

## Infant perception of speech & underlying capacities

## Perceptual precursors

- Attention to language/speech
- Discriminate speech sounds
- Remember sequences
- Discriminate sequences
- Remember/recall
- Discriminate intonations

## Innately guided learning?

- Many organisms are preprogrammed to learn particular things
  - Song learning in birds
- Human infants prefer listening to speech than nonspeech
  - Colombo & Bundy, 1981; Glenn et al. 1981

## Some caveats

- Test procedures
  - Elicited motor response
  - Cardiac & electrodermal response
  - Electrophysiological response
  - Visual fixation responses
  - HAS
  - Conditioning - operant & classical
- Limited data points
- What does a lack of response mean?

## Responses in utero

- By the 26th week of gestation, there is evidence of responses to loud sounds.
- Ambient noise in intrauterine environment of about 85 dB- so anything not loud would never be heard!

## Listening in utero

- Hydrophone studies:
  - with sheep - Armitage et al. 1980
  - with humans - Querleu & Renard, 1981
- Sounds with freq. 1000 Hz or less are transmitted with little attenuation, whereas higher freq. are greatly attenuated

## Listening in utero

- Evidence suggests this is the case....
  - Native language
  - Mother
  - Particular stories - Spence & DeCasper 1982

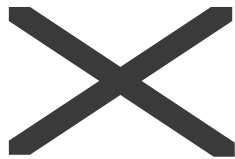
## Auditory development post-birth

- Higher thresholds throughout first year
  - Sinnott, Nozza & colleagues



Tharpe & Ashmead, 2001

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## Auditory development post-birth

- Spatial localization
  - Newborns generally turn head correct direction
    - Muir & Field (1979)
  - Minimal audible angles  $\sim 19^\circ$  at 7 months
    - Ashmead, Clifton, and Perris, 1987
  - Poor localization even at 5 years
    - Litovsky, 1997

## Visual perception

- Newborn vision estimated at 20/400
- At birth, visual scanning for only 5% of day
  - Increases to 35% by 10th week
- Attend preferentially to objects that
  - Move
  - Have sharp contours
  - Have light/dark contrasts
  - Faces

## Auditory-visual links

- Dodd, 1979
  - Recognize synchrony at 10-16 weeks
- Kuhl & Meltzoff, 1982, 1984
  - Recognize correspondence between sight and sound of speech by 18 weeks



<http://iabs.washington.edu/kuhl/research.html>

## Noise

- Newman & Jusczyk, 1996
- With younger infants



## Noise & auditory-visual links

- Hollich, Newman & Jusczyk

## Noise & auditory-visual links

