



Talking Chimp to Chimp

Language may be unique to humans, but our closest relatives do a lot of vocalizing, and researchers are trying to figure out what they're yakking about

BUDONGO FOREST RESERVE, UGANDA—As Cathy Crockford wound her way through the dense trees to observe chimpanzees here, she bore more than a little resemblance to a young Jane Goodall. Crockford, who specializes in chimpanzee communication and is based at the University of St. Andrews in the United Kingdom, has Goodall's lanky build and, like Goodall, wore her long, blonde hair pulled back. She is also a native of England and speaks with a purposeful British accent. But Goodall for many months walked around Gombe alone with little more than a notepad, binoculars, and a satchel over her shoulder. Crockford works with her husband, Roman

Wittig, and in addition to their binoculars and hip packs, they each have their own field assistants. They often cover adjacent terrain and communicate using walkie-talkies. They tap in their locations and observations on palm-held electronic devices. And most important, each of them totes a state-of-the-art Marantz digital tape recorder strapped around their neck with a high-end microphone covered by a foam windscreen.

Crockford and Wittig, along with their St. Andrews colleagues Klaus Zuberbühler and Katie Slocombe, are conducting the most intensive studies ever done to try to unravel the meaning of chimpanzee pant-hoots,

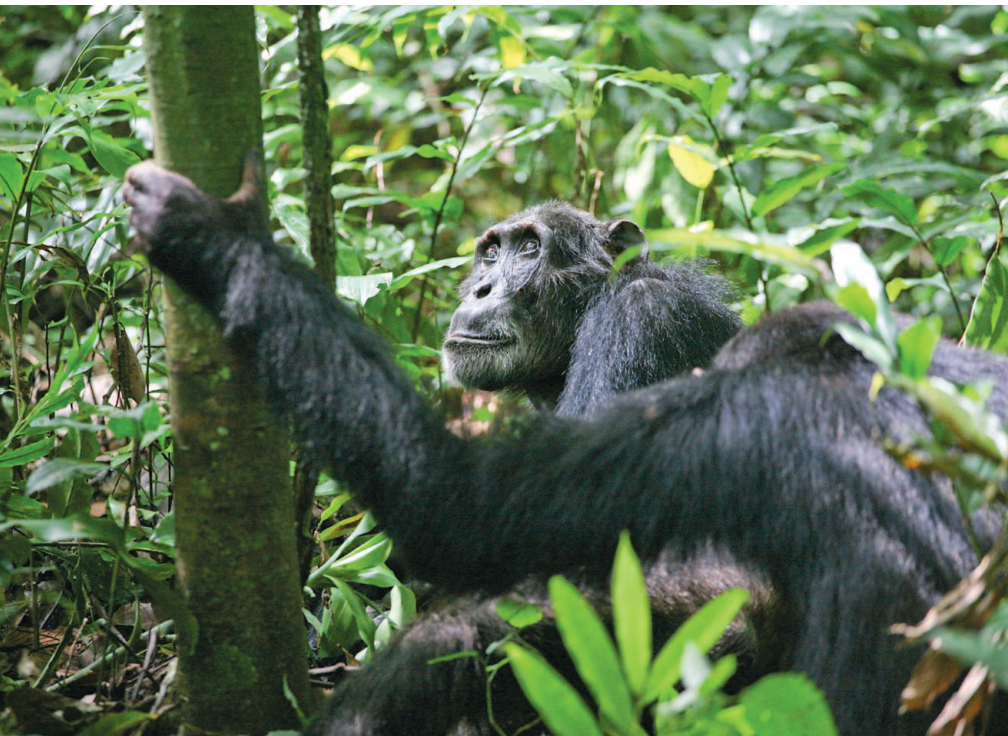
Say what? Cathy Crockford plans to stage playback experiments in which she watches animals' reactions to recordings of different vocalizations.

grunts, screams, and whimpers. Although much work has been done studying communication in wild monkeys and captive chimps, wild chimpanzee vocalizations have received surprisingly little formal analysis. "There's almost everything to still find out about the chimpanzee communicative system," said Vernon Reynolds, an anthropologist emeritus at the University of Oxford in the United Kingdom, who started the Budongo site in 1990. "It's ridiculous that we've done so much work on chimps and have not broken the code of their communication."

Decoding chimpanzee communication has proven much trickier than decoding that of other primate species in part because of their forested habitat. "A lot of communication is exchanged between these parties of chimps that can't even see each other," Crockford explained. "It makes it difficult for us to figure out who is giving this particular call and who is responding. But that's one of the things that we're hoping to get a handle on."

Crockford and Wittig's work builds on chimpanzee studies they did in the Tai National Park with Christophe Boesch while working on their Ph.D.s, including Crockford discovering that different communities there used different pant-hoots and that she could distinguish specific barks tied to specific contexts such as traveling or hunting. They then went on to do postdocs studying baboons in Botswana with Dorothy Cheney and Robert Seyfarth, two pioneers in primate communication based at the University of Pennsylvania. Cheney and Seyfarth, another husband-and-wife team, first received international attention for studies in the 1970s with wild vervet monkeys, which they showed had distinctive alarm calls for snake, eagle, and leopard. Their convincing evidence came from playing recordings of the monkeys' own calls through amplifiers they had hidden around the vervet's habitat in Kenya's Amboseli National Park and carefully documenting how the animals responded. Crockford and Wittig began making recordings of the Budongo chimps in 2008 to conduct similar playback experiments.

Cheney said she and her husband have "great admiration" for Crockford and Wittig's "exciting and imaginative" research. "All work on ape cognition was conducted, and in large part continues to be conducted, on captive animals under conditions that lack ecological validity and typically involve the same individuals tested over and over again in



Listen up. Roman Wittig says chimps in the dense forest often figure out the intentions of others, whether a warning or aggression, based on the vocalizations they hear.

multiple experiments,” Cheney said. “Cathy and Roman are some of the first investigators to attempt to apply the experimental techniques developed by scientists working with monkeys to wild chimpanzees.”

Crockford and Wittig have far more ambitious aims than simply decoding vocalizations that approximate words or capture an emotional state. They want to figure out how chimpanzees navigate their complex social environment. “What do they know about the relationships that others have?” Wittig asked. “Do they know who is friends with whom? Vocalizations in the closed, dense forest are probably the main information they have to understand what intentions others have.”

While Wittig and Crockford followed the Budongo chimps this morning in May 2008, a drama unfolded that they dubbed the Return of Zefa. “It’s like a daily soap opera,” Wittig said. Zefa was the second-ranking male in this community until he disappeared 3 months earlier, leading the researchers to fear that he might have died. But he returned in full force this day, triggering repeated challenges from the new alpha male, Nick, and confrontations with other males that Zefa initiated. Crockford looked up as a racket erupted from the treetops where Zefa was hanging out, took a few steps closer, turned on the recorder, and pointed her microphone toward the piercing noise. “That was pant-grunts and screams coming from where

Nick just drummed,” she said into her mic. Nick apparently had moved on, and Zefa came down from the tree, leading to another outburst from a lower-ranking male, and it sounded as though he was being tortured and screaming for mercy. As the pant-hoots began to fade, they were replaced by a building stream of pant-grunts. “That’s a submissive greeting,” Crockford explained, noting

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—ROMAN WITTIG,
UNIVERSITY OF ST. ANDREWS

that the first vocalization had “graded” into the second.

Wittig believes that the key to making sense of chimp chatter is noticing combinations of calls and other subtleties. “There are little nuances in their vocalizations that may have completely different meaning,” Wittig said. “They might have a little faster increase in the beginning or a higher frequency at the end. What would be great to find out is whether they are meaningful, and not only to the guy who is vocalizing, but to an audience as well.”

Crockford stressed that the pant-hoots, grunts, barks, and screams are not words



but still communicate specific ideas. “These vocalizations are very context-tied, so an individual that is away can probably work out quite a lot of what’s happening if he hears this sort of exchange,” Crockford said. “But I don’t think that necessarily means that it’s symbolic, which it would have to be if this were equivalent to words.”

Crockford and Wittig plan to use the sound catalog of individuals that they’re amassing for playback experiments to analyze the types of complex communications they explored while working with baboons. For example, they found that after a female baboon was attacked, if the victim heard a friendly grunt from one of her attacker’s relatives, it sped reconciliation with the aggressor.

Until now, Wittig said, researchers who study wild chimpanzees have relied mainly on observation, rarely conducting experiments. “I think it’s time to take one step further and try and hypothesize in a clear way and create a playback experiment where chimps can show what their knowledge is about things,” said Wittig. “It’s a big puzzle because we’re not able to go there and ask the chimps direct questions.”

Crockford and Wittig have yet to publish any of their findings from Budongo but expect to soon have a lot to say about an area of chimpanzee research that until now has been remarkably quiet.

—JON COHEN