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opam 2006

Object Perception, Attention, & Memory

Cover Design By: Aaron Pearson

OPAM 2006 Talk Session
Grand Ballroom J and K

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OPAM 2006 POSTER SESSION
10:15-11:45
Ballroom of the Americas

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Yu-Chin Chai & Bart Farell

(2) Can We See in 4D?
Michael Ambinder, Ranxiao Frances Wang, Jim Crowell, & Blair Flicker

(3) Determining the Depth Orientation of Familiar Objects
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(4) The Role of Effector Identity in Blindness to Response-Compatible Stimuli
Akio Nishimura & Kazuhiko Yokosawa

(5) Is Prosopagnosia a Deficit in Computing Exact Distances?
Alexander O'Brien, Eric Cooper, Glenn Casner, & Brian Brooks

(6) Does Prosopagnosia Result from Damage to the Coordinate Recognition System?
Glenn Casner, Eric Cooper, Alexander O'Brien, & Brian Brooks

(7) The Wax and Wane of Effects of Training in Configural Processing on Face Recognition
Jisien Yang & Chon-Wen Shyi

(8) Configural Superiority and Configural Inferiority Effects: RT, Accuracy, and an Ideal Observer Approach
Ami Eidels, James Townsend, & Jason Gold

(9) The Influence of Perceptual Segmentation on Visual Localization
Mordechai Z. Juni & Manish Singh

(10) Spatial Memory and Explicit Knowledge: Effects of Instruction on Representational Momentum
Jon R. Courtney & Timothy L. Hubbard

(11) The Impact of Change Detection on the Recognition of Previously Viewed Object
Cheng-Ta Yang & Yei-Yu Yeh

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(19) Exploring the Boundaries of the Different Object Benefit
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(20) Electrophysiological Correlates of Voluntary and Involuntary Attention to Faces
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(21) Focal Attention can Prevent Attentional Capture
Hsin-I Liao

(22) Equivalent N2pc and SPCN across Different Spatial Cueing Methods
Nicolas Robitaille & Pierre Jolicoeur

(23) The Role of Intraparietal Sulcus in the Attentional Blink Revealed by Single Pulse Transcranial Magnetic Stimulation
Ken Kihara, Nobuyuki Hirose, Tatsuya Mima, Mitsunari Abe, Hidenao Fukuyama, & Naoyuki Osaka

(24) The Impact of Color Segregation on the Locus of Selective Attention
Chou-Yu Tsai, Ting-Hsun Lin, Yen-Ho Chen, & Yei-Yu Yeh

(25) Stimulus Duration Moderates the Effect of Perceptual Load on Distractor Processing
Sih-Hong Lin, Hsuan-Fu Chao, & Yei-Yu Yeh

(26) Investigating The Attentional Blink With A Predictive First Target
Wah Pheow Tan & Veronica Dark

(27) On the Spatial Metric of Short-SOA Costs of Exogenous Cuing
Peggy Chen, Cathleen Moore, & Toby Mordkoff

(28) Attentional Style and Susceptibility to Distraction in Novice and Expert Basketball Players
Nicki Hollums & Crystal Oberle

OPAM Keynote Address
Grand Ballroom J and K
3:00 pm

Nancy Kanwisher

Functional Specificity in the Cortex: Selectivity, Experience, and Generality

Functional MRI has revealed several cortical regions in the ventral visual pathway in humans that exhibit a striking degree of functional specificity: the fusiform face area (FFA), parahippocampal place area (PPA), and extrastriate body area (EBA). I will briefly review this work and then discuss more recent studies that investigate the specificity, origins, and generality of domain specificity in the cortex. In particular these studies ask i) how specialized is the FFA for faces and what exactly it does with faces?, ii) how do cortical responses to visually presented objects change with experience and is extensive experience ever sufficient to create them?, and iii) are domain specific regions of cortex found only in the visual system, or can they sometimes be found for very abstract high-level cognitive functions as well?

Visual Organization
8:20 – 9:05

Session Chair: Kate Arrington, Lehigh University

8:20 An Information Processing Investigation of Hierarchical Form Perception: Evidence for Parallel Processing

Leslie Blaha, Shannon Johnson, & James Townsend
Indiana University

We test the hypothesis of global precedence (Navon, 1977) in the processing of hierarchical forms with an information processing approach. Application of the system factorial technology of methodologies and models (Townsend & Nozawa, 1995; Townsend & Wenger, 2004) were used in a series of selective and divided attention tasks on a set of hierarchical arrow images. Results indicate that processing of global and local information occurs in parallel, with participants terminating processing when a minimum amount of information has been processed. Implications of this model on the global precedence hypothesis are discussed.

8:35 Testing the relatability hypothesis: Inducer offset, not turning angle, is critical for visual interpolation

Jacqueline Fulvio[1], Manish Singh[2], & Laurence T. Maloney[1]
[1]*New York University,* [2]*Rutgers University, New Brunswick*

To determine the geometric determinants of visual contour interpolation, we used displays containing two straight-line inducers occluded by a rectangle. An interpolation window appeared at various locations, and observers adjusted the position and orientation of a line probe visible through it to optimize the percept of interpolation. We tested several conditions that satisfied, or violated, relatability. Analyses of shape and internal consistency revealed that vertical offset between inducers plays a critical role: increasing offset deteriorates interpolation performance, especially once non-relatable. The turning angle between inducers, however, appears less influential, with only severely non-relatable turning angles hindering interpolation.

8:50 The Role of Global Layout in Visual Short-term Memory

George Alvarez & Aude Oliva
Massachusetts Institute of Technology

Recent research suggests that each object in memory is encoded relative to the other objects in memory. Specifically, the spatial configuration of the entire collection appears to play an important role in remembering any of the individual objects. However, the nature of the configural representation has not been explored. Here we identify a quantifiable dimension of spatial configuration, called regularity of connectedness, which captures an important component of the representation of spatial configuration in memory. Thus, the present study goes beyond demonstrating that spatial configuration is encoded, moving us towards understanding how and potentially why it is encoded in memory.

Object Selection and Attentional Control
9:15 – 10:15

Session Chair: Andy Leber, Yale University

9:20 Is Object-Based Attention Mandatory?

Menahem Yeari & Morris Goldsmith
University of Haifa

Is object-based attention "mandatory" or under strategic control? Participants fixated attention on a central cue, which was a part of a perceptual group (Exp. 1) or uniformly connected object (Exp. 2). The cue always pointed to an opposite, different-object location. By varying cue validity, the strategic incentive to avoid preferential attention to the entire cue-object was manipulated: With invalid cueing (no/weak incentive to avoid object-based attention), a same-object RT advantage was observed. With valid cueing (strong incentive to avoid object-based attention), the object effect disappeared. Object-based attention appears to be a "default" mode that can be overridden by strategic control.

9:35 Early crossmodal multitasking interference revealed by event-related potentials

Benoit Brisson & Pierre Jolicoeur
Université de Montréal

We investigated the locus of interference in the psychological refractory period paradigm by measuring the event-related potentials to a lateralized visual target while participants performed a concurrent speeded auditory task. The N2pc was progressively attenuated and the onset latency of the sustained posterior contralateral negativity (SPCN) was progressively lengthened as overlap increased between the first auditory task and the second visual task. These results provide strong electrophysiological evidence of surprisingly early PRP interference on the deployment of visual-spatial attention (N2pc) and transfer into visual-short term memory (SPCN). Implications for models of PRP interference are discussed.

9:50 Can capture of visuospatial attention be contingent on category? Behavioural and electrophysiological evidence

Emilie Leblanc & Pierre Jolicoeur
Université de Montréal

Contingent capture, the involuntary allocation of visuospatial attention to a task-irrelevant item matching the observer's attentional control settings, has been observed for low-level features (shape, colour, etc.). Can capture also be contingent on a higher-level attribute, and if so, does it reflect interference at the visuospatial level? We recorded ERPs during a capture task in which the target was defined by category. The presence of a target-category distractor was associated with lower accuracy (revealing contingent capture), and with an N2pc component in the ERPs, indicative of a shift of visuospatial attention to the distractor location.

10:05 Attentional Orienting in Response to Peripheral Cues Survives the Attentional Blink

S. M. Shahab Ghorashi[1], Raymond M. Klein[2], & Vincent Di Lollo[3]
[1]University of British Columbia [2]Dalhousie University [3]Simon Fraser University

Perception of the second of two targets (T1 and T2) is impaired if the lag between them is short.

Our question is whether information about spatial cues can survive this attentional blink. We used a rapid serial visual presentation of black letters as distractors, with a white letter as T1 and a search array as T2. A white patch preceding T2 signaled the location of the target in the search array (informative in Experiments 1-2; non-informative in Experiment 3). In all experiments we obtained a facilitatory effect of the cue, indicating that information about the cue survives the attentional blink.

Perception of Objects
12:45 – 1:45

Session Chair: Steve Franconeri, Northwestern University

12:45 The landmark effect in perceived object stability: A general mechanism.

J. Stephen Higgins, Ranxiao Frances Wang, & David E. Irwin
University of Illinois Urbana-Champaign

Perceiving object locations after visual distractions is essential for interaction with our world. When two objects viewed before a saccade are re-presented after the saccade, one immediately and the other a short time later, the first is often perceived as stationary even if it moved during the saccade. We sought to determine whether this phenomenon is specific to saccades or whether it applies to other visual distractions as well. We found that the first object presented after visual distraction was perceived as stable regardless of whether an eye movement occurred, indicating that this phenomenon applies to visual distractions and not just saccades.

1:00 The Unique Contributions of Retinal Size and Perceived Size on Change Detection

Brian Levinthal & Alejandro Lleras
University of Illinois Urbana-Champaign

This study examined the influence of an object's perceived size on change detection performance. Participants viewed scenes with colored spheres arranged over a slanted plane, which implied 3D-depth in the display. Spheres varied in two-dimensional size (visual angle) and

in three-dimensional size (perceived size). Two images alternated and the participants' task was to locate the sphere that changed colors between presentations. Results indicated that both 2D and 3D object size influenced detection time, suggesting that change detection in natural scenes is influenced by post size-constancy representations as well as the "retinal" size of changing objects.

1:15 The oblique effect and three dimensional shape
Elias Cohen & Qasim Zaidi
SUNY College of Optometry

We showed a substantial oblique effect for oriented 3D shapes defined by texture cues. Observers identified the orientation or location of a 3D shape more accurately when it was vertical than when it was oblique. However, when 3D depths were equated for possible 2D oblique effects, there was no effect of 3D axis on orientation and location judgments. Thus the 3D oblique effect can be explained by differences in sensitivity to the different 2D orientations in texture flows. Results also show that observer sensitivity to sign of 3D curvature is superior compared to sensitivity to 3D orientation or location.

1:30 The World is Too Much: Effects of Array Size on the Link between Language Comprehension and Eye Movements
Dane Sorensen & Karl Bailey
Andrews University

The visual world paradigm is a methodology in which eye movements are used to infer underlying language processing. The displays used in this paradigm, however, have tended to use relatively small arrays of objects. We present three experiments that suggest that as array size increases, the tight time-locked link between eye movements and language processing that this paradigm relies upon is weakened or eliminated. Increased preview time did not mitigate this effect, and occasionally further weakened the link. The eye movement-language processing link, then, appears to be indirect; further work is needed to identify the mediating cognitive processes.

Perception of Faces and Scenes
1:55 – 2:55

Session Chair: Monica Castelhano, University of Massachusetts, Amherst

1:55 The role of familiarity in 3D view transferability of identity adaptation
Fang Jiang[1], Volker Blanz[2], & Alice J. O'Toole[2]
[1]*The University of Texas at Dallas*
[2]*The University of Siegen, Germany*

Aftereffects induced by faces have provided insights into high-level visual representations. We examined the influence of familiarity on the view-transferability of face identity adaptation. Participants identified frontal views of anti-caricatures following adaptation to either a frontal anti-face (within-view adaptation condition) or an anti-face rotated 30° to the right (across-view adaptation condition). We found that the magnitude of identity aftereffects in both within- and across-view adaptation conditions increased with familiarity. These results showed that familiarity can enhance the magnitude of identity adaptation and the degree to which adaptation transfers across 3D view change.

2:10 Dissociating mechanisms involved in accessing identity by dynamic and static cues
Leslie Steede[1], Jeremy Tree[2], & Graham Hole[1]
[1]*University of Sussex* [2]*University of Exeter*

Idiosyncratic facial and bodily movements can be useful for person recognition. However, research has not yet addressed the neural or cognitive mechanisms involved. We conducted a series of experiments with two developmental prosopagnosics to determine whether mechanisms involved in recovering person identity by dynamic cues, are likely to be the same or different to those involved in accessing identity by static cues. Our results support a single dissociation between mechanisms involved in static and dynamic person recognition. We discuss potential neural mechanisms that are likely to be involved in dynamic person recognition, based on recent behavioral and neural work.

2:25 The Control of Fixation Duration During Scene Perception

Graham Pierce[1] & John Henderson[2]
[1]Michigan State University [2]University of Edinburgh, Edinburgh, UK

Do the durations of fixations during scene perception reflect current processing? We used a stimulus onset delay paradigm during full-color scene viewing to investigate whether individual fixations are controlled directly by current stimulus processing or indirectly by general mechanisms. In three experiments we found strong evidence for both direct and indirect control. Importantly, a relatively large subset of fixation durations increased in direct proportion to delays, suggesting that these fixations reflect real-time ongoing stimulus processing during scene perception.

2:40 Eye Movements and Individual Differences

Xingshan Li[1], Keith Rayner[1], Carrick Williams[2], Kyle Cave[1], & Arnold Well[1]
[1]University of Massachusetts, Amherst
[2]Mississippi State University

Eye movements of Chinese readers and English readers were monitored during scene and face perception, visual search and reading. The results showed that the eye movements were different between Chinese and English readers in fixation duration, saccade size and number of fixations in tasks involving reading and search for Chinese characters. Surprisingly, there were also eye movement differences between the two groups in scene and face perception. Fixation duration in reading tasks was correlated with duration in other tasks for Chinese readers, but not for English readers. Differences in reading experience can affect eye movements in nonreading visual tasks.

POSTER SESSION
10:20-11:45

(1) Effects of reference stimuli on sensitivity to motion & stereoscopic depth

Yu-Chin Chai & Bart Farell
Institute for Sensory Research, Syracuse University

We examined effects of reference stimuli on human's sensitivity to the motion and stereoscopic depth of target stimuli. Stimuli were sinusoidal grating patches. Motion and depth sensitivities were lowest without a nearby reference stimulus and both were affected by the relative orientation and spatial frequency of target and reference stimuli. Orientation differences raised motion and stereo thresholds; reference gratings lower in spatial frequency than the target raised thresholds more than those that were higher. These effects were generally greater for stereo than for motion. The data are consistent with the joint coding of spatial frequency, temporal frequency and disparity.

(2) Can We See in 4D?

Michael Ambinder, Ranxiao Frances Wang, Jim Crowell, & Blair Flicker
University of Illinois Urbana-Champaign

The current studies examined whether people can represent and make judgments about spatial properties of objects composed of 4 spatial dimensions. In 2 experiments, participants viewed 3D cross sections of randomly shaped 4D geometric objects over time in virtual reality, and made judgments either about the Euclidean distance between two of its vertices, or about the angles formed by three of its vertices. Results indicated that participants used 3D shape and 4D distance to make both distance and angle judgments, suggesting that people can integrate information from 4 dimensions for spatial judgments.

(3) Determining the depth orientation of familiar objects

Ryosuk Niimi[1] & Kazuhiko Yokosawa[2]
[1]The University of Tokyo and JSPS Research Fellow [2]The University of Tokyo

It seems important for humans to not only identify familiar objects but also visually

determine their orientations in 3D space. The human performance to detect 15° differences in depth orientations of two familiar objects presented simultaneously was examined. The orientation differences were easily detected from front and back orientations than oblique orientations. This result was common to the orientation differences among two identical objects and two different objects. It was suggested that front and back views provide highly orientation-specific features (e.g., horizontal linear contours, symmetric shape of contours) whereas oblique views mainly provide orientation-invariant features.

(4) The role of effector identity in blindness to response-compatible stimuli

Akio Nishimura & Kazuhiko Yokosawa
The University of Tokyo

Perceiving a visual stimulus is hampered when a to-be-executed action is compatible with that stimulus (Blindness to Response-Compatible Stimuli; BRCS). We explored the role of effector identity for the action in BRCS. Participants conducted bimanual key presses with vertically arranged responses while perceiving a brief presentation of rightward or leftward arrowhead. BRCS due to the compatibility between hand identity and direction of arrowhead was observed, but only when above and below keys were pressed with right and left hands respectively. We discussed the results in terms of orthogonal S-R compatibility (above-right and below-left correspondences).

(5) Is Prosopagnosia a Deficit in Computing Exact Distances?

Alexander O'Brien[1], Eric Cooper[1], Glenn Casner[1], & Brian Brooks[2]
[1]Iowa State University [2]3M Corporation

Cooper and Wojan (2000) posited that the recognition system responsible for face recognition codes the locations of the spatial primitives in a representation using exact distances. If true, then prosopagnosics should show deficits at tasks requiring the judgment of exact distances. A prosopagnosic and a control group were tested on three experiments that required judgment of exact distances: a relative vs. exact distance judgment, a task that required subjects to reproduce distances, and a task in which subjects drew objects. The prosopagnosic showed profound deficits with any task that required the computation of exact distances.

(6) Does prosopagnosia result from damage to the coordinate recognition system?

Glenn Casner[1], Eric Cooper[1], Alexander O'Brien[1], Brian,Brooks[2]
[1]Iowa State University [2]3M Corporation

According to the coordinate relations hypothesis, prosopagnosia results from damage to the coordinate recognition system which is required for any task that cannot be performed using a structural description representation. According to the theory, prosopagnosics should have difficulty distinguishing two objects sharing the same structural description but no difficulty distinguishing objects with different structural descriptions. Three experiments compared a prosopagnosic's ability to distinguish stimuli that either shared a common structural description or did not: discriminating animals, real objects, and nonsense objects. In all cases, the prosopagnosic showed massive problems with any task that required discrimination within a structural description.

(7) The Wax and Wane of Effects of Training in Configural Processing on Face Recognition

Jisien Yang[1] & Chon-Wen Shyi[2]
[1]Department of Psychology [2]Department of Psychology & Center for Research, National Chung Cheng University

Three years ago, we reported that training in configural processing led to improvements in face recognition for 3rd graders, but not for 1st graders. Here we studied whether or not effects of training would still be evident three years later. Experiment 1 was a straightforward follow-up of the previous study, and the results showed that training effect extinguished three years later. In Experiment 2 we varied parametrically the amount of configural alterations, and the results further confirmed waning effect of training. In contrast, effect of training is now evident for those who failed to exhibit any benefits three years ago.

(8) Configural Superiority and Configural Inferiority Effects: RT, Accuracy, and an Ideal Observer Approach

Ami Eidels, James Townsend, & Jason Gold
Indiana University

In visual-search, adding context can dramatically facilitate target-detection latencies. Presented with four diagonal lines, participants were faster detecting an odd line with distinct orientation when a fixed context was added to each of the lines: L shape that created a triangle when combined with the odd line, but not with the other diagonals. This Configural Superiority Effect (CSE) was restricted for speeded detection; a reversed accuracy effect was observed when Gaussian noise was added to the displays. "Ideal observer" performed equally well with and without context, suggesting that the addition of fixed context did not contribute diagnostic information.

(9) The Influence of Perceptual Segmentation on Visual Localization

Mordechai Z. Juni & Manish Singh
Rutgers University New Brunswick

We investigated the influence of perceptual segmentation on the perceived center of dot clusters. Stimuli were comprised of a large "main" cluster and a small cluster. Using a 2AFC task, we found that: (1) With increasing spatial separation, observers' perceived center shifted gradually from overall Center-Of-Gravity toward the "main" cluster's COG; (2) This shift was more pronounced for higher dot densities. The results suggest that, with increased likelihood of segmentation, the visual system assigns lower weights to the small cluster. It thus employs optimal statistical strategies, analogous to Robust Statistics, in dealing with potential outliers (Singh Cohen & Maloney, VSS2006).

(10) Spatial Memory and Explicit Knowledge: Effects of Instruction on Representational Momentum

Jon R. Courtney & Timothy L. Hubbard
Texas Christian University

The remembered position of a previously perceived moving object is often displaced in the direction of motion, and this is referred to as representational momentum (Freyd & Finke, 1984). Although this displacement is influenced by a range of physical or cognitive contexts (for review, Hubbard, 2005), there have been claims that representational momentum is not influenced by error feedback (Finke & Freyd, 1985; Freyd, 1987). The experiment reported here examined whether knowledge of representational momentum influenced subsequent displacement. Informing participants of the existence of representational momentum decreased in forward displacement, although forward displacement was not eliminated. Possible mechanisms are discussed.

(11) The impact of change detection on the recognition of previously viewed object

Cheng-Ta Yang & Yei-Yu Yeh
National Taiwan University

We investigated how change detection influenced the subsequent recognition of the pre-change objects. Change detection was performed either after (Experiment 1) or prior to (Experiment 2) the recognition test. The retention interval was also manipulated. The results showed that recognition after correct detection in Experiment 2 was lower than the recognition that could support subsequent correct detection in Experiment 1 at both retention intervals. Recognition however improved with delay after detection failure in Experiment 2. No such improvement was observed in Experiment 1. Similarity between pre- and post-change objects did not differentially affect recognition between the two experiments.

(12) The Attentional Blink within and across sensory modalities: electrophysiological evidence of an amodal bottleneck

Alexia Ptito[1], Karen Arnell[2], Pierre Jolicoeur[1], & Jeff MacLeod[2]
[1]Université de Montréal [2]Brock University

Abstract: In the Attentional Blink, accurate report of a second target (T2) is impaired if presented shortly after onset of a first target (T1). Research suggests this is due to the existence of an amodal bottleneck in working memory consolidation. We investigated this by manipulating T1 and T2 modality (visual or auditory) across four experimental conditions using equivalent stimuli and tasks in both modalities to minimise task switching. In all modality combinations, the electrophysiological

P3 component to T2 was delayed and reduced in amplitude when T2 was presented soon after T1 relative to when T1 and T2 were presented farther apart.

(13) How colors are memorized in working memory?

Takashi Ikeda & Naoyuki Osaka
Kyoto University

The hypothesis that colors could be memorized either in verbal or visual working memory depending on the color category borders was tested using functional magnetic resonance imaging. Colors across the categories defined by basic color names strongly activated the left inferior frontal gyrus and left inferior parietal lobule corresponding to the phonological loop in verbal working memory, while colors within the same category strongly activated the right inferior frontal gyrus corresponding to the visuospatial sketchpad in visual working memory. The choice of colors to memorize modulated the cognitive load balance between the phonological loop and the visuospatial sketchpad.

(14) Identification of Distractors During Visual Search does not Guarantee Explicit Memory

Melissa Beck[1] & Matthew Peterson[2]
[1]*Louisiana State University* [2]*George Mason University*

Research suggests that explicit memory for the identities of previously examined distractors during visual search is lower than would be predicted by intentional memory tests. Minimal explicit memory for the identity of previously examined distractors may be the result of search tasks that do not require the identification of examined distractors, only the positive identification of the target. To examine this possibility, we used a search task that requires identification of the distractors. Even in this more demanding search task, memory for the identity of previously examined distractors is limited and not necessarily tied to the location of the distractor.

(15) When is a stimulus configuration learned as context? Evidence In support of a selective attention hypothesis

Kris Chang & Kyle Cave
University of Massachusetts at Amherst

This study investigated when a stimulus can be learned as context and guide visual search. Circles and letter L's were used as distractors and either distractor type could provide contextual information. The results from 3 experiments showed that a contextual cueing effect was robust in L's but not in the circles. Only when circles were salient could they be learned as context and guide visual search. In addition, contextual cuing did not depend on the circles being perceptually grouped. Our results support the role of selective attention in contextual cuing, but reveal complexities in how attention is allocated.

(16) Influence of Target Type on the Stroop Dilution Effect

Jong Moon Choi & Yang Seok Cho
Korea University

Three experiments were conducted to examine the influence of the type of the color carrier on the Stroop effect. In Experiment 1, the reduced Stroop effect was obtained when the color carrier was a neutral word. When the location of the carrier was manipulated in Experiment 2, the Stroop dilution effect was obtained, regardless of the locations. When both carrier and flanker were color words in Experiment 3, the effect of the flanking color word was determined by the time required to process the color carrier. The Stroop dilution effect depends on the processing time of the color carrier.

(17) Does a color stimulus capture attention initially?

Kyung Hun Jung & Yang Seok Cho
Korea University

The present study tested whether the color carrier in a Stroop task has priority access to attentional resources over distractors. When the distance between a color carrier and a color word was manipulated in Experiments 1 and 2, the Stroop effect was influenced by the distance between the two stimuli even though the color word was flashed briefly. In Experiment 3, a precue was used to indicate the location of the

color carrier. The Stroop effect was not affected by cue validity. All these results suggest that the color carrier captures attention initially in most cases in the Stroop task.

(18) Dividing attention across feature dimensions in statistical processing of perceptual groups

Tatiana-Aloi Emmanouil & Anne Treisman
Princeton University

When perceiving sets of similar objects (e.g., leaves on a tree, a flock of birds), we may use a statistical mode of processing with global attention to the set as a whole, extracting parameters like the mean and the variance rather than details of individuated objects. Chong and Treisman (2005) found no decrement in performance when people averaged two sets as opposed to a single set, within a single dimension. However, three new experiments exploring the averaging of size, speed, and orientation show a decrement in performance when attention is shared between two dimensions rather than focused on one.

(19) Exploring the Boundaries of the Different Object Benefit

Bryan Burnham & W. Trammell Neill
University at Albany, State University of New York

Recently, G. Davis and colleagues reported that dividing attention across objects slows responses to features appearing on one object than different objects. This "different object benefit" conflicts with studies demonstrating that it is easier to shift attention within one object than between objects. Using Davis and Holmes' (2005) stimuli, we address a bias their participants may have had to shift attention to different objects. We also manipulate factors such as separability of features from objects and object duration to examine the cause of this effect. We found that bias did not account for the different object benefit, which is robust.

(20) Electrophysiological correlates of voluntary and involuntary attention to faces

Ayelet Landau[1], Michael Esterman[2], Lynn Robertson[2], & William Prinzmetal[1]
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To explore differences between voluntary and involuntary attention, we examined cue and target related EEG responses using a cuing paradigm. Participants performed a face-discrimination task. Involuntary attention was manipulated by preceding faces with non-predictive cues. Voluntary attention was assessed using predictive cues. Stimulus parameters were otherwise identical. Both conditions produced significant validity effects. While ERP analyses did not distinguish between the attention conditions, spectral analyses revealed increased gamma-band activity associated with predictive compared to non-predictive cues. An interaction between validity and predictability for target-elicited gamma-band activity indicated that gamma was associated with voluntary orienting.

(21) Focal attention can prevent attentional capture

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Past studies showed that focal attention prevents stimulus-driven capture by an abrupt onset (Theeuwes, 1991; Yantis & Jonides, 1990), but does not prevent contingent capture (Folk, Leber, & Egeth, 2002). In this study, when the target was defined by red and its location was pre-cued with sufficient duration, a red distractor could not capture attention, suggesting that contingent capture cannot occur. When the same RSVP paradigm as in Folk et al. (2002) was used, different results were obtained depending on target identification accuracy. We conclude that neither contingent nor purely stimulus-driven capture can occur outside focal attention.

(22) Equivalent N2pc and SPCN across different spatial cueing methods

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Our goal was to dissociate two ERP waveforms in the context of different selection-cues typically used in their associated paradigm. The N2pc, a component associated with the deployment of attention in the visual field, is usually observed in designs requiring that the subjects select the target on-the-fly, based on a target feature. The SPCN, a component associated with the maintenance of information in visual short-term memory, is usually observed in designs in which selection is based on a previously presented cue (arrow). Both components were observed and were independent of the type of selection-cue.

(23) The role of intraparietal sulcus in the attentional blink revealed by single pulse transcranial magnetic stimulation

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Attentional blink (AB) reflects the temporal limitation of vision. Attending to first target (T1) is the main cause of the AB. We investigated when and where T1 processing occurs in the brain by using transcranial magnetic stimulation (TMS). The AB was reduced when single-pulse TMS was delivered over the left or right intraparietal sulcus (IPS) at 350 ms after T1 onset, while Cz stimulation at the same timing had no effect on the AB, suggesting that an activation of bilateral IPS at around 350 ms after T1 onset is involved in attentional processing of T1, which causes the AB.

(24) The impact of color segregation on the locus of selective attention

Chou-Yu Tsai, Ting-Hsun Lin, Yen-Ho Chen, & Yei-Yu ,Yeh
National Taiwan University

Color segregation was manipulated in two experiments. The target was in red or white among white stimuli using the low-perceptual display in Experiment 1. Color segregation did not moderate the late selection mode. Color segregation was manipulated in Experiment 2 so that the target was in red, both the target and distractor were in red, or only the distractor was in red among white non-targets. Under the low load, compatibility effect was not observed when the target and distractor were in red. Under the high load, the compatibility effect was observed only when the distractor was in red.

(25) Stimulus duration moderates the effect of perceptual load on distractor processing

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The locus of selection in visual attention depends on the perceptual load of target processing (Lavie, 1995). However, stimulus duration was usually short in the experiments that tested the load theory. We adopted Lavie and Fox's (2000) paradigm with long (Experiment 1) or short durations (Experiment 2). The result showed the compatibility effect in responding to the prime target regardless of load manipulation. Yet, the compatibility effect was larger with long than with short duration. Moreover, negative priming was observed with the low-load display but positive priming was observed with the high-load display in the prime trial.

(26) Investigating the Attentional Blink with a Predictive First Target

Wah Pheow Tan & Veronica,Dark
Iowa State University

To explore issues concerning attentional control and target consolidation in the attentional blink (AB), we reduced the necessity for target consolidation by providing first target (T1) identity prior to each trial. The identity was 100%, 50%, or 0% correct. Correct prior identity attenuated the AB in the 50% condition, suggesting aborted T1 consolidation. Although no T1 consolidation was needed in the 100% condition, AB was not attenuated. Perhaps curtailing consolidation is more effortful and only used when benefits are apparent (50% condition). Alternatively, actively ignoring T1 (100% condition) may produce an attentional cost offsetting benefits of reduced T1 consolidation.

(27) On the Spatial Metric of Short-SOA Costs of Exogenous Cuing

Peggy Chen, Cathleen Moore, & Toby Mordkoff
Penn State University

When SOAs between cues and targets are short, exogenous spatial cues can produce a response-time benefit. However, consistent with several recent studies, we have found that a short SOA is not sufficient. At least two other factors - cue-target temporal overlap and the number of cue/target locations - also play roles. Even more interesting: when eight cue/target locations are used, the effect of an exogenous cue is not only to produce a cost on valid-cue trials, but the spatial metric of this "negative cuing effect" depends on whether the cue remains visible at target onset.

(28) Attentional Style and Susceptibility to Distraction in Novice and Expert Basketball Players
Nicki Hollums & Crystal Oberle
Texas State University

This research used static and dynamic measures to assess attentional styles of basketball players. In Experiment 1, participants completed the Group Embedded Figures Test (GEFT) and attempted 50 jump shots with or without defenders present. In Experiment 2, for 15 NCAA and 15 NBA games, data were collected on the outcome and defenders of every jump shot. GEFT scores did not differentiate novice and expert players. However, with the dynamic measure based on susceptibility to distraction, players with high school experience were more field dependent than novices, though players in the NCAA and NBA did not differ in attentional style.

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