
Week 4: Animal Communication

Solutions

- (1) When a dog bares its teeth, it indicates that it is ready to attack. Compare this with humans baring their teeth when they are smiling. What does it mean when we smile? Does it mean that we are ready to attack? Is it arbitrary or iconic? How do dogs probably interpret smiling in a person they don't know?

Solution

When we smile, we are not showing that we are ready to attack, but that we are friendly or happy. This is an arbitrary symbol since teeth are not logically related to friendliness or happiness. Dogs may interpret a broad smile as aggressive if they don't know the person

- (2) A wolf is able to express subtle gradations of emotion by different positions of the ears, the lips, and the tail. There are eleven postures of the tail that express such emotions as self-confidence, confident threat, lack of tension, uncertain threat, depression, defensiveness, active submission and complete submission. This system seems to be complex. Suppose there were a thousand different emotions that the wolf could express in this way. Would you then say the wolf had a language similar to humans? Why or why not?

Solution

A wolf would still not have language similar to humans because he would still lack the design features of productivity, discreteness, and displacement. Productivity would be absent because the wolf can still only produce a fixed number of symbols, even if it is a large number. Discreteness would be absent because the wolf could still not combine emotions to form new meanings. For example, if the wolf has a symbol for depression and hunger, then it could still not say *I am depressed because I am hungry*. What is absent in their system seems to be the combinatorial structure to form new meanings, rather than just discreteness (thinking of discrete vs. continuous). Displacement would be absent because the wolf could still only convey *I am depressed*, but not *I was depressed yesterday* or *wolves in New Jersey are depressed*.

- (3) Consider the honey bee communication system discussed in class and in the reading. For each feature below (a-g), say whether you think the bee communication system displays this feature and why you think so.
- (a) Mode
 - (b) Meaning
 - (c) Arbitrariness
 - (d) Discreteness

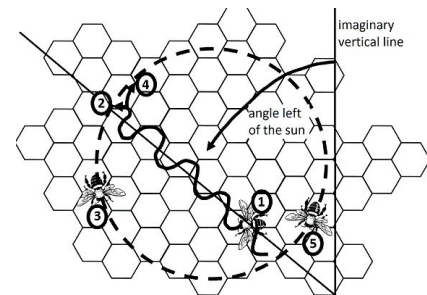
- (e) Interchangeability
- (f) Cultural transmission
- (g) Unboundedness (productivity)

Solution

- (a) **Mode** - yes! It's tactile; messages are transmitted through the bee's dance
- (b) **Meaning** - yes! messages communicate the location of a food source and/or serve the purpose of finding food.
- (c) **Arbitrariness** - yes! the vivacity or dance pattern, for example, are arbitrarily related to food quality and distance, respectively
- (d) **Discreteness** - you could argue either yes or no here (or kind of!). On the one hand, yes, the bees' dance is made up of discrete parts: a dance pattern, a dance direction, dance vivacity. On the other hand, each of these elements are a continuous signal (e.g. the more vigorous the dance the more food there is).
- (e) **Interchangeability** - yes! forager bees can both perform and interpret the dances
- (f) **Cultural transmission** - no! Bee dances are innate, not learned. Orphan bees are immediately understood and they can't learn other bee 'dialects' (Italian bees introduced to Austrian hives aren't understood).
- (g) **Unboundedness (productivity)** - no! The number of signals is fixed. Bees cannot, for example, combine different dances to convey new meanings.

- (4) The picture at the right is a schematic of the bee waggle dance, in which the bee moves through the numbered positions. Describe what the following elements of the dance communicate to the other bees:

- (a) The number of times per minute the bee dances a complete pattern (1-2-3-1-4-5)
- (b) The angle left of the sun
- (c) The vigor with which the bee dances

**Solution**

- (a) Distance to the food source
- (b) Direction of the food source
- (c) Quantity of food at the food source

- (5) AOL Live, in cooperation with the Gorilla Foundation, presented a truly unique interspecies chat with Koko the Gorilla, who speaks in sign language. Koko's caregiver, Dr. Penny Patterson, read members' questions to Koko and relayed Koko's signed responses. Here is an excerpt:

Dr. Penny Patterson: Koko is going to the mirror with my brush to brush her hair. She's purring. She's happy. Looking in the mirror and brushing her hair makes her happy.

Koko: Toilet.

Dr. Penny Patterson: Honey? What? How about another question? What's your favorite color?

Koko: Lips, fake hair.

Dr. Penny Patterson: Oh, you're being funny!

Koko: Polite nipple. Polite.

Dr. Penny Patterson: Nipple means people. That's right.

Koko: Gum, candy.

Dr. Penny Patterson: That's your favorite food!

Koko: Sip, sip, sip, sip, sip!

Dr. Penny Patterson: Koko loves a special drink, and it will be in your Christmas catalog. Koko's special drink. She's kissing the picture. What is your favorite food to eat, Koko? Like -- do you like corn, apples, bananas, nuts?

Koko: Drinks!

Based on the transcript and what you've learned in class so far, answer the following questions:

- (a) How relevant were Koko's utterances?
- (b) What are the main topics Koko talks about? What, if anything, does this reveal about her language use?
- (c) Does Koko ever seem to repeat or imitate Dr. Patterson's signs?
- (d) Do you think Koko can really use language? Justify your answer.

Solution

- (a) Most of her utterances are not relevant.
- (b) Koko mainly talks about food. This suggests that the purpose of Koko's communicative attempts may be to be rewarded with food rather than to communicate certain messages.
- (c) Koko repeats herself often and occasionally imitates something Dr. Patterson just said (Drink). This is reminiscent of other apes we saw (like Nim).
- (d) Probably not. Koko knows lots of words, but she doesn't show any evidence of having a grammar. In other words, she has some discrete elements, but no combinatorial system. *Note that answer may vary here - other acceptable justifications would be mentioning that she mostly just imitates, has a limited range of topics, and only combines a few words (like a 2-year old), even though she has been learning language for decades, etc.*

- (6) In class we learned that baby birds can be tricked into making the mobbing call — an alarm for nest predators — for milk bottles (and then passing this behavior along to their offspring). What does this tell us about the birds' calls?

Solution

This tells us that while the calls themselves are innate (birds are born with them), they have to learn (cultural transmission!) which species are dangerous.

- (7) In class we mentioned that Nim Chimsky's language ability was similar to Genie's. In what way was their language similar?

Solution

Both Nim and Genie were able to acquire a large vocabulary (discrete elements), but not the rules for combining them (grammar).