Psych 229:
Language Acquisition

Lecture 10
Speech Perception Continued


Maintenance & Loss Theory

A problem

If it doesn’t sound like speech, adults can tell the difference. Werker & Tees (1984) with truncated portions of syllables of non-native contrasts.

Pisoni et al. 1982, Werker & Logan 1985: adults can be trained if given enough trials or tested in sensitive procedures with low memory demands.

Maintenance & Loss predicts age-related decline should be absolute.

Another problem

Decline and then recovery (after 4 years old) should never happen.

And another

Some non-native contrasts are easy for older infants adults to discriminate. (Click languages Zulu - click sounds like “tsk tsk” nonspeech)

http://hctv.humnet.ucla.edu/department/linguistics/VowelsandConsonants/course/chapter6/zulu/zulu.html


Conditioned Head Turn Procedure: adults & 6-8 month olds notice difference, but 10-12 month olds don’t.

Appears not...

Another theory: functional reorganization
Changes attested experimentally reflect operation of postperceptual processes that kick in for language

Explanatory power: the whole story
Very young infants respond to any detectable phonetic variation - so can pick up any salient ones in surrounding language. Adults have bias for phonemic information since those are the ones relevant to language. If in non-language setting, can tell the nonphonemic differences. But why can't 12 month olds (up to 4 year olds) do the same?


But a slight problem, with respect to the critical period... there is one Functional reorganization would imply continued flexibility throughout life. Maybe the problem is that there's a difference between perceptual accent (ability to perceive non-native differences) and productive accent (ability to produce non-native differences). Could be a separate critical period for each.

Also a problem with word-learning connection - kids don't seem to show phonetic distinction when word-learning. 12-18 month olds treat "dog" and "bog" as the same. "dog" or "bog"?

Werker & Tees (2002): Speech Perception Decline Trajectory

When do infants lose the ability to distinguish phonetic contrasts from other languages?

Experiment 1: Salish contrasts [language = native American Thompson]

Werker & Tees (2002): Speech Perception Decline Trajectory

How do we know failure to discriminate is due to not being able to hear the non-native difference and not for some other reason?

Barton (1976): 2 year olds can distinguish phonemic-contrastive words if they're very familiar - "pair" vs. "bear"
Werker & Tees (2002): Speech Perception Decline Trajectory

6-month old performance compared to adults

- Significantly different ($\chi^2$)
- Not significantly different ($\chi^2$)

Expt 2: How about a within-subjects comparison, just to make sure?

Real life is messy: need functionally useful categories

Why is losing the ability to discriminate useful?

Links to the more abstract system of phonology


But losing the ability to discriminate isn't all there is to it...

Not everything should be viewed as informative... at least for word segmentation

Looking at 18-month olds

Dutch vs. English vowel lengthening

Ex: tam vs. taam

Surrounding linguistic environment has different information

Prediction (if linguistic environment influences)

More specifically...

Experiment Methodology

Same: look at the tam

Switch: look at the bann

This is a tan... look at the tam


So why does this happen? One idea: Related to vocabulary

Minimal pairs? stat vs. staat in Dutch

But how many contrastive words do 18-month olds know?

Apparently, not many...


Another idea: Related to data distribution of phonetic information

Minimal pairs? bet vs. beat in English

A caveat on the clustering hypothesis...

Discussion: What additional information would be available and helpful?