On July 18, 2005 we held the Second Minerva Workshop. The topic was "The Many Faces of Attention" and the meeting took place at the IIPDM lecture room at the University of Haifa . Below is the program of the Workshop and the abstracts of the talks:

The Minerva Workshop Series

The Many Faces of Attention

08:45 – 09:00	Gathering and coffee	
09:00 – 09:05	Introduction	
09:05 – 10:00	Control processes in the formation of task units	Danny Gopher
10:00 – 10:55	Transient spatial attention and visual temporal processes	Yaffa Yeshurun
10:55 – 11:30	Break (Coffee and light food)	
11:30 – 12:25	Perceptual organization and visual attention	Rutie Kimchi
12:25 – 13:20	Visual attention to objects and space: a dynamic, interactive framework	Morre Goldsmith and Meni Yeari
13:20 – 13:45	Discussion	

Control processes in the formation of task units

Daniel Gopher

Tasks are the elementary units of goal directed behavior. They encompass all structural and dynamic constraints on performance, in the service of intentions or instructions. Tasks are a joint product of top down

constraints and the characteristics of the environment. Information processing, response execution, memory representations and performance competency are all developed within and bounded by their respective task shells. The construct of a "Task Shell" is introduced to denote the establishment of an overall framework that binds together all elements in the service a specified goal. It is argued that the creation of task shells with experience is one of the main functions of control processes, which has nonetheless been neglected by contemporary cognitive research. The chapter describes three examples from training experiments with demanding complex tasks. It is shown how in each case, the formation of a task shell influenced task performance and changed the relationship between its composing elements. The significance of the findings is discussed in the context of the present cognitive research and its future challenges.

Transient spatial attention and visual temporal processes

Yaffa Yeshurun

Visual processing involves spatial and temporal components, yet the investigation of visual processing has primarily focused on the spatial domain. The goal of the studies I will present is to further our understanding of the temporal domain by studying its possible relationship to spatial attention. Specifically, I explored the effects of spatial attention on: a) temporal resolution --the ability to resolve rapid intensity changes over time; b) the perceived duration --the ability to correctly judge the duration of a brief stimulus; c) temporal integration --the ability to integrate information through time; and d) apparent motion --the perception of motion when there is no corresponding physical displacement in space. In all four, classic paradigms for studying these temporal processes –such as measurements of two flash fusion threshold or visible persistence-- were combined with the classic paradigm to manipulate transient spatial attention: peripheral precueing. The Results indicate that attending the target location lowered observers' temporal resolution, lengthened their estimation of stimulus duration,

prolonged the time period over which information was integrated, and degraded the quality of the perceived motion. I will suggest that an attentional mechanism that favors parvocellular over magnocellular neurons can account for both the attentional effects on spatial resolution as well as its effects on temporal processes.

Perceptual Organization and Visual Attention

Rutie Kimchi

Recent research on perceptual organization and visual attention points to important relations between organization and attention processes. In this talk I will focus on two aspects of this relation. The first focuses on the question whether perceptual grouping can take place without attention. Our work suggests that some forms of grouping can take place under inattention while others appear to require controlled attentional processing. The other issue focuses on the question whether objecthood per se can capture attention automatically. I will present findings suggesting that the mere organization of some elements into an object, with no abrupt onset or any other unique transients, suffices to capture attention in a stimulus-driven manner, much as peripheral flickers capture spatial attention automatically.

Visual Attention to Objects and Space: A Dynamic, Interactive Framework

Morre Goldsmith and Meni Yeari

There has been a great deal of research on whether visual attention is allocated to objects or to space. This talk will describe work conducted at the Minerva Center under the umbrella of a general framework for studying this issue. The framework, provisionally named the hierarchical select-organize-navigate-select (H-SONS) framework, is at this point a loose collection of

principled assumptions that can be used to derive working hypotheses regarding the complex interplay of object-based and space-based attentional processing. These assumptions highlight the dynamic, flexible, and interactive nature of visual attention: (1) attention is a dynamic process that continuously selects from among hierarchically organized spatial or grouped-array (object) representations, (2) attentional selection itself acts to change the (hierarchical) perceptual organization of the visual information, (3) attention may “navigate” within and between representations either by orienting (shifts of attention between locations/objects at the same hierarchical level), focusing (zooming in or out to more local/global levels of object structure or space), or both, (4) subsequent selections and chosen modes of navigation may be contextually dependent on previous selections, (5) both the unit of selection and the mode of navigation are (at least partly) under strategic control.

Three main branches of the work that highlight the utility of this guiding framework will be briefly sketched: (a) the role of spatial focus of attention and perceptual organization in object-based attentional selection, (b) strategic control of object-based versus space-based attentional selection, and (c) object-based versus space-based attentional navigation of hierarchically structured displays.