



Gary Shapiro in Borneo teaching an orangutan sign language.

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JUNGLE SCHOOL

Lessons We Can Learn From Orangutans

by Shawn Thompson

One day, on a terribly hot, tropical afternoon in the equatorial jungle of Borneo, I met an orangutan who is the kind of student we teachers adore.

This orangutan—Princess—was strolling down a sandy path through the trees. I'd already heard that she was a smart and diligent student who had learned to communicate in sign language with Gary Shapiro, an American researcher. The orangutan and I sat down for a while, communing silently, because dull brute that I am, I don't know sign language.

I had come to Borneo to work on a book about orangutans as an endangered species and talked in Los Angeles to Shapiro about how primates like Princess learn. From what researchers have discovered, it seems that we can cast aside some of the abstract and complex notions of education that preoccupy us, and take confidence in some fundamental ideas.

For orangutans and human beings are genetically akin and share the same basic types of thoughts and feelings. We also learn in similar ways. Or at least we did thousands of years ago until our large human brains developed an unusual level of abstraction that sometimes merely distracts us. I'm probably not the only teacher who feels at times that my large human brain makes it more difficult for me to teach. The primate researcher Roger Fouts told me in his forthright way, "Our education is not based on the natural way we learned as families and communities for millions of years. That's why it seems broken."

But orangutans still have something basic. Orangutans make good learners under the right conditions, when they are allowed the freedom to pursue their deep, biologically ingrained curiosity and their innate ability to learn with a teacher they respect and know intimately.

The evidence of this lies in a revealing experiment from 1978 to 1981 in which Shapiro taught Princess sign language in the same patch of jungle where I met her several decades later. Like a good student, Princess, now in her 40s and the mother of five, still remembers the sign language and the researcher. But then orangutans are a species with phenomenal memories.

In retrospect, the idea of teaching an orangutan sign language in the late 1970s was a new and radical venture. Orangutans like Princess hadn't been doing well in lab experiments, which led some researchers to believe they were

lethargic creatures who couldn't even learn to imitate human beings, let alone act in a creative and intelligent way.

But a few researchers suspected otherwise and Shapiro was aptly prepared for the task since he was a student of Roger Fouts, the American primate psychologist who made amazing breakthroughs teaching the chimpanzee Washoe to use sign language. Fouts was able to teach chimpanzees because he had developed an understanding of their needs as students.

A SENSE OF FREE WILL

Fouts explained in his 1997 book *Next of Kin: My Conversations with Chimpanzees* what he realized about learning for chimpanzees and children. The traditional belief in a system of discipline, or rewards and punishments—with its intellectual roots in the behaviouralism of B.F. Skinner that Fouts abhors—doesn't work well for chimpanzees. Learning is not naturally a system of domination of teacher over student, of the will of one primate over another. The learner needs a sense of free will, interest and creativity. Fouts wrote:

From Washoe I learned the greatest secret of working with chimpanzees and human children: make an activity a game and they'll do it forever. Ask them to do it, or force it on them, and they lose interest immediately.... If you try to impose a rigid discipline while teaching a child or a chimp you are working against the boundless curiosity and the need for relaxed play that make learning possible in the first place.... Learning cannot be controlled; it is out of control by design. Learning emerges spontaneously, it proceeds in an individualistic and unpredictable way, and it achieves its goal in its own good time.

QUALITY OF RELATIONSHIP

Fouts also explained that, in learning, "the quality of the relationship is critical" for both primates and human beings. "Isn't it interesting how often you hear people say, 'I was never any good at math or German because I hated the teacher. The teacher just rubbed me the wrong way, so I never learned anything.'" Fouts told me in an email how he put that realization into practice: "I take the child or chimpanzee on their own terms and I adapt to them rather than expecting them to surrender to any pre-conceived 'empirical' training regime."

Orangutans need that relationship and, if it isn't there, it can undermine research into them, according to the scientists I interviewed. That's particularly true since orangutans are more solitary than chimpanzees and thus more socially independent than them. Orangutans choose their relationships carefully and sparingly for personal reasons. The social context, motivation and dynamics of captivity can't be ignored, otherwise there's a problem, according to the Australian orangutan primatologists Gisela Kaplan and Lesley Rogers. The researchers say that a problem in an experiment could be explained by "lack of motivation" or a decision to "deliberately fail to solve the problem." Orangutans could also seem to be disinterested because they are "more furtive" in learning than the other apes, say Kaplan and Rogers. Orangutans pretend they are not watching and not learning when they actually are, which is typical of their social behaviour.

I heard similar explanations about the sensitivity of orangutans to relationships from the people who come close to orangutans personally—the keepers in zoos in places like Australia, the United States, Indonesia, the Netherlands and Spain. In Australia, the well-respected orangutan keeper Leif Cocks told me that those who are accepted most readily by orangutans are confident, honest, empathetic, selfless and independent emotionally. When those qualities are missing, the relationship breaks down and the orangutan becomes unmanageable or unresponsive. Doesn't that sound like the classroom? The soul of an orangutan can't be bought for a piece of fruit or coerced by punishment and threats. The orangutan responds in those situations by using his or her wits to undermine and sabotage the human being in a battle of wills. It's the classroom-become-a-power-struggle scenario.

Primed by the example and influence of Fouts and following insights like these, Shapiro went on to prove that orangutans like Princess are highly intelligent and can learn to communicate with sign language if they are taught in circumstances that match their natural ability to learn. In a breakthrough in the jungle of Kalimantan, Princess learned thirty-seven signs in nineteen months and showed a limited ability to combine vocabulary. In one particularly creative moment Shapiro opened a can of fruit and Princess put together two hand signs to call it "sweet fruit."

Shapiro was able to succeed where others failed because he duplicated the natural structure of education for an orangutan. He built a genuine relationship and became a surrogate parent for the young orphan orangutan Princess. The orangutan, in turn, recognized his sincerity and his real interest in her, as only an orangutan, astute at reading the intentions of others, even human beings, could. That created unusual circumstances for the researcher, he told me. For a while, he was inseparable from the orangutan and even let Princess sleep at night on his narrow cot. "It was my first experience with fatherhood," Shapiro said. "I enjoyed it. We developed a routine. I'd get us out of bed early in the morning, take her outside. I'd hold her away, and she'd pee on demand and we'd go back to bed." Shapiro now lives in Los Angeles, but still considers his relationship to the orangutan close, calling her his "adopted daughter." He is also active in the protection and conservation of orangutans through his organization the Orang Utan Republik Foundation.

What are the lessons that Shapiro and other orangutan scientists learned about the natural process of education for orangutans?

PREDISPOSITION TO CURIOSITY

A lesson in the jungle starts with the predisposition to curiosity that is necessary for the survival of the individual and the species. Although scientists have not been looking for a curiosity gene, one of the leading orangutan researchers, Carel van Schaik, said in an interview with me that something like it would have to exist. If not, there would be no incentive to leap beyond what is needed to satisfy basic impulses and needs. "There has to be an engine of innovation somewhere," said van Schaik. In a similar vein, Fouts says in his book that both chimpanzees and human beings are "endowed biologically" with curiosity and "biologically equipped" for learning. According to Fouts, a chimpanzee brain is not born programmed with instructions how to do things, but learns the rules, say, to crack open a nut and then generalizes the rules for other situations. Our ancestors likely did the same thing, says Fouts. He believes that the way that chimpanzees learn is a "strong indication" of what our "hominid ancestors" did.

OPPORTUNITIES FOR CHOICE

Primed by biology, the next step for the orangutan student is to choose the teacher and to choose the time, location and length of instruction. When you lose these elements and have a utilitarian system of education like ours, the teacher is forced to rely on incentives, punishment or some form of constraint to keep the human primates under control. That is the behaviourism of Skinner and exactly what scientists like Fouts say doesn't work for apes—unless the goal is to produce "a Skinnerian rat" or "turn an active learner into a passive one." Forms of "conditioning," of reward and punishment, do not work for learning, either for chimpanzees or children, insists Fouts. He cites an example from Desmond Morris of chimpanzees who were rewarded for doing the drawing that they enjoyed naturally. The drawings changed to hasty, disinterested scribbles, or, as Morris said, "commercial art." The fact that we have to give marks for attendance in university and penalty time for absences in high school just shows how dependent we are on this system. We soothe ourselves with rationalizations like the "resistance to learning" in our students.

FLEXIBILITY

Fouts identifies what he calls "flexibility" with primate learners. He says that chimpanzee mothers only help when the child is interested and shows a will and a need to learn. "When behaviour is acquired in a controlled way, through rigid training," says Fouts, "it's not flexible. Flexibility is the key to primate intelligence." Fouts explains that this is the ability "to apply a skill learned in one situation to an entirely different situation." Instruction applied rigidly in a forceful manner produces rigid and limited results, a kind of mechanical repetition. It destroys the curiosity and play that drive learning and the "flexibility to adapt to new situations." In the same way a sense of play, which

Fouts sees as an engine of learning in chimpanzees, can't be forced, any more than it can with children.

IMITATION

Imitation is also an engine of learning, according to Fouts and other researchers, like Anne Russon, the York University primate psychologist and executive director of the Borneo Orangutan Survival Foundation of Canada, whom I interviewed in Borneo. Russon's findings are based on almost four hundred hours spent observing the way that twenty-six orphan orangutans learned naturally by imitation in the tropical forests of Kalimantan. The word "imitation" doesn't do justice to the process, particularly with the connotations the word has in our society of mechanical mimicry. Imitation in orangutans is intelligent and creative and the orangutan decides what to imitate and when to do it. Like Roger Fouts, Russon took the need for freedom and choice in orangutans into account in her research. She followed orangutans and observed what they did on their own rather than trying to coerce them in an experiment.

The act of imitation that Russon found in orangutans is a cognitive process that involves breaking an action into its parts and assembling them back together again, sometimes with changes and innovations, sometimes with applications to a new purpose. It can also involve taking actions learned separately and putting them together for a new function. The ability of orangutans to make an action work by substituting one element for another and their ability to fit separate actions together for a goal "suggested orangutans analyzed and reconstructed these fragments at sophisticated cognitive levels," according to Russon. The orangutans had some kind of ability to "analyse" the behaviour they see and make "instructions" for themselves to "drive their own activity." Thus orangutans will construct makeshift bridges to get across a river or bail water out of a canoe and find a makeshift oar to paddle themselves to the far shore. In one case, an orangutan took her observations about building a fire and used them to try to build a fire under the dining hall of a scientist's research camp—a bit devious, but still intelligent.

TRUSTING AND NATURAL RELATIONSHIPS

Imitation for orangutans, like other aspects of their learning, is part of a relationship. It has a social function and a social context. Orangutans imitate to be similar to someone they either like or respect, or to be part of the group, according to Russon and the Canadian primatologist Biruté Galdikas. The willingness to imitate can be affected by a wide variation of factors, such as "age, sex, kinship, emotional bonds, and social status," and even personal preferences. It is typical of orangutans to be selective about who they imitate. Orphan orangutans raised from a young age with human beings often prefer to imitate human beings.

"Orangutans turn into specialists in their learning," Russon says. "They have preferred techniques and often practise intensively to improve or extend those techniques. So there are experts on using sticks, lock experts, swimming experts, and so on, just like us. And orangutans—like us—practise a lot. Some of the things they learn are skills, and these need refinement and honing. So, like an athlete, they work on their expertise (that is, practise) until they get it right."

The relationship and "supportive social environment" in learning applies to human beings as well, says Russon, a university teacher herself. "Expecting kids or university students to just learn and work on their own misses a lot of what's important. We too are a social species, so learning in a social context (for example, lectures instead of Internet tutorials) and working together with your teacher and students, are important."

STUDENTS AND TEACHERS

All this may be interesting science, but how well do these primate researchers actually apply their knowledge of teaching personally? I thought an answer to that might come from

asking Roger Fouts and Gary Shapiro about their relationship as teacher and student.

When I asked Shapiro about Fouts as a teacher, he told me that Fouts fashioned "small, very informal groups of graduate students" and, for Shapiro, "that was really quite energizing to be able to learn in that kind of environment. There was a kind of casualness about the relationship and I think that was perhaps like the way chimpanzees learn, more of a free flow, less of the 'I'm-the-professor' attitude. But he never let you forget that he was the professor, that he was the alpha chimp with regards to his students." Fouts went drinking with his students in the local tavern and invited them into his home to meet his family. Later, Fouts told me, "We still use the family model, but I don't drink any more. In the typical classroom, rather than with the chimpanzee students, I try to maintain a friendly confidence in my non-verbal behaviour. This means my attitude is open to the other person in the accepting sense of the word and that I likewise am not defensive or threatening in my non-verbal behaviour. That is, I am comfortable with myself and accept them as well. They seem to be able to participate more with this approach and absorb more as well."

Shapiro reflects that Fouts "provided a very intimate and flexible atmosphere for his students," with Shapiro's description repeating two of the same key values, intimacy and flexibility, that Fouts cites as crucial in the learning of chimpanzees. Shapiro says that Fouts as a teacher did not behave in "a classic Skinnerian" manner, but in a personal, engaged way, using things that related to the student, "and, from that perspective, it would be more like a chimpanzee would educate her child," Shapiro says. "I think he challenged his students to do their best." And, in all this, Shapiro says, Fouts "accepted me," clearly an important distinction for him as a student. "I still feel very, very warm feelings about the man," Shapiro told me. "I don't always agree with some of his ideas, but I think he is really committed to what he believes in."

With Princess, Shapiro assumed the position of his teacher Fouts and, in that sense, he graduated. As a teacher in the jungle, Shapiro took pride in what his student Princess accomplished. And she has grown into a mature and respected orangutan with a reputation for being sensible, clever, even tempered and a good parent. The last time Shapiro saw Princess in the jungle she still recognized him and showed him her cuts and scars as a child would to a father. He asked her questions in sign language and believes she took pleasure that it was he personally who was asking her the questions.

I think that Shapiro, like many others, is a natural teacher. Most of us don't have to bridge the gap between species in our classrooms like he did in the jungle, but we recognize the same sense of accomplishment in being educators. Shapiro told me that his involvement first with Roger Fouts, then Princess, "had profound significance for me." Princess and he "created this classroom in the jungle and Princess had all the hallmarks of a kid who wasn't that interested in school work and it was a lot of work for me to keep her involved. But I think she picked up a lot. I think it was transferred to other aspects of her behaviour and I think it's something that she remembers. How would she be if she had not had this experience with me? I think she probably would be just another orangutan. I think there was something about going through this at her age that awakened some part of her cognitive ability and extended it beyond the normal orangutan's abilities."

That sounds familiar. It's what we teachers naturally want to feel too.

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