

- 1 Language In Animals?
- 2 Language in Animals?
 - Rene' Descartes
 - Clever Hans
 - Animal Communication
 - Teaching Human Language to Animals
 - Is it really language?
- 3 Rene' Descartes
 - "It is a very remarkable fact that there are none so depraved and stupid, without even excepting idiots, that they cannot arrange different words together, forming of them a statement by which they make known their thoughts; while, on the other hand, there is no other animal, however perfect and fortunately circumstanced it may be, which can do the same."
- 4 Rene' Descartes
 - Washoe is a chimpanzee who was taught ASL.
 - She lost several babies.
 - She "doted over the swelling belly" of a pregnant researcher.
 - When the researcher's baby was stillborn she took some time off to recover.
 - Washoe was upset that she took time off.
 - The researcher decided to tell Washoe the truth: "My baby died."
 - Washoe would not let her go when she was ready to leave. She signed, "Please person hug."
- 5 Rene' Descartes
 - Is Descartes right?
 - Is language special?
 - What, if anything, does his position imply about the relationship between language and our other cognitive abilities?
- 6 Clever Hans
 - Description versus Explanation
 - Alternative Interpretations
 - Exerting Control: Oskar Pfungst
 - Another Example: Facilitated Communication
- 7 Animal Communication
 - Spiders
 - Songbirds
 - Vervet Monkeys
 - Honeybees
- 8 Spiders
 - Before a male spider approaches a female to mate, he goes through an elaborate

sequence of gestures.

- The gestures are invariant.
- If he does it wrong, she eats him!

9 Songbirds

- Male songbirds use their songs to establish a territory.
- This serves as a warning to other males and as an invitation to prospective mates.
- In European Robins, the songs can vary in complicated ways, but the only aspect of this variation that “matters” is the alternation between high and low-pitched notes. This communicates how intensely the robin will defend this territory.

10 Vervet Monkeys

- African Vervet monkeys live in close-knit social groups.
- They use three distinct “calls” to signal danger.
 - Snake: Troupe stands on hind legs and scans the ground.
 - Leopard: Troupe climbs onto smallest branches of nearby trees.
 - Eagle: Troupe climbs trees but stays close to trunk or dives into dense bushes.

11 Honeybees

- When a forager bee locates food it returns to the hive and performs a dance.
- The number of repetitions of the dance communicates the quality of the food.
- Distance is communicated by the form of the dance.
 - Round Dance: < 20 ft
 - Sickle Dance: 20 – 60 ft.
 - Tail-Wagging Dance: > 60 ft, coded by rate
- Direction is also communicated in the sickle and tail-wagging dances.

12 Honeybees

13 Teaching Human Language to Animals

- Grey Parrots
- Dolphins
- Apes

14 Grey Parrots

- Irene Pepperberg has spent 25 years teaching Grey Parrots “meaningful use of English speech”.
- Alex is her star pupil.
- Model/Rival Training
- Performance is amazing!

15 Model/Rival Training

- Trainer + Model/Rival + Parrot
- Trainer presents objects to the model/rival and queries them about it.
 - Correct: Get the item.
 - Incorrect: Get corrective feedback.
- The only reward is the object talked about, but after a correct response the parrot can request something it wants (e.g., a nut).

16 Performance is Amazing!

- “Alex exhibits cognitive capacities comparable to those of marine mammals,

apes, and sometimes 4-year-old children.”

- Alex correctly labels
 - 50+ objects
 - 7 colors
 - 5 shapes
 - quantities up to 6

17 Performance is Amazing!

- He correctly uses
 - “No.”
 - “Come here.”
 - “Wanna go X.”
 - “Want Y.”
- He combines labels to correctly identify more than 100 objects in his environment.
- He surfs the internet!
- Watch the video at
 - <http://www.pbs.org/saf/1201/video/watchonline.htm>

18 Dolphins

- Dolphins are social animals.
- They use clicks for echolocation.
- Each dolphin has a “signature whistle”.
- Louis Herman and his colleagues at the U of Hawaii have taught artificial languages to wild-caught dolphins.
 - computer generated high-pitched “words”
 - hand gestures

19 Dolphins

- Each language consists of about 40 words.
 - Nouns (e.g., hoop, frisbee, person, ball)
 - Verbs (e.g., under, fetch)
 - Modifiers (e.g., surface, bottom, right, left)
- Uses a SOV Grammar
 - Phoenix Ake under → Phoenix go under Ake.
- Food rewards for correct responses to commands.

20 Dolphins

- The dolphins learn all the words.
- They make appropriate use of word order.
 - right hoop left frisbee fetch (Take the frisbee on your left to the hoop on your right.)
 - left hoop right frisbee fetch (Take the frisbee on your right to the hoop on your left.)
- They respond correctly to novel combinations of words.

21 Apes

- Early Studies
- Washoe
- Sarah
- Kanzi

22 **Early Studies**

- Kellog & Kellog (1933) raised an infant chimpanzee named Gau along with their own infant son.
 - At 16 months she understood more words (about 100) than the human infant.
 - She never got any better.
- Hayes (1951) also tried to raise a chimp at home.
 - With great difficulty Vicki learned to articulate “mama,” “papa” and “cup”.
- Apes are not adapted for speech!

23 **Washoe**

- Gardner & Gardner (1969) raised Washoe in a trailer and treated her like a human child as much as possible.
- Because chimps are very dextrous, they decided to teach her ASL.

24 **Washoe**

- Washoe’s trainers always conversed in ASL when they were around her.
- By the time she was 5 years old she had acquired 151 signs.
- She is able to use signs in novel yet appropriate combinations.
 - water bird
 - dirty Roger
 - open faucet
- She does not appear to be sensitive to word order.

25 **Sarah**

- Premack & Premack (1972) tried to teach an artificial language to Sarah.
- Sarah was an adult chimp kept in typical laboratory conditions.
- Plastic symbols differing in shape, color and size were used as words.
 - “Apple” is a small, red square.
- These are arranged on a magnetic board.
- Food rewards are used to reinforce correct responses.

26 **Sarah**

- Sarah learned about 130 words.
- She does appear to be sensitive to word order!
 - “If Sarah put red on green, Mary give Sarah chocolate.”
- She seems to understand some “transformations”.
 - Trained on sentences like “Sarah insert banana pail. Sarah insert apple dish.”
 - Responded correctly to “Sarah insert apple pail banana dish.”

27 **Kanzi**

- Kanzi is the star of animal language studies today (Savage-Rumbaugh, Shanker & Taylor, 1998).
- He is a Bonobo chimp.
 - VERY social
 - VERY smart
- He uses a keyboard language called Yerkish.

28 **Kanzi**

- Kanzi was not formally introduced to Yerkish.
- He sat on his adopted mother’s back while she received lessons in Yerkish.
- Mom never learned, but Kanzi started using the keyboard spontaneously.
- Since then his “training” has consisted of walks in the woods.

- 29 **Kanzi**
- Kanzi understands over 200 symbols.
 - He also responds appropriately to *spoken* utterances.
 - “Take off Sue’s shoe.”
 - “Give the dog a shot.”
 - He spontaneously produces two and three word sentences and freely combines symbols with gestures and vocalizations.
 - He is sensitive to word order.
 - Responds correctly to 70% of unfamiliar sentences.
- 30 **Is it really language?**
- Most (psycho)linguists say no!
 - Chomsky’s Criteria
 - Bolinger’s Criteria
 - What do you think?
- 31 **Most (psycho)linguists say no!**
- “In my mind this kind of research is more analogous to the bears of the Moscow Circus who are trained to ride unicycles.” (S. Pinker)
 - Attempting to teach linguistic skills to animals is like trying to teach people to flap their arms and fly. (N. Chomsky)
- 32 **Chomsky’s Criteria**
- Language has structural principles such as grammar.
 - Language has various physical mechanisms (in the brain) of which little is known.
 - Language is used for the expression of thought, for establishing social relationships, and for the communication of ideas.
 - Language has been integrated into a system of cognitive structure.
- 33 **Bolinger’s Criteria**
- Language is human.
 - Language is behavior.
 - The medium of language is sound.
 - Language is hierarchic.
 - Language changes to outwit change.
 - Language is embedded in gesture.
 - Language is both arbitrary and non-arbitrary.
 - Language is vertical (paradigmatic) as well as horizontal (syntagmatic).
 - Languages are similarly structured.
 - Language is heard as well as spoken.
- 34 **What do you think?**
- Is it really language?
 - Do we know what language is?
 - Is language special?
 - What, if anything, have we learned from attempts to teach language to animals?
- 35 **The End!**