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Eye Gaze in Deaf Babies

Heidi M. MacGlaughlin, Ed.D., Kimberly K. Pudans-Smith, and Beth Hamilton, Ed.D.

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Our Story

- Psycholinguistics class as doctoral students
- Discussed language development during the prenatal and infancy

History of the Auditory Literature

- 1952: Auditory and visual senses are “hardwired” for cognitive and communicative advances
- 1980: Biological foundations of language is tied to speech
- 1986: Fetuses prefer information that they heard within the third trimester of a pregnancy
- 2000: Questioned if audition was a prerequisite for the development of visual attention during infancy

DeCasper & Spence, 1986; Petitto, n/d; Piaget, 1952; Spencer, 2000

Is audition a prerequisite for normal development?

- 20 participants
 - deaf infants of deaf mothers
 - deaf infants of hearing mothers
 - hearing infants of hearing mothers
- Result: child's hearing status does **NOT** influence the development of visual attention during the infant-toddler period.

Spencer, 2000



Anecdotes

- Deaf newborn makes direct eye contact at birth which was often noticed by the medical people in the delivery room.



Holden - the next day



Brett - 45 minutes old

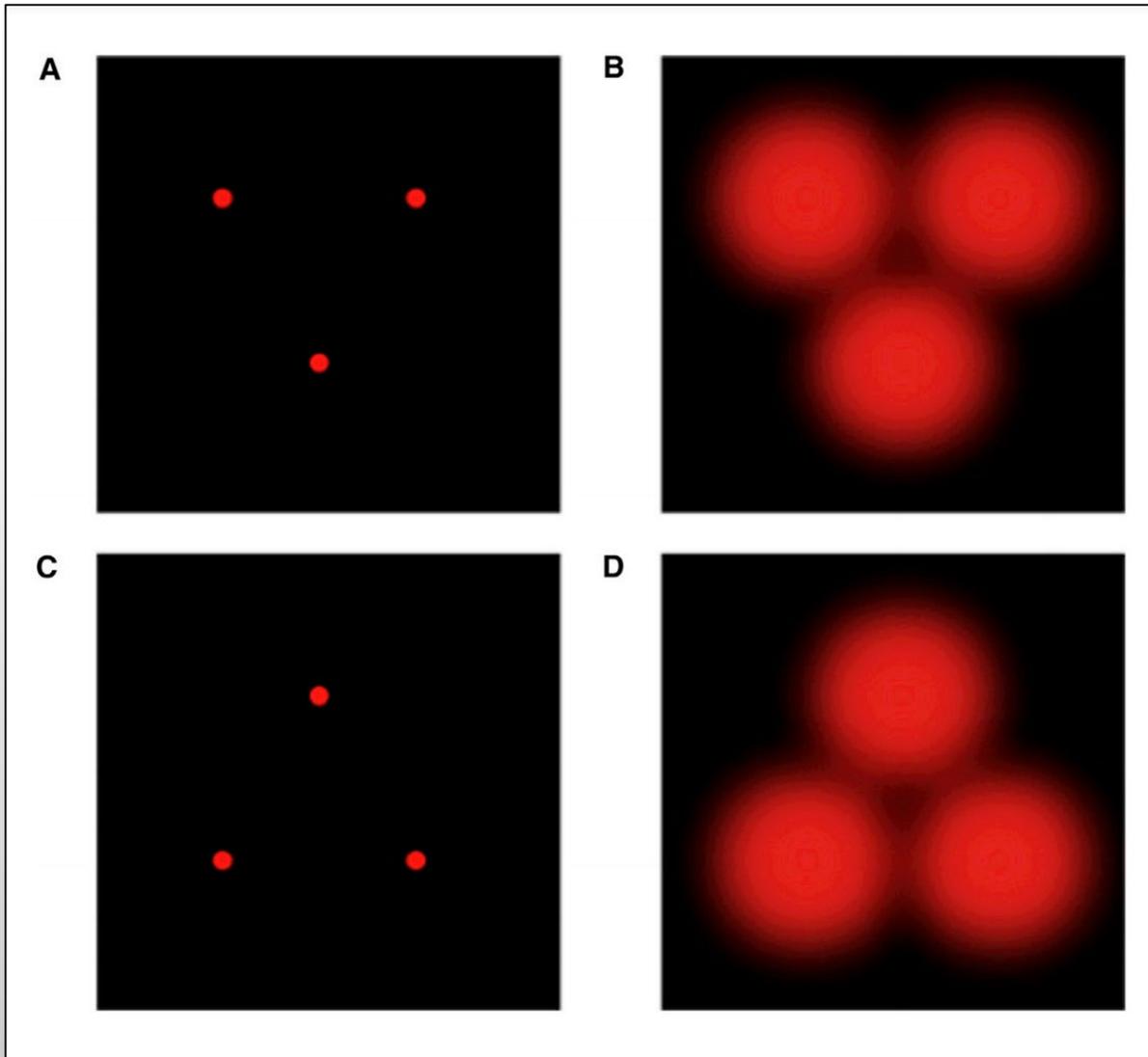
Spencer, 2000

Human Fetus

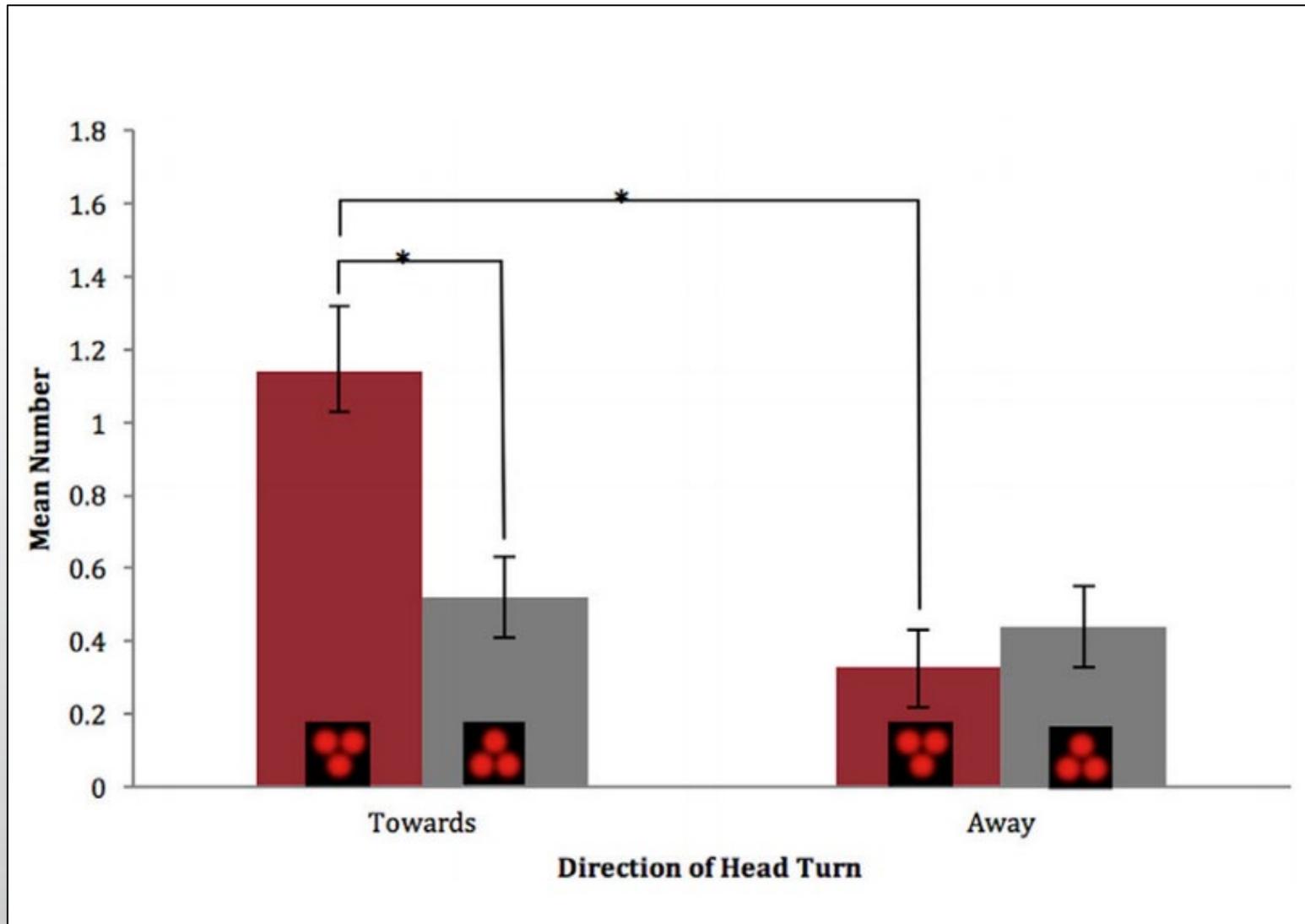
- Third trimester: prefers to look at face-like stimuli when contrasted with the same stimuli in an inverted configuration (three dots)
- Has the capacity to process perceptual information
- 39 fetuses utilizing 4D ultrasound scans
 - repeated five times
 - head turns

Reid et al., 2017





Reid et al., 2017



Reid et al., 2017



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Brooks & Meltzoff (2005) study

- 96 infants - 32 infants (16 female, 16 male) at each age
 - 9 months
 - 10 months
 - 11 months
- Full term - 37 to 43 weeks
 - Normal birth weight (2.5 to 4.5 kg)
 - No major birth complications or postnatal hospitalizations

Results

- ANOVA on the looking scores
 - higher looking scores in open-eyes than closed-eyes
- Nine-month-olds
 - Nearly identical in open-eyes and closed-eyes
- Ten-month-olds
 - Significantly greater in open-eyes
- Eleven-month-olds
 - Significant condition effect was also evident



Gaze Following

Deaf infants: Data has been collected by two other researchers

- Paper currently in preparation
- That 9 month-old Deaf infants develop gaze following earlier than hearing infants

(Baldwin, 1993; Carpenter et al., 1998; Morales et al., 1998; Fox & Card, 2003; Mundy & Gomes, 1998)



Examples

- Deaf infants turn to look at their mother responding to the movement:
 - Mother's face, hands, and body
 - An object held by the mother



Brett - 5 days old

Holden - 3 days old



Harris, 2000



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Points Taken Away

- Speech is NOT critical to the human language acquisition process
- Spoken or signed languages has their own maturational time course at the same time

All babies are born with natural tendency to acquire language regardless through auditory, visual, or tactile

Petitto & Marentette, 1991; Petitto et al., 2002; Petitto, 2005

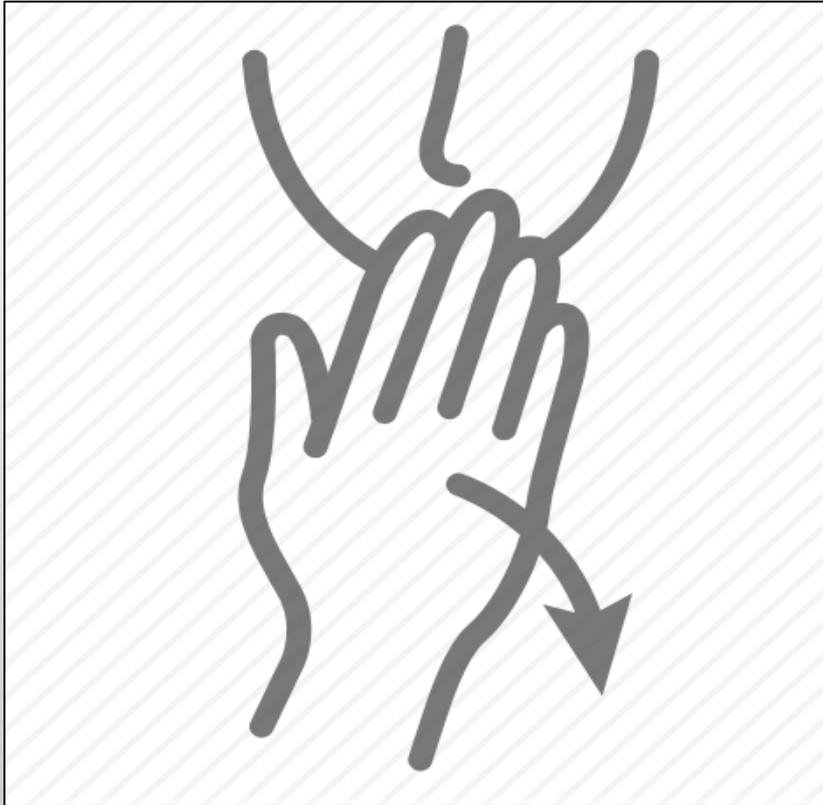


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Continuation Study

- Brief survey including demographic questions
- Any evidence of infant's response at the birth
- Follow-up interview to inquire their experience when meeting their infant for the first time with mother's consent

Contact Information



Heidi MacGlaughlin
hmacglaughli@lamar.edu

Kim Pudans-Smith
kimberly.pudans-smith@gallaudet.edu

Beth Hamilton
bmhamilton5@gmail.com

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