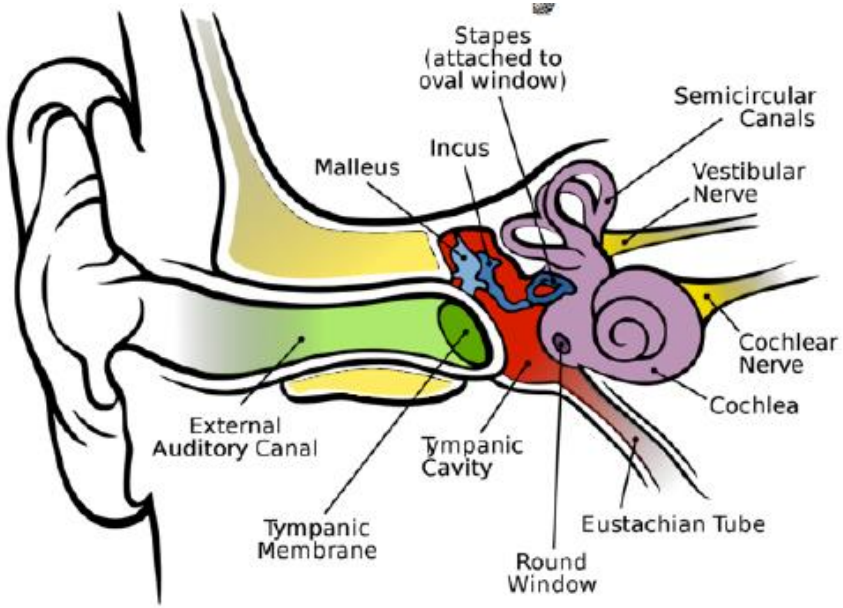
HS 133: Introduction to Phonetics

Instructor: Priyankoo Sarmah

Hearing



Auditory Canal

↓

Tympanic Membrane (Eardrum)

↓

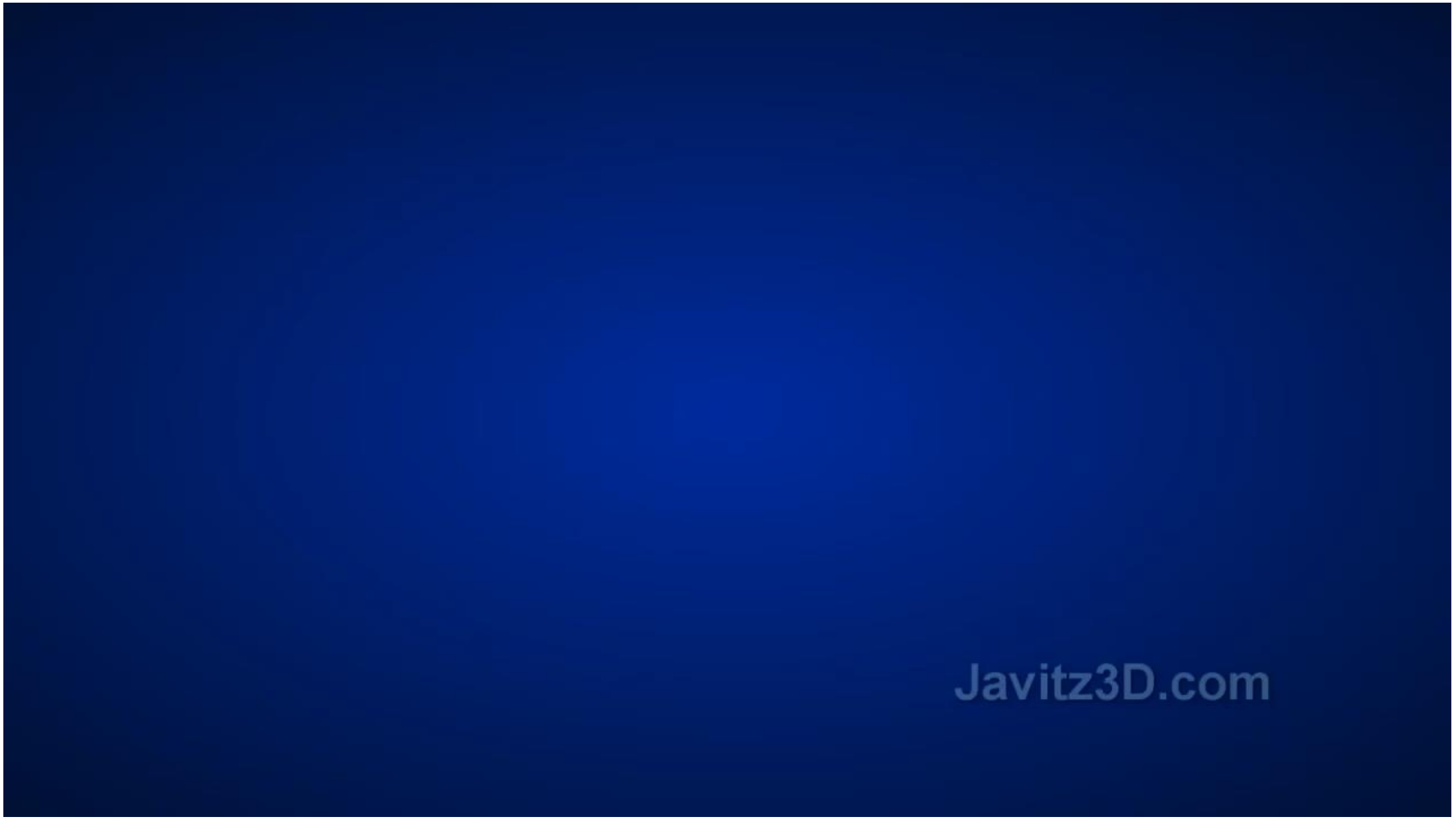
Malleus-Incus-Stapes

↓

Oval window

↓

Cochlea


Javitz3D.com

Threshold of hearing

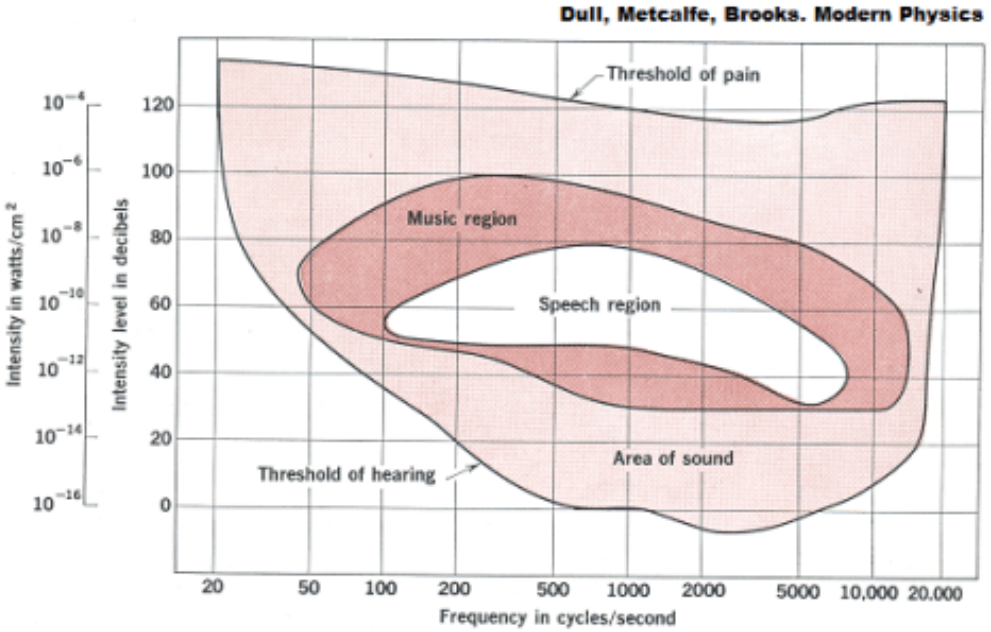
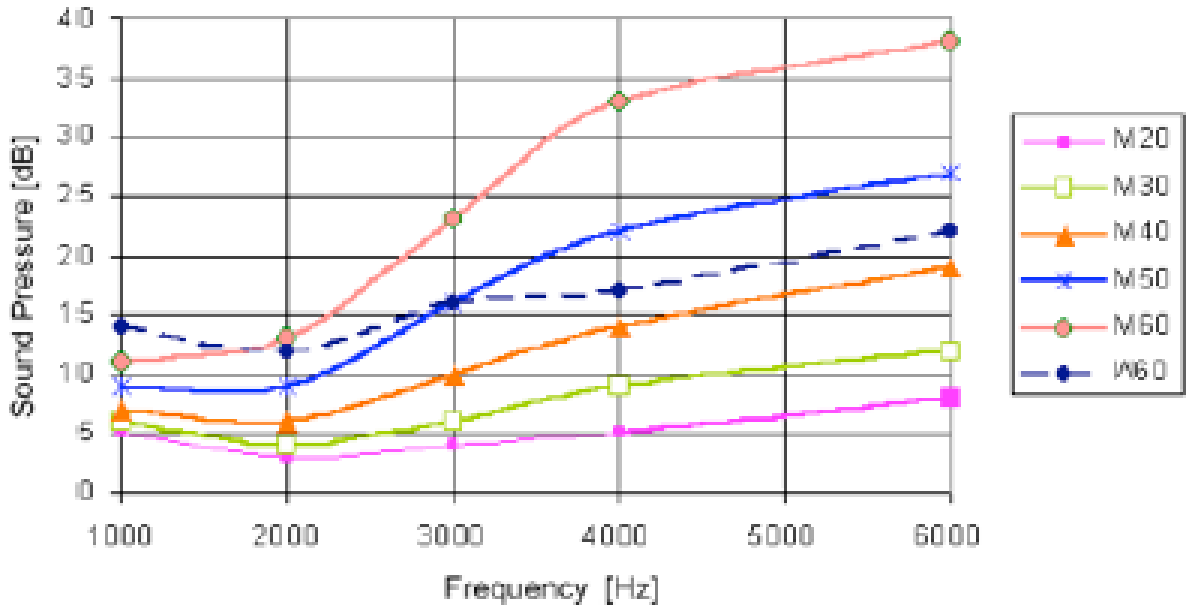
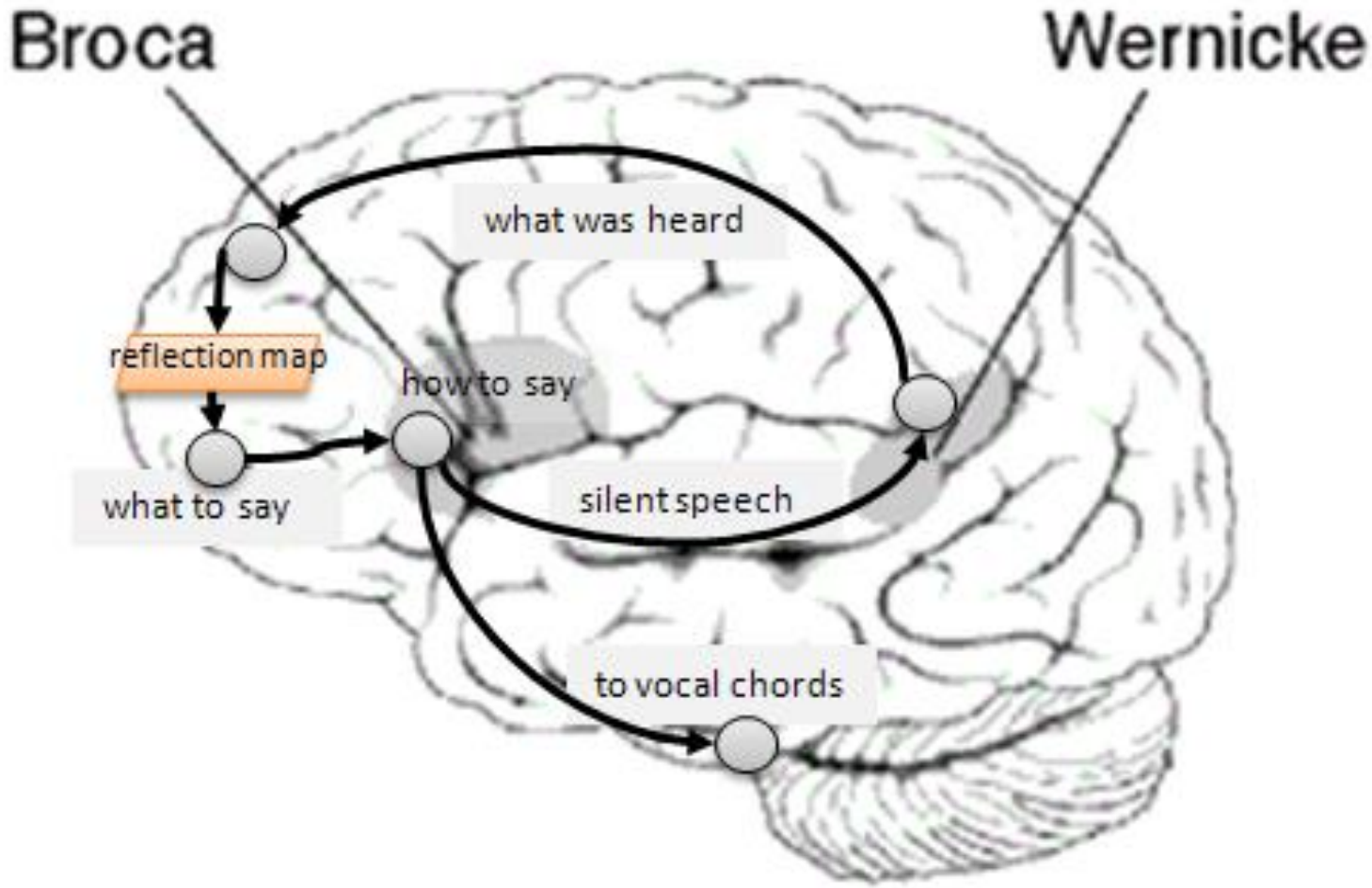


Fig. 15




Broca
Wernicke
what was heard
reflection map
how to say
what to say
silent speech
to vocal chords

Hearing speech

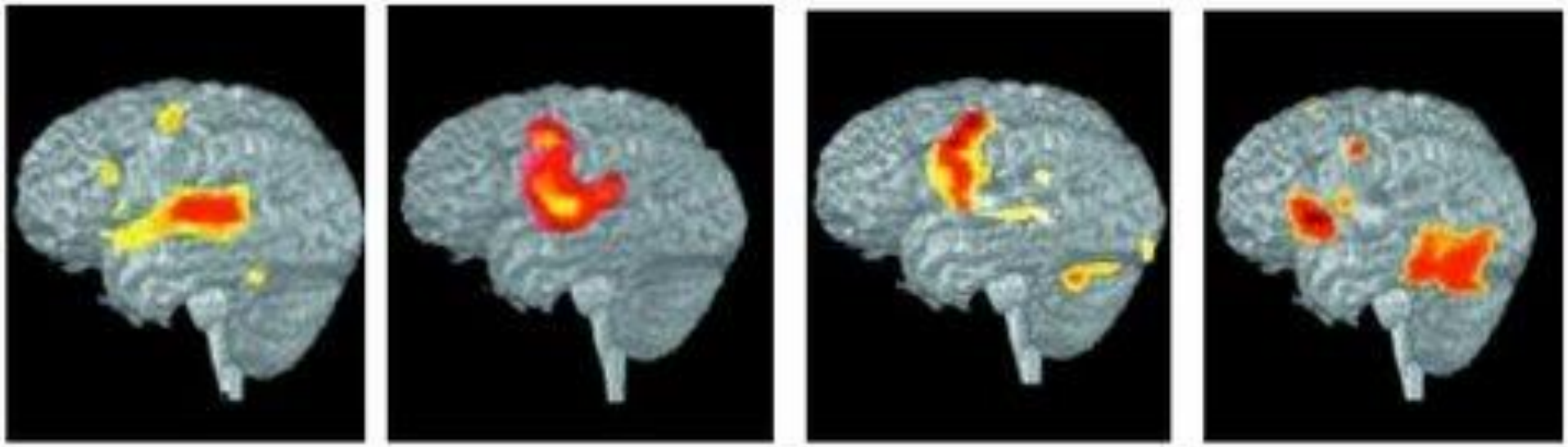
440

15000

16000

17000

18000



Hearing Speaking Reading Thinking

Infants: Listening happens too early!

INFANT BEHAVIOR AND DEVELOPMENT 9, 133–150 (1986)

Prenatal Maternal Speech Influences Newborns' Perception of Speech Sounds*

prenatal sensory experience auditory perception newborn perception
fetal experience prenatal learning speech perception maternal voice

Human newborns do not act like passive and neutral listeners. They prefer their own mothers' voices to those of other females, female voices to male voices, and intrauterine heartbeat sounds to male voices, but they do not prefer their fathers' voices to those of other males (Brazelton, 1978; DeCasper & Fifer, 1980; DeCasper & Prescott, 1984; Fifer, 1980; Panneton & DeCasper, 1984; Wolff, 1963). Why should newborns prefer some sounds over others? One hypothesis is that their auditory preferences are influenced by prenatal experience with their mothers' speech and heartbeats (DeCasper & Prescott, 1984). Several considerations suggest this hypothesis is plausible.

Third-trimester fetuses hear, or are behaviorally responsive to, sound (e.g., Bernard & Sontag, 1947; Birnholz & Benacerraf, 1983; Grimwade, Walker, Bartlett, Gordon, & Wood, 1971; Johansson, Wedenberg, & Westin, 1964; Sontag & Wallace, 1935). Intrauterine recordings taken near term indi-

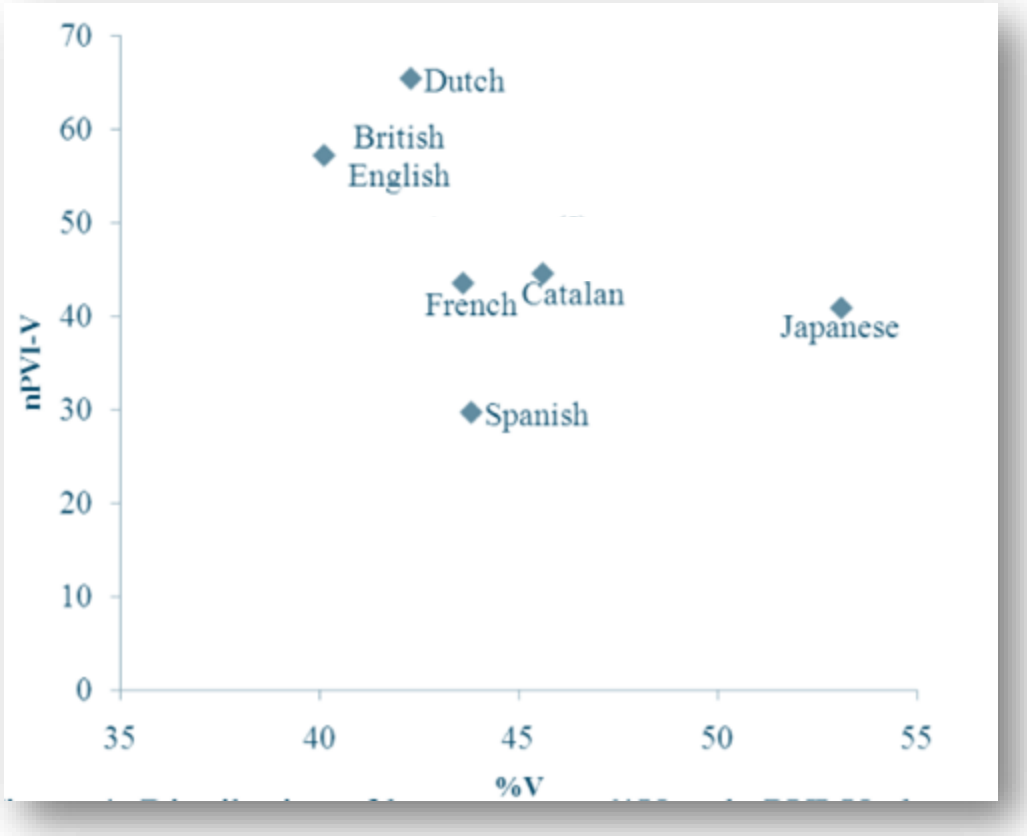
The conclusion implies that the fetuses had learned and remembered something about the acoustic cues which specified their particular target passage (e.g., prosodic cues such as syllabic beat, the voice-onset-time of consonants, the harmonic structure of sustained vowel sounds, and/or the temporal order of these sounds). Recall also that newborns prefer their mothers' voices over

Postnatal Preference

Mother's voice

Other Male voices

Rhythm in Languages



Research Provides First Evidence for Fetal Language Discrimination

Aug 10, 2017 by News Staff / Source

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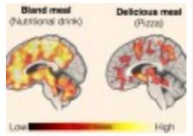
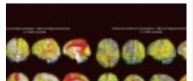


Eating Triggers Release of Endogenous Opioids in Human Brain, Study Reveals



According to new research published in the journal *NeuroReport*, a month before they are born, fetuses can distinguish between someone speaking to them in English and Japanese.

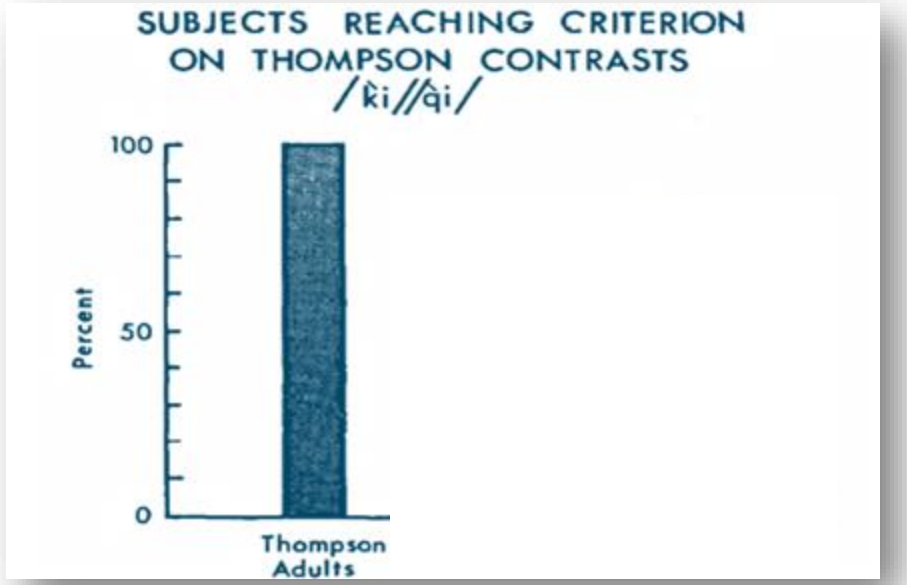
Dr. Gustafson with a mother-to-be in the fetal biomagnetometer. Image credit: University of Kansas.

"Research suggests that human language development may start really early — a few days after birth," said lead author Dr. Utako Minai, an associate professor at the University of Kansas

Infants

- Infants learn the phonetic contrasts of their native language from scratch
- Infants know all phonetic contrasts
  - “forget” the ones that they don’t hear around them.
- Infants “know” a lot of phonetic contrasts
  - boundaries between phonetic categories shift depending on what they hear.

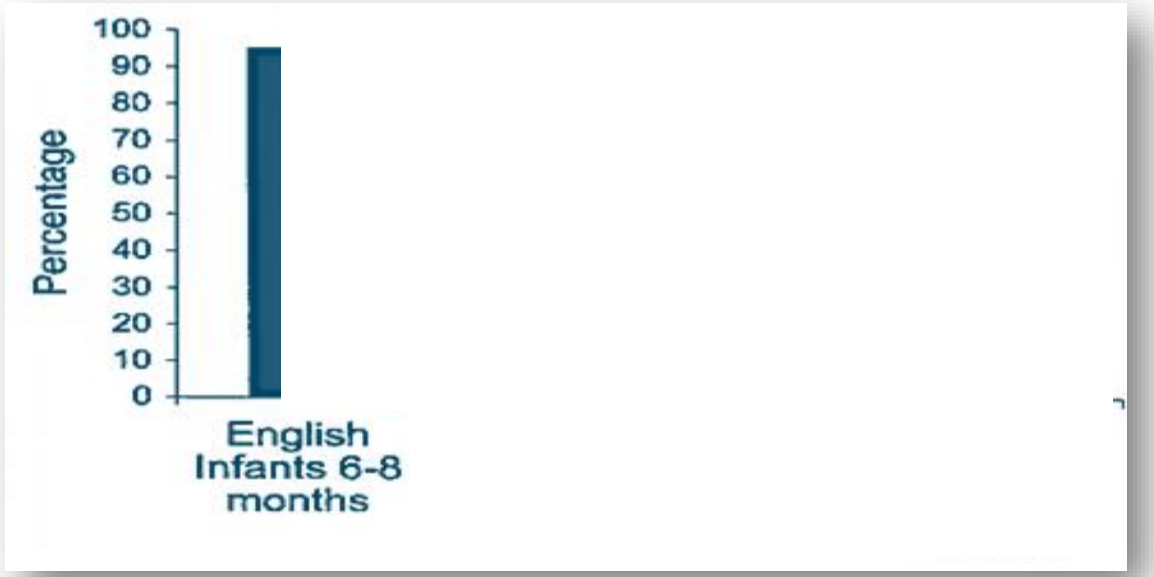
Infants: Listening to Thompson



Werker, Janet F., and Richard C. Tees. "Cross-language speech perception: Evidence for perceptual reorganization during the first year of life." Infant behavior and development 7.1 (1984): 49-63.

- Thompson Salish has two ejectives that sound very similar
- /k’/ vs. /q’/

Infants: Listening to Hindi त vs. ट [t̪ vs. ʈ]



“Perceptual Reorganization”

Werker, Janet F., and Richard C. Tees. "Cross-language speech perception: Evidence for perceptual reorganization during the first year of life." Infant behavior and development 7.1 (1984): 49-63.

Infants to subjects

- **Perceptual reorganization** happens in the first year of a baby