

## Discussion Questions for Animal Communication, Apes, and Language

The video “The Mind: Language”, shown in week 7, has a section the beginning relevant to the communication systems of apes and a couple of relevant study questions, repeated here for your convenience. **See key for week 7 discussion for answers.**

1. (Week 8) What was the purpose of experiments such as those with Vicki, Washoe, and Koko?

2. (Week 8) How did Premack's experiments differ in focus from the ones mentioned in question #1? In what two ways does Premack believe his experiments have shown chimpanzees to be cognitively different from humans?

1. “Dr. Eugene Morton of the Smithsonian Institution has observed that regardless of the species, low and harsh calls signal a sender’s aggressive tendencies, while sounds that are high and tonal indicate the sender’s fearful or submissive state. Intermediate calls indicate intermediate tendencies.” (*ZooView*, Quarterly Magazine of the Greater Los Angeles Zoo Association, Spring 1989, page 15)

Consider the sentence, “**Put the gun down,**” uttered by the following three individuals in the in the respective contexts:

- (1) Clint Eastwood, who has the drop on a bad guy about to rob the unarmed stage coach passengers.
- (2) A movie director telling an actor what he will do as the next action in a scene.
- (3) A store clerk, ready to give the contents of the cash register to an armed robber.

(a) How would the most likely way these sentences might uttered relate to the quote above?

**Clint** would probably say the phrase in his "Make my day!" voice. This corresponds to the "low, sharp aggressive sound".

**The movie director** would probably speak in a rather "neutral" voice. There would be no emotion attached. This corresponds to the "intermediate sound".

**The store clerk** would probably cry out with a high pitched voice, corresponding to the fearful or submissive state.

These voice qualities appear to correspond to the characteristics of animal calls, but in human communication, they can overlie the message itself, whereas in animal calls, the specific vocalization would probably be tied to the voice quality type, e.g. a chimpanzee could not choose to emit the *pant-grunt* in a high loud pitch on one occasion and a low aggressive pitch on another.

(b) Relate the quote and your answer to (a) to Pinker’s notion of showing differences in meaning using “analog” signals (*Language Instinct*, page 342).

These "voice quality overlays" for language are analog in the sense that they could vary in degree depending on level of emotion.

(c) Why could the differences illustrated in (1-3) not be used to argue that language is an “analog” communication system?

The propositional content of the language would remain the same, i.e. the BASIC MESSAGE would not change. In an analog system like the bee dances, the speed of the dance, for example, communicates distance--the "propositional content" is actually affected by the analog differences.

2. "As spring approaches we begin to hear more and more bird sounds associated with courtship. Mockingbirds sing complex songs, composed of a variety of phrases they have picked up from animals nearby. A male singing in his territory repels competing males and simultaneously attracts females. Researchers have found that each year males learn additional phrases. Females select their mates in the spring and are most likely to pair with males who sing the most complex songs. Here a simple auditory signal is cleverly utilized by the females: Males who have survived a longer period have demonstrated their fitness. Therefore, females who select older males are more likely to produce offspring who survive." (*ZooView*, Spring 1989, page 14)

Does the variation in song show that some mockingbirds have the ability to learn to communicate new messages? (Relate your answer to Pinker's typology of animal communication systems—see p. 121 of this reader.)

"Propositional content" of the mockingbird's song is not changing. It still means, "I'm a desirable mate," or the like.

The observation at the end, about females choosing males "more likely to produce offspring who survive" is relevant to the topic of Week 9, the Origin of Language. In the case of the mockingbird, variation in message apparently is useful even though the content of the message (basically, "I am a desirable mate!") does not change. One could, however, well imagine that if individuals in a population somehow managed to produce a larger variety of messages which also varied in content, that this could have survival value and would be passed along. See the "fable" of *The Ugly Daughter* in the study questions for Week 9 (APS book, page 134).

3. Many animals communicate using *pheromones*, "odorous substances which are released ... causing a reaction in another animal, usually of the same species. ... The functions of chemical communication parallel those of visual and auditory systems. Pheromones are used in determining the identity and physiological and social status of individual animals, or the identity of social groups. Pheromones may stimulate aggregation or dispersal in animals." ...

"[Some animals] are like walking chemical factories. The black-tailed deer, for example, produces secretions in at least seven different sites: tarsal glands, metatarsal glands, preorbital glands, forehead gland, interdigital glands, as well as feces and urine." (*ZooView*, p. 17)

(a) What features does pheromonal communication *share* with vocal communication, including language?

Pheromonal systems share with vocal communication a variety of discrete messages and the feature of **arbitrariness**--here, species specificness in "understanding" meaning.

(b) What relative advantages and disadvantages would pheromonal communication have with respect to vocal and/or visual communication? (The answer to this question would presumably say something about why certain types of communication have had selective evolutionary advantages for certain species.)

- **Advantages of pheromones:** Transmission can take place in darkness and around

obstacles (compared to visual); they are energetically cheap (compared to vocal, where energy must be continuously expended if the message is to continue); they can continue to convey message over time (compared to both visual and vocal).

- **Disadvantages of pheromones:** Environmental factors such as wind or humidity can affect transmission; slowness in fade out makes a quick series of different messages difficult.

4. Name some gestures, including facial expressions, and some non-linguistic vocalizations which humans might share with other apes. Name some gestures and non-linguistic vocalization which humans would probably not share with other apes. To what extent do gestures and non-linguistic vocalizations have the feature of *arbitrariness*? How might these gestures and vocalizations be characterized in Pinker's typology of animal communication systems?

*Shared:* e.g. (maybe?) **gestures:** arms raised to show aggression, arms outstretched to beckon, crouching to show submission; **expressions:** smile, quizzical look, bared teeth for anger; **vocalizations:** cry of pain, something like laughter, something like crying

*Not shared:* e.g. **gestures:** various abusive gestures, applause, fingers to lips for silence; **expressions:** sticking tongue out as an insult, winking to show connivance; **vocalizations:** whistling to sign approval or disapproval (depending on culture), various vocalizations meaning 'yes' or 'no' (such as grunting "mhm" or "m'm")

Most of the non-shared would probably be arbitrary. Some of the shared might seem arbitrary as well, e.g. quizzical look, but most would probably have some ecological explanation.

5. Lana began her "utterances" with a symbol meaning 'please' and terminated them with a symbol meaning 'period'. This demonstrates (1) that Lana mastered the concept of politeness and (2) that she had mastered the grammatical concept of a complete sentence. True or false? Justify your responses.



**False:** Both the initial "please" and the final "period" for Lana were just part of the sequence of buttons that she had to push to get the rewards. There is no evidence whatsoever that she conceived of them in the terms the labels that the human designers gave them.

6. Here are a couple of signed utterances by Koko, the gorilla, which Francine “Penny” Patterson has cited as examples of Koko’s creativity in using sign (from *LA Times*, December 1, 1981):<sup>1</sup>

“[Koko] can come up with some pretty devastating insults. After a scolding, she declared, ‘Penny dizzy toilet devil.’”

“One of the arguments is that the gorillas are [learning to sign] by copying you, ... but what about when they invent signs? ... [Koko used] an intense blow sign for ‘You blew it.’”



What about these examples should make us skeptical of Patterson’s claims?

*"Dizzy toilet devil."* One must be very skeptical that Koko could learn to communicate an internal state such as dizziness, much less extend it to a metaphorical use to mean 'silly, foolish'. Likewise, what could 'devil' possibly mean to Koko? The use of this word as an insult is rooted in certain religious beliefs, which it seems pretty unlikely that Koko had. Koko may have learned to use these signs in the context of scolding, but one would like to know what evidence could be adduced that she shares any sense of their meaning as humans use them.

*"You blew it!"* Total nonsense. This is a metaphor based on *spoken* English, i.e. Koko may well have used some kind of blowing gesture to signal displeasure or the like, but for Patterson to translate this as the spoken English idiom using the verb 'blow' is gross anthropomorphism, which assumes that Koko knew the English expression and rendered it as a literal gesture of blowing. One might also note that this could not be the invention of a "sign" that could exist in any human sign language, since human sign languages do not incorporate such gestures as an integral part of signs.

7. Below are some sets of signs in American Sign Language. Which of these signs and sign combinations would we expect a chimpanzee to be able to learn or not to be able to learn? Explain your responses.

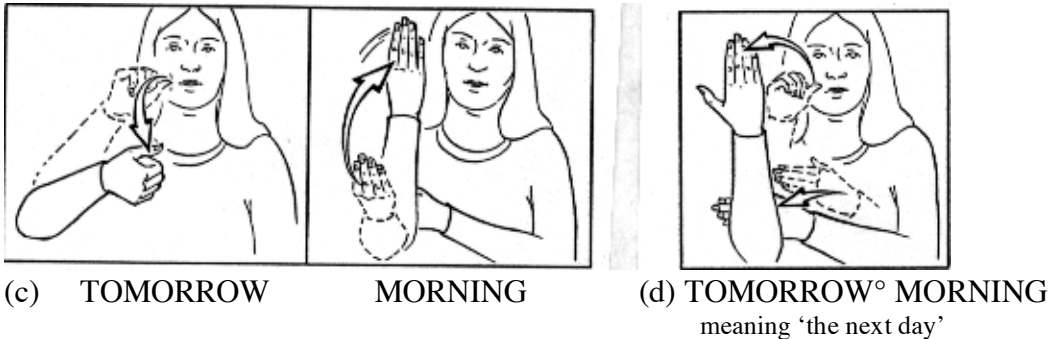


(a) BLACK NAME (b) BLACK° NAME meaning ‘bad reputation’

The chimpanzee could certainly learn 'black', and possibly 'name' in some kind of context like "me name Washoe", though it seems unlikely that the concept of "name" would be something a chimpanzee could learn, at least as it is understood by humans. It is inconceivable that a chimpanzee could learn, much less create a compound like "blackname" meaning 'bad reputation', where neither of the components is directly relatable to the overall meaning. This contrasts to sign combinations like 'water bird' = 'duck' or 'fruit drink' = 'watermelon' which chimpanzees have been observe to use, where both components of the

<sup>1</sup> Picture from [http://www.geocities.com/RainForest/Vines/4451/images/KokoPatersonSmoky\\_64.JPG](http://www.geocities.com/RainForest/Vines/4451/images/KokoPatersonSmoky_64.JPG).

putative compound directly relate to the object--in such cases the skeptic could claim, as I would, that the chimpanzee is not forming unitary compounds at all but rather is just using two signs that relate to the object.



One can assert with some certainty that a chimpanzee could not associate an appropriate meaning to a sign 'tomorrow' at all. A word such as this requires a sense of ongoing time and projection of thought to a time other than the present. There is no evidence that chimpanzees can do this. 'Morning' likewise seems doubtful as a sign a chimpanzee could learn. This assumes, again, the concept of ongoing time and periods of time. This makes the understanding and use of a compound like 'tomorrow morning' doubly inconceivable.

8. On the last page are series of clips from “The First Signs of Washoe” comparing a human ASL signer and Washoe signing GIMME SWEET. Make specific comparisons of the ASL and chimpanzee expressions for the following parameters:

(a) GIMME portion: hand shape and palm orientation, hand position, movement

Similarities:

Both use the right hand with leftward palm orientation; both ultimately have hand movement toward the body.

Differences:

shape and palm orientation: ASL shifts palm orientation toward body and shape to cup; Washoe keeps leftward palm orientation and open hand until beginning *sweet* gesture.

position: ASL is entirely at chest level; Washoe moves from face level to above head and back.

motion: ASL moves only toward body, with short movement away at end to signal the end of the gesture; Washoe reaches away from the body and upward, then toward the body.

Washoe’s entire gesture seems to be an iconic reaching for and taking something.

(b) SWEET portion: hand shape and palm orientation, hand position, movement

Similarities:

Both involve position at the lower portion of the face and a downward movement.

Differences:

shape and palm orientation: ASL uses open five-fingered hand with palm oriented toward body; Washoe uses a closed hand with extended forefinger

position and movement: ASL pulls hand down across chin, and in the video, the signer repeats the movement, which is actually the sign for CANDY, a noun derived from SWEET using the noun-deriving pattern of doubling a verb/adjective movement; Washoe has opened her mouth and touches her tongue, then withdraws her hand.

As with the GIMME portion, Washoe's gesture looks iconic, i.e. putting something into her mouth compared to the essentially non-iconic ASL sign. Moreover, the ASL signer uses the derived noun form, shown by repetition, appropriate as a direct object of a verb, unlike the single movement, which would form a predicate on its own.

## (c) Overall syntax

Similarities:

Both are two-part expressions consisting of a request/command followed by the thing requested.

Differences:

The ASL GIMME portion, though a continuous movement, has two clear components, beginning with the GIVE part and ending with the ME part. The joining of the two is much like spoken languages that treat object pronouns as “clitics” or suffixes, such as French *donne-moi* ‘give-me’. There is a definite break between the GIMME portion and the SWEET portion (more strictly, CANDY/SWEET THING—see comment above on the derived noun) as the hand draws away from the chest after the ME, then starts the SWEET sign.

Washoe's expression is a continuous movement, with the GIMME portion flowing into the SWEET portion with no evidence of a distinct ME other than the fact that Washoe orients the whole expression toward herself.

SUMMARY: Washoe has acquired at least some meaningful gestures that would not be part of her native gestural “vocabulary”. Specifically, she has learned to associate the right hand oriented in a particular way with concept of GIVE/RECEIVE, and she has learned to associate positioning the hand somewhere near, on, or in the mouth with PLEASANT TASTE (though there is no evidence that the sign specifically means SWEET—she might well use the same sign for a sour pickle if it was something that she liked). However, Washoe's use is missing elements that any human acquirer of ASL would incorporate, such as the relevance of particular handshapes, palm orientations, position, and movement. Washoe's use seems to be unitary iconic gestures. Although the human ASL signs are in part iconic, they are consistently made within the limits the parameters already noted. Likewise, Washoe's expressions show no evidence of real structure other than the obvious connection that the desire for receiving something precedes the receipt.

## COMPARISON OF HUMAN ASL SIGNER AND WASHOE



GIVE-----ME

SWEET



GIMME

SWEET

ASL signer: Right hand at chest height, palm facing left; hand arcs upward, palm orients toward body, moves toward upper chest with hand cupping; with a clear break, hand moves away from body, palm opens toward body, open (five-fingered) hand moves to lips, then closes with a movement downward across the chin. The signer repeats the latter sign.

Washoe: Right hand at about face height, palm oriented left, moves up and away from body with fingers open; hand moves back down toward body, as hand closes and forefinger extends; hand moves to open mouth, forefinger touches tongue, then hand moves away from mouth. Washoe repeats the entire sequence.

This course has argued that despite the appearance that chimpanzees can learn to use American Sign Language (ASL), the chimpanzees' ASL-like gestures and the way they combine them are only superficially like the human use of ASL. The "stop-motion" sequences of pictures and the descriptions seem to reinforce that view.