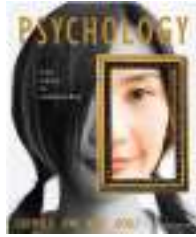


**Psychology:
From Inquiry to Understanding 2/e**

Scott O. Lilienfeld
Steven Jay Lynn
Laura Namy
Nancy J. Woolf



Prepared by Caleb W. Lack

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Chapter Eight
**Language, Thinking, & Reasoning:
Getting inside our Talking Heads**

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Lecture Preview

- How does language work?
- Do we think in words?

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Language

- What is language
 - Arbitrary system of communication that combines symbols, such as words or gestural signs, in rule-based ways to create meaning
- What is the function of language
 - Allows for communication of information, as well as social and emotional functions

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Features of Language

- Language is arbitrary
 - There is no clear relation between sounds and meanings
 - E.g. Pig vs. Tarantula

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Features of Language

- Highly practiced and automatic process
 - We don't realize the complexity of language until we try to learn or use a new one
- Four levels of analysis that must coordinate
 - Phonemes
 - Morphemes
 - Syntax
 - Extralinguistic information

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Phonemes

- Categories of sounds our vocal apparatus produces
- Probably around 100 total, each language only uses a subset of them
- 40-45 in English, range from 15-60 worldwide
 - How many phonemes are there in Turkish?

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TABLE 8.2 Cross-Linguistic Differences in Phoneme Distinction. Often, speakers of one language perceive speech sounds as belonging to a single phoneme category whereas speakers of another language hear the category into two or more distinct phonemes. In cases in which English is the language that doesn't make a distinction, it's difficult for native English-speakers to imagine that the sounds are distinct.

PHONEME DISTINCTION	EXAMPLE	DOES HAVE DISTINCTION	DOES NOT HAVE DISTINCTION
R / L	Rid / Lid	ENGLISH	JAPANESE
S / Z	Ice / Eyes	ENGLISH	SPANISH
K / Kh	Keep / Cool	ARABIC	ENGLISH
D / T / TH	Doll / Tall / no example in English; mouth shaped as if pronouncing the letter <i>t</i> but with the tongue against back of teeth	HINDI	ENGLISH

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Morphemes

- The smallest units of meaning in a language
- Morphemes convey information about **semantics**—meaning derived from words and sentences
- Can be full words (“dog”) or modifiers (“re-”)

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Syntax

- The set of rules of a language by which we construct sentences
 - I ate pizza for dinner.
 - Pizza ate for I dinner.
 - Dün girdiğim sınav çok güzel geçti.
 - Geçti dün çok girdiğim güzel sınav.
- Includes word order, *morphological markers* and sentence structure

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Syntax

- Real-world language rarely follows this completely
- Syntax describes an idealized form of language, like formal language in written text.
- Competence vs. performance

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Extralinguistic Information

- Elements of communication that aren't part of the content of language but are critical to interpreting its meaning
- Facial expressions, tone of voice, previous statements by others
- Used to help interpret ambiguous information

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How we interpret a sentence depends a great deal on the context. How would your interpretation of the sentence "It's just awful in here!" differ in these two contexts?



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Learning Language

- Children are more efficient learners than adults in learning language
- **Language perception**
- Children begin learning to recognize their native language before they are born
 - As soon as the auditory system developed infants start to learn some features of their mother's tongue

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Learning Language

- How to study language learning with infants?
- High-amplitude sucking procedure (HAS)
 - From ling.umd.edu/
 - Ling 240: Language and Mind
 - University of Maryland

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High Amplitude Sucking Procedure

- Initially sucking rate increases (novelty)
- Then decreases
- Decline in response = *habituation*



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High Amplitude Sucking Procedure

When sucking rate declines to a set point (*habituation criterion*), auditory stimulus is changed



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High Amplitude Sucking Procedure

If sucking rate increases, then we know the infant has detected the change

- The renewed response = *dishabituation*



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Learning Language

- How to study language learning with infants?
- High-amplitude sucking procedure (HAS)
 - Two-days old infants suck more when they hear their mother's native language than when they hear a foreign language, even when it is spoken by a total stranger

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Learning Language

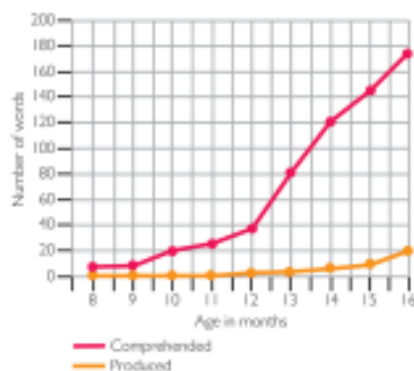
- **Language production**
- Babbling
 - Intentional vocalization that lacks specific meaning
 - Babbling is observed during first year
 - It allows babies to develop control over vocal tracts
- Babies also developed phoneme recognition during this time
 - Interaction between perception and action

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Learning Words

- One of the key principles of language learning:
 - Comprehension precedes production
- Children recognize words long before being able to say them
- Only have a limited ability to coordinate sounds to produce words

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Learning Words

- Recognize own name by 6 months, comprehend other words by 10-12 months
- Begin to *produce* words around 1 year of age, with an exponential rate of increase
- Tend to overextend and underextend word meanings
 - E.g. Daddy refers to all adult men
 - E.g. Cat applies to only their pet cat.
- Children get at least one word's meaning completely wrong at first.

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Syntactic Development

- Refers to combining words into phrase
- One word stage
 - Children use individual words to convey entire messages
- Simple two-word phrases
 - Around two years old

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Syntactic Development

- Children can comprehend basic syntax rules before they can display them



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Sign Language

- Type of language used by deaf communities that relies on visual communication
- Not just gestures or pantomimes, exhibits all features of spoken language
- Same brain areas are involved in and developmental stages passed through in spoken and sign
- Babies can learn sign language as they learn spoken language
 - Very popular in USA nowadays (<http://www.youtube.com/watch?v=ynJrt1w18jA>)

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Bilingualism

- The earlier the better when acquiring new languages
- Usually have one dominant language, but proficient in both
- Pass through same stages as *monolingualists*, although syntax is slowed

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Bilingualism

- Same brain areas used if second language is learned early, but different areas used if learned later in development

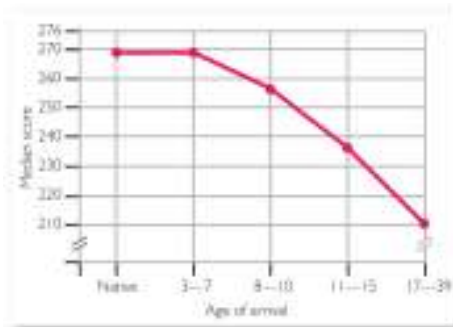
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Theories of Language Acquisition

- How does babies learn language?
- Nurture vs. nature
- What is your opinion?

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Figure 8.4 Proficiency in Second Language Depends on the Age of Exposure. Adults first exposed to English before age seven displayed proficiency comparable to that of native English speakers, whereas those who learned English after age seven were significantly less proficient. (Source: Johnson & Newport, 1989)



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Theories of Language Acquisition

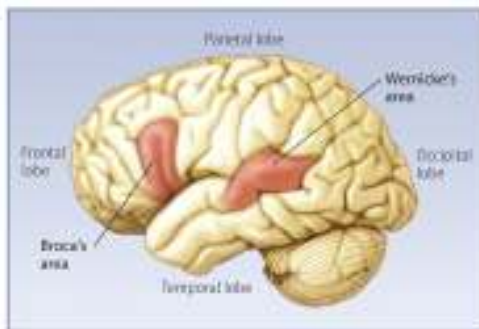
- The *imitation account*
 - babies hear language used in systematic ways and learn to use language as adults use it by imitating them
 - It can't account for **generative** nature of language
 - There are infinite number of sentences in a language
 - Babies utter sentences that they have never heard

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Theories of Language Acquisition

- **The Nativist** account
 - children are born with some basic knowledge about how language works
- Chomsky's **language acquisition device** or **language organ**
 - All languages share the same underlying syntactic principles. This knowledge is innate.
 - Children **discover** principles applied to their mother's tongue.

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Theories of Language Acquisition

- **Social pragmatics** account
 - Specific aspects of the social environment structure language learning
 - Children use context of conversation to infer its topic from actions, expressions, gestures tc.
- Requires assuming that infants have insight into others' thoughts

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Theories of Language Acquisition

- *General cognitive processing account*
 - ability to learn language results from general learning skills
 - There is no language acquisition device
- But, children learn language better than adults, but adults are overall better at learning things
- Specific brain areas are recruited during language

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Nonhuman Animal Communication

- Animals also use scent, visual, vocal forms to communicate
- **What is the difference between nonhuman animal communication and language?**
- Human language is complex in its structure
- Human language is generative
- Human language is not constrained with now and here
- Most animal communication is related with mating and aggression

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Lecture Preview

- How does language work?
- Do we think in words?

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Language and Thought

- Do we think in words?
- Do we also use nonlinguistic information or we use just internal conversation in thinking?

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Linguistic Determinism

- Linguistic determinism is the view that we represent all thinking linguistically
- Can thought exist without language?
 - Children can perform many cognitive tasks before they can speak
 - Studies using neuroimaging showed that language areas are not activated in certain spatial tasks

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Linguistic Relativity

- Linguistic relativity states that language shapes our thought processes
- Color categories
 - Some languages do not have words for certain colors.
 - Do speakers of these languages see the world different than us?

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The Dani language has only words for "dark" and "bright," not individual colors, but Dani people can distinguish colors, just as we do.



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Linguistic Relativity

- Studies suggest language shapes some aspects of perception, memory, and thought
 - Russian migrants recalled more events happened in United States when they spoke English but they recalled more events from Russia when they spoke Russian

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