The Mind of the Chimpanzee

JANE GOODALL

Learning Outcomes

After reading this article, you will be able to:

• Discuss the difficulties Jane Goodall had in convincing others that her study of chimps was scientific.

• Explain how it is possible to objectively study and assess the emotional and mental states of nonhuman primates.

ften I have gazed into a chimpanzee's eyes and wondered what was going on behind them. I used to look into Flo's, she so old, so wise. What did she remember of her youngdays? David Greybeard had the most beautiful eyes of them all, large and lustrous, set wide apart. They somehow expressed his whole personality, his serene self-assurance, his inherent dignity—and, from time to time, his utter determination to get his way. For a long time I never liked to look a chimpanzee straight in the eye—I assumed that, as is the case with most primates, this would be interpreted as a threat or at least as a breach of good manners. No so. As long as one looks with gentleness, without arrogance, a chimpanzee will understand, and may even return the look. And then—or such is my fantasy—it is as though the eyes are windows into the mind. Only the glass is opaque so that the mystery can never be fully revealed.

I shall never forget my meeting with Lucy, an eight-year-old home-raised chimpanzee. She came and sat beside me on the sofa and, with her face very close to mine, searched in my eyes—what? Perhaps she was looking for signs of mistrust, dislike, or fear, since many people must have been somewhat disconcerted when, for the first time, they came face to face with a grown chimpanzee. Whatever Lucy read in my eyes clearly satisfied her for she suddenly put one arm round my neck and gave me a generous and very chimp-like kiss, her mouth wide open and laid over mine. I was accepted.

For a long time after that encounter I was profoundly disturbed, I had been at Gombe for about fifteen years then and I was quite familiar with chimpanzees in the wild. But Lucy, having grown up as a human child, was like a changeling, her essential chimpanzeeness overlaid by the various human behaviours she had acquired over the years. No longer purely, chimp yet eons away from humanity, she was man-made, some other kind of being. I watched, amazed, as she opened the refrigerator and various cupboards, found bottles and a glass, then poured herself a gin and tonic. She took the drink to the TV, turned the set on, flipped from one channel to another then, as though in disgust, turned it off again. She selected a glossy magazine from the table and, still carrying her drink, settled in a comfortable chair. Occasionally, as she leafed through the magazine she identified something she saw, using the signs of ASL, the American Sign Language used by the deaf. I, of course, did not understand, but my hostess, Jane Temerlin (who was also Lucy’s ‘mother’), translated: ‘That dog,’ Lucy commented, pausing at a picture of a small white poodle. She turned the page. ‘Blue,’ she declared, pointing then signing as she gazed at a picture of a lady advertising some kind of soap powder and wearing a brilliant blue dress. And finally, after some vague hand movements—perhaps signed mutterings—’This Lucy’s, this mine,’ as she closed the magazine and laid it on her lap. She had just been taught, Jane told me, the use of the possessive pronouns during the thrice weekly ASL lessons she was receiving at the time.

The book written by Lucy’s human ‘father,’ Maury Temerlin, was entitled Lucy, Growing Up Human. And in fact, the chimpanzee is more like us than is any other living creature. There is close resemblance in the physiology of our two species and genetically, in the structure of the DNA, chimpanzees and humans differ by only just over one percent. This is why medical research uses chimpanzees as experimental animals when they need substitutes for humans in the testing of some drug or vaccine. Chimpanzees can be infected with just about all known human infectious diseases including those, such as hepatitis B and AIDS, to which other non-human animals (except gorillas, orangutans and gibbons) are immune. There are equally striking similarities between humans and chimpanzees in the anatomy and wiring of the brain and nervous system, and—although
many scientists have been reluctant to admit to this—in social behaviour, intellectual ability, and the emotions. The notion of an evolutionary continuity in physical structure from pre-human ape to modern man has long been mostly acceptable to most scientists. That the same might hold good for mind was generally considered an absurd hypothesis—particularly by those who used, and often misused, animals in their laboratories. It is, after all, convenient to believe that the creature you are using, while it may react in disturbingly human-like ways, is, in fact, merely a mindless and, above all, unfelling, 'dumb' animal.

When I began my study at Gombe in 1960 it was not permissible—at least not in ethological circles—to talk about an animal's mind. Only humans had minds. Nor was it quite proper to talk about animal personality. Of course everyone knew that they did have their own unique characters—everyone who had ever owned a dog or other pet was aware of that. But ethologists, striving to make theirs a 'hard' science, shied away from the task of trying to explain such things objectively. One respected ethologist, while acknowledging that there was 'variability between individual animals,' wrote that it was best that this fact be 'swept under the carpet.' At that time ethological carpets fairly bulged with all that was hidden beneath them.

How naive I was. As I had not had an undergraduate science education I didn't realize that animals were not supposed to have personalities, or to think, or to feel emotions or pain. I had no idea that it would have been more appropriate to assign each of the chimpanzees a number rather than a name when I got to know him or her. I didn't realize that it was not scientific to discuss behaviour in terms of motivation or purpose. And no one had told me that terms such as childhood and adolescence were uniquely human phases of the life cycle, culturally determined, not to be used when referring to young chimpanzees. Not knowing, I freely made use of all those forbidden terms and concepts in my initial attempt to describe, to the best of my ability, the amazing things I had observed at Gombe.

I shall never forget the response of a group of ethologists to some remarks I made at an erudite seminar. I described how Figan, as an adolescent, had learned to stay behind in camp after senior males had left, so that we could give him a few bananas for himself. On the first occasion he had, upon seeing the fruits, uttered loud, delighted food calls: whereupon a couple of the older males had charged back, chased after Figan, and taken his bananas. And then, coming to the point of the story, I explained how, on the next occasion, Figan had actually suppressed his calls. We could hear little sounds, in his throat, but so quiet that none of the others could have heard them. Other young chimps, to whom we tried to smuggle fruit without the knowledge of their elders, never learned such self-control. With shrieks of glee they would fall to, only to be robbed of their booty when the big males charged back. I had expected my audience to be as fascinated and impressed as I was. I had hoped for an exchange of views about the chimpanzee's undoubted intelligence. Instead there was a chill silence, after which the chairman hastily changed the subject. Needless to say, after being thus snubbed, I was very reluctant to contribute any comments, at any scientific gatherings, for a very long time. Looking back, I suspect that everyone was interested, but it was, of course, not permissible to present a mere 'anecdote' as evidence for anything.

The editorial comments on the first paper I wrote for publication demanded that every reference be replaced with it* and every who be replaced with which. Incensed, I, in my turn, crossed out the its and whichs and scratched back the original pronouns. As I had no desire to carve a niche for myself in the world of science, but simply wanted to go on living among and learning about chimpanzees, the possible rejection of the editor of the learned journal did not trouble me. In fact I won that round: the paper when finally published did confer upon the chimpanzees the dignity of their appropriate genders and properly upgraded them from the status of mere 'things' to essential Beingness.

However, despite my somewhat turbulent attitude, I did want to learn, and I was sensible of my incredible good fortune in being admitted to Cambridge. I wanted to get my PhD, if only for the sake of Louis Leakey and the other people who had written letters in support of my admission. And how lucky I was to have, as my supervisor, Robert Hinde. Not only because I thereby benefitted from his brilliant mind and clear thinking, but also because I doubt that I could have found a teacher more suited to my particular needs and personality. Gradually he was able to doak me with at least some of the trappings of a scientist. Thus although I continued to hold to most of my convictions—that animals had personalities; that they could feel happy or sad or fearful; that they could feel pain; that they could strive towards planned goals and achieve greater success if they were highly motivated—I soon realized that these personal convictions were, indeed, difficult to prove. It was best to be circumspect—at least until I had gained some credentials and credibility. And Robert gave me wonderful advice on how best to tie up some of my more rebellious ideas with scientific ribbon. 'You can't know that Fifi was jealous,' he had admonished on one occasion. We argued a little. And then: 'Why don't you just say If Fifi were a human child we would say she was jealous?' I did.

It is not easy to study emotions even when the subjects are human. I know how I feel if I am sad or happy or angry, and if a friend tells me that he is feeling sad, happy or angry, I assume that his feelings are similar to mine. But of course I cannot know. As we come to grips with the emotions of beings progressively more different from ourselves the task, obviously, becomes increasingly difficult. If we ascribe human emotions to non-human animals we are accused of being anthropomorphic—a cardinal sin in ethology. But is it so terrible? If we test the effect of drugs on chimpanzees because they are biologically so similar to ourselves, if we accept that there are dramatic similarities in chimpanzee and human brain and nervous system, is it not logical to assume that
there will be similarities also in at least the more basic feelings, emotions, moods of the two species?

In fact, all those who have worked long and closely with chimpanzees have no hesitation in asserting that chimps experience emotions similar to those which in ourselves we label pleasure, joy, sorrow, anger, boredom and so on. Some of the emotional states of the chimpanzee are so obviously similar to ours that even an inexperienced observer can understand what is going on. An infant who hurts himself screaming to the ground, face contorted, hitting out with his arms at any nearby object, banging his head, is clearly having a tantrum. Another youngster, who gambols around his mother, turning somersaults, pirouetting and, every so often, rushing up to her and tumbling into her lap, patting her or pulling her hand towards him in a request for tickling, is obviously filled with joie de vivre. There are few observers who would not unhesitatingly ascribe his behaviour to a happy, carefree state of well-being. And one cannot watch chimpanzee infants for long without realizing that they have the same emotional need for affection and reassurance as human children. An adult male, reclining in the shade after a good meal, reaching benignly to play with an infant or idly groom an adult female, is clearly in a good mood. When he sits with bristling hair, glaring at his subordinates and threatening them with irritated gestures if they come too close, he is clearly feeling cross and grumpy. We make these judgments because the similarity of so much of a chimpanzee's behaviour to our own permits us to empathize.

Empathy and intuition can be of tremendous value as we attempt to understand certain complex behavioral interactions, provided that the behaviour, as it occurs, is recorded precisely and objectively. Fortunately I have seldom found it difficult to record facts in an orderly manner even during times of powerful emotional involvement. And “knowing” intuitively how a chimpanzee is feeling—after an attack, for example—may help one to understand what happens next. We should not be afraid at least to try to make use of our close evolutionary relationship with the chimpanzees in our attempts to interpret complex behaviour.

Today, as in Darwin's time, it is once again fashionable to speak of and study the animal mind. This change came about gradually, and was, at least in part, due to the information collected during careful studies of animal societies in the field. As these observations became widely known, it was impossible to brush aside the complexities of social behaviour that were revealed in species after species. The untidy clutter under the ethological carpets was brought out and examined, piece by piece. Gradually it was realized that parsimonious explanations of apparently intelligent behaviours were often misleading. This led to a succession of experiments that, taken together, clearly prove that many intellectual abilities that had been thought unique to humans were actually present, though in a less highly developed form, in other, non-human beings. Particularly, of course, in the non-human primates and especially in chimpanzees.

When first I began to read about human evolution, I learned that one of the hallmarks of our own species was that we, and only we, were capable of making tools. Man the Toolmaker was an oft-cited definition—and this despite the careful and exhaustive research of Wolfgang Kohler and Robert Yerkes on the toolusing and tool-making abilities of chimpanzees. Those studies, carried out independently in the early twenties, were received with scepticism. Yet both Kohler and Yerkes were respected scientists, and both had a profound understanding of chimpanzee behaviour. Indeed, Kohler's descriptions of the personalities and behaviour of the various individuals in his colony, published in his book The Mentality of Apes, remain some of the most vivid and colourful ever written. And his experiments, showing how chimpanzees could stack boxes, then climb the unstable constructions to reach fruit suspended from the
ceiling, or join two short sticks to make a pole long enough to rake in fruit otherwise out of reach, have become classic, appearing in almost all textbooks dealing with intelligent behaviour in non-human animals.

By the time systematic observations of tool-using came from Gombe those pioneering studies had been largely forgotten. Moreover, it was one thing to know that humanized chimpanzees in the lab could use implements: it was quite another to find that this was a naturally occurring skill in the wild. I well remember writing to Louis about my first observations, describing how David Greybeard not only used bits of straw to fish for termites but actually tripped leaves from a stem and thus made a tool. And I remember too receiving the now oft-quoted telegram he sent in response to my letter: “Now we must redefine tool, redefine Man, or accept chimpanzees as humans.”

There were initially, a few scientists who attempted to write off the termiting observations, even suggesting that I had taught the chimps! By and large, though, people were fascinated by the information and by the subsequent observations of the other contexts in which the Gombe chimpanzees used objects as tools. And there were only a few anthropologists who objected when I suggested that the chimpanzees probably passed their tool-using traditions from one generation to the next, through observations, imitation and practice, so that each population might be expected to have its own unique toolusing culture. Which, incidentally, turns out to be quite true. And when I described how one chimpanzee, Mike, spontaneously solved a new problem by using a tool (he broke off a stick to knock a banana to the ground when he was too nervous to actually break it from my hand) I don’t believe there were any raised eyebrows in the scientific community. Certainly I was not attacked viciously, as were Kohler and Yerkes, for suggesting that humans were not the only beings capable of reasoning and insight.

The mid-sixties saw the start of a project that, along with other similar research, was to teach us a great deal about the chimpanzee mind. This was Project Washoe, conceived by Trixie and Allen Gardner. They purchased an infant chimpanzee and began to teach her the signs of ASL, the American Sign Language used by the deaf. Twenty years earlier another husband and wife team, Richard and Cathy Hayes, had tried, with an almost fatalistic view of the eventual outcome, to teach a young chimp, Vikki, to talk. The Hayes’s undertaking taught us a lot about the chimpanzee mind, but Vikki, although she did well in IQ tests, and was clearly an intelligent youngster, could not learn human speech. The Gardners, however, achieved spectacular successes with their pupil, Washoe. Not only did she learn signs easily, but she quickly began to string them together in meaningful ways. It was clear that each sign evoked, in her mind, a mental image of the object it represented. If, for example, she was asked, in sign language, to fetch an apple, she would go and locate an apple that was out of sight in another room.

Other chimps entered the project, some starting their lives in deaf signing families before Washoe. And finally Washoe adopted an infant, Loulis. He came from a lab where no thought of teaching signs had ever penetrated. When he was with Washoe he was given no lessons in language—aquin—not by humans, a nyway. Yet by the time he was eight years old he had mastered eighty-three signs in their correct contexts. How did he learn them? Mostly, it seems, by imitating the behaviour of Washoe and the other three signing chimps, Dar, Mora and Tatu. Sometimes, though, he received tuition from Washoe herself. One day, for example, she began to swagger about bipedally, hair bristling, signing food! food! food! in great excitement. She had seen a human approaching with a bar of chocolate. Loulis, only eighteen months old, watched passively.

Suddenly Washoe stopped her swaggering, went over to him, took his hand, and moulded the sign for food (fingers pointing towards mouth). Another time, in a similar context, she made the sign for chewing gum—but with her hand on his body. On a third occasion Washoe, apropos of nothing, picked up a small chair, took it over to Loulis, set it down in front of him, and very distinctly made the chair sign three times, watching him closely as she did so. The two food signs became incorporated into Loulis’s vocabulary but the sign for chair did not. Obviously the priorities of a young chimp are similar to those of a human child!

When news of Washoe’s accomplishments first hit the scientific community it immediately provoked a storm of bitter protest. It implied that chimpanzees were capable of mastering a human language, and this, in turn, indicated mental powers of generalization, abstraction and concept-formation as well as an ability to understand and use abstract symbols. And these intellectual skills were surely the prerogatives of Homo sapiens. Although there were many who were fascinated and excited by the Gardners’ findings, there were many more who denounced the whole project, holding that the data was suspect, the methodology sloppy, and the conclusions not only misleading, but quite preposterous. The controversy inspired all sorts of other language projects. And, whether the investigators were sceptical to start with and hoped to prove the Gardners’ work, or whether they were attempting to demonstrate the same thing in a new way, their research provided additional information about the chimpanzee’s mind.

And so, with new incentive, psychologists began to test the mental abilities of chimpanzees in a variety of different ways; again and again the results confirmed that their minds are uncannily like our own. It had long been held that only humans were capable of what is called ‘cross-modal transfer of information’—in other words, if you shut your eyes and someone allows you to feel a strangely shaped potato, you will subsequently be able to pick it out from other differently shaped potatoes simply by looking at them. And vice versa. It turned out that chimpanzees can ‘know’ with their eyes what they ‘feel’ with their fingers in just the same way. In fact, we
now know that some other non-human primates can do the same thing. I expect all kinds of creatures have the same ability.

Then it was proved, experimentally and beyond doubt, that chimpanzees could recognize themselves in mirrors—that they had, therefore, some kind of self-concept. In fact, Washoe, some years previously, had already demonstrated the ability when she spontaneously identified herself in the mirror, staring at her image and making her name sign. But that observation was merely anecdotal. The proof came when chimpanzees who had been allowed to play with mirrors were, while anesthetized, dabbed with spots of odourless paint in places, such as the ears or the top of the head, that they could see only in the mirror. When they woke they were not only fascinated by their spotted images, but immediately investigated, with their fingers, the dabs of paint.

The fact that chimpanzees have excellent memories surprised no one. Everyone, after all, has been brought up to believe that ‘an elephant never forgets’ so why should a chimpanzee be any different? The fact that Washoe spontaneously gave the namesign of Beatrice Gardner, her surrogate mother, when she saw her after a separation of eleven years was no greater an accomplishment than the amazing memory shown by dogs who recognize their owners after separations of almost as long—and the chimpanzee has a much longer life span than a dog. Chimpanzees can plan ahead, too, at least as regards the immediate future. This, in fact, is well illustrated at Gombe, during the termiting season: often an individual prepares a tool for use on a termite mound that is several hundred yards away and absolutely out of sight.

This is not the place to describe in detail the other cognitive abilities that have been studied in laboratory chimpanzees. Among other accomplishments chimpanzees possess pre-mathematical skills: they can, for example, readily differentiate between more and less. They can classify things into specific categories according to a given criterion—they have no difficulty in separating a pile of food into fruits and vegetables on one occasion, and, on another, dividing the same pile of food into large versus small items, even though this requires putting some vegetables with some fruits. Chimpanzees who have been taught a language can combine signs creatively in order to describe objects for which they have no symbol. Washoe, for example, puzzled her caretakers by asking, repeatedly, for a rock berry. Eventually it transpired that she was referring to Brazil nuts which she had encountered for the first time a while before. Another language-trained chimp described a cucumber as a green banana, and another referred to an Alka-Seltzer as a listen drink. They can even invent signs. Lucy, as she got older, had to be put on a leash for her outings. One day, eager to set off but having no sign for leash, she signalled her wishes by holding a crooked index finger to the ring on her collar. This sign became part of her vocabulary. Some chimpanzees love to draw, and especially to paint. Those who have learned sign language sometimes spontaneously label their works, ‘This [is] a apple’—or bird, or sweetcorn, or whatever. The fact that the paintings often look, to our eyes, remarkably unlike the objects depicted by the artists either means that the chimpanzees are poor draughtsmen or that we have much to learn regarding apestyle representational art!

People sometimes ask why chimpanzees have evolved such complex intellectual powers when their lives in the wild are so simple. The answer is, of course, that their lives in the wild are not so simple! They use—and need—all their mental skills during normal day-to-day life in their complex society. They are always having to make choices—where to go, or with whom to travel. They need highly developed social skills—particularly those males who are ambitious to attain high positions in the dominance hierarchy. Low-ranking chimpanzees must learn deception—to conceal their intentions or to do things in secret—if they are to get their way in the of their superiors. Indeed, the study of chimpanzees in the wild suggests that their intellectual abilities evolved, over the millennia, to help them cope with daily life. And now, the solid core of data concerning chimpanzee intellect collected so carefully in the lab setting provides a background against which to evaluate the many examples of intelligent, rational behaviour that we see in the wild.

It is easier to study intellectual prowess in the lab where, through carefully devised tests and judicious use of rewards, the chimpanzees can be encouraged to exert themselves, to stretch their minds to the limit. It is more meaningful to study the subject in the wild, but much harder. It is more meaningful because we can better understand the environmental pressures that led to the evolution of intellectual skills in chimpanzee societies. It is harder because, in the wild, almost all behaviours are confounded by countless variables; years of observing, recording and analyzing take the place of contrived testing; sample size can often be counted on the fingers of one hand; the only experiments are nature’s own, and only time—eventually—may replicate them.

In the wild a single observation may prove of utmost significance, providing a clue to some hitherto puzzling aspect of behaviour, a key to the understanding of, for
example, a changed relationship. Obviously it is crucial to see as many incidents of this sort as possible. During the early years of my study at Gombe it became apparent that one person alone could never learn more than a fraction of what was going on in a chimpanzee community at any given time. And so, from 1964 onwards, I gradually built up a research team to help in the gathering of information about the behaviour of our closest living relatives.

Critical Thinking

1. Describe Lucy's "human" behavior.
2. What is the physiological evidence that chimpanzees resemble us?
3. Why has it been, for some scientists, more absurd to accept a similarity of mind than a similarity in physical structure?
4. What were considered inappropriate descriptions of chimpanzees when Jane Goodall began her study at Gombe?
5. What is a "cardinal sin" in ethology? What is Jane Goodall's answer to such a view?
6. Why did it eventually become impossible to brush aside observations regarding animal minds?
7. What was considered one of the "hallmarks of our species"? What did Kohler's study show?
8. Why were Jane Goodall's observations significant?
9. What did Washoe and Loulis show regarding chimpanzee abilities? What was the "bitter protest" about?
10. Be familiar with chimpanzee abilities with respect to "crossmodal transfer of information," "self-concept," memory, planning ahead, pre-mathematical skills, classifying ability, combining signs creatively, and labeling their own art.

II. How does Jane Goodall answer the question of why chimpanzees have evolved such complex intellectual powers?
12. How does Jane Goodall characterize the differences between lab studies versus studies in the wild?

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