

# INTD0112

## Introduction to Linguistics

Lecture #3  
Feb 22<sup>nd</sup>, 2007

### Announcements

- Homework #1 will be posted on the course website either later this evening or by tomorrow morning at the very latest. I will send a message about that once it is posted. You'll have seven days to work on it from the time it is posted.
- Part 1 of the Human Language Series movie, is on reserve and available for viewing.

### The biological basis for language

- Summary of arguments we discussed on Tuesday:
  - The poverty of the stimulus argument.
  - The double dissociation argument.

### Uniformity of language acquisition

- In acquiring their native language, children go through the same stages, with slight differences, e.g., consider the acquisition of negation in English:
  - no Fraser drink all tea*
  - He no bite you.*
  - I can't catch you.*

### Uniformity of language acquisition

- More interesting still is that children go through the same stages across different languages: babbling, one-word stage, two-word stage, telegraphic speech, until they eventually converge on the "adult" grammar.

### Uniformity of language acquisition

- Children also overgeneralize, again showing they're trying to figure out a "mental" grammar:
  - comed, goed, bringed,*
  - mans, foots*
- Notice that these forms do not occur in the linguistic environment of the child. Contrary to behaviorism, then, language learning cannot be a process of habit formation, in a response-to-stimulus fashion, coupled with reinforcement.

## Reinforcement goes by unnoticed

- Even worse for the behaviorist approach is that it predicts that children should actually respond positively to correction of their utterances. But there is good evidence to the contrary: children typically resist correction of their language.
- Consider a couple of famous anecdotal child-parent exchanges:

## “Incorrigible” children

- *Exchange #1 (from Braime 1971):*  
Child: Want other one spoon, daddy.  
Parent: You mean, you want the other spoon.  
Child: Yes, I want other one spoon, please Daddy.  
Parent: Can you say ‘the other spoon’?  
Child: Other...one...spoon  
Parent: Say ‘other’  
Child: Other  
Parent: ‘Spoon’  
Child: Spoon  
Parent: ‘Other spoon’  
Child: Other...spoon. Now give me other one spoon?

## “Incorrigible” children

- *Exchange #2 (from McNeill 1966):*  
Child: Nobody don’t like me.  
Parent: No, say ‘nobody likes me.’  
Child: Nobody don’t like me.  
[repeats eight times]  
Parent: No, now listen carefully; say ‘nobody likes me.’  
Child: Oh! Nobody don’t likes me.

And there is further evidence for the biological basis of language from *creolization*.

## Cases of language emergence

- In fact, in certain situations, a language may arise without a language input, as the case is with creole languages.
- A creole language (e.g., Hawaiian Creole English) arises on the basis of a pidgin, which is a makeshift system of communication created by speakers who did not know each other’s languages, thereby showing clearly that it did not “take language to make language.”

## And, there’s also a critical period for language acquisition

- Ever wondered why you’re having hard time learning a foreign language, even though you had no trouble whatsoever learning your first language?
- Well, if language is a biological system, we have an answer: Certain biological abilities follow a timetable and then get “turned off” or at least “degrade” considerably, as Eric Lenneberg suggested for language in 1967.

### **And, there's also a critical period for language acquisition**

- The cases of “wild children”.
- **Isabelle** discovered at the age of 6 with no language skills, but within a year she learned to speak and was able to function normally in school.
- **Genie** discovered at the age of 13, but her language development never matched what normal children do.
- **Chelsea** misdiagnosed as retarded, fitted with hearing aids at 31, but after 12 years of training her language level remained that of a 2 and ½ year old.

### **Language and the brain**

- Finally, we know from neuroscience studies that language is neurophysiologically represented in the brain.
- In fact that study of how language is represented and processed in the brain is called *neurolinguistics*.

### **Language and the brain**

- For one thing, for most right-handed individuals, language is represented in the left cerebral hemisphere of the brain.
- Of course since we cannot operate on the brain directly, we look for opportunities when this becomes possible, or make use of technology that allows access to how the brain functions when it comes to language.

### **Autopsy studies**

- One method to investigate the brain is through autopsy studies to find out if there is a correlation between damage in certain areas of the brain and the loss of certain linguistic abilities.
- While useful, autopsy studies can only be carried out after the patient's death.

### **Imaging the brain**

- Recent decades have seen a number of technological advances that have greatly facilitated the investigation of the brain.
- Computerized axial tomography (aka CT scanning) is a technique that uses a narrow beam of X-rays to create brain images.
- Obviously, this method can only give us static images of the brain.

### **PET**

- Other techniques have been invented, therefore, to provide “dynamic” imaging of the brain.
- One such technique is positron emission tomography (aka PET), which allows us to see how blood flow to the brain shifts to different locations depending on the task being performed.
- Examples.

## **fMRI**

- Another dynamic brain-imaging technique is functional magnetic resonance imaging (fMRI), which allows many measurements to be taken in a single testing session and offers a good measure of how brain activity changes during language comprehension and production.
- Pretty expensive, though.

## **MEG**

- Another technique for the study of how language is processed in the brain is magnetoencephalography, known as MEG (thank God), which records very subtle changes within the magnetic fields generated within the brain.
- Provides excellent time resolution: A millisecond-by-millisecond record of how the brain responds to a stimulus event.
- Pretty expensive.

## **Dichotic listening studies**

- Dichotic listening studies help us in the study of the specialization of the cerebral hemispheres, and is based on the assumption that each hemisphere is primarily wired to the opposite side of the body.

## **Split brain studies**

- Split brain studies investigate cases when the two hemispheres cannot communicate with one another due to surgery.
- For example, split brain patients can name objects when held in the right hand, but not when they're held in the left hand.

## **Aphasia**

- Aphasia is a language impairment that results from damage to the brain, due to a stroke, trauma to the head, brain infection, etc.
- There are several cases of aphasia.

## **Nonfluent aphasia**

- Nonfluent aphasia (aka motor aphasia) results from damage to parts of the brain responsible for motor activity and speech articulation.
- Nonfluent aphasia could be severe, in which the case the patient would be completely mute (which is called global aphasia), or less severe, in which case there is difficulty in language production (e.g., *Broca's aphasia*).

## Broca's aphasia

- Broca's aphasics typically have difficulty producing speech:  
*... har eat ... wit ... poon*  
(Intended sentence: It is hard to eat with a spoon.)
- They also typically omit function words, e.g., articles, pronouns, prepositions, auxiliary verbs, and inflectional suffixes, from the sentence.

## Broca's aphasia

- There seems to be evidence as well that Broca's aphasia involves disturbance of the patient's syntactic competence:
  - a. *The mouse was chased by the cat.* (normal)
  - b. *The dog was chased by the cat.* (unsure)
  - c. *The cat was chased by the mouse.* (as in a)

## Fluent aphasia/Wernicke's aphasia

- Fluent aphasia patients have no difficulty producing language. Their problem is in selecting, organizing, and monitoring their language production.
- One such case of fluent aphasia is *Wernicke's aphasia*, where patients' speech sounds very good, there are no long pauses, sentence intonation is normal, function words are used, and word is syntactically correct. The problem is that their speech rarely makes any sense:  
*I could if I can help these this like you know ...  
to make it. we are seeing for him. That is my  
father.*

## Other language impairments

- Other interesting phenomena that bear on the relationship between language and the brain include *dyslexia*, *dysgraphia*, *agrammatism*, etc., which are discussed in chap. 14 of your textbook. You should read about them.

## So, to sum up the evidence for the biological basis for language,

- There's poverty of the stimulus in language acquisition.
- There's dissociation between language and general intelligence.
- There's uniformity of language acquisition by children within the same language and across languages.
- There is good evidence that language learning is not a matter of habit formation.
- There is some evidence for a critical period.
- And there is good evidence that certain linguistic abilities are represented in certain parts of the brain.

BUT ...

## Universality

- If we are all born with the same language faculty, how is it that we come to speak dramatically different languages?
- Chomsky's answer is that the language faculty is an abstract system of principles, call it *Universal Grammar* (UG), that interacts with the linguistic experience to give rise to a particular language.

## Universality

- Contrary to common belief, then, linguists believe that languages are fundamentally the same, and not fundamentally different. Cross-linguistic variation is all but a "surface" phenomenon.
- As the course goes on, you will see how the space of variation among human languages is very limited and is constrained by general principles of grammar in all human languages.

## Generality

- Also, if language is viewed as a system of knowledge, then it makes no sense to say that a language "has no grammar." Every language has a sound system, rules for word formation, rules for sentence formation, as well as systematic meanings for words and sentences. Every language is a rule-governed system, therefore

## Parity

- Notice also that if language is an internalized system of knowledge, then it does not make sense to talk about one language being "better than" or "superior to" another language. Linguistically, all languages are equal. Thus, there is no such thing as a "primitive language."

## Parity

- The same extends to dialects: There is no sense in saying that one dialect is better than another, either. All dialects are linguistically valid systems of knowledge.
- And so-called standard dialects have no linguistic merit over nonstandard dialects. The difference is actually sociopolitical than anything else.
- We will revisit this issue in detail in the second half, but it is important to bear this in mind.

## Different kind of linguistic knowledge

- Notice, crucially, that if our linguistic knowledge is the result of interaction between nature and nurture, then we are actually talking about a different kind of linguistic knowledge than the "*prescriptive*" rules you learned from your school teacher (like "Don't end a sentence with a preposition", or "Don't split the infinitive," rules that we disregard on a daily basis, much to the chagrin of school teachers, but for the delectation of linguists).
- As a matter of fact, you acquire this knowledge pretty early in your life (around the age of 5), i.e., even before you go to school.

### Prescriptive vs. descriptive grammar

- It's important therefore to understand that linguistics is not *prescriptive*, but *descriptive*.
- Linguists do not concern themselves with telling people how to use the language. Rather, linguists assume that people already know their language and set out to describe the different kinds of knowledge that people have of their language.

### Goals of linguistic theory

- Linguists are thus mainly concerned with two main questions:
  - a. What is it that we know when we know a language?
  - b. How does this knowledge arise in the mind?

### Grammar is a “mental” entity

- The answer to the first question is to study language as a system of knowledge, or to use a familiar term though in a rather different way, a *grammar*. Linguists typically break down a grammar into subcomponents and work on each:

### Components of a mental grammar

- **Phonetics**: The study of the articulation and perception of speech sounds.
- **Phonology**: The study of the sound system in a language.
- **Morphology**: The study of word structure.
- **Syntax**: The study of sentence structure.
- **Semantics**: The study of meaning of words and sentences.

### Other subfields within linguistics

- The answer to the second question is the study of **first language acquisition**.
- But linguists also raise questions for the mutability of linguistic knowledge, i.e., the fact that language changes over time. This is the domain for **historical linguistics**.
- Linguists also raise questions for how we come to use language in social contexts and how people's forms of speech vary (the so-called *dialects*). This is the domain for **sociolinguistics**.

### Other subfields within linguistics

- **Psycholinguistics**, on the other hand, studies the cognitive processes that we engage in the production and perception of language.
- We have already spent some time today talking about **neurolinguistics**.
- **Computational linguistics** is concerned with ways to model natural languages so they can be used by machines.

### **Course plan**

- We will cover most of these (check your syllabus), though you have to remember this is a course in the “formal” study of language, so all of the first half of the semester and some part of the second half will be devoted to the study of the five main components of linguistic knowledge. Importantly, though, understanding these is crucial to understanding other areas of linguistics as well.

### **Next class agenda**

- Phonetics: The sounds of language. Chap 2, pp. 15-37.