Behavioral Hearing Assessment in Babies & Infants
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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

II. Behavioral Observation
Wilson, Moore & Thompson, 1976

- **BOA** (Complex Noise Signal in dB SPL)
  - Age: 6-11 and 12-17 months

- **VRA**
  - Age: 5 to 16-18 months
  - Mean and Median
  - Range from 10th to 90th percentile
3-Month-Olds

Moore, Wilson, Thompson, 1977

- Complex Visual Reinforcement
- No Reinforcement

Mean # of Responses

# of Auditory Presentation
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:
- Stimulus
  - Desired Behavior
    - Reinforcer

Visual Reinforcement Audiometry:
- Auditory stimulus
  - Head turn
    - Visual Reinforcer
Key Elements of a Conditioning Program:

- Appropriate stimulus
- Waiting posture
- Response
- Reinforcer

Moore, J.M. Seminars in Hearing, 11(4), 1990
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
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!