Prosodic markers can help, but can’t be all there is – specific linguistic units are difficult for young learners to locate in fluent speech.

Still prosody is something noted early by children (2-6 months) and stored in memory (Mandel et al. 1994; Mandel et al. 1996; Nazzi et al. 2000)

Newborns discriminate mother’s native language from another language based on prosodic information (Mehler et al., 1988; Nazzi et al. 2000)

Syllable weight:

- VCV: week, noon, taste
- V(C): plot, debt
- Light

Metrical phonology:
- trochee: ba by
- iam: go eat

Turk, Jusczyk, & Gerken (1995): Infants sensitive to syllable weight when discerning stress patterns

Support for highly specific acoustic information in memory for infants

Jusczyk, Luce, & Charles-Luce 1994

Infants sensitive to frequency of consonant sequences = evidence of statistical learning

Johnson et al. (2003): 12-month olds are biased to segment fluent speech based on their knowledge of what a viable auditory word form is for the language

A note on how to conduct language acquisition research

The interplay between prosodic cues and statistical cues

Mattys et al. (2001): 9-month olds use phonotactic information

Thiessen & Saffran (2003): 6-month olds prefer statistics to prosody

Johnson et al. (2003): 12-month olds are biased to segment fluent speech based on their knowledge of what a viable auditory word form is for the language

Learner’s job: parse continuous stream of speech into sentences, clauses, words, syllables, and phonemes

Phoneemes are language specific - r/l is a phonemic contrast (changes word’s meaning) in English but not in Japanese

Dental T vs. retroflex t is a distinction in Hindi, but not in English

Lisa = Risa for some of my Japanese friends

Kids of the world require knowledge of phonemes before they can figure out what different words are - and when different meanings are signaled by different words

A Brief Foray into Phonemes & Categorical Differences

How do the acoustic signals of phonemes vary?

How “categorical” are the sounds of a language?

Voice Onset Time (VOT)

Voice Onset Time (VOT) production

Not uniform (2 categories)

Perceiving VOT

‘Categorical Perception’

Discrimination

Why is this pair difficult?

(i) Acoustically similar?

(ii) Same Category?
Discrimination

A More Systematic Test

<table>
<thead>
<tr>
<th>Same/Different</th>
<th>0ms</th>
<th>60ms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same/Different</td>
<td>0ms</td>
<td>10ms</td>
</tr>
<tr>
<td>Same/Different</td>
<td>40ms</td>
<td>40ms</td>
</tr>
</tbody>
</table>

Within-Category Discrimination is Hard

Cross-language Differences

English vs. Japanese R-L.

Cross-language Differences

English vs. Hindi
alveolar [d]
retroflex [D]

Cross-language Differences

Participants: Thai – native
English- second (>3 years in the US)

[d1a] [d2a] DIFFERENT

Imsri & Idsardi (2001)


1-4 month olds can distinguish ba vs. pa

Note: Jusczyk & Derrah (1987) and Bentenchi et al. (1988) showed syllable is a salient linguistic unit for infants (newborns to 2-month olds)

But only if it’s a categorical difference (can’t distinguish within-category differences)

Kids...

This ability extends to phonemic contrasts that are non-native. (Japanese infants can discriminate contrasts used in English but not in Japanese.) This goes for both vowels and consonants.

vs. adults

Adults can’t, especially without training - even if the different is quite acoustically salient.

So when is this ability lost?


Comparing perceptual ability

Werker et al. 1981: English-learning 6-8 month olds compared against English & Hindi adults on English & Hindi contrasts

Conditioned Head Turn Procedure

ba... ba... ba... da...


But when after 6-8 months is the ability to lost?

Key into “critical period” hypothesis for language (Lenneberg 1967): when language can be learned natively

In sum for the critical period, children of 23 and 24 weeks have trouble with the expectation that the nonsense but not the real speech would be blocked. However, difference between English-speaking and Thai-speaking infants is not as big as expected. This suggests that the ability to discriminate the Hindi non-native phoneme is not fixed by six months. The study was extended to an additional child who would continue to be tested in the same manner as the other infants. The difference between English-speaking and Thai-speaking infants was still significant at the second test, but the difference was not significant at the third test. These findings suggest that the critical period may begin to influence speech perception long before age at testing and before the critical period is extended by Lenneberg.


Conditioned Head Turn Procedure

ba... ba... ba... da...