

# Four levels of language

- phonology -- surface form of language
  - segments
- semantics – meaning
  - lexicon
- syntax
  - grammar
- pragmatics
  - function

Language is Special

Innate

independent language organ

independent course of  
development

not traditional perception and  
learning theory



Noam Chomsky  
Univ. of Maryland, Jan. 26, 2012

# Linguistic Nativism

- Most of the acquisition of natural languages by human beings depends on un-acquired (or acquired but unlearned) linguistic knowledge or language specialized cognitive mechanisms

# Critique: Language is Special

- Poverty of the Stimulus
  - positive evidence is actually enough to learn the various patterns that linguists claim are unlearnable by positive evidence alone.
  - brain's mechanisms of statistical pattern recognition could solve many of the imagined difficulties.

# Critique

- Nativism discourages reductionist analysis by precluding (black-boxing) inquiry about significant causal factors

# Linguistic Non-Nativism

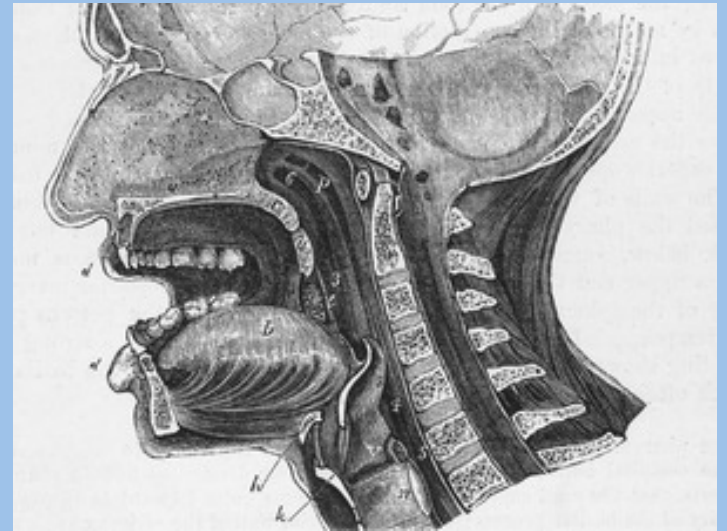
- Very little of the acquisition of natural languages by human beings depends on un-acquired (or acquired but unlearned) linguistic knowledge or language specialized cognitive mechanisms

# stochastic learning theory

- holds that language learning is based on complex, higher-order properties of stochastic patterns in sensory experience, not a mere tabulation of frequency of patterns.

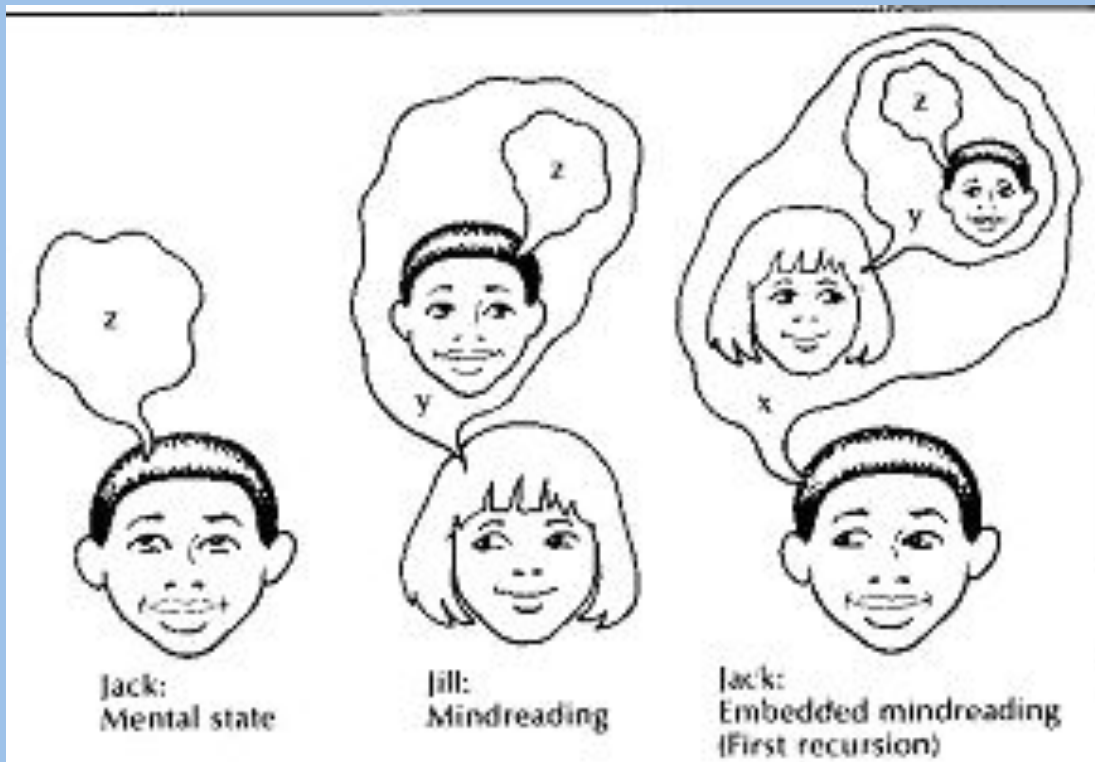
# What's Needed for Spoken Language Acquisition?

- Sensory Input
- Signal analysis
- Category Learning
- Syllabification
- Recombining Syllables





# What's Not Needed for Spoken Language Acquisition?



Unencumbered by the  
Thought Process

# Speech is MultiSensory



Meltzoff AN, Moore MK .1977, Science 198: 75–78.

Baby imitations--15 seconds in

<http://www.youtube.com/watch?v=cJ3Ec70Mnqw>

Tongue protrusion--25-50 seconds

<http://www.youtube.com/watch?v=l0N6mIpoN3M&NR=1>





## Language and Speech Perception

[http://www.youtube.com/watch?v=Q-B\\_ONJIEcE](http://www.youtube.com/watch?v=Q-B_ONJIEcE)

<http://www.youtube.com/watch?v=USlgSFgzwww>

<http://www.youtube.com/watch?v=mZAuZ--Yeqo>

<http://www.youtube.com/watch?v=G2XBikHW954>



*TRENDS in Cognitive Sciences*

**Figure 1. The Intermodal Preferential Looking Paradigm.**

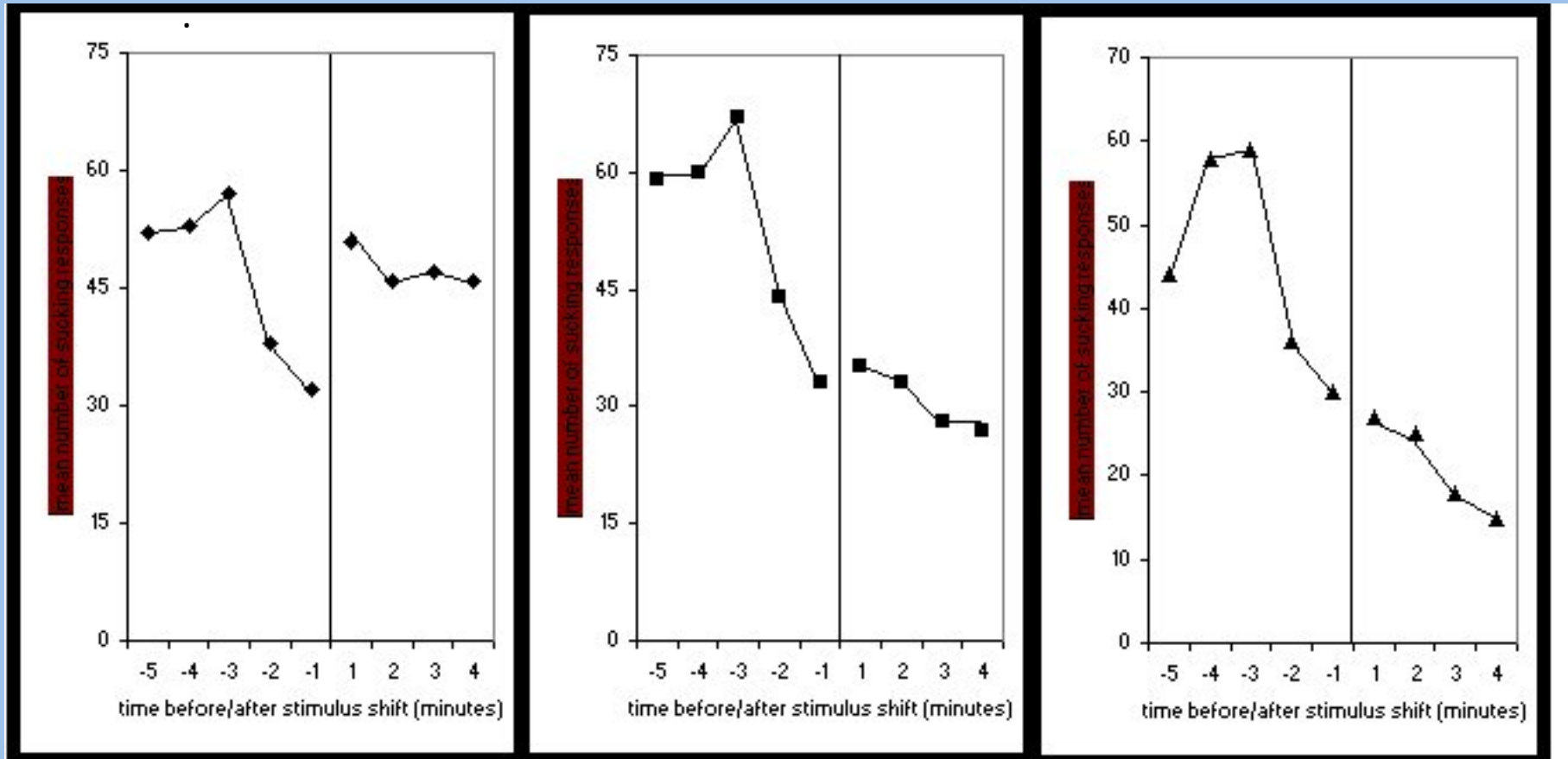
# Infants Have the Wetware for Spoken Language

<http://www.youtube.com/watch?v=Ew5-xbc1HMk>

## Infants Perceive Subtle Distinctions in Speech

Infants Perceive Categories and When They Occur

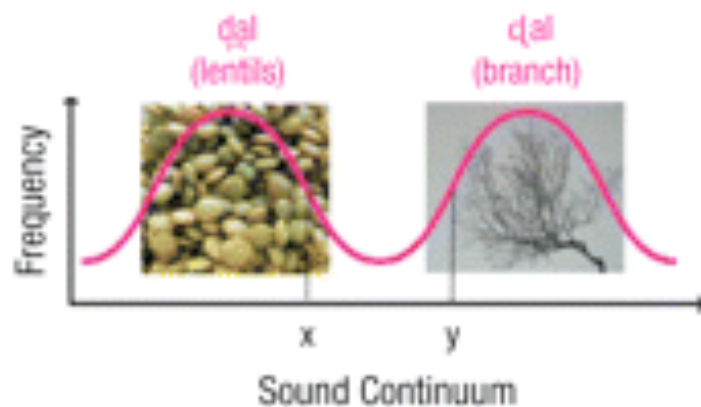
<http://www.youtube.com/watch?v=dAU5CAI1U6M>





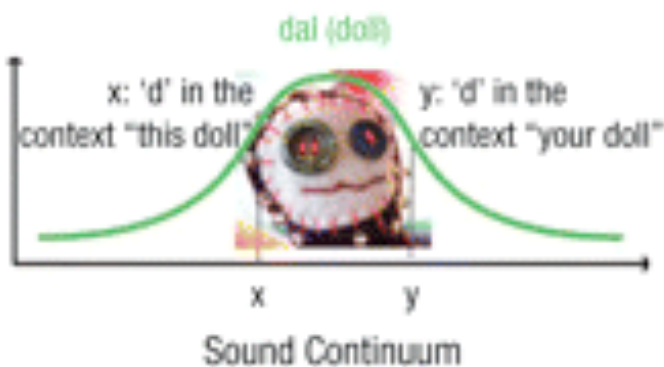
### Hindi (Discrimination)

Natural Language Environments



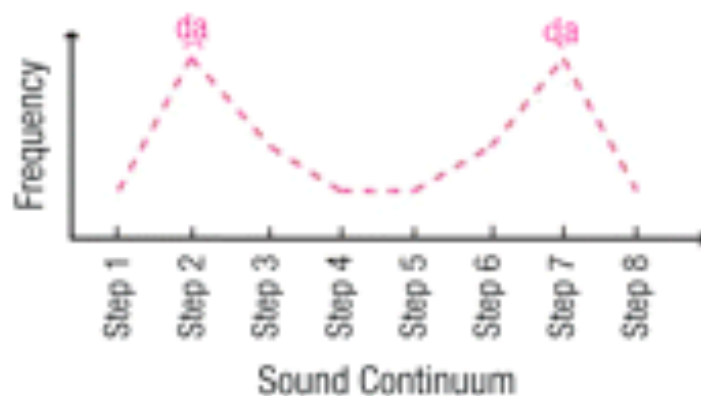
### English (No Discrimination)

Frequency



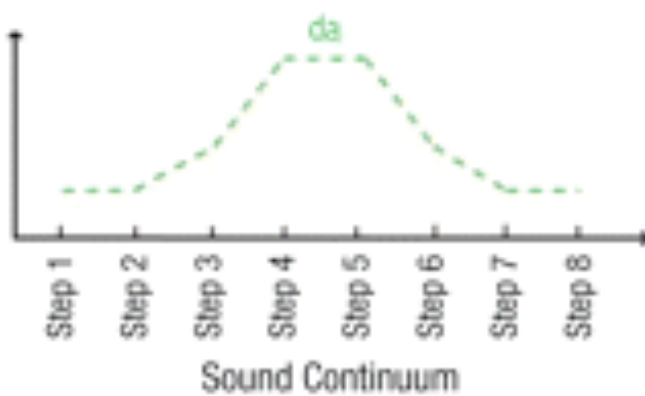
### Bimodal (Discrimination)

Distributional Learning Environments



### Unimodal (No Discrimination)

Frequency

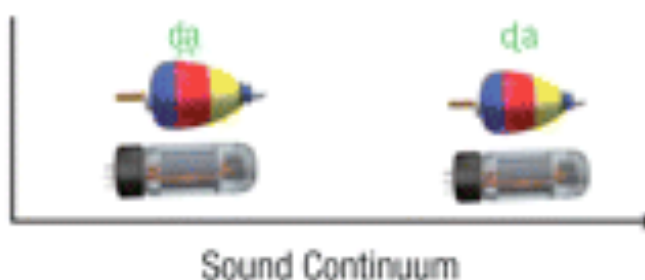


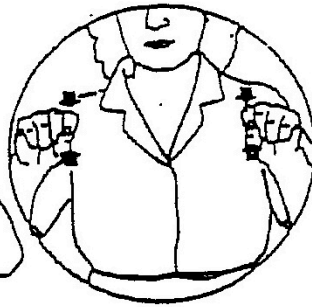
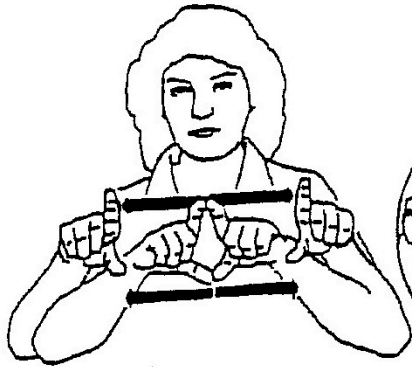
### Consistent Pairings (Discrimination)

Acquired Distinctiveness Learning Environments

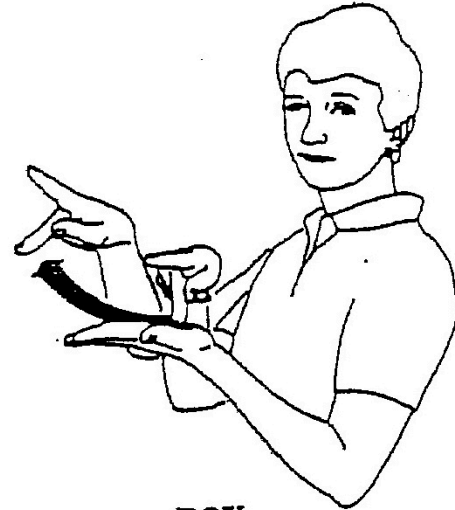


### Inconsistent Pairings (No Discrimination)





card



pay

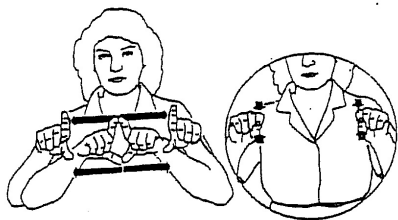


understand

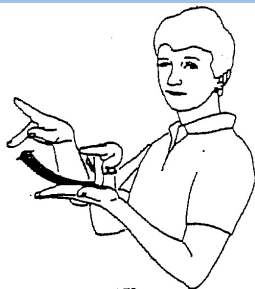


don't understand

# American Sign Language (ASL)



card



pay



owe



late



library



understand



don't understand



emergency



deaf

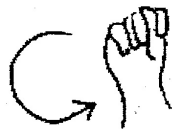


close

### Days of the Week



Monday



Tuesday



Wednesday



Thursday



Friday



Saturday



Sunday

**sign** **with** **me**

**Communicate  
Even Before Your Baby Can Talk!**



**Bath**



**Bed**



**Cookie**



**Daddy**



**Eat**



**Frog**



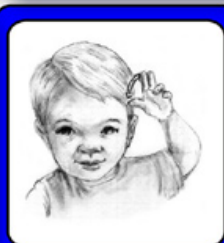
**Gentle**



**Hear**



**Help**



**Horse**



**Hot**



**I Love You**



**Milk**



**Mommy**



**More**



**No Touch**



**Potty**



**Shoes**



**Telephone**



**Thank You**



**Where**



[www.signwithme.com](http://www.signwithme.com)





# SpeechReading

