Language: Words and Sentences

Words

• Behavioral acts (utterances, gestures) referring to objects or events or relationships in world
• Meaning is through learned association of arbitrary symbol with referent
• Meaning may also depend on context
• Branch of linguistics dealing with words and meaning is called “semantics”

Sentences

• Ordered arrangements of words to convey meaning
• Meaning is dependent on order: contrast “Dog Bites Man!” with “Man Bites Dog”--same words, different meaning; determined by rules of “grammar”
• Branch of linguistics dealing with the rules for constructing sentences is called “syntax”
• Grammars in human languages are “generative”
Primate “Language”--Words in the Lab

Chimps:

• Washoe: learned to produce and understand hundreds of signs in ASL
• Kanzi: learned hundreds of distinct (and arbitrary) symbols on keyboard--can both produce and understand

Monkeys:

• Have been taught to use to understand spoken words and gestures, can be trained as domestic helpers
• Ability to produce words is much more limited
Primate “Language”--Use of Words in the Wild

Apes: wide vocal repertoire of screams and grunts, but no evidence for use of “words” in the wild
Vervet monkeys: Predator-specific alarm calls
(Robert Seyfarth and Dorothy Cheney)

- 3 acoustically distinct calls; given in response to
distinct classes of predators; evoke distinct responses
- **Leopard call**--other monkeys run into trees, go as
  high as possible, and look back at ground
- **Eagle call**--monkeys descend into lower branches of
trees and look up
- **Snake call**--monkeys stand up and look for snake in
  grass
Primate “Language”--Words in the Field (Monkeys)

Vervet monkeys: Predator-specific alarm calls
(Robert Seyfarth and Dorothy Cheney)

- 3 acoustically distinct calls; given in response to distinct classes of predators; evoke distinct responses
- **Leopard call**--other monkeys run into trees, go as high as possible, and look back at ground
- **Eagle call**--monkeys descend into lower branches of trees and look up
- **Snake call**--monkeys stand up and look for snake in grass
Primate “Language”--Words in the Field (Monkeys)

Vervet monkeys: Predator-specific alarm calls
(Robert Seyfarth and Dorothy Cheney)

- 3 acoustically distinct calls; given in response to distinct classes of predators; evoke distinct responses
- **Leopard call**--other monkeys run into trees, go as high as possible, and look back at ground
- **Eagle call**--monkeys descend into lower branches of trees and look up
- **Snake call**--monkeys stand up and look for snake in grass
Primate “Language”--Words in the Field (Monkeys)-cont’d

Are vervet alarm calls “words”?
• Association between sound and referent is arbitrary
• Role of learning

- BUT: what do “words” evoke--just a behavior linked to a sound or actually a representation in the receiver’s mind of the referent?
Primate “Language”--Words in the Field (Monkeys)

Vervet monkeys: “Wrrrs” and “Chutters”
- Given in response to intrusion by another troop of monkeys
- Causes other monkeys to first look toward caller, then to look for intruders

If Monkey A’s “Wrrr” is repeated in absence of intruder, other monkeys will habituate to that monkey’s “Wrrr”....

Thus, monkeys respond to calls based on their semantic content, not just their acoustical properties!
**Primate “Language”--Sentences (Syntax)**

**Kanzi**: seems to show recognition of meaning based on syntax:

- “Give your dog a shot” (in the film)--gives toy dog a shot with syringe

- Go get the ball that’s outside” (in the film)--goes outside looking for ball, ignoring ball that is inside

- “Make the dog bite the snake”--makes toy dog bite toy snake, and not the other way around

**Alternative hypotheses:**

- **H1**: Kanzi really has learned the rules of syntax
- **H2**: Kanzi is just selecting the response that is consistent with all the words he has heard, independent of their order
Primate “Language”: Evidence for a Theory of Mind?

Alternative hypotheses:
- H1: primates produce words/sentences with an understanding of their behavioral effect on receiver? (requires understanding of mental state and likely behavior of receiver)
- H2: primates produce associate words with context, and possibly with outcomes such as the rewards they obtain from producing the words, but don’t have an understanding of how the receiver might be interpreting them

Evidence
- Apes clearly seem to understand not only how others should respond to their signals, but also how receivers should respond to another ape’s signal (Kanzi)
- Monkeys show no evidence of understanding the behavioral effects of their signals--examples:
  - Vervets stop doing alarm calls after they have reached safety, even when they can see that their own kin are still in danger
  - Baboons give contact calls that serve to keep the group together, but they do this only when they are lost--even a mother that hears the distress calls of her infant won’t give contact calls that could help him find her