

COMMENT

The Clever Hans Phenomenon Conference

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Clever Hans, a horse owned by a retired schoolteacher named Wilhelm Von Osten, became famous in the early 1900's for his extraordinary learning ability. The horse had been taught how to read, spell and do arithmetic by the same methods Von Osten had used with his human pupils, with the addition of a head-shaking, hoof-tapping code the horse needed to communicate with his teacher.

However, as Oscar Pfungst, a skeptical observer from the University of Berlin's Psychological Institute discovered, Hans did not know how to read, write and do arithmetic. When Hans was given a question, he would watch Von Osten or another questioner very closely. The horse could see that the questioner unconsciously leaned forward as he counted the hoof taps, and jerked his head back very slightly when the right number of taps had been reached. Hans stopped tapping when he saw that jerk.

Hans was a clever observer and communicator, but not a good calculator. The horse not only was unable to put two and two together, he didn't know what a "two" was. Van Osten had misunderstood what was being communicated.

Since that time, whenever researchers have claimed that they have taught an animal to communicate, critics have cautioned that the results may be due to the Clever Hans Phenomenon: The researcher may have unconsciously cued the animal into the right answer, and the animal may only know that the code can be used to get something tasty out of the researcher, not that the different signs in the code mean anything in themselves.

Controlling for Clever Hans is very important in the recent communication research with apes and dolphins, if only because apes and dolphins are so smart—more capable than horses of hoodwinking unwitting humans. There are other pitfalls besides unconscious cuing in animal communication research, too, including anthropomorphization, the ubiquitous human capacity for reading meaning into any random sign (the basis for the Rorschach test), and simple self-deception. Another problem is having to use meaningful signs—speech, printed words—to describe what a meaningful sign is—tantamount to defining an eraser as something with which you erase.

A conference on the Clever Hans Phenomenon would seem a likely place to discuss these problems. It could have drawn savants from the wide variety of dis-

ciplines which view the development of language and thought as important areas of study—linguistics, neurology, ethology, child psychology, anthropology, archaeology, artificial intelligence, and ape language research, for instance.

Instead, the New York Academy of Science's "Conference on the Clever Hans Phenomenon: Communication with Horses, Whales, Apes and People," held last May in New York City, turned out to be an unprofessional, unpleasant attempt on the part of a semiotics professor to discredit the whole area of ape/human communication research.

Thomas A. Sebeok, director of the Research Center for Language and Semiotics Studies at Indiana University, and Robert Rosenthal, Harvard professor of social psychology, organized the conference. According to Duane Rumbaugh, an ape communication researcher and one of the invited speakers, Sebeok and his wife had claimed in an as-yet-unpublished manuscript that the Clever Hans Phenomenon had confounded every contribution to the data base in the chimp and gorilla studies—in other words, that apes did not have, and communicate, ideas, but only watched, imitated and manipulated the researchers.

Setting the Stage

At the beginning, the point of the conference and its direction were unclear. The first two speakers were Heini Hediger, an eminent zoologist from the University of Zurich, and Paul Bouissac, a student of the circus from the University of Toronto. Their talks were interesting, but not controversial. It seemed strange, however, that although Hediger had no trouble understanding questioners who agreed with him, he seemed unable to understand the English of those who were critical of his statements.

Then Duane Rumbaugh, foster parent of the computer-communicating chimps, Lana, Austin and Sherman, stood up to speak. After a quiet start, he launched into an attack on Sebeok and other critics who, he said, contrary to good scientific practice, drew their evidence too often from secondary sources and reported only negative results.

Sue Savage-Rumbaugh was more direct. She started her talk by saying, "Tom Sebeok maintains that there is 'no way to assess the language skills of apes which does not involve human cuing.'" She continued: "When told of a recent study in which Sherman and Austin were videotaped using symbols to regulate the exchange of food—with no human present—he refused to view this unedited tape, stating that the camera angle would render the work unacceptable though he had no idea of the camera's position nor the scope of the picture." Referring to the Sebeoks' unpublished manuscript, which had been sent to the Rumbaughs before the conference, Savage-Rumbaugh then said that she was obliged to forgo presenting data she had prepared for the meeting in order to have time to respond to the Sebeoks' attack.

When Savage-Rumbaugh had finished, Sebeok promptly took the floor to say that her polemics were "empty" because she had no data to present. Savage-Rumbaugh asked him why he and Jean Umiker-Sebeok had not come to see the Rumbaughs' lab before writing their critique. Sebeok said that they had not been invited. A little later, however, he admitted that he and his wife did not go to labs anymore, invited or not, because "the labs stage situations."

More Attacks

This sort of vindictive behavior continued throughout the two-day conference. When Marcello Truzzi, a sociologist from Eastern Michigan University, criticized how the conference had been set up, Sebeok made his most unpleasant attack on the animal communication researchers: One of the final problems Truzzi posed in his talk was the question of when to investigate an unlikely claim, that of a flying elephant, for example. It would depend on the circumstances and on the person who claimed to have seen this miraculous elephant, he said. For example, a drunk suffering from delirium tremens would not be a reliable witness. A circus in the center of town and a winch and crane nearby might explain a child's claim. On the other hand, what would you do if a calm, generally unimpressible colleague calls you up and says, "Listen, you're not going to believe this, but I swear I just saw a flying elephant?" Truzzi answered his own question: "There are probably no Dumbos around, but if you generally trust the man, you have to believe he saw something and you might be willing to find out what it was."

Sebeok stood up during the question and answer period and started talking about this question of Dumbos. A few sentences into his explication, "Dumbo" had inexplicably changed to "Rumbaugh" (the names rhyme).

Truzzi (interrupting): *Dumbo* the flying elephant, you mean.

Sebeok: Yes, "Rumbaugh," the flying elephant. As I was saying—

Truzzi: Am I hearing you right? You're saying Rumbaugh?

Sebeok: Yes, I'm saying Rumbaugh. As I was saying....

The last speaker, magician James Randi, had made his scientific reputation, it would seem from his own remarks, by debunking mentalist Uri Geller on a number of continents. A magic trick, he said, is partly a matter of directing the audience's attention away from what is actually going on. When asked at the end of his talk if he thought the chimp communication researchers were committing some kind of fraud, he said yes. When asked if he had any evidence—if he had ever read the studies or seen the films, he said no, then directed the audience's attention to its watches and closed the conference before anyone could ask another similar question.

Do You Want to Talk About It?

For some, language has been the last barrier separating *Homo sapiens* from the Pongidae, and this barrier too would seem to be falling. The historical evidence suggests that the vehemence of such critics of animal communication research as the Sebeoks and linguist Noam Chomsky stems from human chauvinism.

However, the Rumbaughs did not set out to discover whether chimps were humans in some bizarre disguise (or vice versa). They inaugurated their experiments, Duane Rumbaugh stated, to develop a computer keyboard language ("Yerkish") that could be used by severely retarded human children to communicate their needs and interests.

What is more, it is not only the ape language researchers who are knocking down the barriers between species. Physiological and genetic research have

found uncanny similarities between chimps and humans. For example, the chimp's brain shows the asymmetry which in the human denotes handedness and a differentiation between speech and nonspeech (nonverbal) areas (Desmond, 1979). Second, according to recent molecular anthropology studies, *Homo sapiens* and the African apes (the chimpanzees and gorillas) split from a common ancestor no more than 4 to 6 million years ago, not very long in evolutionary time (Zihlman and Lowenstein, 1979). Third, "the fine structure and genetic organization of the chromosomes of man and chimpanzee are so similar that it is difficult to account for their phenotypic differences" (Yunis et al., 1980).

The Piagetian models of human cognitive development are a neutral yardstick for measuring reasoning ability which have been used successfully in a number of areas, including archaeological anthropology (Marshack 1972). In her presentation at the conference, Suzanne Chevalier-Skolnikoff said that she had applied two of the Piagetian models to apes and found that the apes passed all of the cognition tests up to Stage 6 (18 months of age in human terms) regardless of whether they were able to make signs or use a computer keyboard. Since children are beginning to speak at that age, there would seem to be little reason why chimps would not be able to learn signs or words as well, provided that they wanted to and had some mechanism with which to do so. Originally, finding the right mechanism was a problem. The Gardners at the University of Nevada made one of the first breakthroughs in the field when they hit upon using sign language.

Chimps as "Animal Models"

Duane Rumbaugh says that of the nine retarded children in the program at the Georgia Retardation Center in Atlanta who had "essentially no ability to speak intelligibly" before being taught Yerkish, five are now able to communicate to a "very significant degree."

If it is true that these children were helped, arguments about whether language acquisition by chimps makes them "human" (or makes us chimpanzees) are trivial. If it is also true that the retarded children are successfully manipulating "arbitrary symbols," as Duane Rumbaugh puts it, this may raise questions about our theories on the brain and on mental retardation. According to an instructor in special education at Southern Connecticut State College, it is now standard practice to teach severely retarded children sign language because they learn signs much more quickly than speech (personal communication). The Bliss system of pictographs* works well too, although no one really knows why. The problem in severe retardation is not with blockages in the communication channels, but with the child's ability to make sense of what he or she sees and hears. Why should the child be able to understand and use signs or Bliss symbols if he or she cannot handle speech?

Chimps could not learn to speak very well either. Although the simplest explanation is lack of the proper vocal apparatus, it would be enlightening if the apes' troubles with speech could be found to have more complicated roots. And

*A communication system which uses abstract pictorial symbols rather than words.

it would be helpful if the next cross-discipline animal communication conference would address these questions instead of serving as a showplace for its organizers' prejudices.

References

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