

Discussion Questions for The Origin of Language

The video “The Mind: Language”, shown in week 7, had a segment relevant to this week’s topic and a study question, repeated here for convenience.

3. (Week 9) Why does Lieberman believe that the reconstructed vocal organs have implications for how the brain has to be reconstructed? Why does he believe that Neanderthal could not have had speech as we know it? What evidence does he give for the selective advantage of speech? [See week 6 discussion questions for answers.](#)

1. From *The Nature Enquirer*

Local Parrots Adopt Human Languages

By PARRY KEAT

Members of a flock of parrots in the Los Angeles area are now using human language to communicate among themselves.

Flocks of parrots have long been observed in the Los Angeles basin. The parrots presumably are escapees from pet shops and people’s homes who have banded together because of the gregarious nature of the birds.

The mild weather and

large numbers of fruit trees in backyards have allowed the birds to survive outside their native habitat.

Recently a number of people have reported hearing English, and occasionally Spanish, coming from local tree tops. Further investigation revealed parrots chatting among themselves.

In an interview with *The Enquirer*, Paul E. Kraquer, an African grey

parrot serving as spokesman for one of the flocks explained, “Squawk, life was tough. People were spraying their trees with poison, there were kids with beebie guns. You know how it goes. We just had to find a way to pass information around. Those squawks of ours didn’t cut it. We decided amongst ourselves to take a cue from the humans and start using language instead.”



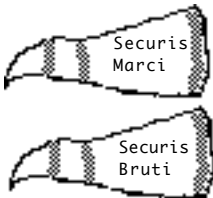
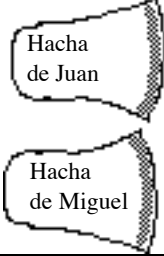
Why should we be skeptical of this report from *The Nature Enquirer*?

In discussion animal communication, we found that other mammals, much less parrots, do not have the vocal organs for producing spoken language. (Parrots can make language-like sounds, but they are using entirely different physical mechanisms from humans.) More important, however, is the point made in this lecture that it goes against everything we know about evolution to think that an organism could develop a complex system, such as the combination of mental and physical structures necessary for language, then “discover” a use for that system. Such a system must have evolved by small, accumulated steps, where each step had some sort of adaptive value.

2. From *The Scientific Van Nuysian*, February 1997:

THE INSCRIPTION OF AXES

Axes or axelike tools have been connected with humans and with hominid fossils ranging back as much as 2,000,000 years. Paleontologists, working with archeologists, have recently found that throughout history ax makers have consistently made identifying inscriptions on axes. Plates 1-4 show example axes from four eras in hominid history.

			
<p>Plate 1. Axes from <i>Homo erectus</i> sites.</p>	<p>Plate 2. Axes from <i>Homo neanderthalis</i> sites.</p>	<p>Plate 3. Ancient Roman axes.</p>	<p>Plate 4. Axes from 18th century Spain.</p>

Axes from East African *Homo erectus* sites are always identified with a single mark. Axes from a site near Mumambushi, Tanzania all have a single deep slash, as in the upper ax in Plate 1, dated approximately to June 11, 924567 BC. The lower ax in Plate 1, approximate 2.64 years older than the upper ax, comes from a site at Rutango, Malawi, where all axes have been found to have a “λ” shaped marking. Axes found at Neanderthal sites always have two marks. All axes have a triangular indentation accompanied by a second mark. In Plate 2, the two axes come from Tiefertal, German, both dated at about July 41332 BC. The upper one has a single slash and the lower an inverted “T” shape. The two Roman axes in Plate 3, from the 4th to the 2nd century BC have inscriptions reading “Mark’s ax” and “Brutus’s ax” respectively. The axes in Plate 4, from 18th century Spain, read “ax of John” and “ax of Michael” respectively. Ax makers in Spain ceased inscribing axes after the 18th century.

a. What could the *Homo erectus* inscriptions tell us that might provide information on the origin and/or evolution of language?

It would seem to at least be evidence for being able to use symbols. The inscriptions seem to stand either for personal or place names.

b. What could the Neanderthal inscriptions tell us that might provide information on the origin and/or evolution of language?

Like the *Homo erectus* transcriptions, they are evidence for use of symbols. They suggest a beginning of syntax. If the Δ means ‘ax’, the second sign may be some kind of modifier, e.g. a possessor. However, like chimpanzee signing, we have no evidence for real structure.

c. What do the Latin inscriptions tell us as compared to the Neanderthal?

Latin exhibits a number of features showing that it is real Language. There is at least duality of patterning and a structural link (genitive marking) between the two words.

d. How does the change in inscription between Latin and Spanish differ from the change between Neanderthal and Latin?

There is probably an actual change in system between Neanderthal and Latin (though we cannot be absolutely sure). Neanderthal at the very least does not give clear evidence of structure. The change between Latin and Spanish is normal linguistic change—there is no change in fundamental design of the system.

3. The following is a fable told by old women in a remote East African village. It is claimed that the story goes back some 80,000 generations.

THE UGLY DAUGHTER

It is said that one of our ancestors gave birth to twelve daughters. Three of them were eaten by wild animals, three died of unidentified diseases, three were killed in various accidents, but three survived. Two of the daughters were normal, with nice, short necks like everyone else, but the third had a strange long neck that everyone thought was ugly, and all the other children harassed her. Moreover, the two normal daughters made the same cries as everyone else, saying, “Hoo” when they found food and “Waa” when they wanted to be joined by others. The ugly one made these sounds, but she also kept making the sounds “Boo” and “Baa”, which only increased her ostracization.



Nonetheless, when they grew up, all three found mates and gave birth to lots of children, most of who were killed in one way or another. The ugly sister had 14 sons, and among the four who survived, one had his mother’s funny long neck and insisted on making the same funny sounds that she made. He was tough and survived the harassments of childhood and eventually acquired six or eight mates. Unlike the other males, he figured out how to treat his mates each in a special way. If he wanted to attract one, he would say “Boo”, but if he wanted to attract another, he would say “Baa”, and so forth for the others. In this way, he became a very successful father and patriarch. More and more of the strange long-necked children making strange noises showed up in the community. Some of them started applying their noises to objects, making one sound if they found grubs and another if they found termites. They learned more sounds, lived happily, established great kingdoms, and took over the world. The end.

a. How does this story illustrate the process of *evolution*?

There is multiplication, variation, and heredity.

b. How might the longer neck of the “ugly sister” have been a feature that could set the communicative system on a new track?

It apparently allowed her to produce a wider variety of sounds. In particular, it seems to have allowed her to produce an oral consonant which would not be possible in the “Standard Plan” vocal tract.

c. What step did the son of the “ugly sister” take that could set the communicative system on a new track?

He used his vocal signals voluntarily and arbitrarily rather than as fixed responses.

d. What major steps might this fable ignore as an “explanation” of how Language started?

How would an organism begin to VOLUNTARILY use possible vocalizations? How would the COGNITIVE step to associate a vocal signal as a symbol take place?

4, Why would we not find the following:

- A fish which can smoke cigarettes.

Fish don't have lungs; they could not inhale smoke. (In addition, wet tobacco does not burn well.)

- A human who can do the 800 meter in 80 seconds (= 8 X 100m X 10"/100m).

Though there are humans who can run 100 meters in 10 seconds, they do not have the oxygen producing capacity to sustain this.

- A talking dog.

Dogs have the "Standard Plan" upper respiratory tract. They cannot make human language sounds.

- A six-week old child who can recite "The Pledge of Allegiance".

Besides lack of cognitive development, an infant this age could not make the necessary variety of sounds.

- Specialists in the Heimlich maneuver on the staff for primates in a zoo.

Non-human primates have a "Standard Plan" upper respiratory tract, which would not allow food to pass through the larynx.

5. The lecture notes on "The Origin of Language" include the following quote from Philip Lieberman's *Biology and Evolution of Language*:

"The species specific aspects of *human* language indeed may be at the level of speech production and speech perception, which appear to reflect the presence of specialized neural devices that interface with a cognitive, general-purpose neural 'computer'. The properties of human speech, if this view is correct, then must reflect the neural devices that govern the production and perception of speech." (Lieberman, p. 259)

How does this view differ from the one presented by Pinker and in this course?

Lieberman sees the brain evolution as a general increase in its capacity as a "general-purpose neural 'computer'", with evolution of a vocal tract being the central feature in the evolution of language in that it provides a more effective means of delivering highly articulated messages rapidly. Pinker's (and Schuh's) view is that evolution of cerebral modules specialized for a communication system of a particular design must be in parallel to evolution of the vocal tract.

6. Which of the following might be useful in identifying earlier or “intermediate” stages in the evolution of Language? For each, say why or why not it would be useful and why.

a. A *Homo erectus* body found frozen in a Siberian glacier, perfectly preserved, including all soft tissues.

Useful. It could not tell us what his communication system itself was like, but we would have the detailed anatomy of his upper respiratory tract and brain, which we could compare with those of modern humans.

b. The discovery that orangutans could discriminate and learn signs for colors such as purple, vermilion, magenta, puce, mauve, and beige and could make such sign combinations as *magenta antimacassar*, *beige toupee*, *purple love seat*, etc.

Not useful. We already know that apes can learn symbols and combine at least two symbols. The fact that the symbols refer to unusual concepts or objects does not increase what we already know about apes, and it seems likely that this represents informative intermediate stages.

c. The discovery and decipherment of documents from a cave in the Sahara desert from a civilization of some 8,000 years ago, approximately 2,000 years older than the oldest previously known written documents.

Not useful. This would be a human language with all the design features of modern language. It would obviously be of great interest for linguists and historians, but it would say nothing about language origin and evolution.

d. A time machine which would permit us to travel to any time in the past or future.

Useful. Would provide direct attestation of how early hominids communicated.

e. Isolation of a group of children from birth, permitting no contact with adult speakers of any language so that we could study the type of vocal communication the children develop.

Hard to say. Presumably they would develop a communication system of some kind, and child language and pidgins do appear to be “intermediate” systems of a type. However, there are problems (aside from the ethics of such an experiment). First, human children are HUMANS, i.e. they do not have “intermediate brains and vocal tracts”, so we cannot be sure that the system they come up with really looks like the actual precursors of language. Second, the children would be coming up with their system from scratch, whereas for any precursor to human language, the system would have been in use in the community, with children acquiring it along the same lines as children acquire human languages, i.e. children would not be creating a brand new system.

7. Characterize each cognitive system below with respect to its neighbor(s) as “unrelated”, “possible precursor”, “simplified”, “elaborated”. **Language** is given as an example. There is probably room for discussion on any of these characterizations.

Language	chimpanzee: <i>pant-grunt</i>	2-year old child: “Juice allgone.”	Mother to child: “Your juice is gone?”	Adult: “Did you drink all the juice that I gave you?”
	unrelated	precursor	simplified	elaborated
Music	chimpanzee bangs on piano	2-year old child bangs rhythmically on piano	drinkers in a bar in 18th century English colony sing “To Hype- rion in Heaven”	Leonard Bernstein arranges “The Star Spangled Banner” for the New York Philharmonic
Math/logic	Your dog learns that when you get out a leash, it is time to go for a walk.	Sarah the chimpanzee learns to manipulate plastic chips meaning “same” and “different”	Third grade students learn that even numbers are those divisible by 2.	Pythagoras works out the Pythagorean Theorem
Games	Dogs chase each other around in a park.	Children play stickball in an alley in the Bronx.	The Dodgers vs. Giants game is halted by rain after 1 inning.	The Dodgers beat the Giants 2 to 1 in a 20 inning game.

Some, maybe all of these are open to debate. I have my own ideas, but they are not necessarily definitive, so I haven’t given any “answers”.