IS LANGUAGE AN EXCLUSIVE ABILITY OF MAN?

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One result of the acceptance of the evolutionary theory is a belief that the gap between man and the lower primates is much less than previously supposed. When it was believed by most scientists that man was a direct creation by God, man was seen to be clearly distinct and different. Evolution on the contrary, stresses a continuity between the lowest form of life and the highest. Evolutionary theory has permeated virtually all of the sciences, and humanities, and even the study of language ability. For many years, it was accepted that language ability is unique to man and, that, biologically, animals do not have the brain structure or the speech mechanism needed to use language. This idea has been challenged for the past decade or so. New research, though, indicates that the older view, i.e. that there is a chasm between man and the animals regarding language ability, is probably more correct.

Scientists and other researchers have always held that there is an unbridgeable chasm between humans and the animals. Man was seen to be unique in many ways, but his primary uniqueness was his "higher" level brain. It was felt that animals were able to learn, but their learning was very limited, and they could not even approach man's thinking ability or his language (although they could communicate via simple signs).

In the past century, a number of researchers, such as B.F. Skinner, have concluded that all behavior is learned via a simple behavioristic model, and this includes the behavior of both man and animals. Further, the behavioral learnings, or results, of man was not seen as drastically different from that of the animals. Skinner and others concluded that language and thinking are learned behaviors, which are learned according to the reward and punishment system of the environment, so that it was possible to teach animals how to use language if this system were exploited correctly. In the last twenty years, Noam Chomsky has compiled a great deal of research data and indirect evidence to counteract this belief. Chomsky claimed that the basis of language is biological, not learned, and that language is unique to man. Hence animals would never, regardless of the amount of training, learn to use a language.

In the last decade, Chomsky's position has been challenged by a number of researchers. Foremost has been the research which indicates that primates and other animals *are able to learn a language*, and are much closer to man in their thinking ability than was previously thought. If language can successfully be taught to primates (specifically chimpanzees and apes), this would bridge much of the chasm between man and the higher primates. Research by Kellogg[1] Desmond[2], Premack[3] and Rumbaugh[4] indicated that, indeed, chimpanzees could learn both to use language and to read. Penny Patterson of Stanford University declared that "language is no longer the exclusive domain of man." Similarly, David Premack, whose famous chimp Sarah, learned to use a series of plastic chips, reported: "Sarah comprehended (and in a few cases produced) sentences formed by a process more demanding than that of combining phrases." Many more exaggerated claims came out in both the popular and the professional press, which claimed, in essence, that many primates possess a language ability similar to that of man. It now seemed that the chasm between man and the primates was, at least relative to language abilities, bridged to a large degree.

Further study, though, and extensive examination of previous studies, have caused researchers to reevaluate the above revolutionary opinions, *lending support to the earlier position*, that there is, after all *an unbridgeable chasm between man and the animals.*

An article in *Time* stated[5]

> "though a few experts express skepticism, these claims of the ape's linguistic ability were widely accepted during the 1970's. But now many scientists are beginning to have second thoughts. They suggest that much of what the animals are doing is merely mimicking their teachers and that they have no comprehension of syntax. What is more, they say, the primate experimenters are probably eager to prove their case, so that they often provide inadvertent cues to the animals, who quickly realize that 'right' answers will bring them some goody. In short, the skeptics raised the possibility that the apes have been making monkeys out of their human mentors."

One of the first researchers to question the belief that "monkeys could talk" was Wilson[6]. Wilson relied primarily upon his own reading and a critical examination of most previous studies. Those directly connected with the research he used, though, insisted that chimps can read, "think" and "talk" much like humans.

The first researcher directly involved in primate research seriously to question the position that some primates can use language was Dr. Herbert S. Terrace, a professor of psychology at Columbia University, with a doctorate from Harvard under B. F. Skinner. He has concluded from his extensive research that the earlier position is most probably correct. Terrace's work is significant in that he is a secular researcher, and has published his works in the secular press, both in the popular *Psychology Today*[7] and the book *Nim.*[8]

In Terrace's own words, he describes his experience[7]

> After a five year research project of (my) own I became skeptical about such pronouncements. When I began my study with a male chimp called Nim Chimpsky, I hoped to demonstrate that apes can, indeed, form sentences. I wanted to go beyond the anecdotal evidence reported by other studies and show that grammatical rules are needed to describe many of an ape's utterances. Initially, the

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> regularities I observed in thousands of Nim's communications in sign language suggested that he was, in fact, using grammar. However, after analyzing videotapes of his 'conversations' with his teachers, I discovered that the sequences of words that looked like sentences were subtle imitations of the teacher's sequences. I could find no evidence confirming an ape's grammatical competence, either in my own data or those of others, that could not be explained by simpler processes.

Although it is recognized that many animals can communicate via song, certain noises, and other means, human language is distinctive from animal communication because of its use of *sentences*. The concept of "sentence" usually suggests using a set of words or symbols to communicate *according to their position within the total set of words; i.e., there is grammar. The meaning of words can be learned individually, but sentences can not. Instead, a person must master grammatical rules*, which allow meanings to be conveyed by arranging a set of words in certain orders. Thus, *concepts*, such as subject, verb, preposition, pluralization, etc., individually must be mastered. The sentence "Frank threw a ball at Larry," contains the same words as "Larry threw a ball at Frank," but means something entirely different, as does the sentence, "Larry threw Frank at a ball," or, "Frank threw 'a' at Larry Ball."

Because all primates are physically incapable of producing the broad range of sounds that exist in most of man's languages, most researchers have used various signs or symbols to teach primates to "talk" and "think." For example, the word "apple" may be represented by a triangular piece of blue plastic, or the pressing of the knuckle of the index finger into the cheek and twisting it forward.

Using these symbols, apes have been able to produce sequences which make sense to humans, such as "Mary gives Sarah apple." Nonetheless, we must determine whether or not "such sequences were actually generated by a grammar." Terrace[9] concludes that: "It is difficult to answer this question, if for no other reason than that linguists have yet to devise a decisive test of whether a sequence of words constitutes a sentence. Even if an animal produced such a sequence, we could not conclude that it was a sentence . . . when viewed in the larger perspective of the monkey's total output, meaningful sequence (can often be) seen as *chance utterances.*" As he further notes: "Although the words and word order may be meaningful to an English speaker, they may be meaningless to the animal producing them."[10]

Terrace concludes that the assumption that primates are able to create elementary sentences is at least premature for other reasons also. One important such reason is that the word order which was given by the animal was sometimes changed in the final report in order to make it conform to the rules of English. Thus, as Terrace points out: "The combinations 'more drink' and 'drink more' were both recorded as instances of 'more drink.'" Clearly, if both the symbols for "more" and "drink" were rewarded, it could be expected that *both signs would occur in the same utterance* without the animal actually purposely combining them to produce a "sentence."

In addition, it was *assumed* by some researchers that (e.g.), the sight of a swan caused the chimpanzee to create a new word from separate words, namely, "water" and "bird", in a novel manner. Yet, there is *no way of knowing* whether or not "water" and "bird" are actually *unrelated* signs, *each* appropriate to a separate stimulus received, or whether they were the result of a true "new word" construction.

Actually, when the chimp was shown a swan, and responded "water bird," it was not clearly known *why* the chimp responded this way. The chimp could have responded to conditioning by seeing water, and respond with "water," and also seeing a bird, have responded with "bird." Or, the chimp could have responded to "water," and because of not being rewarded for this response try again with "bird," with the hope that this time he will receive a reward. The primates were trained primarily by conditioning, i.e., responding with the appropriate sign when the appropriate stimulus was presented, then were rewarded only if correct. If incorrect, lack of a reward could be seen as "punishment" for a wrong answer. Regardless of what signs were given, we cannot conclude that the animal purposely put them together in order to convey a "new" idea.

The same could be true with other symbols, such as "blue line" or "big doll." The chimp could be responding totally to conditioning, i.e., responding "blue" because the line is blue, and "line" because the blue object is a line. This simple conditioning is *not* clear proof that the primates were learning a language, but only an example of a characteristic that is present in all animals (conditioning).

Analyzing the signing process indicates that typically the teacher tries to initiate signing, and that then *the chimp learns that the more rapidly it signs, the more rapidly it can obtain what is wanted.* Therefore, it seems evident that the chimp is not specifically communicating with the teacher, but eliciting somewhat random responses through which it hopes to obtain some reward—and the faster the responses, the *more likely the chimp will be rewarded.* For this reason, the chimp puts words together in what has been interpreted by researchers as a sentence, but actually the chimp may simply be spewing out a large number of signs in an effort to produce "The right one" so as to be rewarded. Terrace notes that "From the chimpanzee's point of view, the teachers' signs provide an excellent model of the signs it is expected to make. By simply imitating a few of them, often in the same order used by the teacher, and by adding a few 'wild cards'. . . the chimpanzee may well produce utterances that appear to follow grammatical rules." "In short, the primates seem to be simply mirroring the signs of its teachers, and its behavior is really nothing more than conditioning and does not even *approach* the level of behavior exhibited by a human child.

As noted above, Terrace's *original* research was undertaken to *confirm* the conclusion that primates could learn a language. He himself stated, at first: "The more I analyze Nim's (the chimpanzee's) combinations,

the more certain I felt I was on solid ground in concluding that they were grammatical and that they were comparable to the first sentences of a child" (emphasis mine). Further research, though, caused him to question this conclusion. In Terrace's words, "it was not until Nim was returned to Oklahoma Institute for Primate Studies. . . that I became skeptical of that conclusion." In analyzing the data, he then concluded that there were "a number of important differences between Nim's and a child's use of language." Some of these differences were as follows:[12]

1) The average length of Nim's utterances fluctuated between 1.1 and 1.6 signs, and there was no increase in their length. Children, when they begin combining words, enunciate short utterances; but in time, quite soon, in fact, the *average length increases.* Terrace reasoned that "despite the steady increase in the size of Nim's vocabulary, the *mean length of his utterances did not increase.*"
2) The *maximum length* of a child's utterances is very reliably related to their *average length.* As a child uses longer sentences, the average length increases. On the other hand Nim's utterances showed no such relationship.
3) Extensive research by Richard Sanders showed that Nim's signing with his teachers "bore only a superficial resemblance to a child's conversations with his or her parents."
4) Very few, only 12%, of Nims' utterances were spontaneous, whereas a significantly larger proportion of a child's utterances are spontaneous.
5) As the child matures, his/her utterances which are full or partial imitations decrease to zero percent by the time the child is three. On the other hand, when Nim was 26 months old, 38% of his utterances *were* full or partial imitations of his teachers, and when he was 44 months old, the *proportion had actually risen to 54%*, showing an inverse relationship!
6) Another difference was found in that children generally involve themselves in two-way conversation, i.e., they add information to the proceeding utterance. On the other hand, Nim rarely added information and showed no evidence of "turn taking," but primarily repeated what was given him.
7) There is also clear evidence that prompting (possibly conscious) by the teacher influenced the chimp's so-called "original responses," and that this was *not* the chimp's own thought process.
8) And, lastly there had evidently been much misinterpreting of the chimp's signs. It is necessary to film the entire sequence, preferable focusing on the face expressions, etc., of both the researcher *and* the primate. In many, if not most, cases, this evidentally was not done.

Sebeok noted that when Coco (a female gorilla worked with by psychologist Patterson at Stanford University) gives the sign for drink and makes the proper gesture, but touches her ear instead of her mouth, it was assumed that the gorilla did not make a mistake but "was joking!"[13] If Coco smiles when asked to frown, it was assumed that she was displaying an understanding of opposites! Such interpretations could purport to prove anything.

The Controversy

This controversy is so involved that *Time* states that it is "now the center of a raging academic storm."[5] It has even gotten to the point where, according to the *Time* magazine quoted above, the Gardeners, monkey researchers, have considered suing Terrace.

Terrace is not the only psychologist critical of the belief that primates other than man are able to use language. Linguist Thomas Sebeok and his wife, anthropologist Donna Jean Umiker-Sebeok, both at Indiana University, maintain that much of what passes for language skill in apes can just as well be explained by the "Clever Hans" effect.[13] The "Clever Hans" effect is named after a German circus horse that astounded audiences at the turn of the century by tapping out with his hooves the correct answer to complex mathematical and verbal problems. It was found, however, that the horse, Clever Hans, was actually picking up unintentional cues, primarily posture and facial expression (but also possibly breathing patterns and eye-pupil size) from the questioner, who knew the answer and unintentionally conveyed to the horse when to stop stomping.[14] This may be done quite unconsciously, but nonetheless the information was evidently conveyed.

The famous husband and wife team of researchers at Georgia State University, Duane and Susan Rumbaugh, concluded "there is no solid evidence to date that would indicate that the ape is capable of using syntax with competence." And the famous Noam Chomsky concluded "It's about as likely that an ape will prove to have a language ability as that there is an island somewhere with a species of flightless birds waiting for human beings to teach them to fly." This comment refers to the fact that Chomsky does not believe any animal aside from man has the innate ability to use language—Chomsky feels that language ability is biologically unique to humans, including the ability to conquer syntax, and link words into sentences, however simple.

Summary

There is much evidence to indicate that the original assumptions that chimpanzees and some primates are able to learn language, and therefore the assumption that language is no longer the exclusive domain of man, is at least premature. This assumption was based partly, if not mostly, on evolutionary theory; and was an attempt to decrease the chasm between man and higher primates. Further research, especially that of H. S. Terrace and others, has indicated that this assumption is incorrect. Critical examination of the ape-chimpanzee language studies finds that there are a number of explanations for their seeming production of language that are both simpler, and more empirically supportable, than the assumption that primates are able to use and create language.

References

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