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This paper is a description of and some comments on a psychological experiment that obtained some amazing results and gave rise to some professional controversy that has never been fully settled.

In 1975 I gave a paper called "Tarzan and the Wild Children," in which I discussed Edgar Rice Burroughs' fictional story about a child found in the jungle and raised by apes. Many of you would be familiar with that series of books and movies, which became quite famous in the 1930's and 40's. The story was somewhat believable since there are many examples of abandoned, newborn animals of one species being found and raised by an animal of another species.

There are other stories, such as that of Mowgli, raised by wolves in Kipling's Jungle Book and the ancient legend of Romulus and Remus, said to have been reared by wolves before going on to build what became the great city of Rome.

It is well known that innate behavior can be shaped by early experiences, but to what extent? We know that ducklings will become imprinted on whatever is present when they are born – almost always their mothers. But if someone else is present, or even a mechanical duck, they will follow that around like it was their mother. (A psychologist named Lorenz was the originator of the *imprinting concept*, and he claimed that ducklings with which he experimented would follow him around if he was present when they hatched and would relate to him as their mother throughout their lives.)

Thus, some psychologists began to wonder about the possible effect of an animal being raised by, and in the same manner as a human child, and especially what the effect might be on the animal's communication skills. Charles Darwin had suggested that what made human language distinctive was its abstract cognitive features, and he believed that our power of abstract thought was firmly rooted in the cognitive abilities of our apelike ancestors albeit less well developed by the evolutionary process. Little attention, however, was paid to this part of his theory.

Thus, in the early 1930's a psychologist, Dr. Winthrop Kellogg, and his wife decided to try a cross-fostering experiment, by raising their infant son, Donald, with an infant chimpanzee, named Gua. The two infants slept in identical baby beds, wore the same kind of clothes, and were fed the same food in the same manner and given equal attention and affection. Of course the chimp's development was somewhat more advanced than Donald's, because of the different maturity rates of the chimp and the human, It also happened that Donald was said to be acquiring more chimpanzee sounds than Gua was acquiring human sounds, and the study was discontinued, at Mrs. Kellogg's insistence.. Students in my developmental class would always ask about the later development of Donald and Gua, and I could assure them that Gua went to a nice zoo to live, and Donald grew up normally, graduated from college, and became a physician.

There were several other studies involving chimps and human children being reared for different amounts of time, but there was little success in any speech ability being developed.

The obvious weakness in the studies lay in the lack of vocal mechanism inherent in the physical makeup of the chimps

Attention focused on the chimpanzee, since that species, along with gorillas and orangutans are the closest genetic relatives to the homo sapiens, and chimps are easier to manage than gorillas or orangutans. You may recall the cute little chimp named Cheetah, who was the favorite of children who saw the Tarzan movies.

And this brings me to the story of Washoe. Washoe was a young chimp, born in West Africa, in 1965 and captured by the U.S. Air Force for research in the space program. She was then purchased from NASA by a University of Nevada psychology professor, a scientist of some renown, named Allen Gardner and his wife Beatrix, who also had a Ph.D. in a related field and had studied ethology, which is the study of animal behavior under natural conditions.

Washoe was to be subject of a cross fostering experiment of a different type. The Gardners had hit on the idea of teaching the chimp sign language to see and measure how well she could develop a knowledge of language and how

well she could learn to communicate with people as well as to study her emotional and intellectual development in a human environment. Much was known already about the very complex behavior of chimps who lived in their natural habitats. But what could be the difference if they were raised like humans? The formal study took five years, and the subsequent story of Washoe's life about 35 more, but during the first several years of her life she never heard a single word spoken. Everyone who worked with her had to learn ASL, American Sign Language, and had to communicate with her in that medium.

I learned about this study some 10 years after it was completed, when a book called Next of Kin was written by Dr. Roger Fouts, who as a graduate assistant during his days as a psychology student at University of Nevada where the research was conducted, told the story of how the research was done and of the controversy that it stimulated among psychologists of different theoretical viewpoints.

Washoe lived in a little house erected in the backyard of the Gardners' home. They never tried to act as a mother and father to the chimp. Her caretakers were graduate student assistants, one or two of which came in every morning to wake Washoe and provide her with breakfast. Their world was completely devoid of oral speech. All of the students had to learn sign language before they could work with Washoe. Her home was furnished simply but filled with toys, dolls, and other things common to a human child's bedroom.

Roger Fouts, a graduate student who wanted to be a clinical psychologist, not a research scientist, at the time, became the main teacher and companion of Washoe. Fouts' wife, and later even his children became a part of what they later referred to as their family, and they lived as a family for some 35 years, even after the study was completed and after Washoe had learned to respond to oral speech, though her own communication was always in sign language, and her communication skills were quite impressive.

While working with Washoe, Foust discovered that the chimp could pick up ASL gestures without direct instruction simply by observing humans around her who were signing among themselves. This proved to be an important discovery and turning point in their work. It was a marked

difference in the procedure of psychologists who worked with laboratory mice, dogs, and other animals. And it set the stage for some disagreement between these researchers and the so-called rat psychologists who followed the behavior shaping theories of B.F. Skinner.

For example, these researchers discovered that when staff members signed a word "toothbrush" in Washoe's presence, with no spoken words used, Washoe showed no indication of having learned the sign, but later she reacted to the sight of a toothbrush by spontaneously producing the correct sign, thereby proving that she had learned the ASL sign without anybody having attempted to teach her or even being aware that she had learned it. There were many other examples of this type of behavior. While on a routine automobile ride Washoe saw a swan, swimming in a pond, something she had never before seen and then spontaneously signed the words "water" and "bird." Time does not permit going into the many examples of Washoe showing that she learned many things not taught directly by the staff.

But another instance made them realize that Washoe was learning the way humans learned. A female staff member named Ann returned to work one day, after having been absent two weeks because she had had a baby which died. Washoe had missed her and it was Washoe's habit to cold shoulder those to whom she was miffed, so she was aloof toward Ann all morning. Ann realized that Washoe was upset with her so she decided to tell her what had happened by signing to her "my baby died." Washoe then signed "cry," touched Ann's cheek, and drew her finger down the path a tear would make on a human being. Chimpanzees, incidentally, do not shed tears.

After the project was completed and papers began to be published in journals, it aroused some interest, but considerable criticism, as many skeptics insisted that Washoe was not using language in the thoughtful spontaneous way that humans do, that her utterances were all merely rote, reward-based responses. Evidence, however, repeatedly suggested otherwise. When Washoe's caretakers came in in the mornings, she would sign such things as "Come Hug," "Gimme Clothes" or "Please out, open door."

A linguist, Dr. Noam Chomsky, criticized the study, denying that

Washoe had developed any real language. Chomsky was, at the time, the foremost expert on language development in children, but the results of the Washoe study contradicted many aspects of his own theory as to how humans learn to talk. He even went so far as to adopt a chimp of his own and to teach him to use language, according to his own theories, but his study was a dismal failure which led to some revision of his theory, though the controversy was never settled.

The Gardners, who were the chief investigators of the Washoe Project, moved away after the formal study was completed and results published, and Fouts retained possession of Washoe and continued working with her. After he finished his own degree he received an opportunity for a teaching position at the University of Oklahoma, where he planned to move Washoe and his family and continue his research, since Oklahoma had one of the most well known Institutes for Primate Studies, in the world. He then took Washoe and his family to Oklahoma to continue his research, but this gave rise to another controversy.

Unknown to Fouts, Dr. William Lemmon, the director of the institute, had a different approach to primate research and different ideas about the abilities of primates, how they should be treated, and different methods for teaching them. Fouts was stunned when shown the living quarters for Washoe. After years of cuddling with her dolly in a real bed, Washoe was expected to sleep in a concrete cell surrounded by noise and aggression by the other inmates of the institute.

When Washoe stared at the hairy animals around her, Fouts signed to her "What they?" Washoe's response was "Black bugs," which was a familiar sign, and Fouts knew Washoe did not like the other animals and did not consider herself to be one of them. Fouts also learned that Lemmon used corporal punishment with his animals, so it was obvious they would never get along. Fouts did, however, find a little better living arrangement for Washoe, to separate her from the other primate inhabitants, and eventually to gather several more chimps in his group for research.

With four other chimps Fouts set out to study the question of whether other chimps could learn as Washoe had or whether they had simply found a kind of chimpanzee genius, who by this time had a large sign vocabulary and

could communicate at a level commensurate with that of a four year old child. He then began teaching ASL to four other chimps. He found that there were differences in ability and found that some responded more positively to rewards and that they had different attitudes toward the efforts to teach them. The results were quite variable with the different participants, but he achieved enough success to attract attention.

In 1971 the popular press became aware of what they called the “talking chimpanzees.” *Life* magazine asked to do an article, which appeared in a February, 1972, issue. Washoe, however, was not featured. Gardner, the original investigator did not want the publicity for some reason, so the article featured other chimps. The popular periodicals, *Psychology Today* and *Science Digest* were two among other publications that followed up with articles in which several other chimps were featured as success stories in the cross fostering experiments.

One sad development to Fouts was that Washoe never successfully had any offspring of her own. Her first was still born, and the second died a few days after birth. After the loss of her second child, Washoe became depressed, and Fouts decided to arrange an adoption for her. So he obtained one year old Loulis, who had been born at the Yerkes Primate Center but whose mother had died. When Fouts next saw Washoe he signed to her “I have baby for you,” and Washoe first seemed pleased and excited. As soon as she saw, however, that it was not her baby, the one she had lost, she rejected him. Both mother and child were reluctant at first, but they soon began to adopt each other, and a new experiment began with the question “Could one chimpanzee teach another chimpanzee sign language?”

To answer this question, Fouts changed his procedure at this point. From the day Loulis arrived, no human used sign language in his presence, to make sure he did not learn ASL from humans. The humans would talk and Washoe do the signs and Loulis had only Washoe to help him. On his eighth day with Washoe he learned his first sign – the name of one of the lab assistants. He soon learned three more signs – tickle, drink, and hug, three of Washoe’s most frequently used. After some eight weeks with Washoe Loulis was regularly signing to humans and chimps. By eight months he was using nearly two dozen signs. He had become the first non human to learn a human language from another non human.

There is, of course, more to the scientific studies with Loulis and the other chimps, including some notable contributions to the understanding and teaching of autistic children, but at this point another problem erupted when Dr. Lemmon announced that he was taking possession of Washoe and moving her away from Fouts . There followed a legal battle as to who actually owned Washoe, and it was eventually established that she had been legally obtained from NASA by Gardner, and that he was the chimp's owner. He then transferred ownership to Fouts, who immediately made preparation to leave the University of Oklahoma, taking his family of wife, children, and five other chimps with him. Finding another position was somewhat complicated by the size and nature of the Fouts family.

He had been first offered an assistant professorship at Yale University, but by this time he had become an advocate for the rights of primates and after visiting the accommodations for animals at Yale he decided that it would not do for his family, so he surprised them by refusing the offer. Instead, Fouts accepted a tenured professorship at Central Washington University, a small and almost unknown school, located in Ellensburg, Washington, because it offered the chance to establish a comfortable home for Washoe and her family and a place where Fouts could continue both his research and his effort to make others aware of what he considered to be the moral rights of primates. They moved there in 1980, and Washoe lived happily there until her death on October 30, 2007, at age 42.

Fouts has spent much of the rest of his life as an advocate for animal rights, particularly with respect to primates. He and his wife helped to establish the Chimpanzee and Human Communication Institute at Central Washington University and to found what became known as the Great Ape Legal Project, which seeks to represent the moral rights of Primates. Fouts believed that his research had generated proof of Darwin's theory that primates possessed at least a primitive form of abstract ability that made them the next of kin to homo sapiens.

In his book Fouts wrote the following: "In 1996 I visited Africa where I discovered that chimpanzees are not only individual people, they are *a* people which *The American Heritage Dictionary* defines as 'a body of persons sharing a common religion, culture, or language.' Fouts

wrote further, "Of course I knew intellectually, that chimpanzees are people, but actually seeing a chimpanzee culture firsthand was one of the peak experiences of my life."

Jane Goodall, perhaps the world's most prominent primatologist wrote the following about Fouts: "Roger was tested-- and found not wanting...he had the courage to confront the ethical implications of his own research...(and he risked) his own career to ensure that Washoe be spared life imprisonment in a small bleak cell...and to stand up to the research establishment and its cruel treatment of our closest, evolutionary relatives."