theory-driven methods documented a strong potential in the combination of general recognition theory and systems factorial theory.

The Role of Perceptual Organization in Visual Crowding

Cathleen Moore, Nicole Jardine
University of Iowa

Visual crowding refers to the deleterious effect of closely spaced stimuli (flankers) on the ability to identify target stimuli. Increasing the spatial separation between flankers and targets reduces crowding, and the amount of spacing required to achieve non-crowded levels of performance increases with eccentricity. When target and flankers are featurally dissimilar (e.g., different contrast polarities), crowding is reduced. This last observation suggested the hypothesis that crowding reflects interference at a level of representation that is downstream of organization processes such as grouping and figure-ground assignment (Grouping Hypothesis). When the target can be represented as a distinct group from the flankers, that group can be selected separately, resulting in reduced interference. An alternative hypothesis is that crowding reflects the loss of information that is a consequence of early sensory encoding mechanisms (Information Loss Hypothesis). Under this view, displays with dissimilar flankers and targets suffer less loss of task-relevant information than those with similar flankers and target. When there are feature discontinuities in the displays from which crowding is measured, any effects on crowding are consistent with both hypotheses. We present a set of experiments in which we tested whether object history, separate from stimulus differences at the time crowding was measured, could influence visual crowding. Such a finding would be inconsistent with the Information Loss hypothesis and consistent with the Grouping Hypothesis. Across multiple strategies, we failed to find effects of object history on crowding. Both hypotheses, therefore, remain viable.