

# Trees Before Forest?



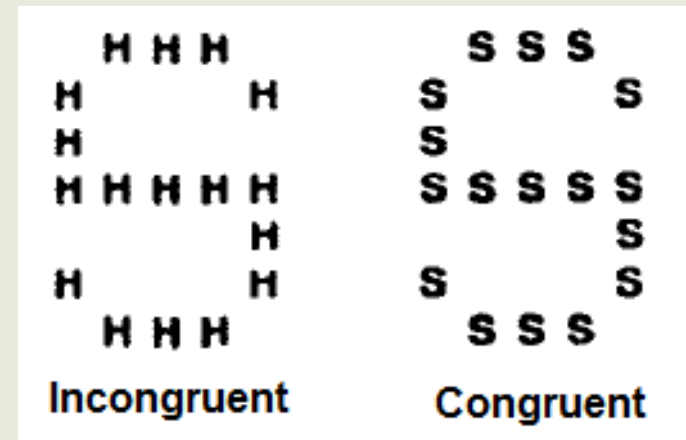
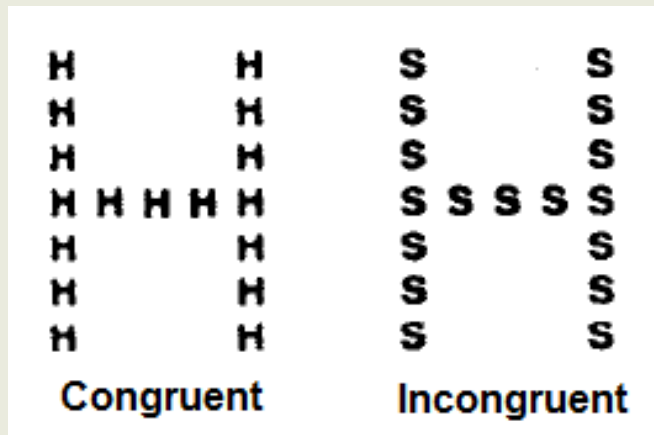
## Involvement of Low Level Structures in Local and Global Processing

**Rita Soloveichick, Ruth Kimchi and Shai Gabay**

# Background



- The processing of global structuring of a visual scene and the analysis of its local features has been studied using a global - local task (Navon, 1977; for a review see Kimchi, 2014).
- In this task, participants are presented with hierarchical stimuli, and are requested to respond, in different blocks, either to the global or the local dimension.



# Background



- The results from such experiments indicate:
  1. Global advantage– Reaction times (RTs) for the global task are shorter than RTs for the local task.
  2. Global-to-local interference - The global dimension interferes with the local dimension, causing slower RTs when the two dimensions are incongruent.

# Current Study



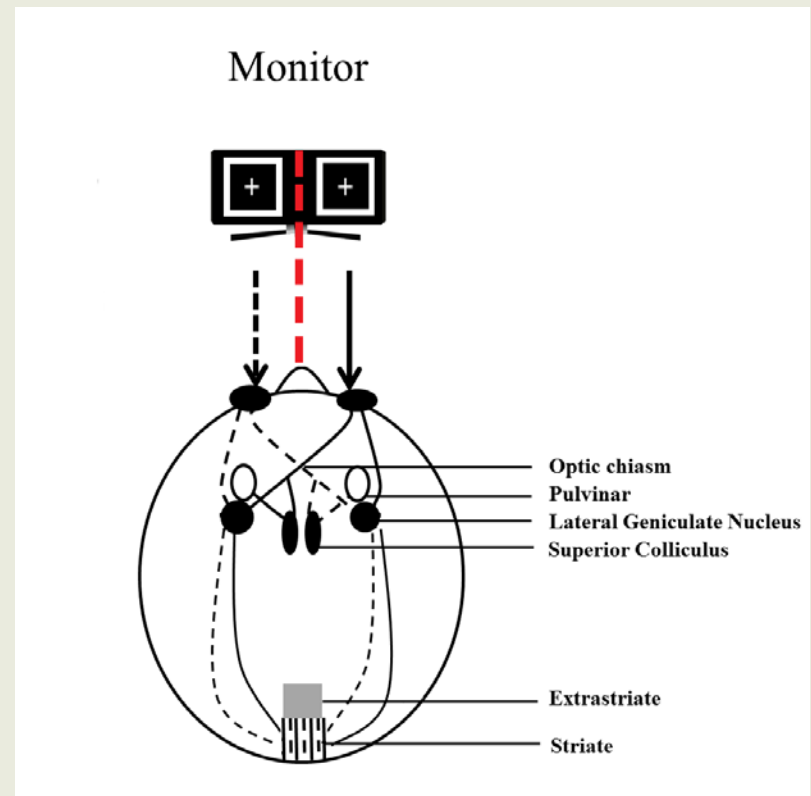
**Is there an involvement of lower/subcortical structures of the visual system in the processing of global or local dimensions?**

# Method



Visual input is:

- **SO: Manipulating the two images eye-of-origin can help us determine whether input layers of the primary visual cortex involves low level (monocular) structures**
- **(No eye-dependence – binocular representation from extrastriate visual areas (Gabay, Burlingham & Behrmann, 2014))**



# Experiment 1 – Global Local Task

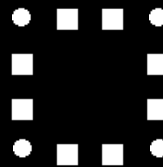
## Stimuli



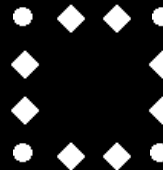
Global Dimension

Percept

Local Dimension



Congruent

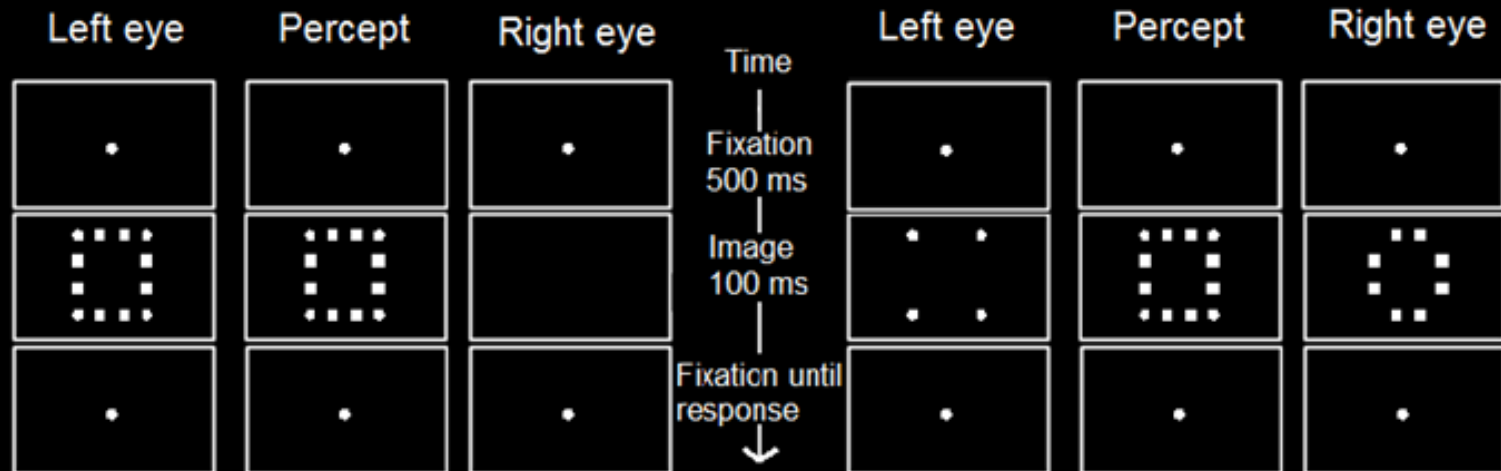


Incongruent

# Experiment 1 – Global Local Task

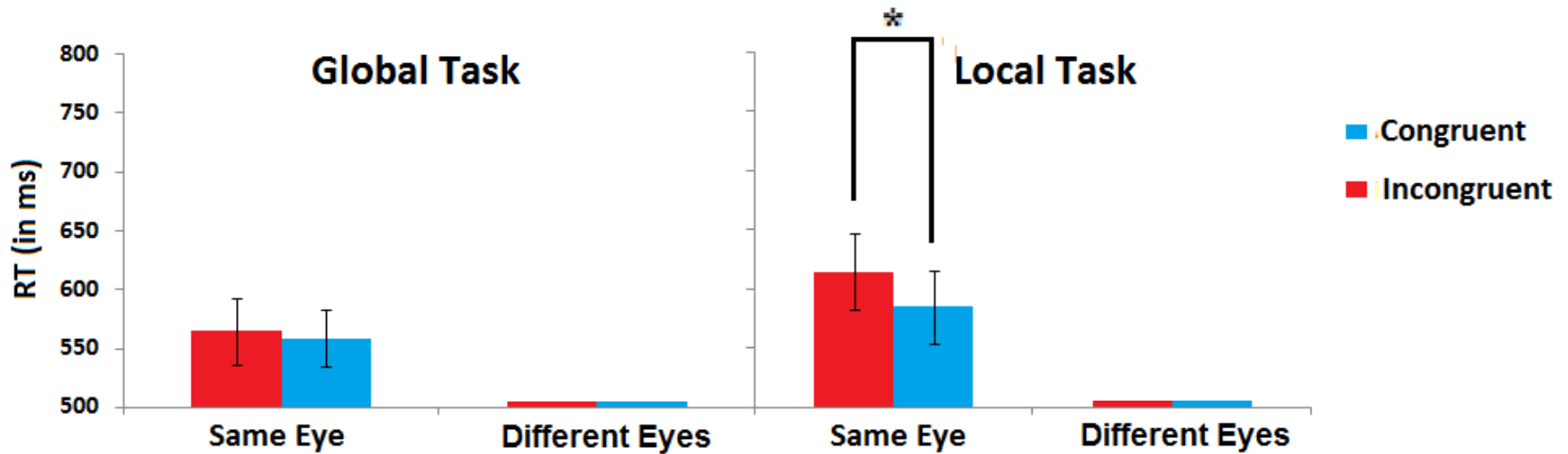
## Procedure

### Trial Sequence



# Experiment 1 – Global Local Task

## Results





# Experiment 1 – Global Local Task

## Discussion



Our results indicate that there is an involvement of low structures of the visual system in the processing of both local and global information.

# Experiment 2 – Global Local Task 2

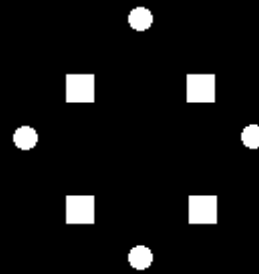
## Stimuli



**Left Eye**

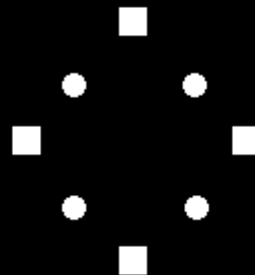
**Percept**

**Right Eye**



**Incongruent**

**Congruent**



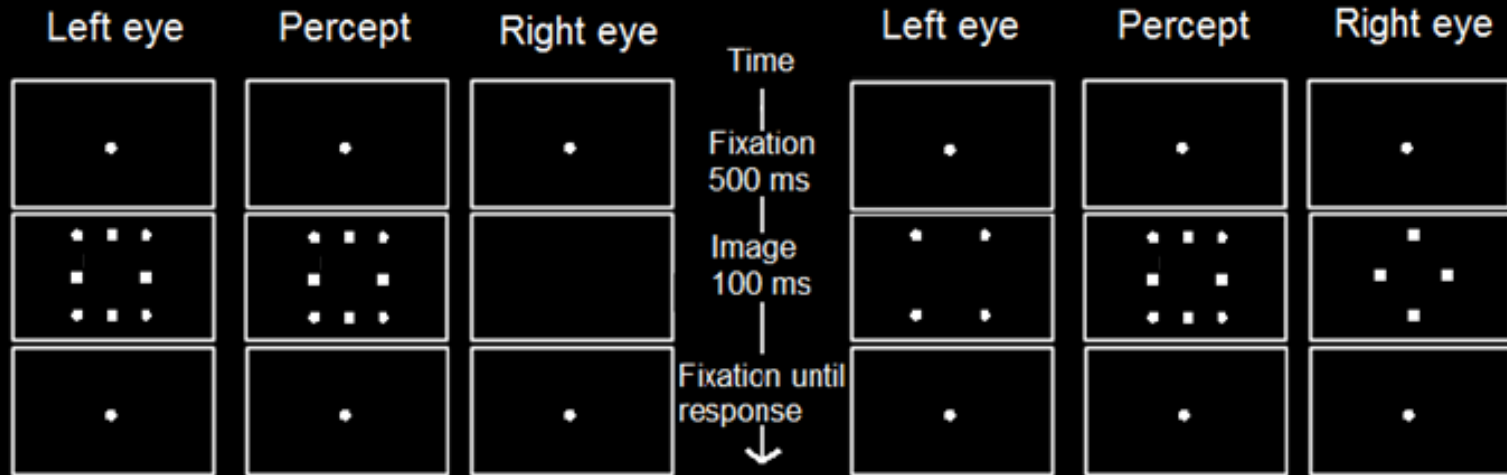
**Incongruent**

**Incongruent**

# Experiment 2 – Global Local Task 2

## Procedure

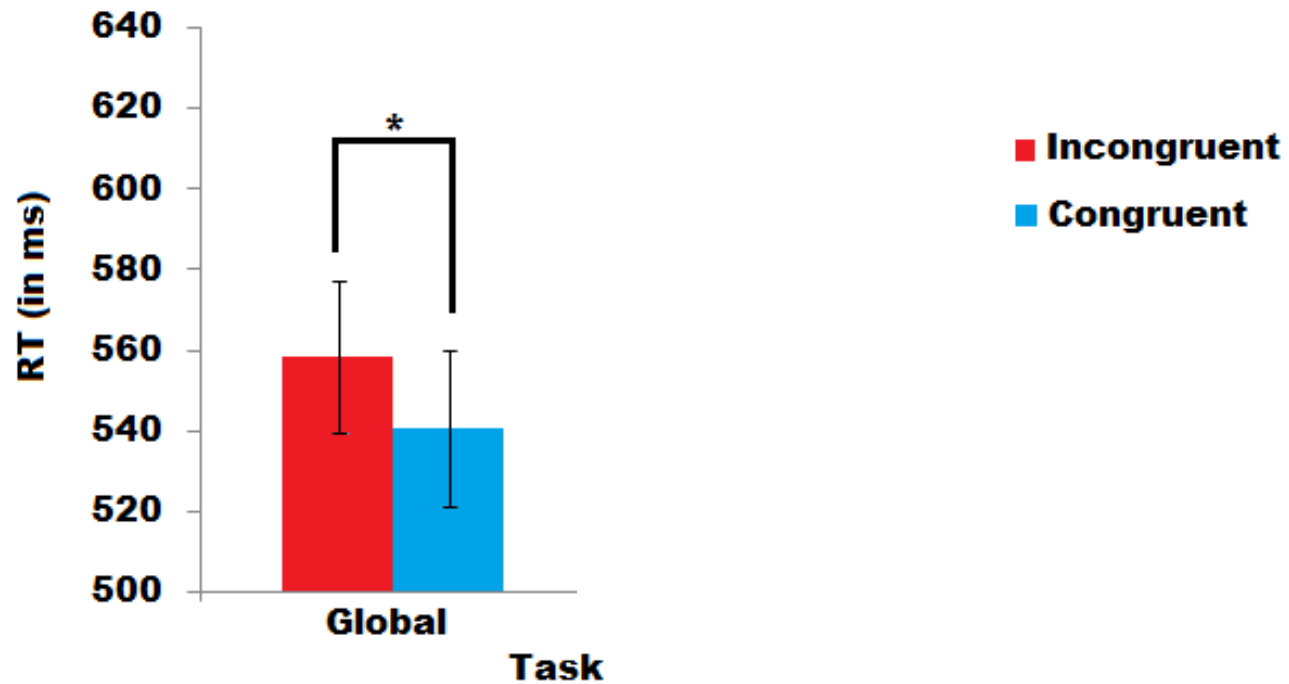
### Trial Sequence



# Experiment 2 – Global Local Task 2

## Results

### Same Eye Presentation

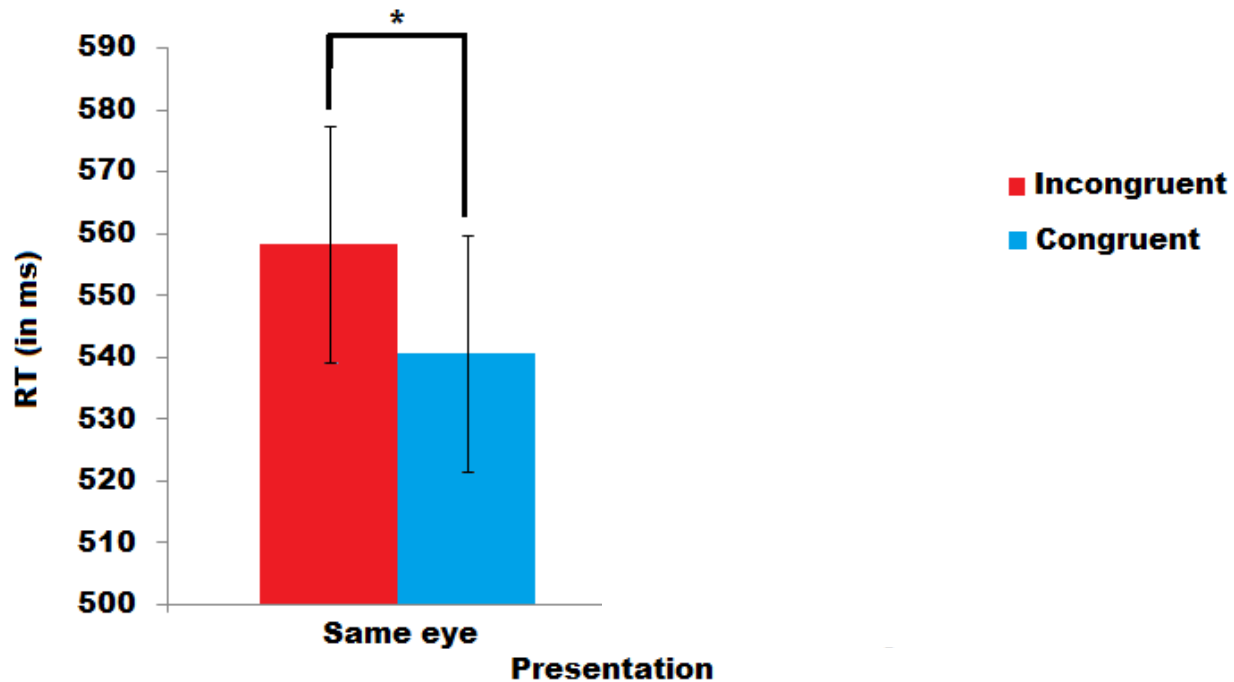


# Experiment 2 – Global Local Task 2

## Results



### Global Task

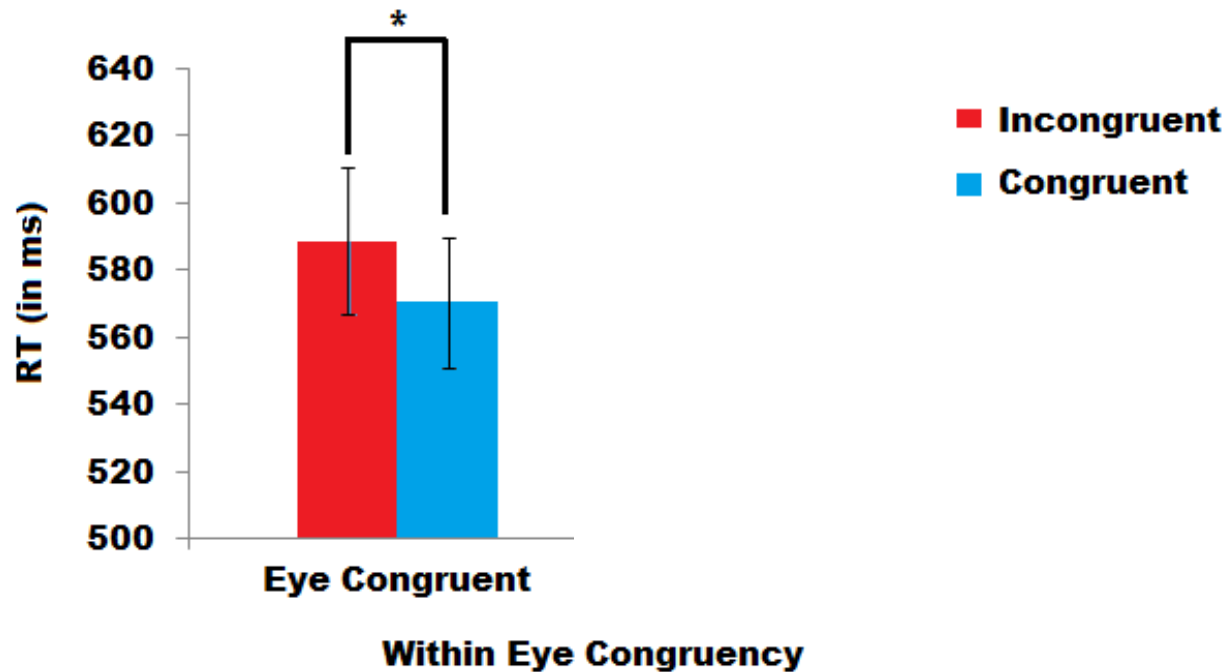


# Experiment 2 – Global Local Task 2

## Results



### Local Task Different Eyes Presentation



# Experiment 2 – Global Local Task 2

## General Discussion



- To conclude, in both experiments we've demonstrated the involvement of low structures of the visual system in global and local processing.
- Additive congruency effects were demonstrated, suggesting two independent systems of processing hierarchical information at monocular and binocular portions of the visual system.



**Thank you!** ✨