

INTD0112

Introduction to Linguistics

Lecture #2
Feb 20th, 2007

Announcements

- Homework #1 will be assigned on Thursday rather than today due to the cancellation of last Thursday's class.
- Textbook website: Create an account to get access to supplementary materials.
- The Human Language Series Movie: Part 1., on reserve.
- Thanks for filling in the questionnaire, with many interesting suggestions and comments. Here's a summary:

Topics of interest

- Semantics, indigenous languages, how language develops, how it is acquired, how it changes over time, language families, geographical and social dialectal variation, the nature of human language, foreign (second) language acquisition, endangered langs., slang, how languages are similar, how languages differ, language as a communication system, formation of new words/phrases, sign languages, language and the brain.

Summary of last class

- Human language is a communication system that has a set of distinctive "design features" that set it apart from other animal communication systems:
- Interchangeability, cultural transmission, arbitrariness, discreteness, and (perhaps more importantly) displacement, creativity and discrete infinity.

Spiders

- Animal communication systems lack creativity. For instance, spiders use a complex system of gestures for courtship, but the system is invariant. One never finds a "creative" spider changing or adding to the particular courtship ritual of the species. [Link](#)

Fiddler crabs

- The same is true of fiddler crabs' "claw-waving" movement, which is typically used to signal to another member of its "clan." Whatever the signal means, it is fixed and cannot be decomposed into smaller elements. [Link](#)

Bees

- The “language” of the honeybees is a more complex communication system that seems to pose a challenge to the uniqueness of human language.
- Bees interact via a “dancing” signaling system whereby they communicate to one another the distance, direction, and quality of a food source.
- Some bee dances.

Bees

- But why is this challenging?
- Well, it seems like we found a nonhuman communication system that has displacement and that can, in principle, generate an infinite number of messages.
- Or does it?
- For one thing, if it does have displacement, it is definitely restricted to a particular domain. It is frozen and inflexible.

Bees

- Also, we can represent the bees’ messages in a number of ways. It could be that the signal is “*There’s a food source 40 feet from the hive at a 45° angle from the sun,*” in which case it does exhibit displacement.
- But the signal could also be represented differently, e.g., “*Fly 45° for 2 minutes.*”

Bees

- But the bees communication system also lacks *creativity*. An experimenter showed that by forcing a bee to walk to the food source. When the bee returned, it indicated a distance 25 times farther away than the food source actually was. The bee had no way of getting “creative” to communicate the special circumstances under which it found the food location.

The European robin

- Similar conclusions can be drawn with regard to bird songs. The European robin has a particular song to indicate possession of a certain territory. While the songs are complicated and vary, two French scientists found that the rival robins paid attention only to the alternation between high-pitched and low-pitched notes. The different alternations therefore express intensity and nothing more. The robin is creative in his ability to sing the same thing in many different ways, but not creative in his ability to use the same system to express new and different meanings.

The European starling

- A more recent article can be found here: http://www.livescience.com/animalworld/060426_starling_linguist.html
- Read it and think about the issues.

So, why is human language *special*?

- The answer provided by linguists, and most notably by Noam Chomsky, to this question is: *Biology*.
- We learn and use language for the same reason birds fly and fish swim. We are genetically endowed with a species-specific “language faculty.”
- But if this is true, then animals cannot even learn a human language, and apparently there is good evidence that this is indeed the case.

Primate studies

- 1930s: Gua, the chimp, and Donald.
- 1950s: Viki
- Washoe and American Sign Language: 132 signs at five years of age. Creating novel combinations, e.g., WATER BIRD (for a swan).

Primate studies

- 1972: Koko, like Washoe, learned several hundred signs, and created new ones, e.g., FINGER BREACELET (for ring). [Play with Koko online](#).
- And others: Sarah, Lana, and Clever Hans (the horse).

Nim Chimpsky

- Then came Nim Chimpsky in the late 1970s. Nim was trained by Herbert Terrace, and by four years of age, he had acquired 125 signs.
- Close examination of the videotapes of chimp and trainer, however, showed that there were many dissimilarities between Nim’s and a human child’s acquisition of language.

Nim Chimpsky

- Nim never initiated signing.
- Only 12% of his signs were spontaneous, whereas 40% were mere repetitions of the trainer’s signs.
- Nim’s signing was typically a request for food or social reward. He never asked questions.
- Nim did not seem to know any grammar. He rarely went beyond the two-word combinations, and when he did, the additional signs added no new information, e.g., *give orange me give eat orange me eat orange give me eat orange give me you*.

Nim Chimpsky

- Tapes of Washoe and Koko showed the same thing.
- Terrace thus concluded that these chimps never actually learned human language.
- Chimpanzee signing and symbol manipulation is more likely the result of response-reward association and/or trainers’ cueing (aka dressage).
- And language use ≠ social interaction.

Moral of the Great Ape Debate

- Among linguists, the general belief is that animals' communication systems, while rich, sophisticated, and subtle, are *qualitatively* different from human language.
- Biology just happened to have it this way.
- Ok, but do we have arguments in favor of this "biological basis of human language" view?"
- Sure. Consider.

So rich knowledge, such a poor stimulus

- For one thing, our knowledge of language is largely unconscious. We've seen last time that we know what's good and what's bad in English, even though it's very unlikely that any of you guys knew why.
- Let's consider some of these examples again:

So rich knowledge, such a poor stimulus

Who did John say that Mary saw?
Who did John say ___ Mary saw?
Who did John say ___ saw Mary?
*Who did John say that saw Mary?

- A potential rule to account for this paradigm would be something as complex as this:
- "You can't form a subject wh-question if the embedded clause is introduced by the word *that*; however, if *that* does not introduce the embedded clause, then forming a subject wh-question becomes possible. If the wh-phrase is an object, however, then forming a wh-question is possible, whether or not the embedded clause is introduced by the word *that*."

So rich knowledge, such a poor stimulus

Compare

Who did Mary meet at the party?
Who did John say that Mary met at the party?
Who did Sarah believe that John said that Mary met at the party?
Who do you think that Sarah believed that John said that Mary met at the party?

with

*Who do you believe the claim that Mary met?
*Which book did Mary talk to the author who wrote?
*Who did Mary talk to John without meeting?

So rich knowledge, such a poor stimulus

- What would the rule be like here? Maybe something like this:

"You can form a wh-question no matter what the distance between the wh-word and the verb it is associated with is, unless there is a noun like "claim" followed by "that", or a relative pronoun like "who", or a preposition like "without" in the sentence."

So rich knowledge, such a poor stimulus

- You also know that "prasp" and "psapr" are not English words, but you also know that "prasp" could potentially be a name for a flying bike, whereas "psapr" can never be part of the English lexicon.

So rich knowledge, such a poor stimulus

- And consider your pronunciation of the plural -s in the following words:
cats
dogs
kisses
- You might not have noticed that before, but the -s is actually pronounced differently in each case. You know that, even though it's something you were never taught.

So rich knowledge, such a poor stimulus

- And how about the following two sentences? What does each mean to you?
Anne hit the man with an umbrella.
Visiting relatives can be a nuisance.
- So, how do we know all this?

So rich knowledge, such a poor stimulus

- You know all of this (and more) because it is part of your “unconscious” native knowledge of English. And your grammaticality judgments are based on your linguistic “intuitions”, not on what you were taught in school. It's part of your linguistic “**competence**.”

So rich knowledge, such a poor stimulus

- In other words, every one of us acquires a “system” of linguistic knowledge in our childhood that allows us to know what is possible and what is not possible in our native language.
- And we acquire it so effortlessly, in such a short time (typically five years), and without any need for formal instruction.

So rich knowledge, such a poor stimulus

- This is the so-called *Plato's paradox*:
“How does a system of knowledge with such complexity and abstractness arise in the mind when the stimulus bearing on that system is so impoverished?”

The biological basis for language

- Chomsky's answer: It must be that part of our linguistic knowledge is “built-in”. In other words, we must be born endowed with an innate faculty to learn language, a faculty that allows us to construct rich and complex systems of knowledge on the basis of poor and noisy input data.

Evidence for language as a biological system

- We already saw how certain types of complex and abstract knowledge are available to us, even though the linguistic input around us is so poor and noisy. In other words, our rich system of linguistic knowledge is quite underdetermined by our experience.

Evidence for language as a biological system

- This is the so-called “**poverty of the stimulus**” argument for the biological basis for language: If we come to acquire certain types of knowledge which cannot be attributed to the linguistic environment or “nurture”, then this knowledge has to come from “nature;” it has to be genetically given.

Language and intelligence

- But why can't our ability to learn language be part of our general intelligence as human beings?
- Good question. But there is good evidence that language actually exists as a separate module in the human mind/brain.

Language and intelligence

- The main argument against language being part of our general intelligence is the so-called “*double dissociation*” argument.
- Put simply, there are cases where general intelligence is affected but language ability remains intact. And there are cases where linguistic ability is affected, but other cognitive abilities remain intact.

Language and intelligence

- *Turner's Syndrome* and *Williams Syndrome* are cases of mental retardation, but individuals suffering from them seem to have normal language behavior.
- By contrast, there are individuals with *specific language impairments* whose cognitive abilities are all but normal.

Uniformity of language acquisition

- On the other hand, in acquiring their native language, children go through the same stages, with very 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

- Children also overgeneralize, again showing they're trying to figure out a "mental" grammar:

*comed, goed, bringed,
mans, foots*

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.

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.

So, ...

- 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.
- And there is some evidence for a critical period.
- *Well, ... if it looks like biology, then it must be biology!*

Next class agenda

- More about language and linguistics. Chap 1 cont.
- Phonetics: The sounds of language. Chap 2, pp. 15-37.