# Experimental Methods in Infant Research

## Psychophysiological

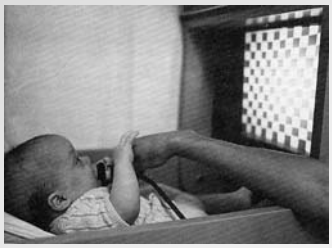
**Heart Rate**

**EEG/ERP**

## Behavioral

**Kicking**

**Sucking**



**Preferential Looking**



# Preferential Looking

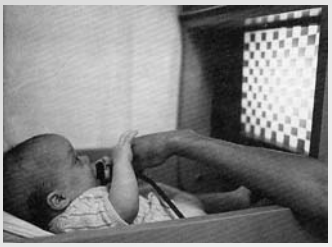
# Psychophysiological Methods

- Heart-Rate
  - The rate at which the heart beats (beats/min.) changes as a function of stimulation
    - Increased HR to fearful stimuli (defensive reaction)
    - Decreased HR to interesting stimuli (orienting reaction)
  - Employed in studies of information processing in infancy
    - If baby exhibits decreased HR to an interesting stimulus (e.g., a face, a speech sound, a taste) this is interpreted as evidence that baby finds the stimulus interesting



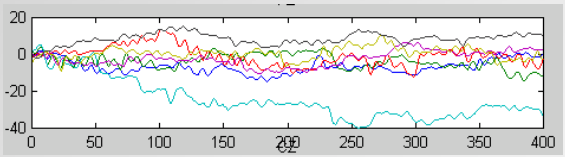
# Behavioral Conditioning Studies Using Sucking

- Sucking is a reflexive response produced by infants whenever they have an object in their mouth
- Infants can be taught to vary their rate and intensity of sucking in response to particular contingencies and to particular stimuli
  - High-Amplitude Sucking (HAS) is a precedure that is often used in speech perception research with newborns & young infants

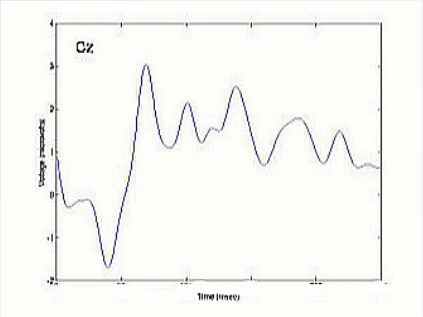


# Psychophysiological Methods

- EEG (electroencephalogram)
  - Collective neural activity of the cortex; buried in this general activity are ERPs



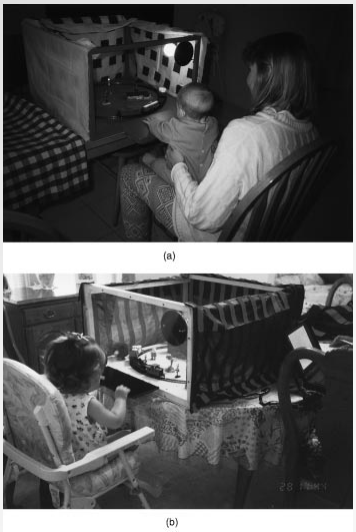

- ERP (event-related potentials)
  - Electrical potentials reflecting the activity of a population of neurons (this activity is the sum of millions of neurons) engaged in a specific task in a particular brain region
    - E.g. – the processing of a visual stimulus in the occipital cortex or the processing of a speech stimulus in the temporal cortex






# Conditioning Studies

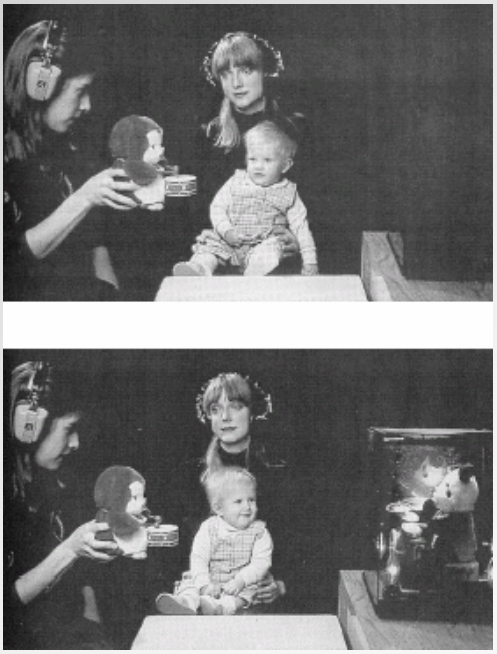
- Operant (or instrumental) conditioning
  - used to teach infants to produce a particular response (e.g,, foot kick) to obtain a reward (e.g., movement of mobile)
  - Mobile conjugate reinforcement task (Rovee-Collier)




  - Train task

# Conditioned Headturn Procedure

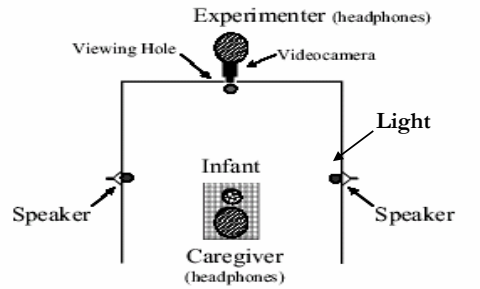
- Baby is trained to turn head in response to a change in the background stimulus (e.g., vowel /i/ presented several times followed by the vowel /o/ as in Kuhl, 1979)
- If baby turns head in the correct direction he/she is reinforced (dancing bear in box)
- The proportion of correct headturns is measured
- Once conditioned, the infant's response to different stimuli can be tested and, thus, can be used to test detection, discrimination, & categorization
- Useful in 6 to 10-month-old infants





# Headturn Preference Procedure (HPP)

- Lights on each side attract infant's attention to sound
- As long as infant looks sound is presented
- Duration of looking time indicates preference for one sound over another
- Can be used to test for recognition, segmentation, & preference



# Methods Based on Visual Attention

## Behavioral

**Looking**

Paired-Preference

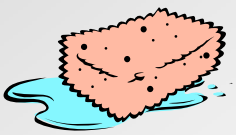
Habituation/Test



# Preference for Novelty

- **Information**

Sights
Sounds
Smells
Touches
Tastes



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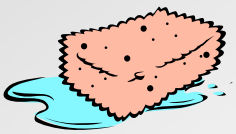
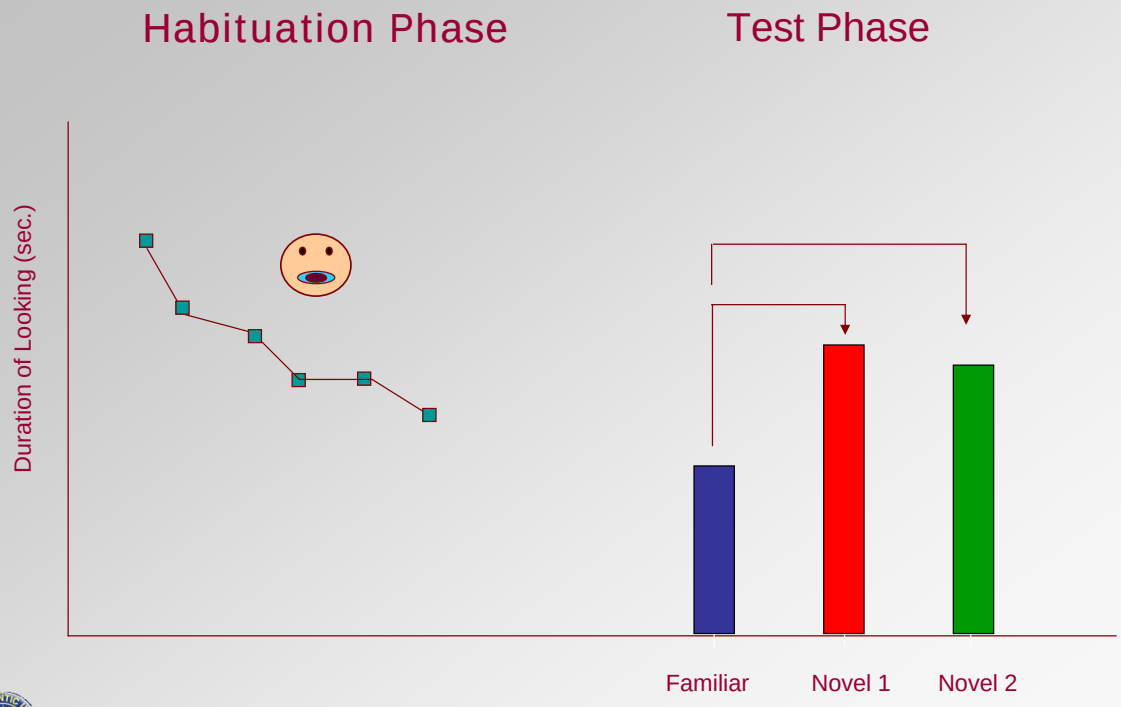




# Habituation/Test Method



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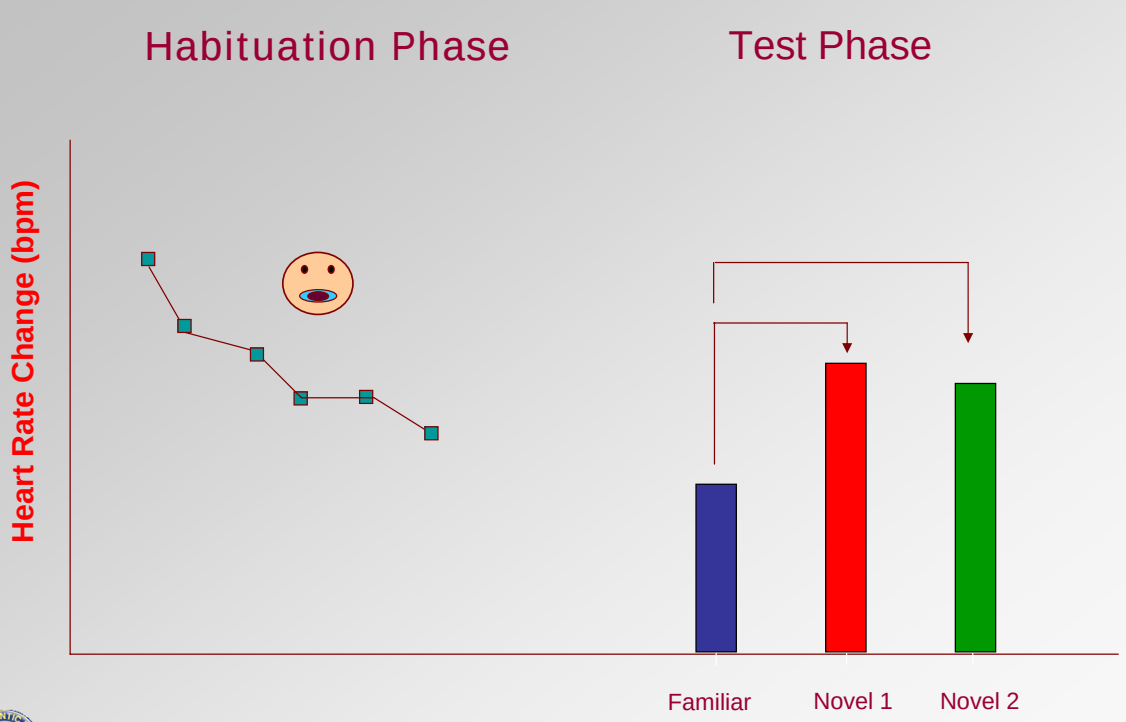
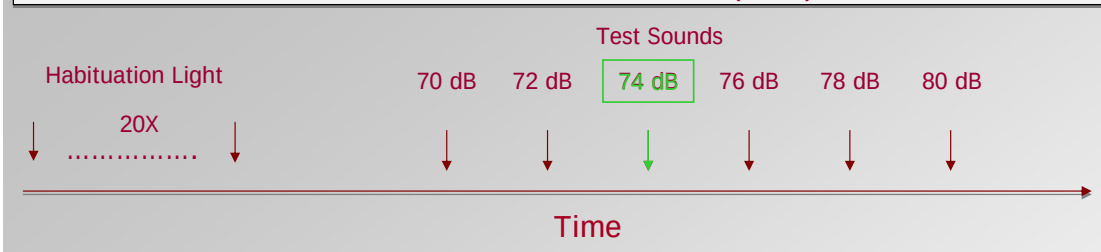





# Cross-Modal Intensity Matching in Neonates

Lewkowicz & Turkewitz (1980)



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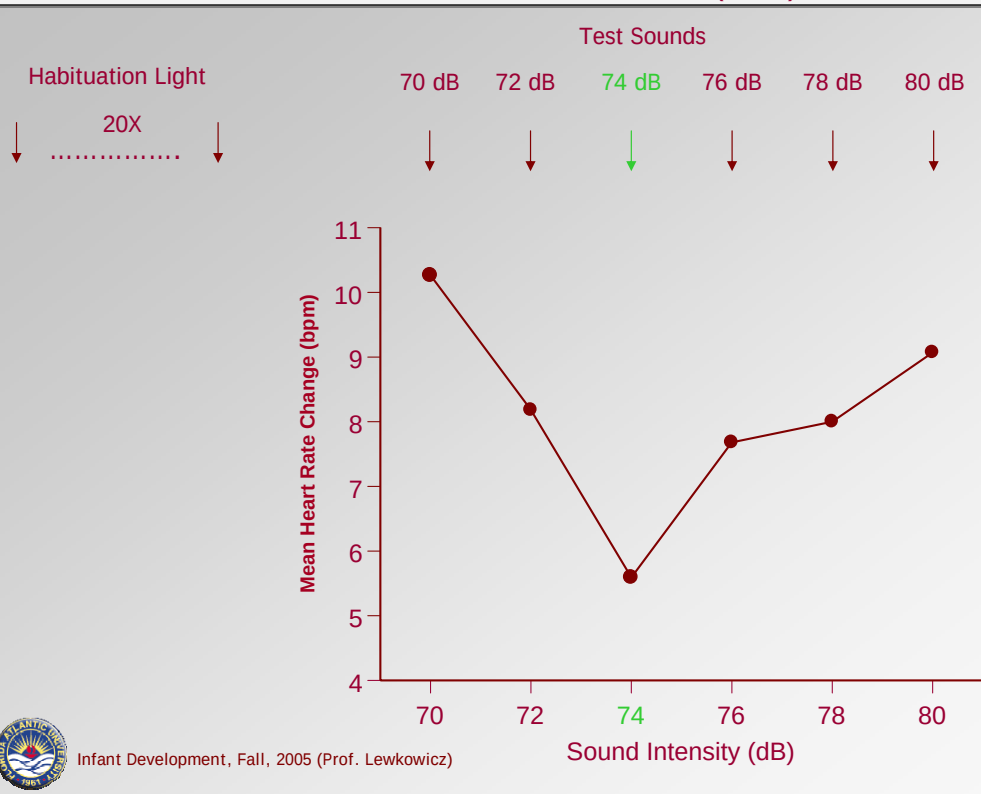
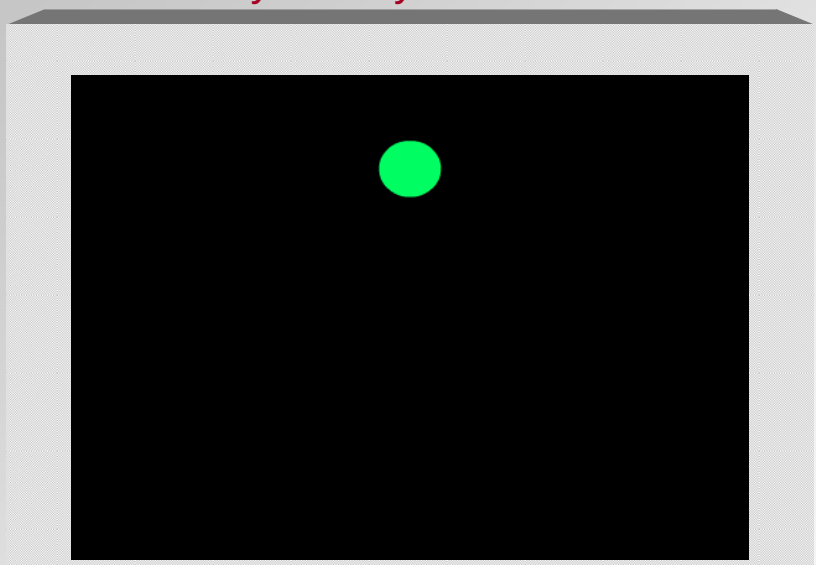




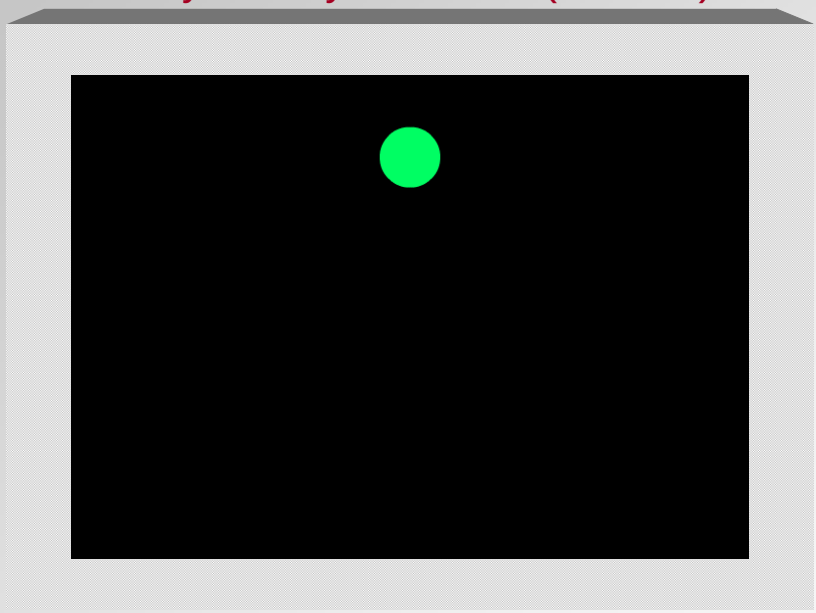

# Infant Perception of A-V Synchrony Relations

Synchrony Condition



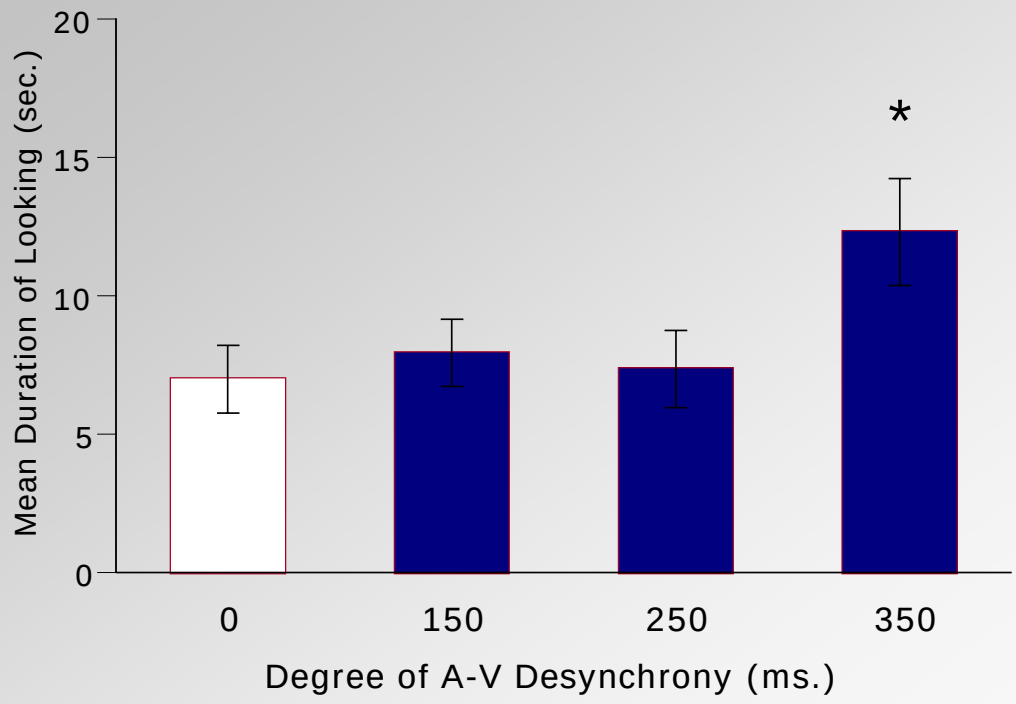
# Infant Perception of A-V Synchrony Relations

Desynchrony Condition (350 ms.)



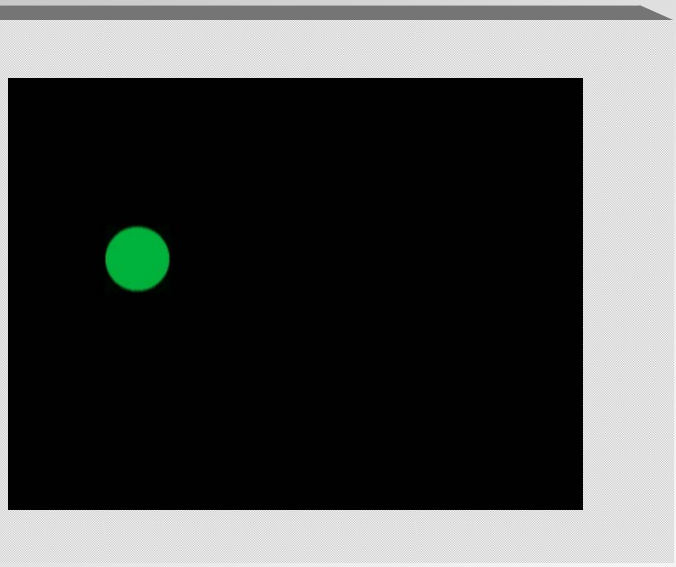


# Infant Perception of A-V Synchrony Relations




2, 4, 6, 8, month-olds

# Synchrony-Based Intersensory Matching





# Synchrony-Based Intersensory Matching