

## ATTENTION-GETTING AND ATTENTION-HOLDING PROCESSES OF INFANT VISUAL PREFERENCES

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COHEN, LESLIE B. Attention-getting and Attention-holding Processes of Infant Visual Preferences. *CHILD DEVELOPMENT*, 1972, 43, 869-879. *In a new procedure that permitted the independent assessment of attention-getting and attention-holding processes of various stimulus parameters, 18 male and 18 female 4-month-old infants were exposed to checkerboards varying in size and number of squares. The major finding was that the latency of turning toward the pattern was determined more by the size of the checkerboard than by the number of checks, while the duration of fixation was more a function of the number of checks than the size. Infants also tended to turn faster toward and look longer at the right side than the left. The results supported the contention that infant attention should be divided into separate attention-getting and attention-holding processes.*

A common procedure for investigating infant visual attention has been to present a series of visual patterns for several trials of fixed duration and to record infants' total fixation time per trial. While this procedure has yielded valuable information on infants' preferences for patterns (e.g., Brennan, Ames, & Moore 1966; Kagan & Lewis 1965) and changes in preferences over time (e.g., Caron & Caron 1969; Cohen, Gelber, & Lazar 1971; Pancratz & Cohen 1970), it has also obscured information. For example, the direction in which the infant is looking before a trial begins will

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This research was supported in part by grants HD 03858 from the Institute of Child Health and Human Development and MH 07346 from the National Institute of Mental Health. I wish to express my gratitude to Ellen Bush for testing the subjects in this experiment and to Judy DeLoache for her careful reading of the manuscript and many helpful suggestions for improving it. Requests for reprints should be addressed to me at the Department of Psychology, University of Illinois, Champaign, Illinois 61820.

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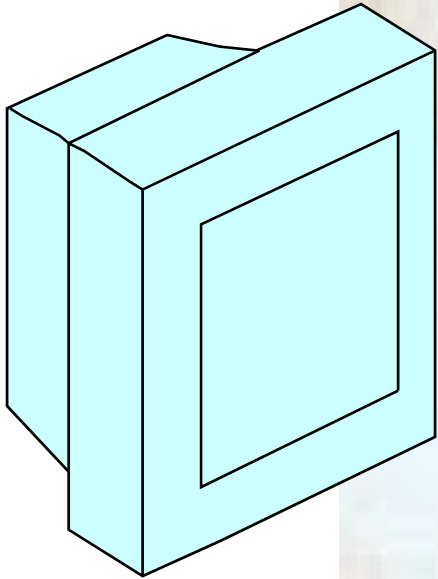
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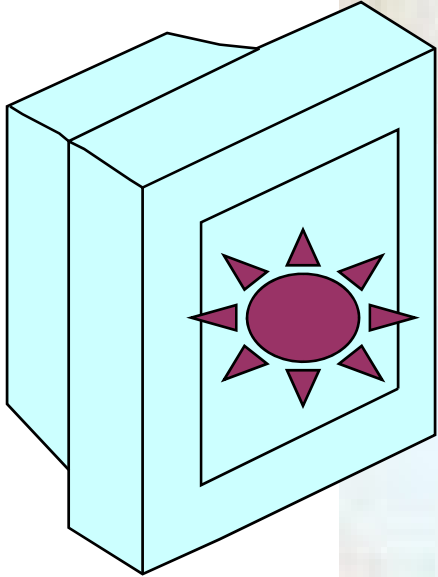
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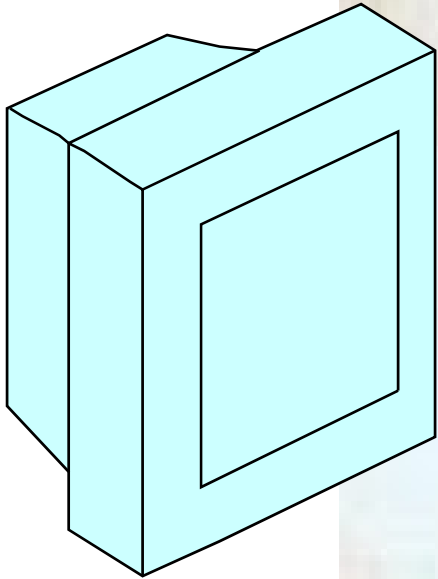
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fixation on each trial were the dependent variables. Taken together, the two studies support Cohen's hypothesis that infant attention involves at least two different mechanisms: an attention-getting process which determines whether or not the infant will orient toward a stimulus projected in his periphery, and an attention-holding process determining how long his gaze will be maintained once he fixates.

Whatever conclusions are reached from the studies, the present investigation has already demonstrated the feasibility, perhaps even the necessity, of independently assessing attention-getting and attention-holding aspects of infant visual fixations.

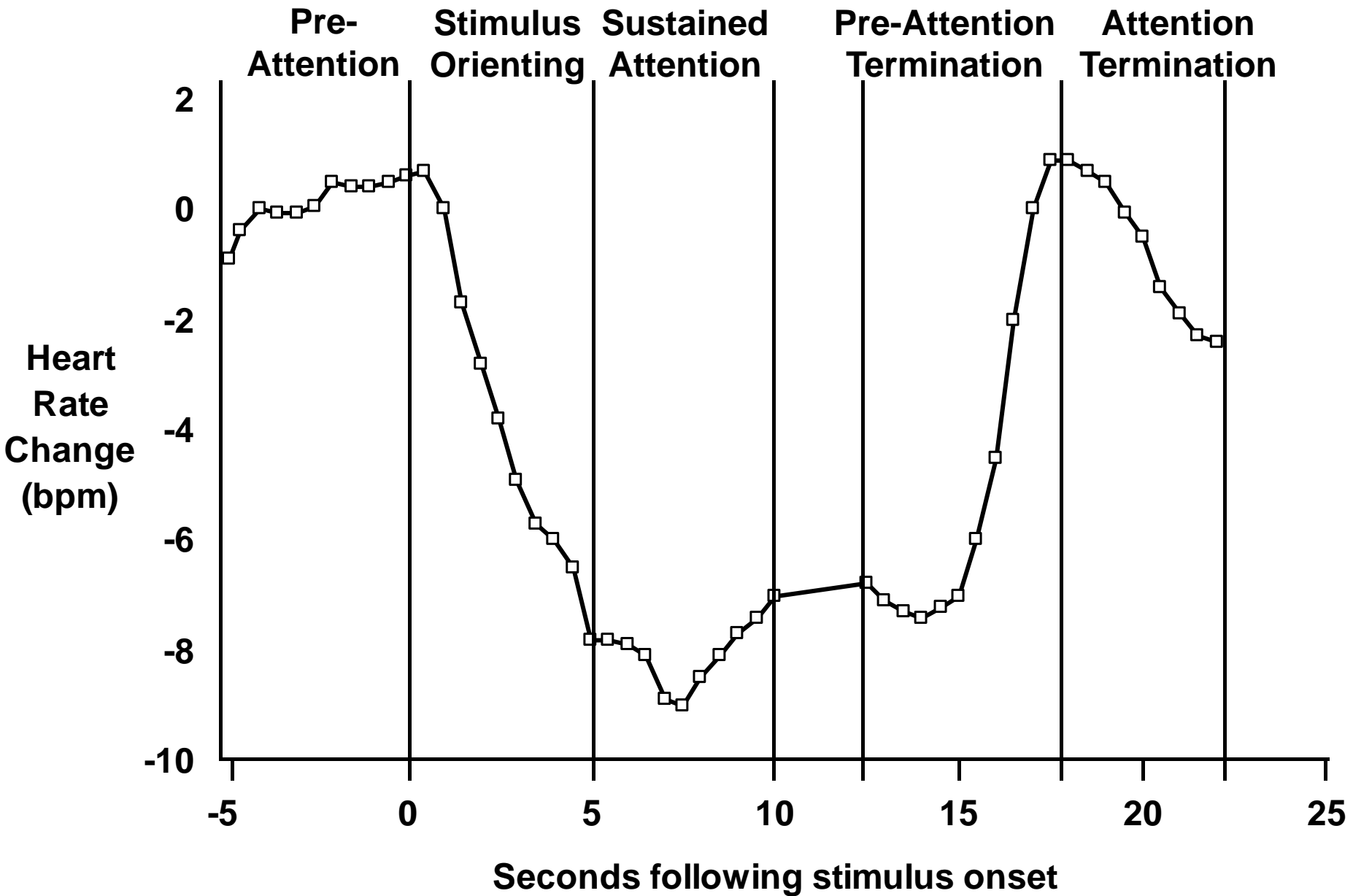




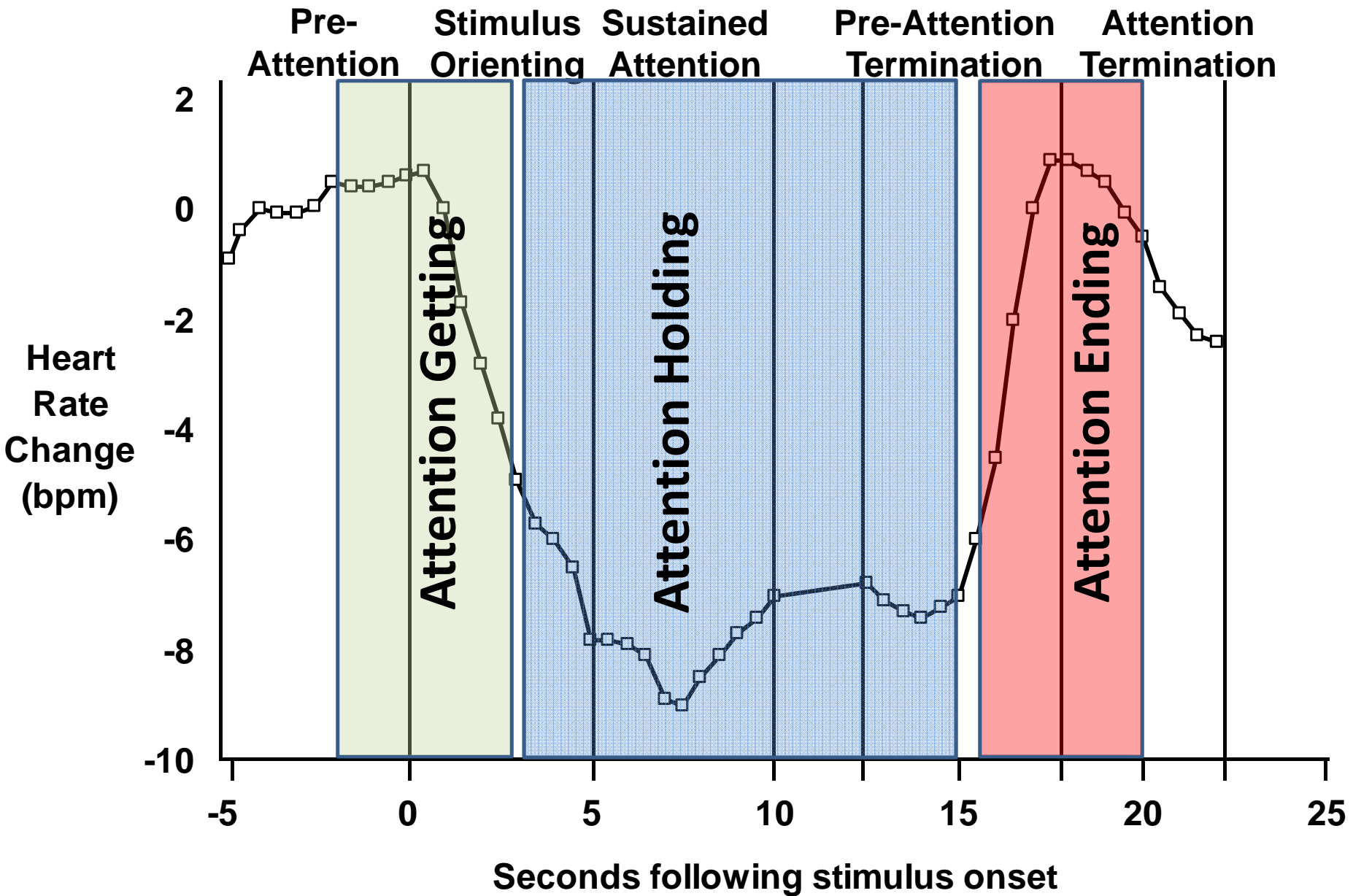


**“Model Preparation” for distinguishing  
“attention-getting” and “attention-holding”**



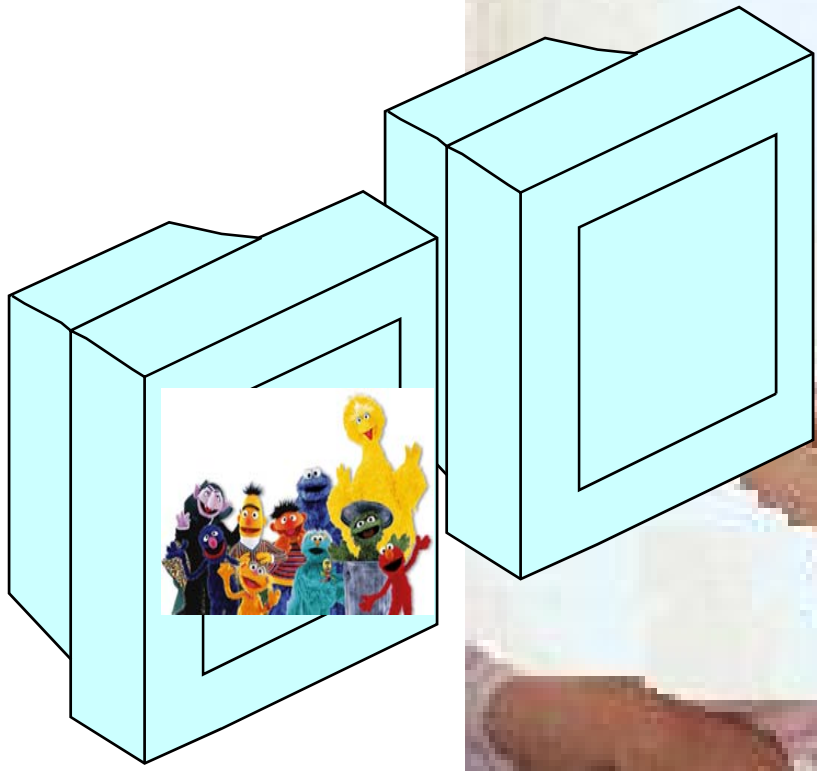
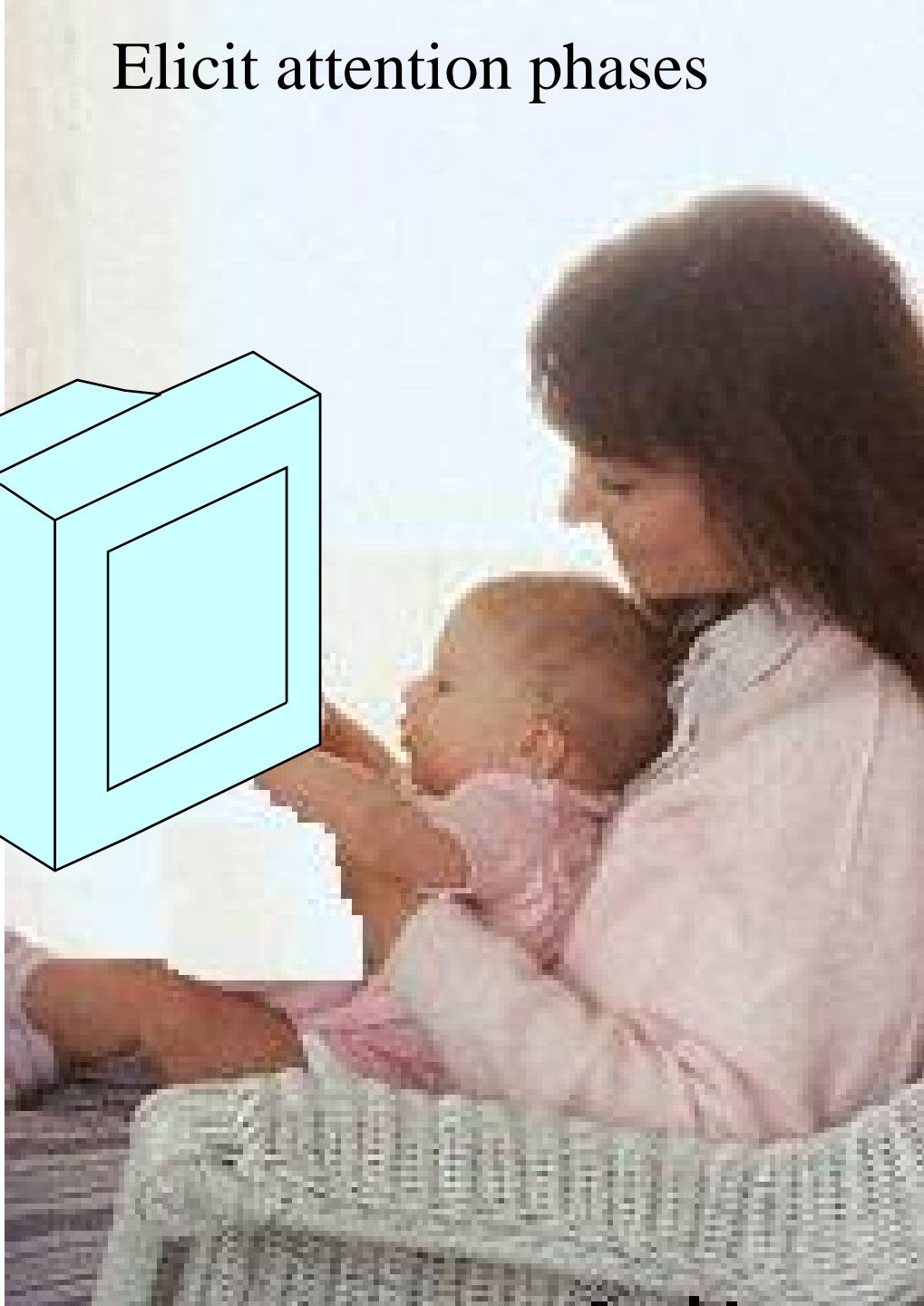




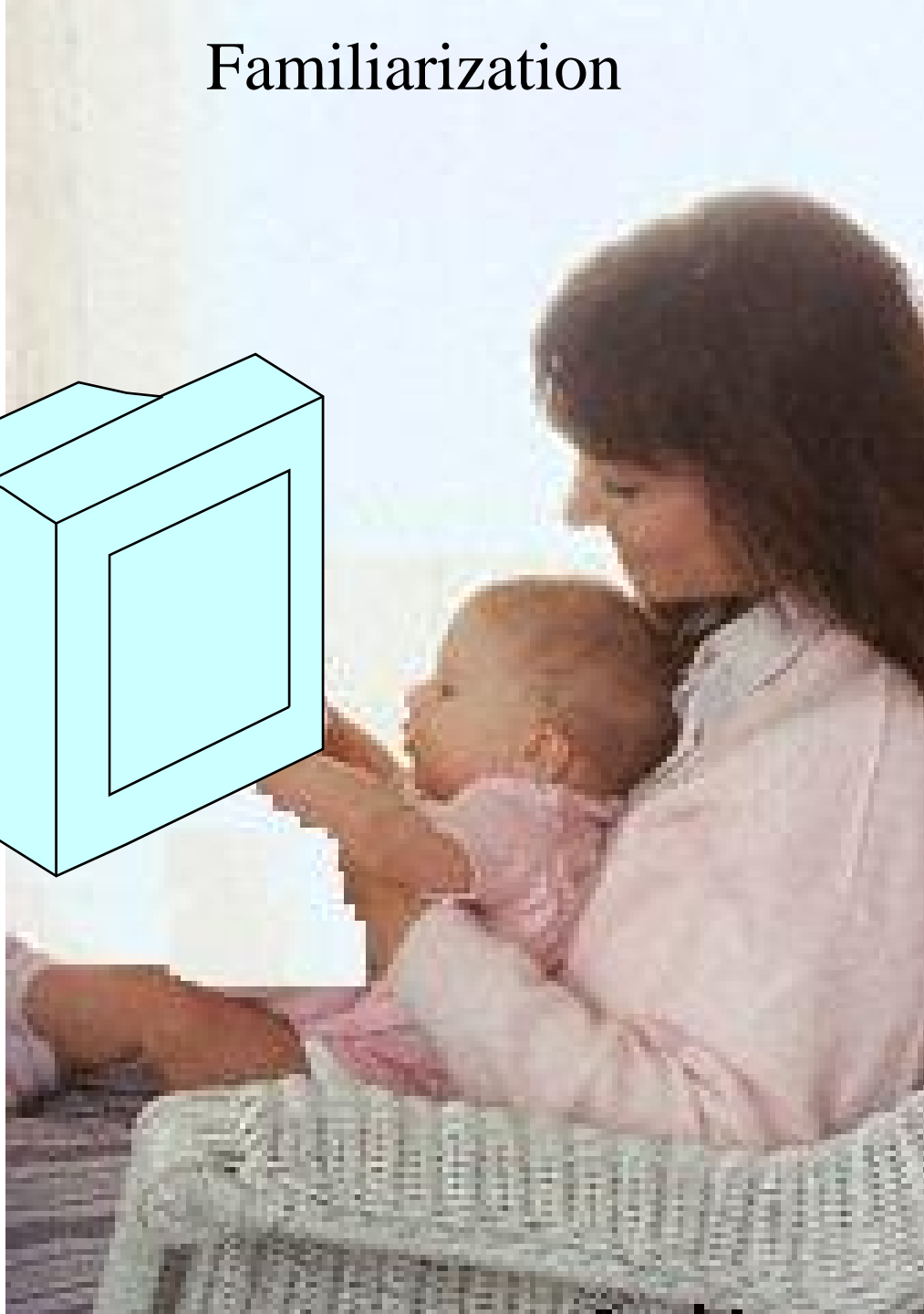
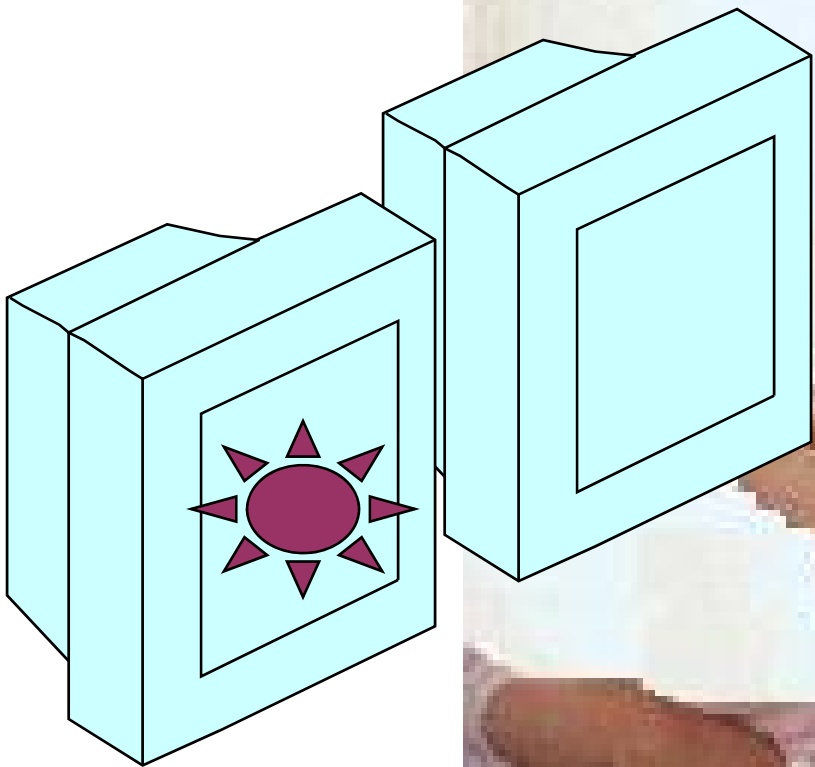


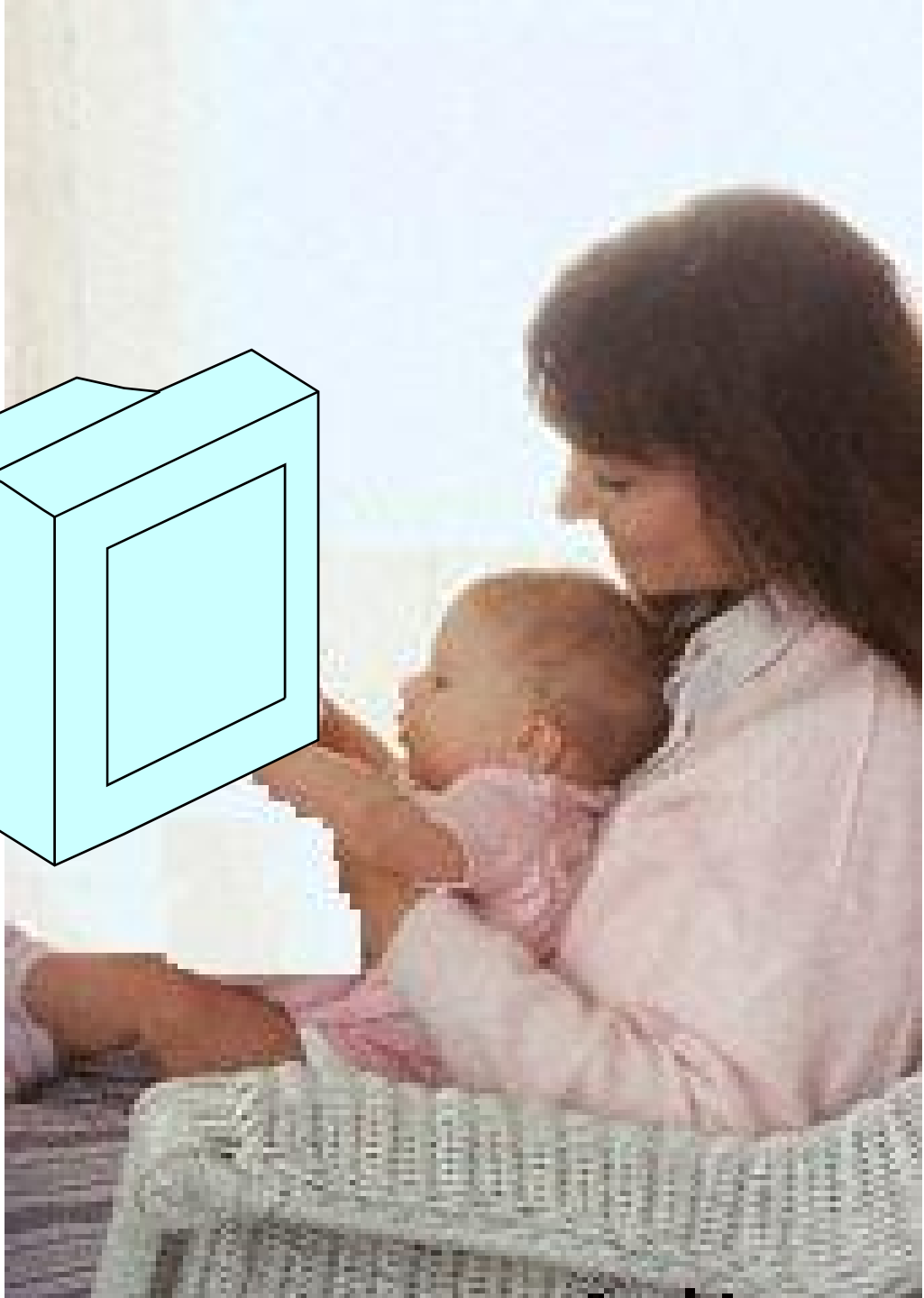
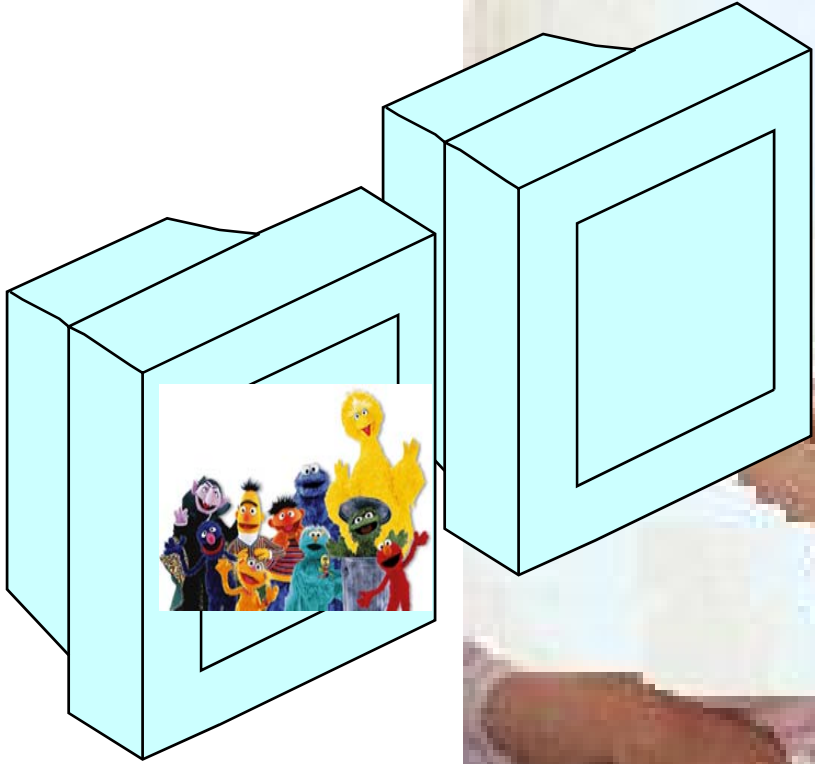
On the other hand, Cohen (1969) has provided some evidence for the hypothesis that attention holding involves more active information processing and may be influenced more by the variability, amount of edge, or novelty of the pattern. Research currently being conducted in our laboratory is ex-

# Elicit attention phases

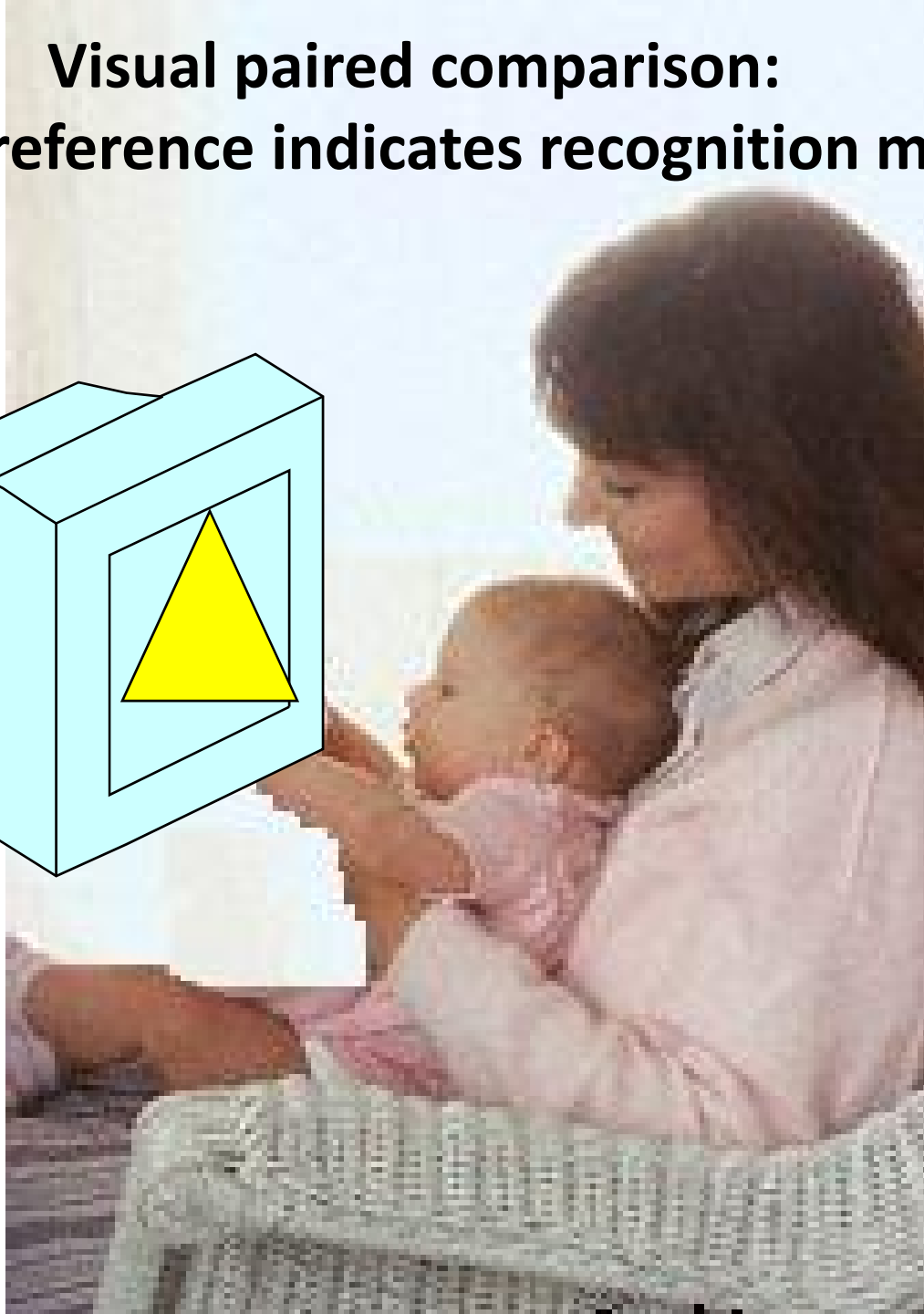
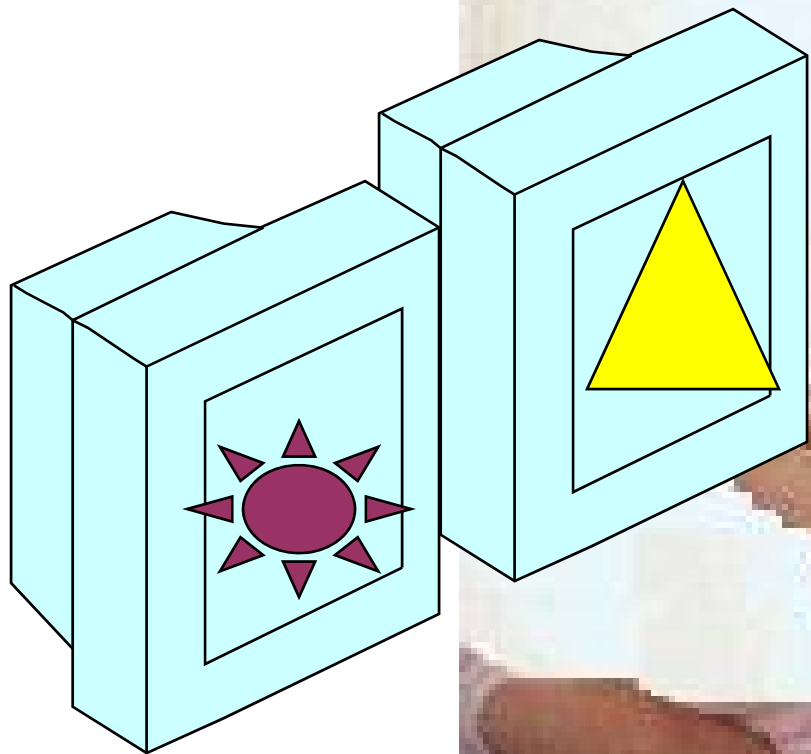


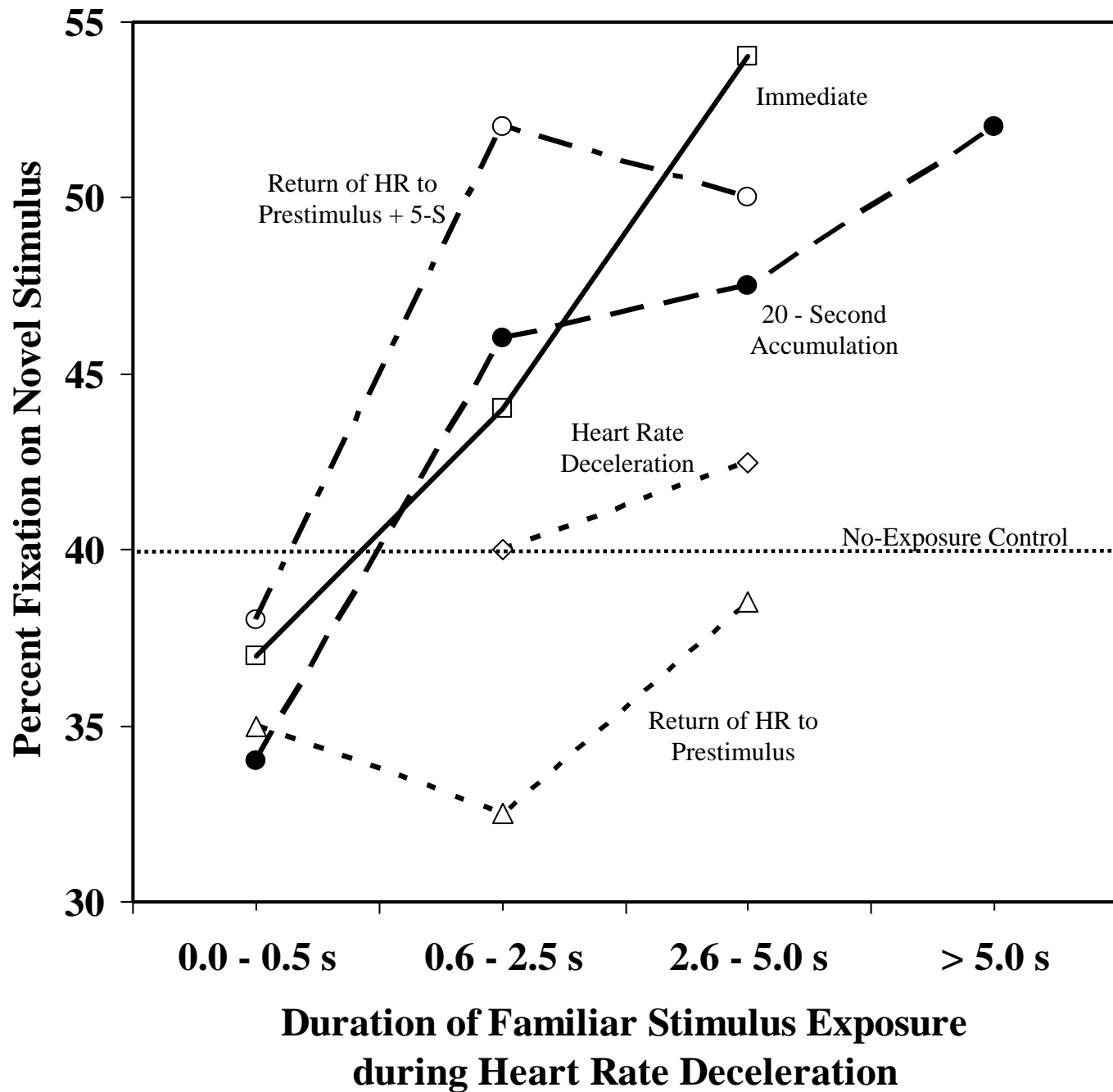
# Familiarization

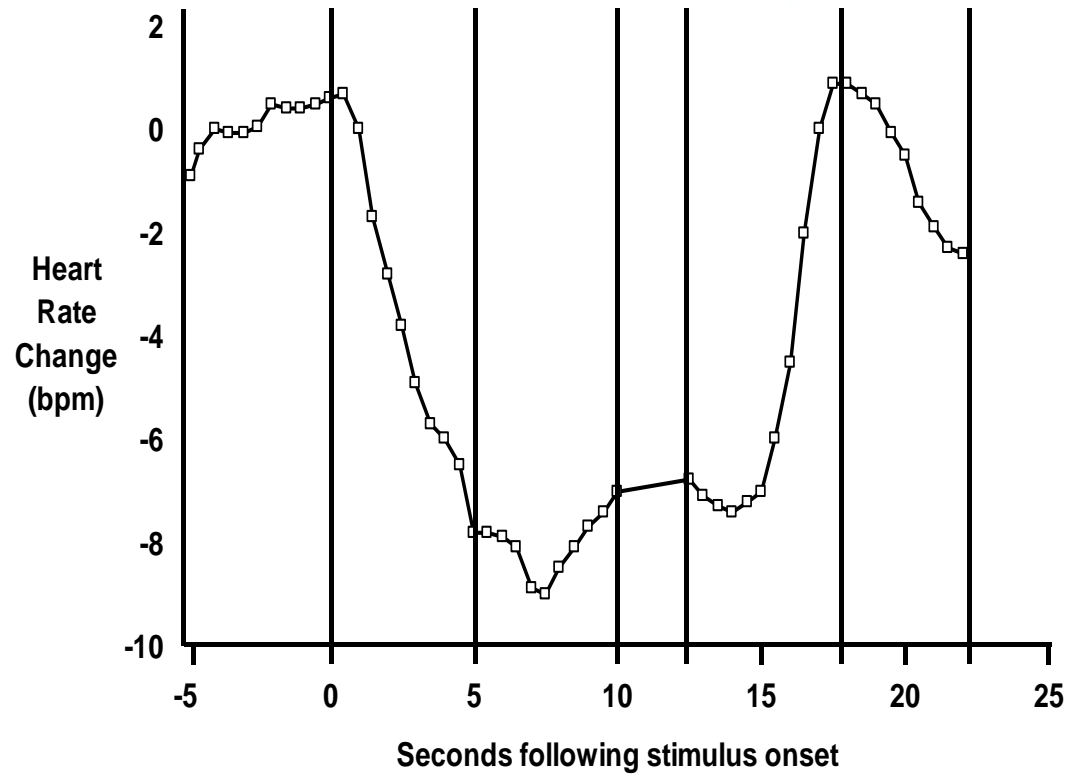
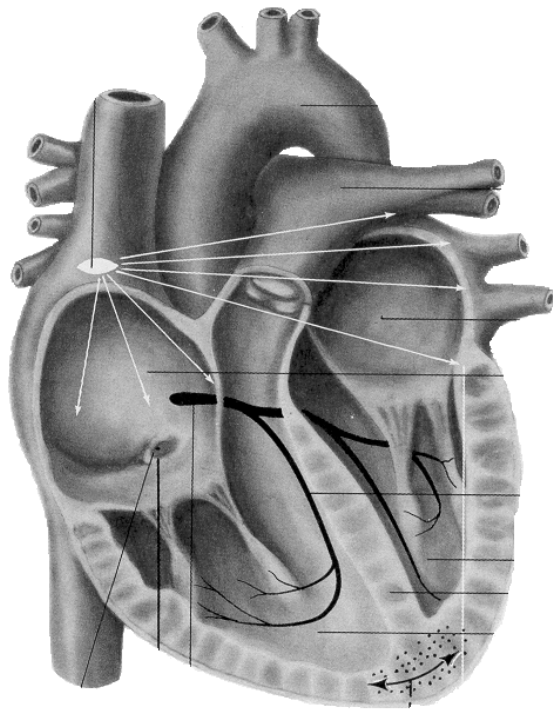
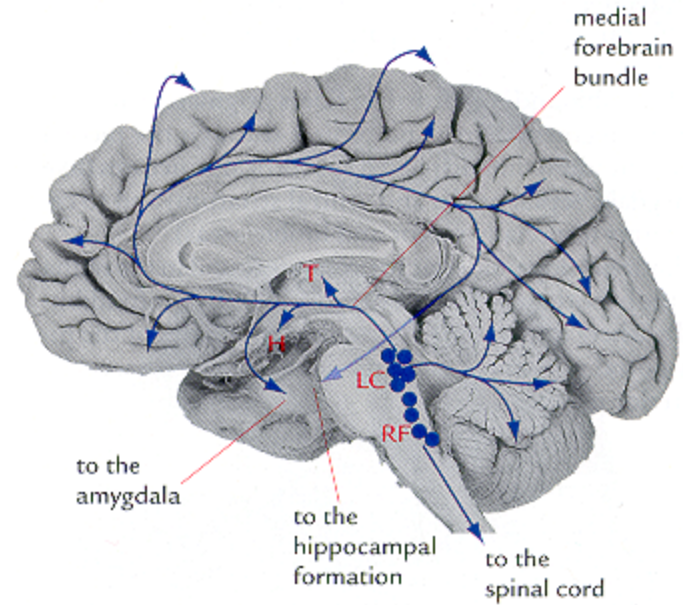
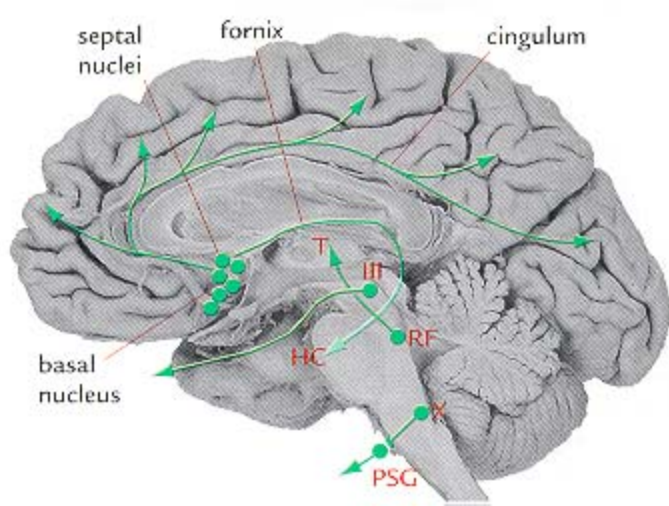




**Visual paired comparison:  
Novelty preference indicates recognition memory**







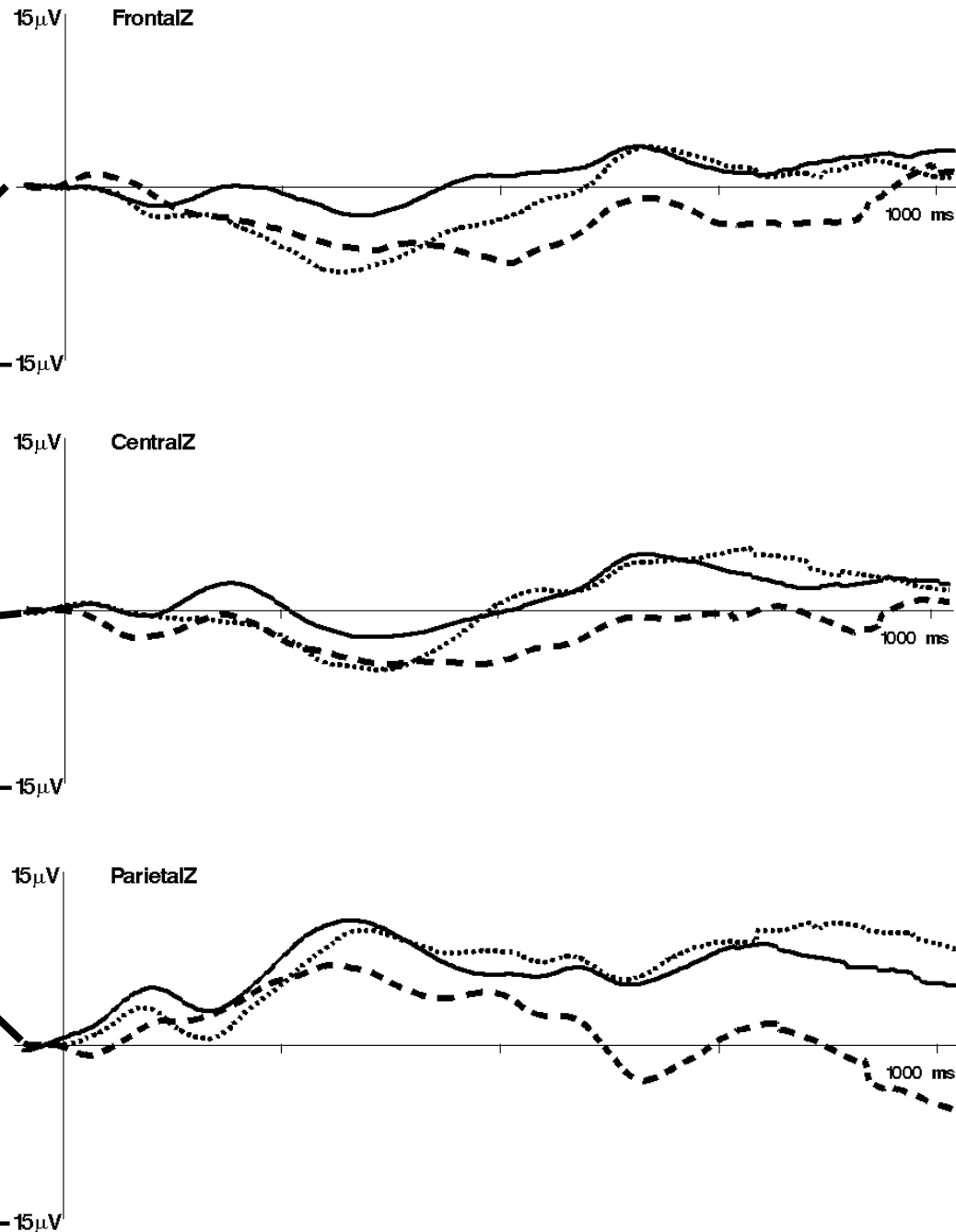
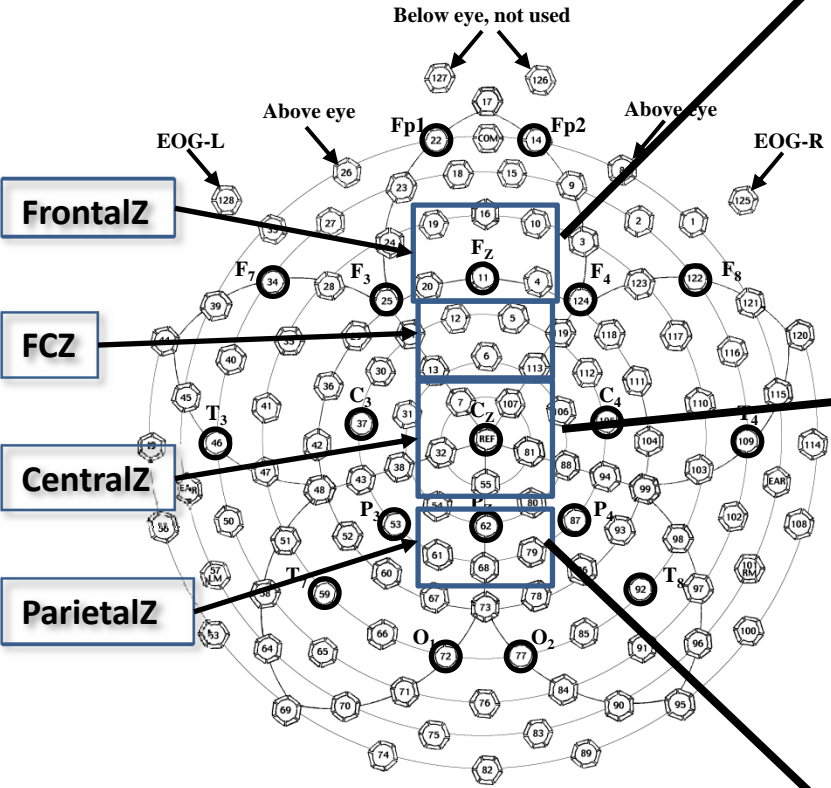


**Neuroimaging tools for infant participants are limited  
Use high-density scalp-recorded ERP?**



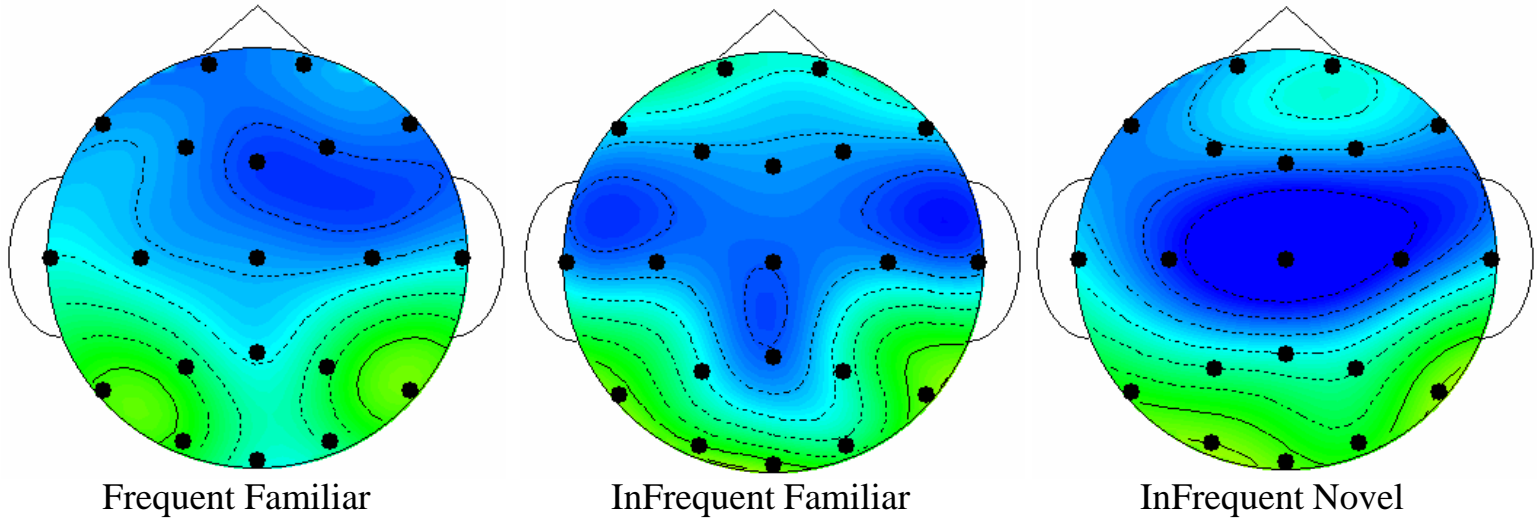
# Brief Stimulus Presentations, Post-Stimulus ERP, "Nc"

## SensorNet Layout

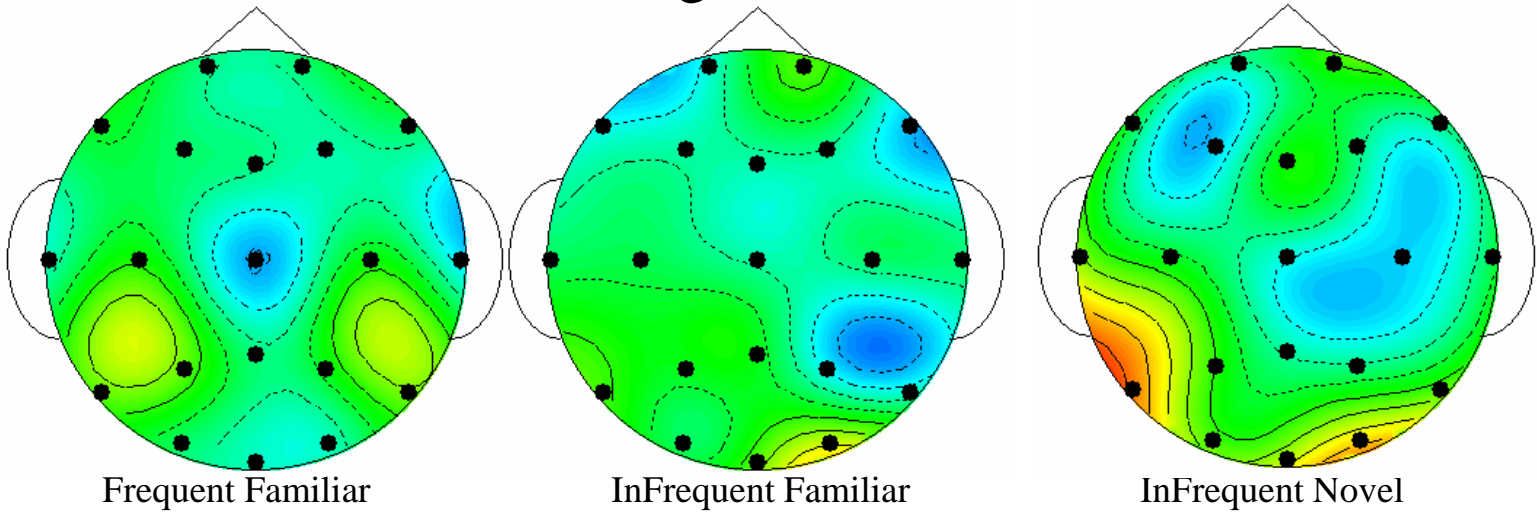


- Frequent Familiar
- ..... Infrequent Familiar
- - - Infrequent Novel

# Nc During Attention



# Nc During Inattention

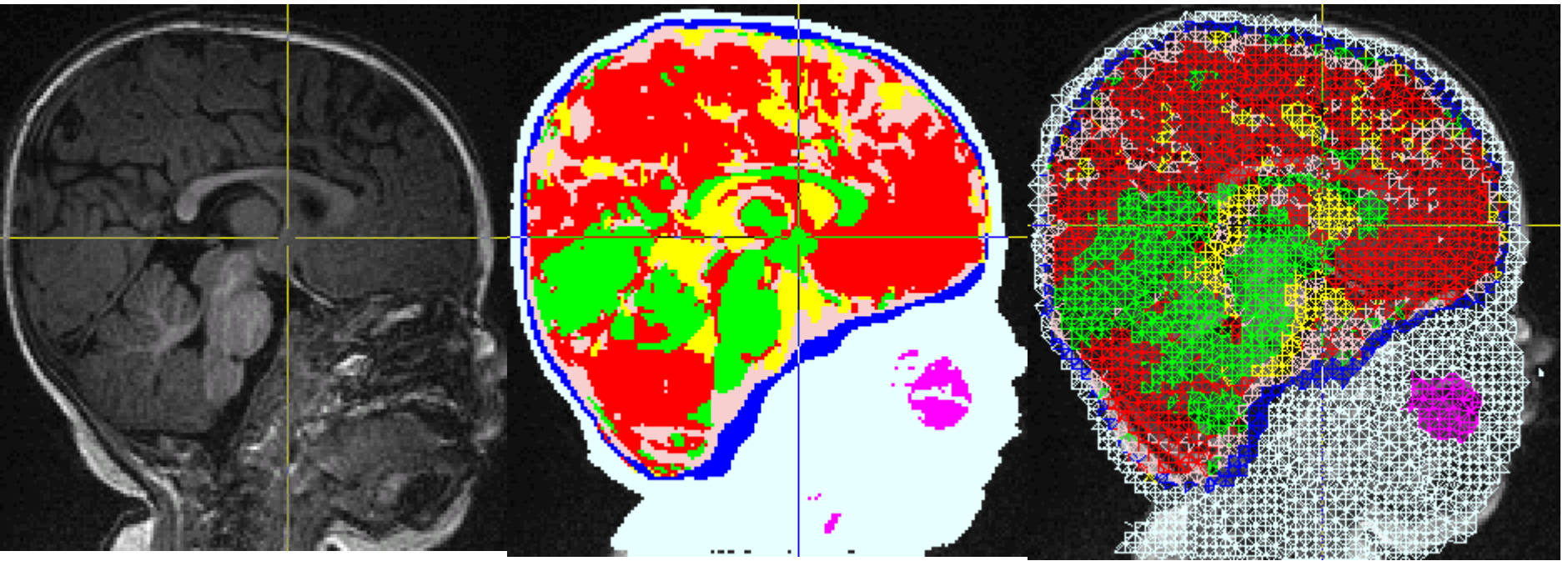


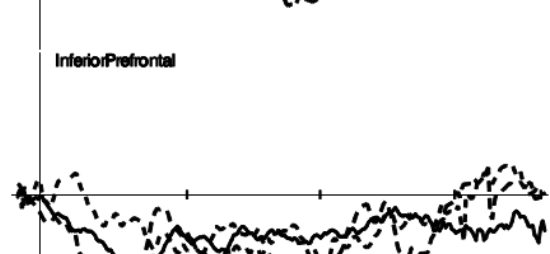
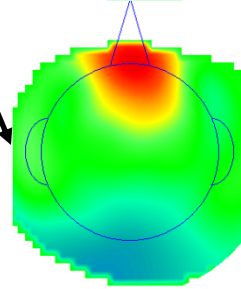
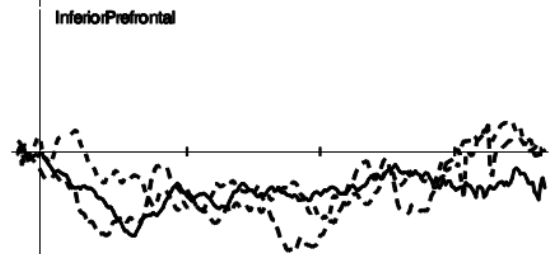
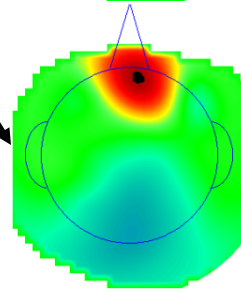
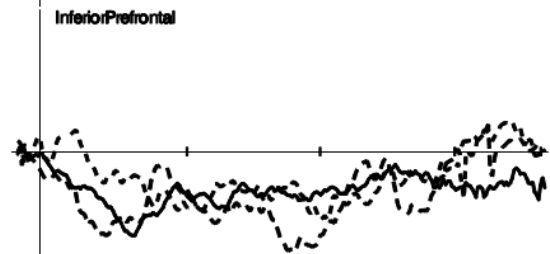
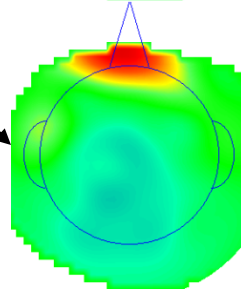
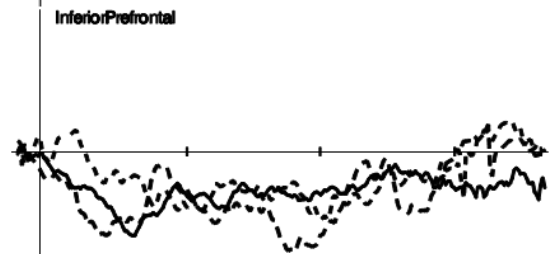
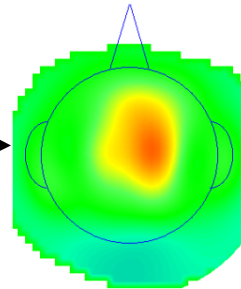
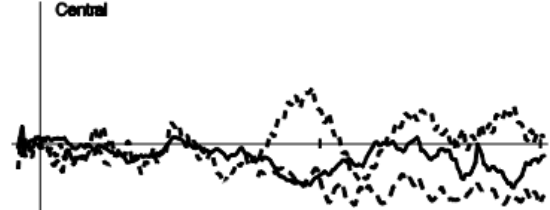
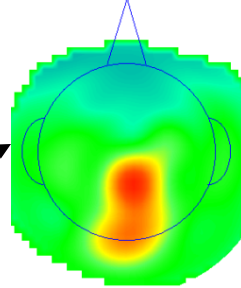
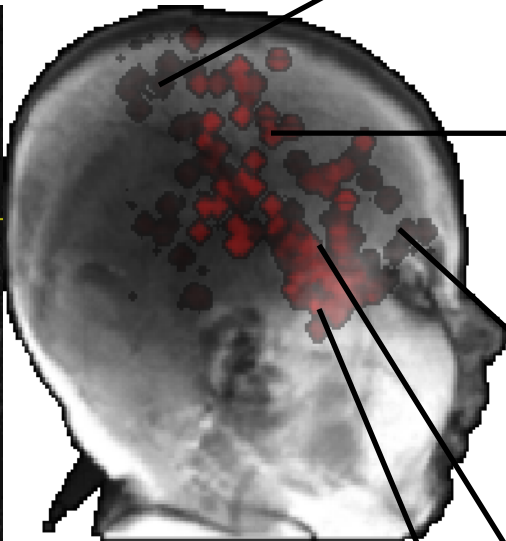
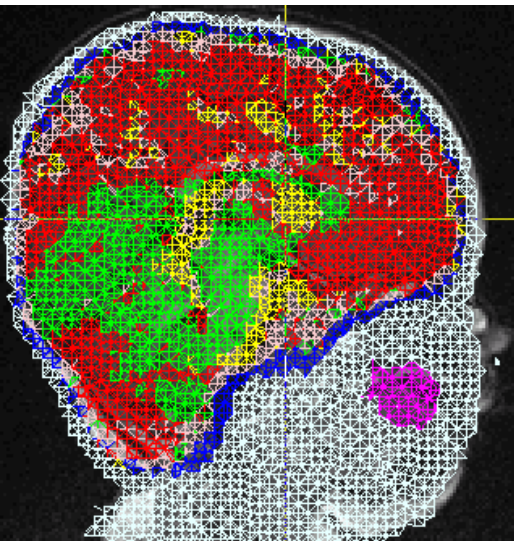
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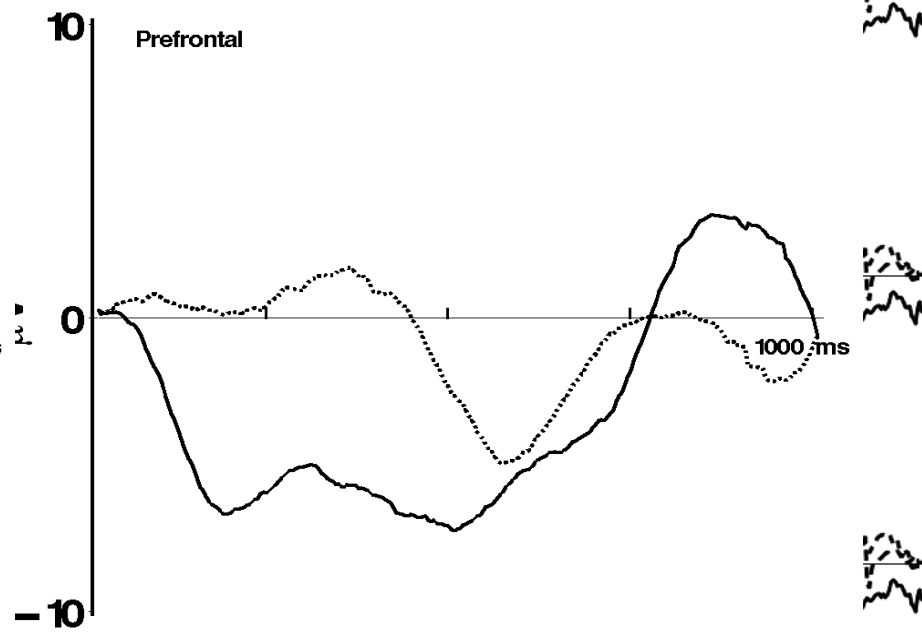
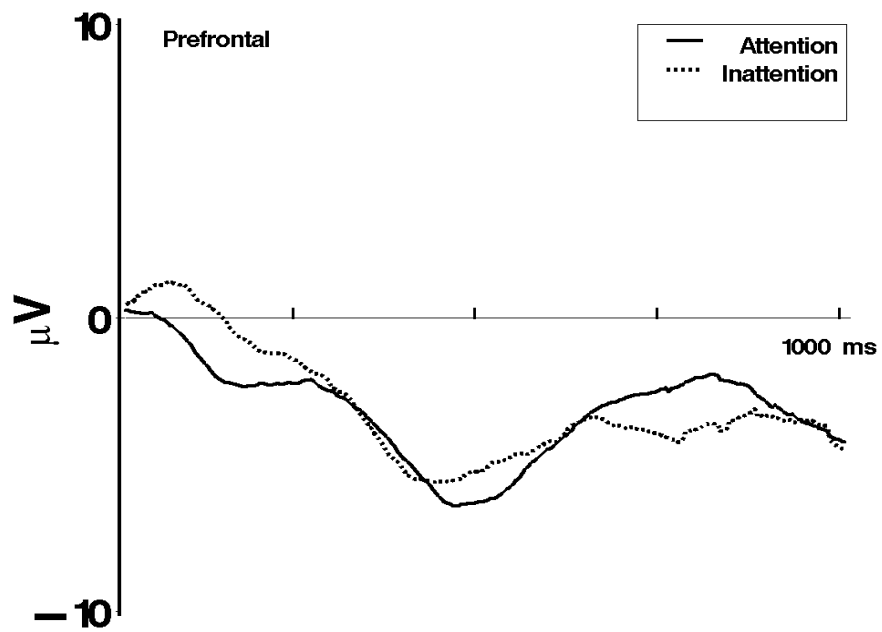
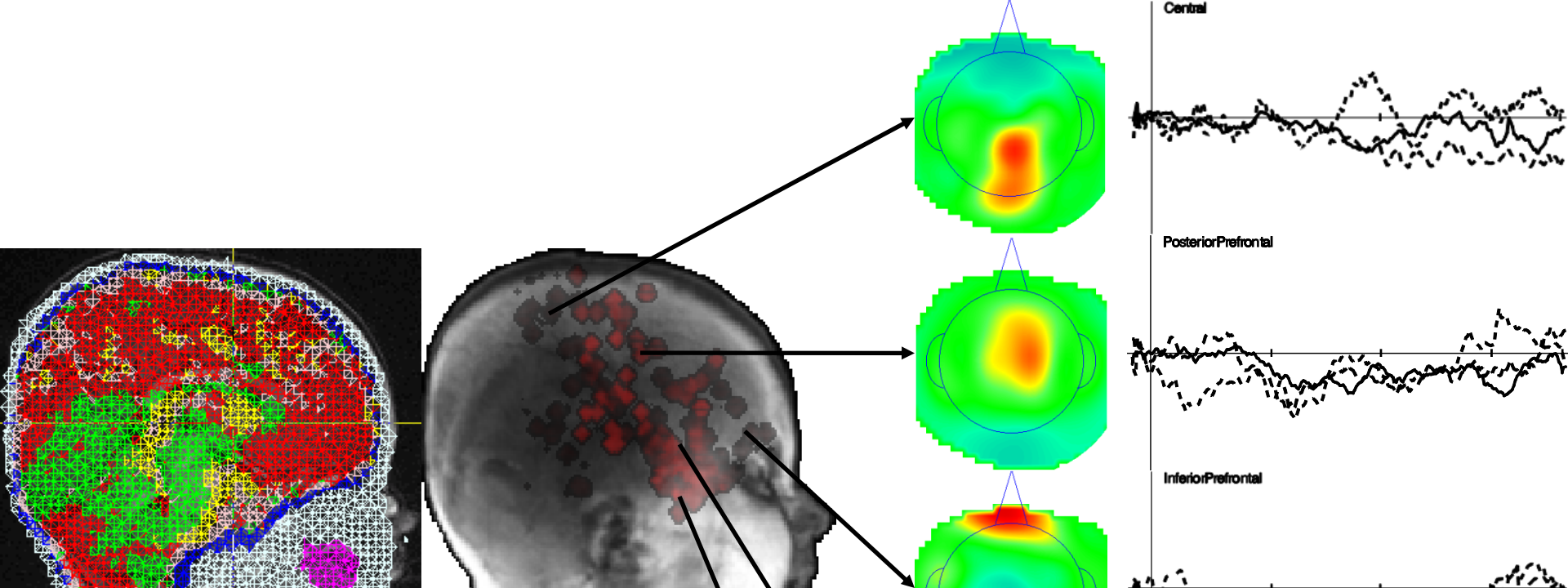
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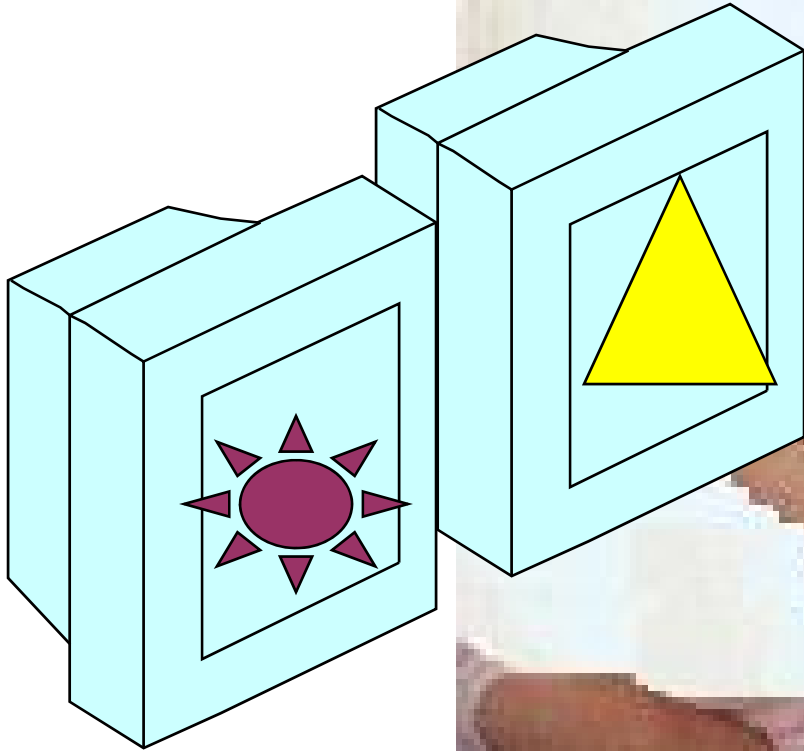








# Measure EEG/ERP in Paired-Comparison Procedure Brain Basis of Visual Preferences





### **1985 (New Investigator Research Award): Heart-Rate-Defined Attention Phases in Infants**

Infant visual attention consists of sequentially ordered, multiple processing phases<sup>[1,2,3,4,5]</sup>. Cohen<sup>[1]</sup> distinguished attention-getting and attention-holding processes with measures of visual fixation. Psychophysicologists investigating infant attention<sup>[2,4,5]</sup> have indexed four phases of attention with infant heart rate (HR): automatic interrupt, stimulus orienting, sustained attention, and attention termination.

**1988, 1992: Heart-Rate-Defined Attention Phases in Infants** Infant visual attention consists of sequentially ordered, multiple processing phases<sup>[1,2,3,4,5]</sup>. Cohen<sup>[1]</sup> distinguished attention-getting and attention-holding processes with measures of visual fixation. Ruff<sup>[6,7,8,9]</sup> distinguished “casual attention” and “focused attention” with fixation, object handling and mouthing, and distraction measures. Psychophysicologists investigating infant attention<sup>[2,4,5,10,11]</sup> have indexed four phases of attention with infant heart rate (HR): automatic interrupt, stimulus orienting, sustained attention, and attention termination.

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