## INTD0111A

# The Unity and Diversity of Human Language

Lecture #4 Feb 18<sup>th</sup>, 2009

## Announcements

- Reminder: Today is the first lecture in the linguistics series. Talk starts at 4:30pm in RAJ conference room.
- Due to the Winter Carnival recess, there will be no office hours on Friday Feb 20<sup>th</sup>.
- (Mrs. Advocate enters-quietly. Apparently, D is still not feeling well, but I'll pretend I didn't notice.)

## Summary of our discussion of the nature of human language

- > 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.

## The dances of bees: An exception?

- The "language" of the honeybees, however, is a more complex communication system that seems to pose a challenge to the uniqueness of human language.
- Bees interact via a "dance" signaling system whereby they communicate to one another the distance, direction, and quality of a food source. <u>WATCH</u>.

## 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

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. So, why is human language special?

- The answer provided by many linguists 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 speciesspecific "language faculty."
- But if this is true, then animals cannot even learn a human language, or can they?

## The Great Ape Debate

- ≻ 1930s: Gua.
- > 1950s: Viki.
- > Washoe and American Sign Language: 132 signs at five years of age. Creating novel combinations, e.g., WATER BIRD (for a swan).
- > 1972: Koko, like Washoe, learned several hundred signs, and created new ones, e.g., FINGER BREACELET (for ring).

## 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.
- Ferrace 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  $\neq$  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.

#### Language as a biological system

- > Mrs. Advocate: "Ok, ok, I see your point. But do we have other arguments in favor of this "biological basis of human language" view?"
- Sure. One such argument comes from the fact that we know far more about our language than what our experience with our language could have given us. The so-called *poverty of the stimulus* argument of Chomsky.

Stuff that you know, even though you don't know that you know it. So, how did you know it? Stuff that you know, even though you don't know that you know it. So, how did you know it?

- You know that "klirb" and "rnig" are not English words, but you also know that "klirb" could potentially be an English word (maybe a name of a new kind of edible CDs), whereas "rnig" can never be part of the English lexicon.
- > So, how do we come to know this?

Stuff that you know, even though you don't know that you know it. So, how did you know it?

- > 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.

Stuff that you know, even though you don't know that you know it. So, how did you know it?

> And while you can "eat a turkey sandwich" or just "eat", you can only "devour a turkey sandwich", but not just "devour". Stuff that you know, even though you don't know that you know it. So, how did you know it?

- We know: If "John gave money to the children", then we can also say that "John gave the children money."
- But we also know: If "John donated money to the children", we cannot say that "\*John donated the children money."
  - So, how do we know that?

Stuff that you know, even though you don't know that you know it. So, how did you know it?

You also know that while you can "vacation in France" or "summer in Paris", you cannot "\*midnight in the streets" or "\*noon at the dining hall."

(Note that a star is linguists' convention to indicate that a language form is bad.)

Stuff that you know, even though you don't know that you know it. So, how did you know it?

➤ Consider:

I took my shirt off. I took off my shirt.

≻ But:

I took it off. \*I took off it. Stuff that you know, even though you don't know that you know it. So, how did you know it?

 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?

Stuff that you know, even though you don't know that you know it. So, how did you know it?

> We know:

Who did John say that Mary saw? Who did John say \_\_ Mary saw? So, maybe the word "that" is optional.

> But now consider:

Who did John say \_\_ saw Mary? \*Who did John say that saw Mary?

So, what's the deal?

## Stuff that you know, even though you don't know that you know it. So, how did you know it?

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 complementizer *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 complementizer *that*."

Stuff that you know, even though you don't know that you know it. So, how did you know it?	
Consider:	
John hurt himself.	(himself = John)
John hurt him.	(him ≠ John)
But now consider:	
John said that Bill hurt himself.	
(himself = Bill, but ≠ John)	
> Now consider further:	
John said that Bill hurt him.	
(him ≠ Bill, but may = John)	



Stuff that you know, even though you don't know that you know it. So, how did you know it?

- > We know this is good: Who did you see Mary with?
- > But we also know this is bad: \*Who did you see Mary and?

Mrs. Advocate: "But how ..." Mr Linguist: "Doesn't really matter how now. The fact is we just KNOW this stuff." Stuff that you know, even though you don't know that you know it. So, how did you know it?

And it gets interesting:

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?

> Where do we stop? Infinity?

Stuff that you know, even though you don't know that you know it. So, how did you know it?

#### > But compare with these now:

\*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?

> What would the rule here be like? 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."

## Stuff that you know, even though you don't know that you know it. So, how did you know it?

#### > One more:

In a potluck dinner gathering, you may ask: Who brought what?

But not:

\*What did who bring?

Mrs. Advocate: "What did who bring? That sounds pretty odd."

Yes. And you know it even though nobody ever told you about this before. I mean, not until I mentioned it today, right?

### A different kind of linguistic knowledge

- In other words, there is 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.
- > So how do you know all this?

### The biological basis for language

- 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".

## The biological basis for language

- 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.

## The biological basis for language

This is what Noam Chomsky calls *Plato's Problem*:

"How does a system of knowledge with such complexity and abstractness arise in the mind when the evidence 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

- > 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 "prewired".
- In my talk today, I'll mention a few cases from child language in support of this argument.

## Question!

- > Mrs. Advocate: "I have a question."
- Please.
- "Is there any other evidence for the existence of a language faculty in the human brain? I mean, why can't this ability be part of our general intelligence as human beings?"
- Excellent question. Let's review the evidence.

## Language is a biological system

- 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 is a biological system

- Turner's Syndrome and Williams Syndrome are cases of mental disability, 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 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, twoword stage, telegraphic speech, until they eventually converge on the "adult" grammar.

## So, why are we struggling learning a second language?

- > There is an interesting answer to that within the biological view of language.
- I'm afraid we ran out of time today, so we'll start with that question on Monday.

## Next class agenda

- Introducing the theory of Universal Grammar: Principles and Parameters.
- > Word order variation revisited: The head parameter.
- > And of course comes with it an introduction to syntax (be ready).
- Keep reading Baker's book. We're pretty much done with Chapters 1 and 2, but we'll be covering materials from Chapter 3 on Monday.