

Animal Cognition

A cognitive science debate with repercussions

Human versus Animal Cognition

- Animals are automata, humans are intelligent
- Humans are animals plus delta
- DNA and Brain differences between humans and apes < 1%
- What we learn about animal cognition is irrelevant to human condition

What do Animals have?

- ability to survive and reproduce in hostile environment
- exquisite neural structures for perception and action
- social systems, but no money
- emotions, feeling, personality, goals,
- family values - mating, cannibalism, etc.

Animals Communicate

- Bird Song
- Bee Dance
- Chimp Calls
- Experiments with chimp sign language

Language as the Last Refuge of the specialness human

- Certainly animals cooperate and communicate
- but they use of sounds as signs
- not use of sounds as symbols
- no complex syntactic structures
- lack of abstraction

Bird Song

- Species specific calling pattern
- used for mating and domain establishment
 - recognition is very sensitive to species specificity
- Sequential Structure
- Children learn by exposure to parents at early age
 - song learning has "critical period"
Sequential structure of chickadee similar to regular language

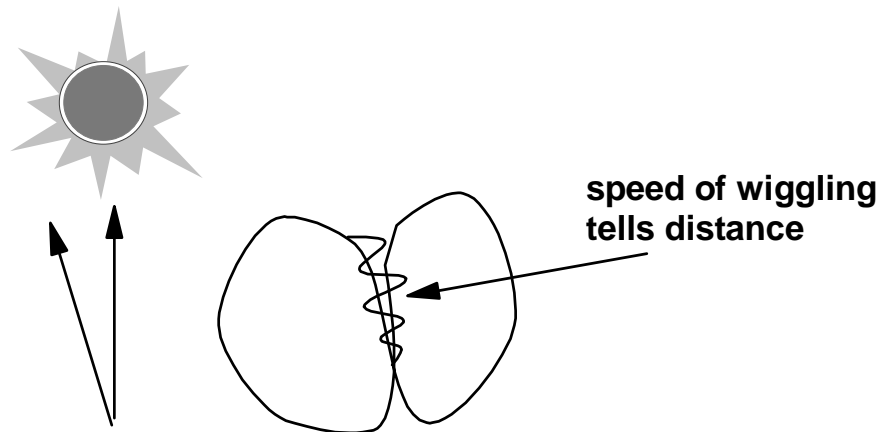
Bee Dance (Von frisch, 1967)

- Returning Bee tells other bees the distance and direction of food
- repeated Figure 8 with central angle indicating direction w.r.t. sun and waggle intensity indicating distance to goal
- Other bees follow dancer around and sense vibrations with antennae
- Dancer occasionally stops and regurgitates to indicate the kind of food

Symbolic - elements of the dance refer to direction and distance

How a Bee Communicates

- 10 degrees left of sun, 3000 meters

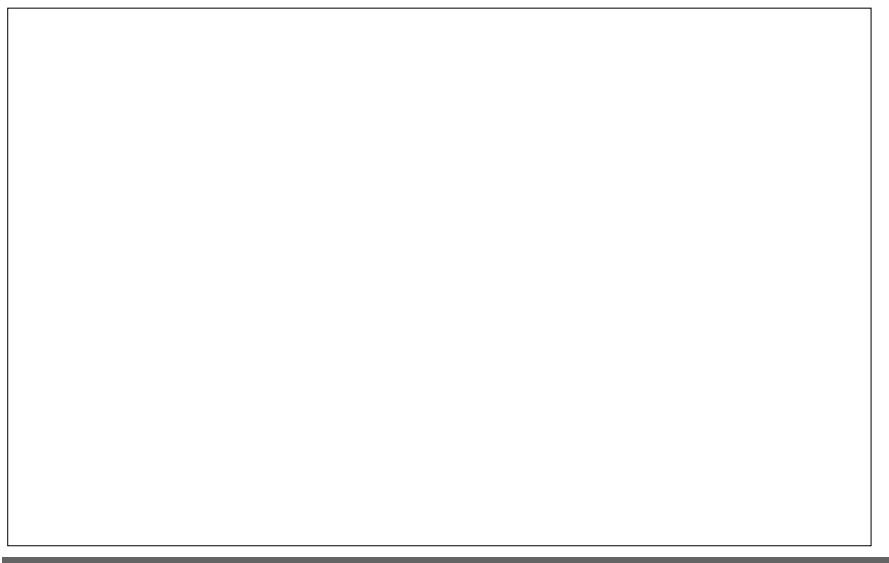


vertical central angle indicates direction of sun

Primate Communication

- vervet Alarm Calls
- context sensitivity
- keen perceptual Ability - able to discriminate sounds which humans cannot
- no discernable combinatorics

Vervet Harsh noises (A subset of their communication)



Chimps and Sign Language

- Chimps do not have great vocal apparatus
- Since 1960's many efforts at teaching chimps SIGN language, using their hands, plastic symbols, and computer keyboards
 - Washoe ,Sara ,Nim chimpsky
- Equivocal Results
 - early critical period and lots of "bonding"
 - Understanding more than generating
 - anti-scientific selection of performances
 - responding to handler's nonverbal queues
 - passing language to children?

Repercussions of the Debate

- What makes humans special in the absence of divinity?
- Do animals think?
- Do they have rights?
- can we eat them?
- can we farm them?
- can we use them as subjects for medical research?