

AoW 12.14.09

1. Mark your confusion.
2. Show evidence of a close reading on the page.
3. Write a one-page reflection in your WN

## **Boom! Hok! A Monkey Language Is Deciphered**

Source: Nicholas Wade/New York Times, 12.8.09

Boom boom! (I'm here, come to me!)

Krak krak! (Watch out, a leopard!)

Hok hok hok! (Hey, crowned eagle!)

Very good — you have already mastered half the basic vocabulary of the Campbell's monkey, a fellow primate that lives in the forests of the Tai National Park in Ivory Coast. The adult males have six types of call, each with a specific meaning, but they can string two or more calls together into a message with a different meaning.

Having spent months recording the monkeys' calls in response to both natural and artificial stimuli, a group led by Klaus Zuberbühler of the University of St. Andrews in Scotland argues that the Campbell's monkeys have a primitive form of syntax.

This is likely to be a controversial claim because despite extensive efforts to teach chimpanzees language, the subjects showed little or no ability to combine the sounds they learned into a sentence with a larger meaning. Syntax, basic to the structure of language, seemed to be a uniquely human faculty.

Still, species like gibbons and whales make complex vocalizations in which the order of the sounds seems to have some effect on their meaning, though it is hard to say what. Dr. Zuberbühler's team reports deciphering some of the Campbell's monkey's communication system in *The Proceedings of the National Academy of Sciences*.

"Krak" is a call that warns of leopards in the vicinity. The monkeys gave it in response to real leopards and to model leopards or leopard growls broadcast by the researchers. The monkeys can vary the call by adding the suffix "-oo": "krak-oo" seems

to be a general word for predator, but one given in a special context — when monkeys hear but do not see a predator, or when they hear the alarm calls of another species known as the Diana monkey.

The “boom-boom” call invites other monkeys to come toward the male making the sound. Two booms can be combined with a series of “krak-oos,” with a meaning entirely different to that of either of its components. “Boom boom krak-oo krak-oo krak-oo” is the monkey’s version of “Timber!” — it warns of falling trees.

There is yet another variation on this theme, Dr. Zuberbühler’s team reports. Into the “Timber!” call, the Campbell’s monkeys insert a series of up to seven “hok-oo” calls. The combined call indicates the presence of other monkey groups and is heard most often when the monkeys are on the edge of their home range.

The meaning of monkey calls was first worked out with vervet monkeys, which have distinct alarm calls for each of their three main predators: the martial eagle, leopards and snakes. But the vervets did not combine their alarm calls to generate new meanings, unlike human words that can be combined in an infinite number of different sentences.

If the Zuberbühler team’s observations are correct, the Campbell’s monkeys can both vary the meaning of specific calls by adding suffixes and combine calls to generate a different meaning. Their call system, the researchers write, “may be the most complex example of ‘proto-syntax’ in animal communication known to date.”

Dr. Zuberbühler said he planned to play back recordings of given calls to the Campbell’s monkeys and to test from their reactions whether he had correctly decoded their messaging system.