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Interspecies Communication: N'Kisi The Parrot

If animals could really communicate with us, what would they want to say? To find out, I have been working to teach a young parrot to communicate in spoken English. "N'Kisi" (in-KEE-see) is a hand-raised, domestically bred Congo African Gray Parrot who is now one of the most skilled language-using animals. He does not simply mimic, as most parrots are thought to do, but can understand and use language appropriately. N'Kisi was not *trained* to perform behaviors by rote or on demand, like the animals used in entertainment or in laboratory research studies. Instead, he has been *taught* the meaning and purpose of language, and encouraged to express himself, in a nurturing environment of human-animal social relationships. N'Kisi speaks in original sentences, showing an understanding of grammatical rules, and can conjugate verbs to talk about the past, present, and future. He generally initiates comments about whatever is happening in his environment, and has expressed love, compassion, logic, and a sense of humor. N'Kisi's remarkable abilities have provided us with a window into the animal mind, and an opportunity to explore meaningful communication with another intelligent species.

At age 9, N'Kisi has a vocabulary of over 1,200 words, which he can use in context. For comparison, Koko the famous sign-language-using Gorilla learned hand signs for 1000 words by age 29, and Alex the Parrot uses around 250 words after 23 years of teaching. However, the counting methods used by each researcher are different, which must be taken into account. Since N'Kisi may be the first animal known to conjugate verbs and use plurals and other inflections, to document this finding we count all forms of words that are used correctly. Parrots can have a lifespan similar to humans, and N'Kisi's language skills continue to develop. He is learning around 100 new words per year, depending on the amount of teaching. Eventually, animals in language studies have reached a plateau after a certain point, and their language and cognitive skills may never progress beyond a level comparable to that of a human child. Language-using animals are extremely rare; with only a handful of individuals of various species documented in intensive studies around the world, each one is a unique case study, and each can shed light on another aspect of the animal mind.

What is most notable about N'Kisi compared to other language-using animals is that he speaks in sentences, showing a grasp of grammar and syntax in formulating his own novel constructions. N'Kisi has created complex original sentences up to 16 words long. For example, referring to my treatment for a serious illness, N'Kisi said: "Remember, we had the sick, but then we had to go to the doctor, my body." (He often spoke of this as though it affected him too.) While the grammar isn't perfect, and there are some interesting errors, N'Kisi's linguistic skills are clear when we compare this with the longest recorded primate "sentence", from Nim Chimpsky: "Give orange me give eat orange me eat orange give me eat orange give me you." While Nim's ability to communicate his intended meaning is amazing (animals in language studies often use their skills to request favorite foods), this string of repeated words lacks grammatical structure. Due to results like this, many scientists have thought that animals are not capable of using syntax, and this has been considered a definitive aspect of human uniqueness. Indeed, after Jane Goodall's discovery that chimpanzees use tools, language was thought to be the fundamental dividing line between humans and animals. And after animals in interspecies communication studies demonstrated some rudimentary language abilities, syntax has been seen as the new boundary. However, new research is emerging which suggests that some species, such as starlings and parrots, may have some capabilities in this area, too.

Regarding animal language, syntax has been described as the ability to combine known vocabulary words in a potentially infinite number of new phrases, following the laws of grammar. N'Kisi's ability to form novel sentences with appropriate grammatical structure is thus a significant advance. One of our most remarkable conversations occurred when N'Kisi was only about 3 years old, after we had rented a car and taken him for a ride around a beautiful park:

NKisi; "Remember, we went in a car."

Aimee; "Yeah, I remember!"

N'Kisi; "We went for a ride in a car."

Aimee: "Yeah! Did you like it?"

N'Kisi: "I like that--wanna go out in the car."

Aimee: "We can't; we don't have a car now."

N'Kisi: "Wanna go in a car right now."

Aimee: "I'm sorry, we can't right now-- maybe we can go again later."

N'Kisi: "Why can't I go in a car now?"

Aimee: "Because we don't have one."

N'Kisi: "Let's get a car."

Aimee: "No, 'Kisi, we cant get a car now."

N'Kisi: "I want a car!"

Aimee: "I'm sorry, baby, not today."

N'Kisi: "Hurry up, wanna go in a car! Remember? We were in a car!"

What is most striking about this conversation, besides his accurate conjugation of verb tenses, is that N'Kisi seems to have an understanding of time, and can speak about things in the past, present, and future. Animals were not thought to be capable of communicating about anything that was not present or occurring at the time. But N'Kisi often talks about experiences that have made an impression on him, sometimes for months afterward; as well as things that are going to happen, or that he'd like to do.

No other animal has been known to conjugate verbs. However, this may also be due to the type of language used in prior studies. The American (hand) sign language and lexigram (abstract symbol) systems used in studies with primates do not have all of the syntactical elements of spoken language; and other animals including parrots have been taught using a simplified laboratory "pidgin" that excludes most grammatical details.

When composing sentences, N'Kisi sometimes makes the kind of mistakes small children do, like saying "Jane flied in a airplane." Although there is nothing about this in the existing literature on animal communication, linguists who study children's language consider such "generalization errors" for irregular verb tenses to be an important milestone in language acquisition, as they show an understanding and independent application of linguistic rules. N'Kisi has also invented original expressions for new things he does not know the name of, like calling the decongestant aromatherapy oils I was using to help get over a cold "pretty smell medicine." Now when I am getting sick, he will tell me, "Gotta put smell medicine."

These breakthroughs may have been possible because N'Kisi's use of language was not constrained to fit any pre-determined, task-based criteria, as in most laboratory studies. Instead, our project is based on the model of field research, observing and documenting his spontaneous behavior in a more naturalistic way, over the course of a long-term study. Our work together is communication-based, rather than task-based, and no behaviorist training techniques are used, such as treat rewards for the production of desired responses. N'Kisi has never been taught the concept of performing for a reward, and would not understand it. He is allowed to use the tools of language freely, to communicate for his own ends. One drawback of this method, however, compared to the traditional use of rewards, is that N'Kisi does not say anything "on cue." All of his comments are entirely self-generated, and he says what he wants, when he wants to. But the decision to relinquish a framework of control has opened the door for N'Kisi's creativity.

N'Kisi is capable of associating words and pictures with things they represent. When the renowned primatologist Jane Goodall first met N'Kisi, she said "You must be N'Kisi—I've heard a lot about you." He replied immediately, "Got a chimp?" N'Kisi had never said the word "chimp" before; but he had been shown a book with pictures of Jane Goodall with chimpanzees the day before, and was told she was coming to visit him. His sense of humor was also evident when he met another African grey parrot, Endora. The first time N'Kisi saw Endora hanging upside down by her claws from the top of her cage and swinging back and forth to get attention, he remarked, "You gotta put this bird on the camera!" --suggesting a sense of the purpose of filming, to show extraordinary things.

Another time a necklace I was wearing broke, and as I bent to pick up the beads, he said "Oh no, you broke your new necklace." N'Kisi often expresses concern for others; for example, when our parrot Pooka is bothering another bird, N'Kisi will tell him to "Be more gentle." While N'Kisi can be altruistic, he may also be deceptive: after he saw his flock mate Endora getting punished for making an ear splitting whistle, he would make the whistle himself, and then yell "Endora!" Since he often chided other birds for misbehaving, this tricked us into covering her--until we learned to see whose beak the sound was really coming from. Deception is thought to require a "theory of mind," the ability to form a concept of what someone else is thinking.

Sometimes N'Kisi likes to engage in pretend play, and acts out situations with his toys. Once as I was videotaping him, he pretended to put batteries in a toy that needed new ones. He reached around and pecked the place in the back where the batteries go, and then announced, "There— I put a battery." Pretending is another activity that requires an understanding of abstract concepts. I have been documenting N'Kisi's language for over 6 years, and have recorded thousands of his comments, many of which reveal aspects of intelligence and awareness that animals were not thought to be capable of-- especially a species so different from us.

N'Kisi was not taught using the "model-rival" method used with Alex and other parrots, which requires two researchers to act out exercises in object labeling. He was systematically taught much in the same way as a human child. Human mothers instinctively talk to babies in a special way that seems to facilitate learning. Linguists call this simplified, singsong mode of speaking to young children *Motherese*. I adapted some of these techniques, using insights gained from over 15 years of working with parrots. From the moment N'Kisi's teaching began when he was 5 months old, every word he ever heard was used in context. Activities were explained to him in a natural fashion, and he observed and participated in our social interactions. This gave him the opportunity to discern the contextual meaning of words, by observing recurrent patterns.

Two basic teaching methods were used: *sentence frames* and *cognitive mapping*. The first describes objects and activities in a series of sentences, repeating a key word. For example, if I were getting a glass of water, I'd show him and say, "Look, that's my water. Oh boy, yummy water! You want some water?" etc; N'Kisi not only had an opportunity to learn the target word, but was also getting lessons in forming sentences. Cognitive mapping reinforces meanings that may not yet be fully understood. If N'Kisi said the word "water," I would get some water and give him some, or show and describe things that are not appropriate to give him. A key aspect of these methods is repetition. The target word is repeated a few times, in varied sentences, but *only* in reference to what is occurring *at the time*, to enable a conceptual link to be made between word and thing. One unintentional side effect of this method is that N'Kisi's own speech often reflects this same "Motherese" style of repetition.

How is N'Kisi able to learn aspects of a human language? This would suggest that he has the cognitive hardware that would be required to understand the rational scaffolding of language. But why would a non-human animal have evolved this capability? There are several theories that may account for this. One is that animals who have to remember a large number of seasonal food sources across a large territory range-- like trees that fruit at particular times-- must create complex mental maps, and this cognitive function may be similar to the one necessary for language. Another theory is that social animals must keep track of all of the other animals in the group, and the shifting politics of their social hierarchy, and this may require similar cognitive skills. There is also the possibility that animals may have some form of rudimentary language of their own. Researchers have discovered that several species including vervet monkeys, prairie dogs, dolphins, and others have various types of calls that have specific meanings, such as alarm calls for different types of predators, contact calls, and identifying calls unique to individual animals. Parrots have different types of natural calls that seem to serve specific functions, and they also imitate the calls of other species in the wild. African Grey Parrots live in large flocks, with complex social interactions that have yet to be studied. They are considered one of the most intelligent species of birds, with a brain-to-body size ratio comparable to that of higher primates.

Success in teaching a parrot to use language will depend on several factors. The most important is the depth and intensity of the parrot's relationship with the human teacher. Many species of birds form closely bonded relationships with another individual that may be life-long, and this devoted camaraderie can be transferred to a human companion, just as a pet dog will transfer its instinctive pack loyalty to its human family. Teaching a parrot to speak takes a lot of time and patience. Some birds are also more vocally inclined than others. This may have more to do with control of the syrinx, the organ analogous to the human larynx that parrots use to make sounds, than it does with innate intelligence. Just as some people can sing better than others do, control of the syrinx can vary as an individual talent even within the same species, and some parrots have more difficulty reproducing human speech sounds.

It was important that N'Kisi have relationships with other parrots, and learn to communicate with others of his own kind as well. He lives in a mixed species "flock" of humans, other parrots, and reptiles. This has also allowed me to observe the calls and gestures parrots use to communicate with each other, and their interrelational dynamics. N'Kisi's abilities have flourished in this intimate family group, which provides him with social engagement and a sense of security and self-confidence. Due to my background as an artist, I knew that self-confidence is an important pre-requisite for creativity. Hoping to encourage his creativity and help N'Kisi feel more empowered to use language for his own ends, I made the unusual decision to give him "dominance" in our relationship. He is housed with a high perch, so his eye level is higher than anyone else's. In wild flocks dominant parrots compete for the highest position in roosting trees, where they keep watch as sentinels and give warnings to protect the flock. N'Kisi's emotional level seems comparable to a human toddler's, and he is extremely sensitive and shy. Taking into account his social needs, I have worked to establish mutual trust, and engage him in our dialogue as a willing partner. This dialogue is entirely dependent upon our close relationship, which has facilitated and motivated the desire to communicate.

As our closeness grew, one of my most startling discoveries was that sometimes N'Kisi seemed to vocalize unspoken thoughts, and even described images I was looking at in other rooms. To learn more about this curious phenomenon, biologist Rupert Sheldrake and I designed a series of carefully controlled "double blind" tests. The results were highly significant statistically compared to chance, and seemed to support the hypothesis that N'Kisi was indeed able to describe what I was looking at in a distant enclosed room, even though there was no possibility for any cues through normal means. These findings are controversial, and challenge many dominant beliefs and scientific theories. However, experiments in quantum physics have confirmed the existence of "non-local" phenomena, although the mechanism of how widely separated particles can "communicate" instantly regardless of distance has yet to be explained. This may be related to telepathy, or even the "group mind" of synchronously wheeling flocks of birds. Advances in quantum research may open this new frontier for further scientific study.

N'Kisi's abilities continue to advance. He is now learning phonics, and has spelled some simple words, like C-A-T; perhaps someday he may learn to read a little. He is fascinated with the idea of writing, and has even expressed interest in writing a book. He talks about this often; during one videotaping session he said, "I write here, and made book. Let me write book. I wish I could be on a book. I wanna be on a book." I am currently writing a book to share his story.

N'Kisi's accomplishments may help further our understanding of the other minds that share this planet, and our own. We are only beginning to learn about the intelligence of other animals, and yet tragically, many of the most intelligent species, including African grey parrots, are now endangered in the wild. Greys and other threatened species of parrots are still being captured and exported for the pet trade; tens of thousands may die in the process every year. And many people who purchase parrots as pets are unable to deal with a parrot's demanding social needs, causing a growing problem of abandoned parrots, with limited sanctuaries for their long-term care. Hopefully learning about N'Kisi's abilities will help inspire people to protect these intelligent species and their habitats, so their wild societies can survive for future generations. Language-using animals are like animal ambassadors, bridging the worlds of other species with our own. And at the heart of every successful study in interspecies communication, there is an extraordinary human-animal relationship.

Further Resources

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To see N'Kisi on video, see *Jane Goodall's When Animals Talk*, 2005 Discovery/Animal Planet

To hear N'Kisi talk in a teaching session, go to http://www.sheldrake.org/nkisi/nkisi1_text.html