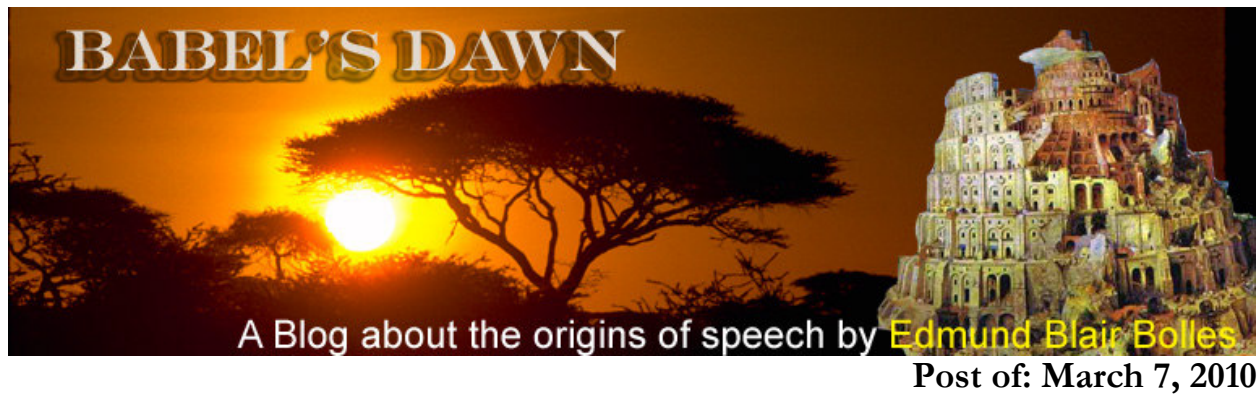


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## Apes Are Shrewd Listeners



A **baboon** can make only a few calls, but its can learn many things by listening shrewdly.

Forget syntax and semantics for a moment; how far did people have to come to master the physical acts of speaking and listening? I had a short post the other day ([here](#)) in which zebra finches appeared to be alert to phonetic categories. I've been wondering how apes fit into this story. A new volume, *Primate Ethology*, includes a chapter by [Robert M. Seyfarth](#) and [Dorothy L. Cheney](#) titled "Primate Vocal Communication" and apparently the whole chapter is available on Google books ([here](#) p. 84). It provides a handy survey of what our primate ancestors brought us before we started to speak.

The authors' first point is that while a primate's capacity to create vocalizations is strictly limited, they have "an almost open-ended ability to learn new sound-meaning pairs" [p. 86]. It has a

plausible ring to it, but what can the ‘meaning’ part of a pair be? Examples, are the ability to associate voice with vocalizer’s social rank, voice with vocalizer’s individual identity, voice with vocalizer’s family, name with individual, command with action, another species’ warning with danger, another species’ call with members of the calling species.

This list suggests that none of the social information that speakers recognize in a voice is special to humans. I think hints about that have appeared before on this blog, but the radical proposition that *NONE of the social information* is special takes a bit of courage and I’m glad to have the authors to lean on. They offer no interpretation of their observations; whether the pairings are associative or dependent on some other process goes unanswered. My only strong objection is to the way they call half the pairing “meaning,” which makes the linkage sound more linguistic than it is.

I could make the same objection to the next observation, that primates can tell the “intentions” of another’s vocalization. It is not clear that primates have intentions when they make their sounds, but otherwise the point is valid. Primates can tell from the social context whether vocalizations are directed toward them or another.

So their perceptual powers are subtle and rich, but “monkeys and apes have a relatively small repertoire of context-specific calls that show relatively little modification in their acoustic properties during development” [87]. This difference is the “paradox” the authors examine. Primate perception is rich enough to deal with very complex vocalizations, but, except for humans primates, produce much less than they can handle.

The standard view of primate vocalization holds that it is reflexive, involuntary, and incapable of suppression. The authors disagree, saying that it is voluntary but sharply constrained.

Even in highly emotional circumstances like encounters with predators, some individuals call at high rates, others call less often and still others remain silent. [88]

That’s interesting, but I would like to know if the same individuals call at the same rates over time. In that case the difference could be attributed to something individual rather than a “decision” (word used by the authors). Other illustrations of flexibility in call behavior include:

- Monkeys can learn through operant conditioning to limit their calls to certain situations.
- Male chimpanzees in three neighboring troops have distinctive, group-specific pant hoots, whereas males in a troop far away sound very similar to all three. (How does that work exactly? The calls of A, B, and C are distinctive, but the calls of D sound like A,B, and C.)
- Chimpanzees can make sounds that “exaggerate the severity of an attack,” but they only do so when the status of another chimp present equal or is higher than the attacker.
- When monkeys were moved from Washington, D.C. to Madison, Wisconsin the calls of the DC monkeys became closer to the sounds of the Madison monkeys.

The authors conclude that “the basic structure of nonhuman vocal signals appears to be innately determined, whereas the fine spectrotemporal features can be modified based on auditory experience and social context” [90]. They go on to make a more radical statement that primate communication systems use a “small repertoire of relatively fixed and inflexible calls, each linked to a particular social context, [that] nonetheless gives rise to an open-ended, highly modifiable, and cognitively rich set of meanings” [90].

Listeners can even “extract” propositions from these calls. However, these propositions are deduced by the listener and not intended by the caller. An example of such a proposition might be

that caller A is going to defend his location more vigorously than caller B, so listener C had better move toward caller B. The callers don't intend that message, but the listeners can hear it in their voices. (Can we call that process *communicating*? Not if you understand communication to be telling somebody something. It sounds more like stepping on a twig and giving your position away.)

This very strong difference between callers and listeners is critical in understanding the knowledge in a primate group. Ever since Darwin people have assumed that ape and monkey knowledge is quite limited because their calls are reflexive and emotional rather than referential. However, the fact that the source of the information is emotionally triggered does not mean that the listener cannot draw logical inferences about the caller and the social situation. The vocalizer is sharply limited in its ability to produce calls, but the listener is not anywhere nearly so strongly constrained in its ability to understand the richness of the situation producing the calls.

The authors go on to speculate about how we developed a vocal system that makes a richer use of our listening capacity. I was surprised that they proposed that developing a "theory of mind" was the key to evolving language. Many scholars suspect that apes do have a theory of mind while others doubt that toddlers need a theory of mind to use their protolanguage. At any rate, the authors' approach to language origins puts them in the generative school that says "long before our ancestors spoke in sentences, they had a language of thought in which they represented the world... in terms of actors, actions, and those who are acted upon."

As often happens when people are in a hurry to tack on an explanation of language origins the authors have replaced one hard problem (origins of speech) with another (origins of a theory of mind), making for a rather anticlimactic paper. But the important part stays with us. Apes and monkeys don't say very much, but they hear plenty

#### Links:

Short post: [http://www.babelsdawn.com/babels\\_dawn/2010/02/normal-perception-is-enough.html](http://www.babelsdawn.com/babels_dawn/2010/02/normal-perception-is-enough.html)

Robert M. Seyfarth: <http://www.med.upenn.edu/ins/faculty/seymarth.htm>

Dorothy L. Cheney: <http://www.med.upenn.edu/ins/faculty/cheney.htm>

Google book access:

<http://books.google.com/books?hl=en&lr=&id=hv28p1tCnnEC&oi=fnd&pg=PT97&dq=%22evolution+of+language%22&ots=f-u4eY4ozT&sig=K3rYy9Y8-0mQAtQFa3714y-NE0I#v=onepage&q=%22evolution%20of%20language%22&f=false>