

Conclusion

Infants are “universal listeners”, adults are specialized for the language they have learned.

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Specialization for language

If two sounds are not phonemically contrasted in any language, but are just as distinct acoustically as some phonemically contrasting pair, infants do NOT discriminate them!

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Hindi vs English

Hindi speaking adults and English exposed infants (6-8 months) discriminate Hindi retroflex [ʈ] versus dental [ʈ] and voiceless aspirated [ʈʰ] versus voiced [ʈʰ].

Cf. Thai aspirated and un-aspirated voiceless stops.

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Children vs. Adults

English exposed infants (6-8 months) discriminate Hindi retroflex [ʈ] versus dental [ʈ] and voiceless aspirated [ʈʰ] versus voiced [ʈʰ].

English adults **cannot**.

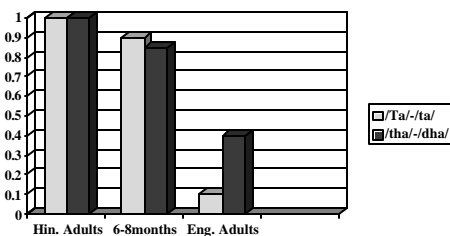
Werker et al:
Age and Linguistic Experience study

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Chart: Age and Linguistic Experience

Werker et. al. 1981



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Universal to specialized

Series of studies found that: the change between universal listener and specialized listener occurred far earlier than anyone expected: by 12 months old. (In fact 4 year olds seem to be the worst of all at hearing distinctions that are not in their language.)

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What adults can discriminate

Moreover, adults can discriminate some sounds, e.g. among **ejectives** in Nthlakampx (a Salish language), in non-speech contexts.

Note: ejectives discussed in "Speech Sounds Around the World"

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Hypothesis

Infants are universal listeners. Children 1-5 approx. are super-specialized listeners (native language only)

Adults are specialized listeners for language, but can use other means of discrimination.

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Babbling

- Coordination of articulatory movements
- Syllabic structure, often CVCVCV
- repetitive
- Often has intonation
- Onset at 10 mos +/-
- No meaning!

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What is babbling for?

Q Linguistic practice

Q Social function

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A babbler



Some audio clips of babbling

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Onset of babbling is probably maturationally determined

i.e. determined by how cognitively mature an infant is

... not determined by the environment:

Deaf children babble;
Severely neglected children babble;
Onset of babbling correlates with gestational age

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Onset of Babbling

Children who are unable to babble because of medical conditions/treatments begin age-appropriate babbling when medically possible (see LF);

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Babbling: the brain or the mouth?

Answer: it's the BRAIN

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<http://www.dartmouth.edu/~lpetitto/Science2002.html>

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Babbling: the brain or the mouth?

Answer: it's the BRAIN

Children exposed to sign language babble manually.

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A two-syllable babble



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Babbling vs Gesture

Petitto and Marentette (Science 91)

Babbling is systematic
Syllabic organization
Repetition
Meaningless, etc.

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vs. gestures, pointing, etc.

% of manual activity for hearing children < 20%

For deaf children:

40 % - 75%
10 mos. 14 mos.

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3 taping sessions

Child	Gesture	Manual Babbling
	Hearing	
H1	98	10
H2	195	8
H3	121	14
	Deaf	
D1	101	80
D2	122	111

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Manual and verbal babble

Time frames the same: e.g babbling to words; 11 - 12 mos.

Continuity: used the same sounds / signs.

The language capacity is **amodal**.

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Sounds in Words

Around 18 months children produce first words.

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Paul Shopen 2 years old

- Exercises in LF p 296

a. sun [sʌn] d. snake [nek]
a. see [si] e. sky [kay]
b. spoon [pun] f. stop [tap]

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PS's rule

[s] is deleted when it immediately precedes a consonant:

Adult [spun] → [pʌn]

Adult [si] → [si]

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Another Case

g. bed	[bet]	m. bus	[bʌs]
h. wet	[wet]	n. buzz	[bʌs]
i. egg	[ek]	o. man	[mæn]
j. rake	[rek]	p. door	[dɔr]
k. tub	[tʌp]	q. some	[sʌm]
l. soap	[sop]	r. boy	[boi]

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Final stops/fricatives devoice

Stops, (affricates) and fricatives are all voiceless when they are at the end of a word/syllable.

Adult [bed] → [bet]

But adult [dɔr] → [dɔr], because this stop is not final.

Cf. Turkish (accents in speaking English)

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Other consonants do not devoice

Only stops and affricates and fricatives (“obstruents”) do.

Nasals, [r] and the glide [y] remain voiced in final position.

Adult [mæn] → [mæn]
not [mæ̃n]

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One more case

s. laugh [læp]

t. off [ɔp]

u. coffee [kɔfi]

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Paul's rule

Replace [f] with [p] at the end of a word/syllable.

Adult [ɔf] → [ɔp] but the [f] appears in [kɔfi]

How will he pronounce “love”?

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Adult [ɫv] → [ɫp]

If [v] is treated like [f] it will be replaced by a bilabial stop. The stop will be voiceless in accordance with the rule posited above.

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Important points:

Children are not merely making mistakes. They are systematically producing words with particular phonetic properties.

What they do is very similar to what language communities do when they borrow words— adapt them in a systematic way to their own constraints.

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Summary

Children are general-purpose speech sound learners. “universal listeners”

They develop and follow phonological rules which may be different from those in the target language, but are commonly found in the languages of the world.

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