

Behavioral Hearing Assessment in Babies & Infants

Third Latin American Pediatric Amplification Conference
October 12, 2012



Anne Marie Tharpe
Vanderbilt University School of Medicine

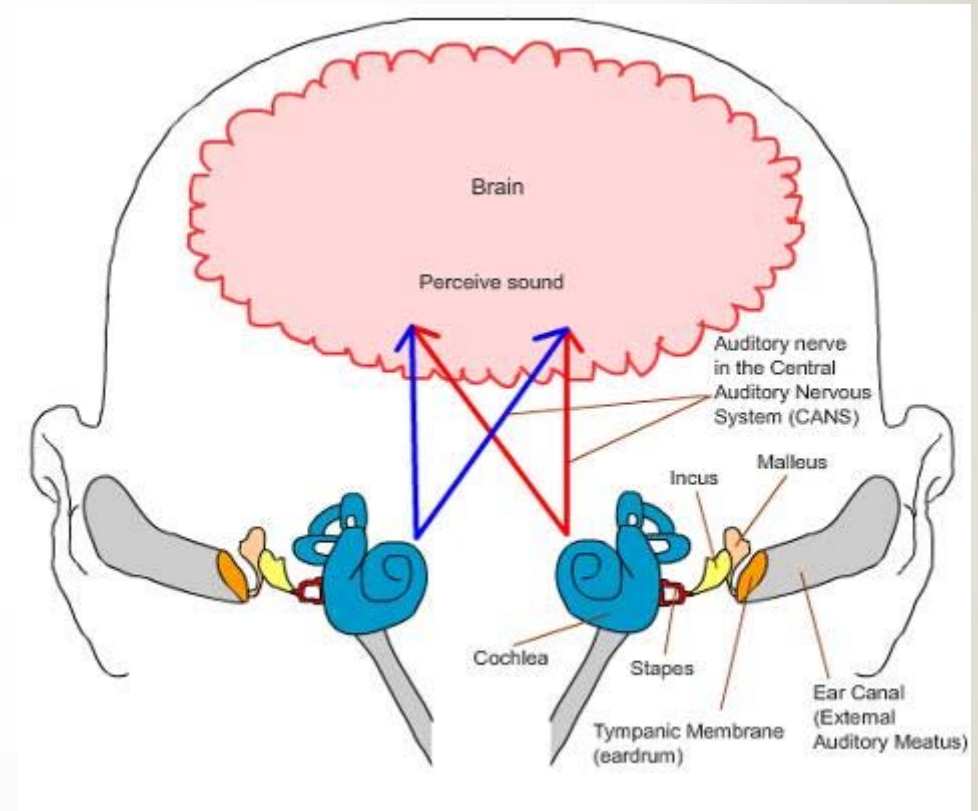
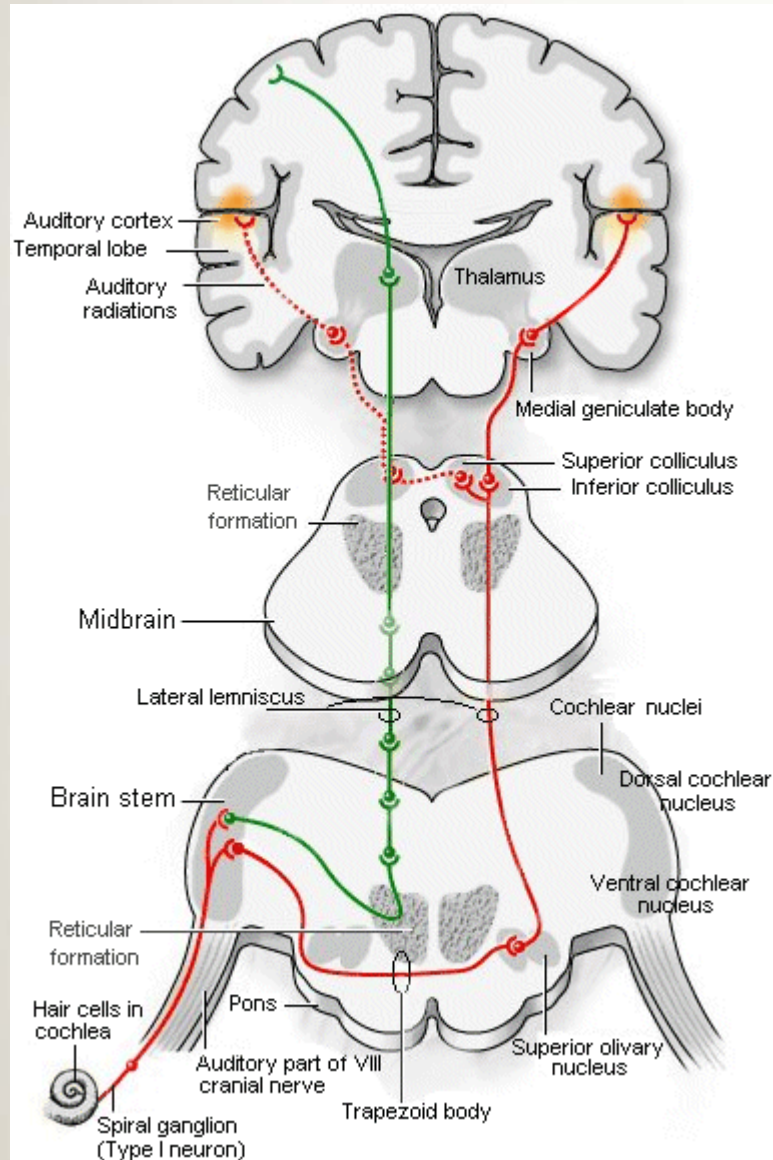
Preview

- I. Background
- II. Behavioral Observation
- III. Visual Reinforcement Audiometry
- IV. Conditioned Play Audiometry

I. Background

In today's world with otoacoustic emissions, auditory brainstem responses, and auditory steady state responses, do we still need to learn behavioral test techniques?

- Auditory neuropathy/dysynchrony
- Fragile health care needs (30-40% of children have additional disabilities) many of whom cannot be sedated
- Physiologic equipment is expensive and may not be available



Age-Based Protocols

- Chronologically/Developmentally
Birth to 4 months
- Chronologically/Developmentally 5
– 24 months
- Chronologically/Developmentally 25
– 60 months

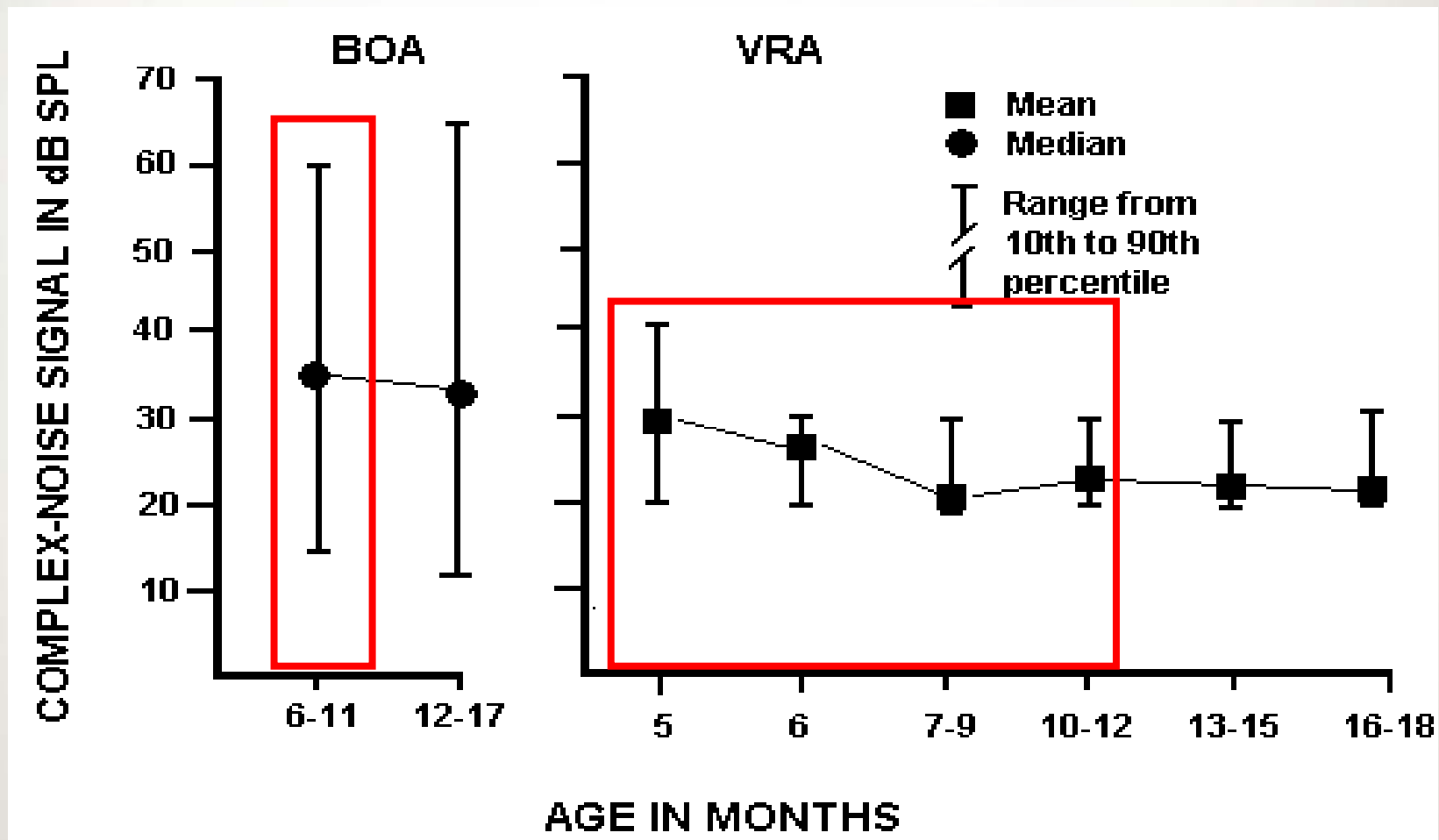


ASHA Guidelines (2004)

II. Behavioral Observation

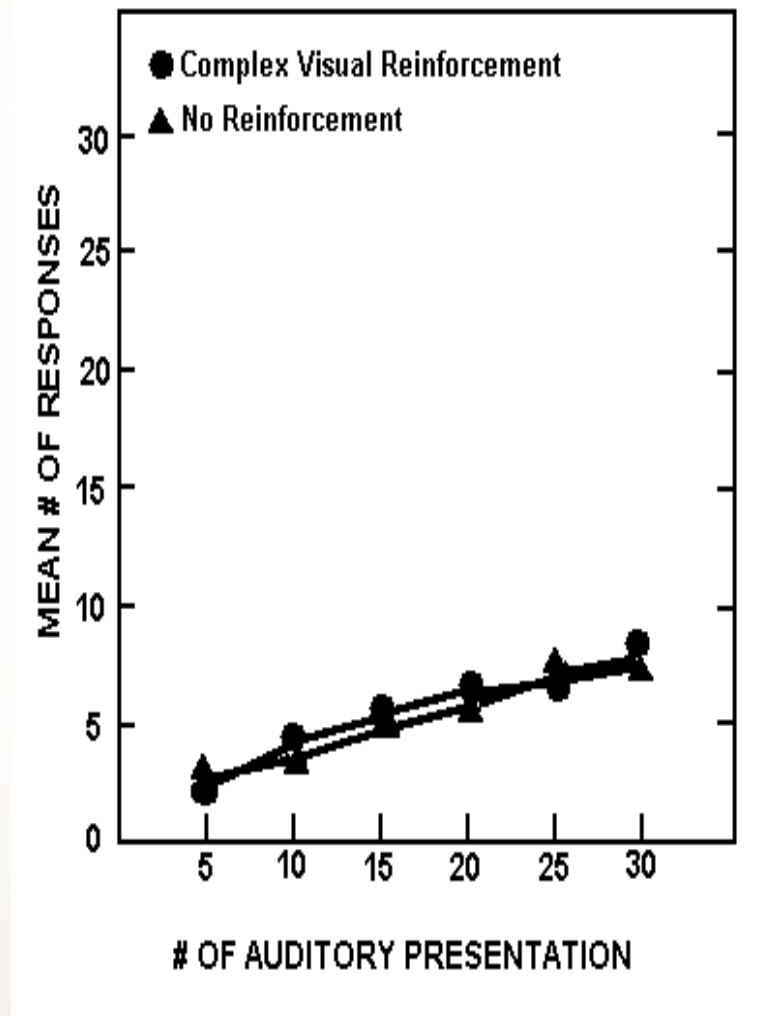


Wilson, Moore & Thompson, 1976



3-Month-Olds

Moore, Wilson, Thompson, 1977



Behavioral Observation Video



III. Visual Reinforcement Audiometry

ASHA Protocol: 5-24 Months

- Speech & frequency-specific stimuli (.5, 1.0, 2.0 & 4.0 kHz)
- Bilateral testing with insert earphones



“It is easy to teach a baby the headturn. The hard part is teaching the baby **not** to turn.”

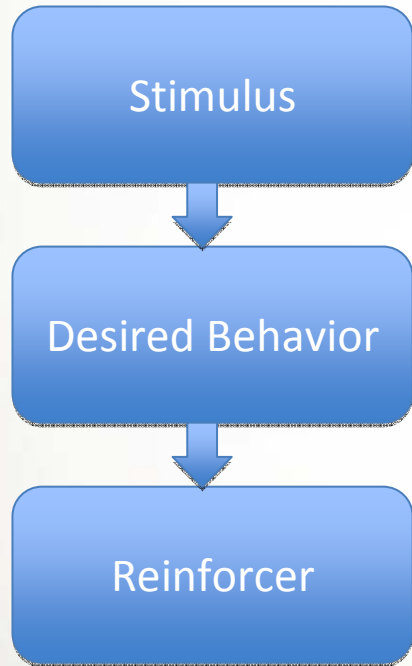
(Nozza, 1999)

Control Trials

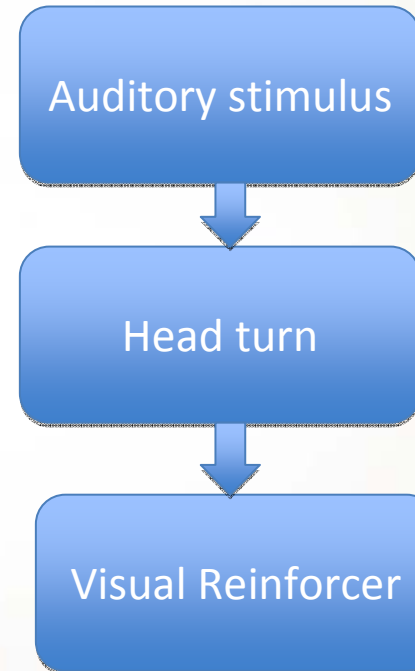
- An observational time when the examiner records whether a response occurs without a stimulus.
- Should be the same amount of time allowed for a response



Operant Conditioning



Visual Reinforcement Audiometry



Key Elements of a Conditioning Program:

- Appropriate stimulus
 - Waiting posture
 - Response
 - Reinforcer

Appropriate Stimulus

- Broad-band, complex
- Frequency-specific

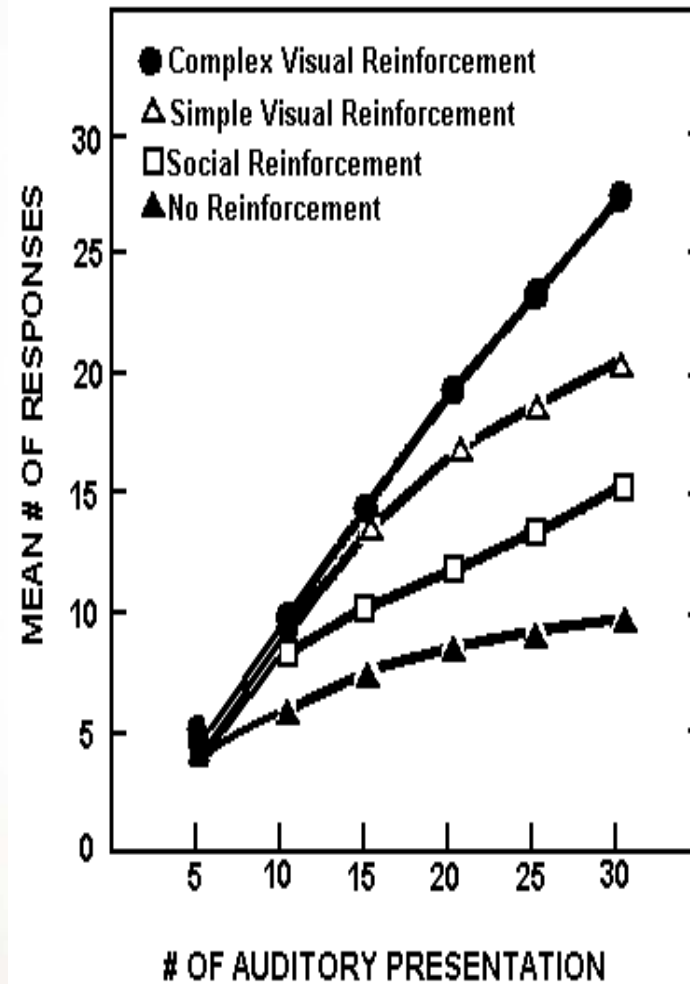
Waiting Posture



Response: 90° head turn



Reinforcer



(Moore, Wilson, Thompson, 1977)



Suggested VRA Protocol:

- ✓ Starting level of 30 dB
- ✓ Step size of 20 dB down, 10 dB up
- ✓ No conditioning, unless indicated

Visual Reinforcement Audiometry Video



IV. Conditioned Play Audiometry



ASHA Protocol: 25-60 Months

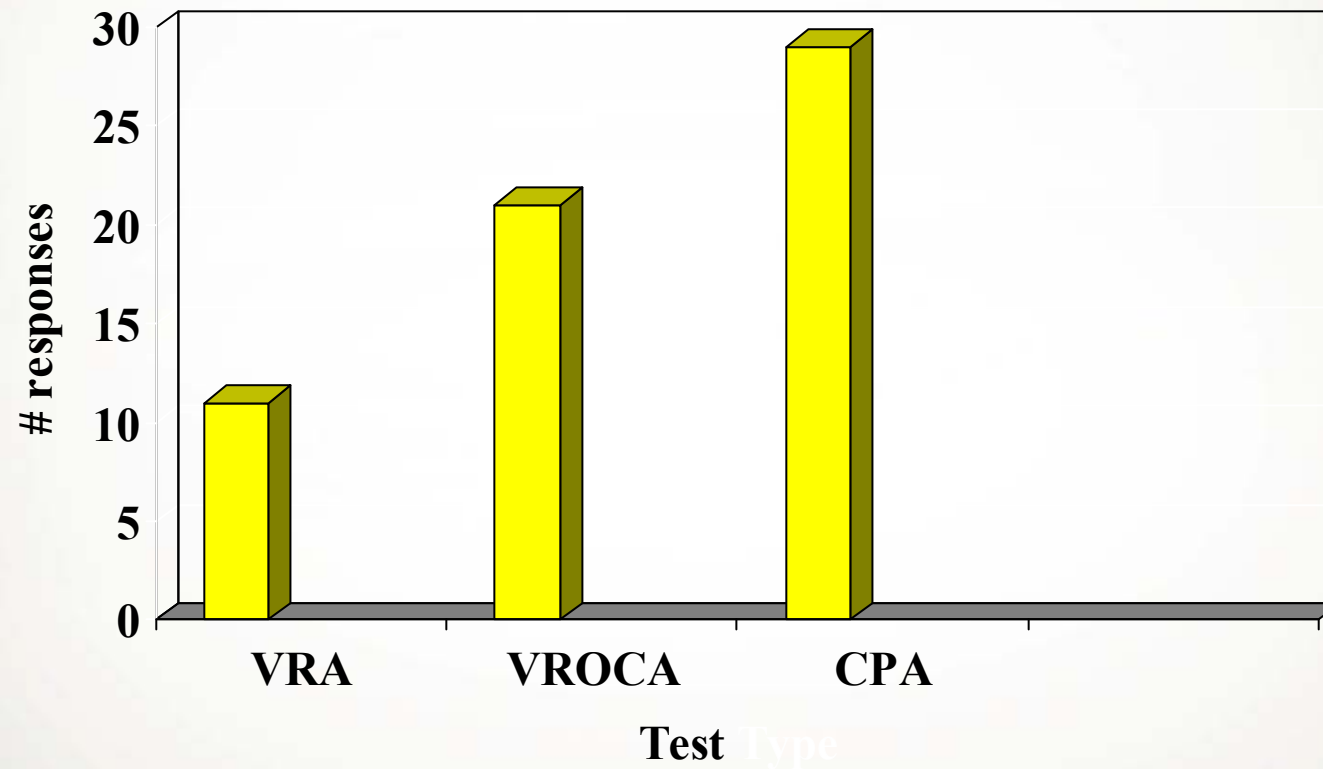
- Behavioral Assessment
 - Visual Reinforcement Audiometry (VRA)
 - Visually Reinforced Operant Conditioning Audiometry (VROCA)
 - Tangible Reinforcement Operant Conditioning Audiometry (TROCA)
 - Conditioned Play Audiometry (CPA)



Thompson, Thompson, & Vethivelu, 1989

- ✓ Compared effectiveness of 3 test procedures on 2-year-olds (VRA, VROCA, & CPA)
- ✓ 100% of the VRA group conditioned to task
- ✓ 83% of VROCA group conditioned to task
- ✓ 68% of CPA group conditioned to task

Responses of 2-yr-olds

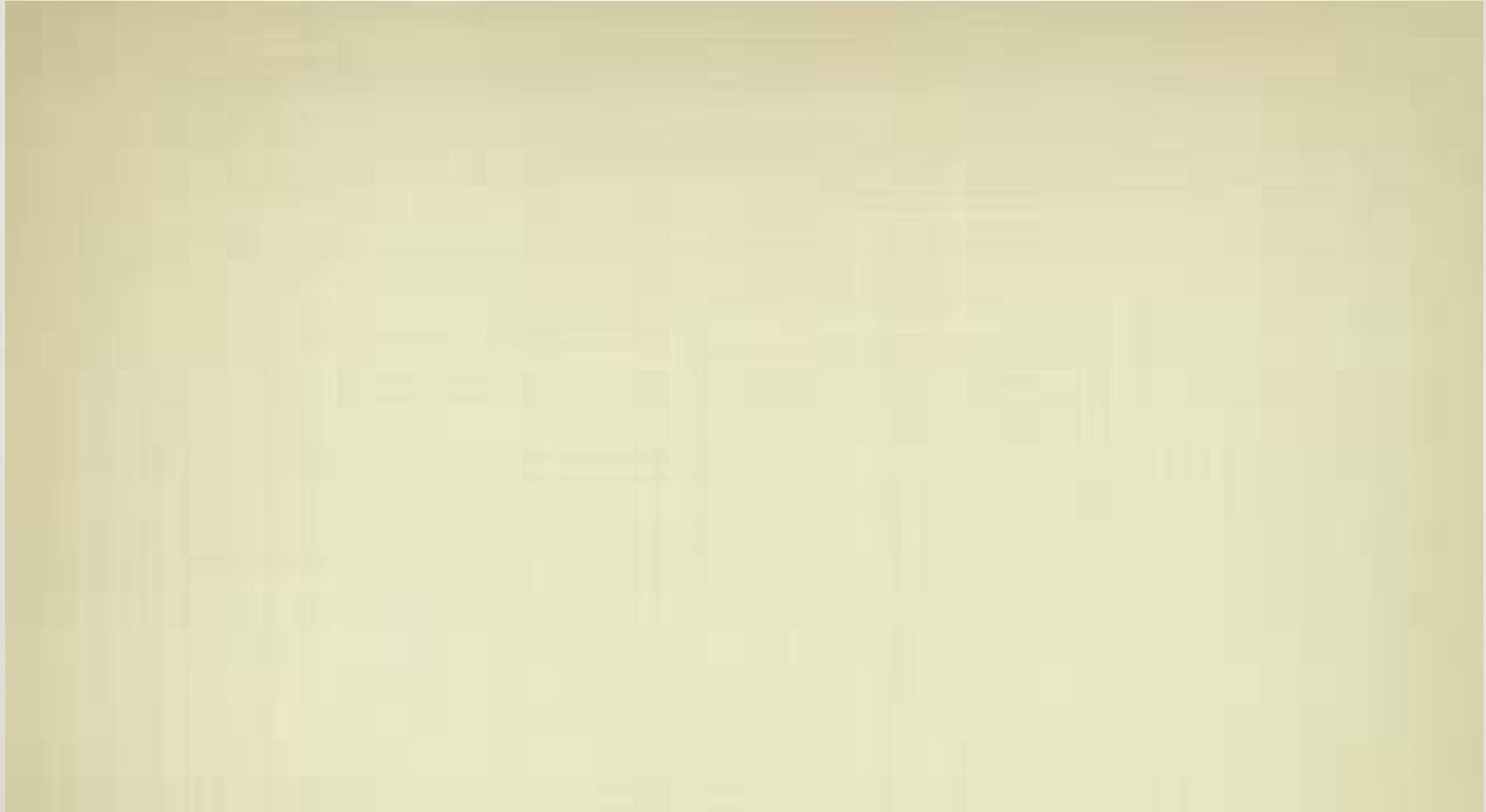


Thompson et al., 1989

Conclusions of Thompson et al.

- ✓ On average, more responses with CPA prior to habituation than with VRA or VROCA
- ✓ However, less likely to condition to CPA (~70%) than to VRA or VROCA

Conditioned Play Video



Thank you!

