2010-04-01

EEG Responses of 5-Month-Old Infants to Static and Dynamic Face-Voice Synchrony

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Jones, Blake L.; Ahlander, Sarah A.; Leishman, Joan M.; and Mangum, M., "EEG Responses of 5-Month-Old Infants to Static and Dynamic Face-Voice Synchrony" (2010). FHSS Mentored Research Conference: 41.
https://scholarsarchive.byu.edu/fhssconference_studentpub/41

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EEG Responses of 5-Month-Old Infants to Static and Dynamic Face-Voice Synchrony

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Study One—Static Faces

Intro
Previous behavioral research with faces and voices demonstrates that at an early age infants notice, and prefer, synchrony between faces and voices. However, little is known about how infants’ process information regarding face-voice synchronies neurophysiologically. Therefore, Study 1 examined infants’ electrophysiological responses during brief presentation of synchronous, as well as asynchronous, face/voice stimuli.

Methods

- 16 5-month-old infants
- EEG recorded using 64 channel EGI system
- 30 Sync & 30 Asynch static trials

Results

Early Auditory Response
- Auditory P2 over left lateral sites
  - Greater response for Synchronous
  - \( t_{15} = 2.32, p < .05 \)

Late Visual Response
- Visual P2 over occipital sites
  - Greater response for Asynchronous
  - \( t_{15} = 2.94, p < .01 \)

Late Attentional Response
- Nc over fronto-central sites
  - Greater for Asynchronous
  - \( t_{15} = 2.94, p < .01 \)

Discussion

Early sensory processing may be enhanced with synchronous presentation of faces and voices. The attentional response for asynchronous presentation may reflect a greater level of “surprise” to asynchrony. These results parallel behavioral research demonstrating infants’ perceptual sensitivity to temporal synchrony.

Study Two—Dynamic Faces

Intro
Study 2 was designed to examine infants’ electrophysiological responses during brief presentations of dynamic face and voice stimuli.

Methods

- 21 5-month-old infants
- EEG recorded using 64 channel EGI system
- 30 Sync & 30 Asynch dynamic trials
- Dynt trials showed women speaking to infants for 1000ms
- Asynch trials used the same vocal track, but dynamic image showed the same women saying different words

Results

Visual Early Response
- Early P1 over occipital sites
  - Greater response for synchronous
  - \( t_{20} = 2.65, p < .05 \)
- Later P2 over occipital sites
  - No significant differences \( p = .83 \)

Early Auditory Response
- Auditory P2 over lateral scalp sites
  - Greater response for Synchronous
  - \( F_{1,20} = 11.09, p < .01 \)

Attentional Response
- Nc over fronto-central sites
  - Greater response for Asynchronous
  - \( F_{1,20} = 5.12, p < .05 \)

Discussion

Replicates observed patterns in Study 1 by showing early auditory processing differences favor synchrony and later attentional processing differences favor asynchrony
Extends Study 1 by controlling of audio/visual input and timing across conditions
Provides another dependent measure of sensory integration in young infants beyond behavioral measures.

References


Poster presented at Mary Lou Fulton Conference, BYU, Provo, UT (April, 2016). Research supported by the Family Studies Center at BYU, the Mary Lou Fulton Chair, and the Camilla Eyring Kimball Endowment housed in the College of Family, Home, and Social Sciences. *Please address all correspondence to: chris_porter@byu.edu