



BASICS

MAY 6-7, 1995

**The 1995 Banff Annual Seminar
in Cognitive Science (BASICS) Presents:**

Learning & Attention: Brain and Behavioural Approaches

Sponsored by

The Western Canadian University

Psychology Consortium:

The University of Calgary

The University of Lethbridge

The University of Alberta

The University of Manitoba

The University of British Columbia

Simon Fraser University

The University of Victoria

The Banff Park Lodge

Banff, Alberta, Canada

Saturday, May 6

Sunday, May 7

**BASICS 1995:
Learning and Attention:
Brain and Behavioural Approaches**

Friday, May 5

8:30 PM Informal Gathering in the BPL Lounge

Saturday, May 6 BlackBear Room

8:45 Opening Remarks (Kimron Shapiro)

9:00 - 10:30 **Michael Posner (University of Oregon)**

10:30 - 11:00 coffee

11:00 - 12:30 **Steven Luck (University of Iowa)**

12:30 - 2:00 lunch

2:00 - 3:30 **Lynn Robertson (UC Davis)**

3:30 - 4:00 coffee

4:00 - 5:30 **Patrick Cavanagh (Harvard University)**

7:30 Conference Banquet (BlackBear Room)

Sunday, May 7 BlackBear Room

9:00 - 10:30 **Jeremy Wolfe (Harvard Medical School)**

10:30 - 11:00 coffee

11:00 - 12:30 **Steven Yantis (Johns Hopkins University)**

12:30 PM Closing Remarks (Peter Dixon)

Jeremy M. Wolfe
Center for Ophthalmic Research
Brigham and Women's Hospital and
Harvard Medical School

Title: Where is Guided Search going?

Guided Search is a model that holds that information from parallel, preattentive feature processes can be used to guide the deployment of limited capacity processes in visual search for target items among distractors. In this talk, I will discuss two parts of this model. First, I will give the results of some new experiments on the preattentive processing of shape information. Second, I will show how deployment of attention depends on the location of the target in the visual field.

Steven Yantis
Johns Hopkins University

Title: On the Continuity of Perceptual
Experience: Implications for
Perception and Attention

When an observer views a real-world scene, some objects in the scene will be partly occluded by intervening surfaces; as the observer moves through the environment, some unoccluded objects will be temporarily occluded and revealed. Yet although the retinal image is fragmented in space and time, perceptual experience is coherent and continuous. Several experiments will be described that explore the perceptual mechanisms that achieve and maintain perceptual coherence. We have found that disruptions in the continuity of a perceptual object (e.g., when an object initially appears) capture attention. However, disruptions attributable to occlusion are discounted: temporarily occluded objects are perceived as spatiotemporally continuous.

Lynn C. Robertson
Veterans Administration and Center
for Neuroscience
University of California at Davis

**Title: Implications of Visual Search Deficits
for Cognitive Theory**

Visual search data from groups of patients with neglect, groups of patients with focal lesions and a single patient with bilateral parietal lesions will be discussed. Additional studies that evaluate spatial representation and feature binding will also be presented. The data are consistent with Treisman's feature integration theory in positing access to spatial information for proper search and conjunction of features. In addition they demonstrate that the dorsal "where" system of the human cortex is necessary for proper feature binding. They also suggest that explicit access to spatial information is necessary for normal feature integration.

Patrick Cavanagh
Harvard University

Title: Attention-Based Visual Processes

Attention has often been characterized as a passive enhancement of sensory data, however, recent experiments show attention as an active component, constructing and maintaining explanations of visual scenes. Evidence will be given from attentive tracking tasks, attentional aftereffects, and mentally imposed links between image elements that reorganize a motion sequence.

**Michael I. Posner, Bruce McCandliss &
Yalchin Abdullaev
University of Oregon, Eugene**

Title: Attention, Brain Plasticity and New Learning

It is now possible to see in real time the activation of brain networks that perform some attentional functions. A network involving the parietal lobe appears to influence activation of form pathways by 100 msec after input. This network is well developed at 6 months. A network involving the anterior cingulate is activated by the task of generating a use to a visual word at about 200 msec. This activation changes with practice during word generation. New learning influences regions involving semantic analysis prior to areas reflecting visual word forms. Together these studies suggest different forms of plasticity in human brain circuitry with differing time scales.

**Steven Luck
The University of Iowa**

**Title: Attentional Modulation of Sensory
Processing in the Visual
Search, Spatial Cueing, and Global/Local Paradigms**

Recordings of event-related brain potentials (ERPs) have provided evidence that sensory processing is suppressed for stimuli presented outside the focus of attention, and similar results have been obtained in visual search and spatial cuing tasks. Previous studies primarily examined the effects of directing attention to peripheral locations, but analogous results have recently been obtained in a series of global/local experiments in which attention was directed foveally and the size of the attended area was manipulated. Specifically, the attentional focus appeared to contract around the fixation point during local discriminations, resulting in reduced sensory processing for stimuli presented parafoveally. These results indicate that the brain employs a common set of attentional processes across widely diverging tasks.