Talking the Talk

by Katie Neith

When you consider the transformation of modern human beings over the past 250,000 years, it is clear that both biological evolution and human invention have contributed to our ongoing development as a species. The use of complex language is, of course, a key skill that sets us apart from other animals, and one that many scientists believe is primarily a product of natural selection. But Caltech professor Fiona Cowie, who studies evolutionary biology and linguistics through the lens of philosophy, believes that language is a tool that was originally a product of human ingenuity.

"My approach is different from that of almost everyone else who works on the evolution of language, the majority of whom think that language arose initially through mutation and natural selection," she explains. "And you can see how, if language arose in a species, it would be favored by natural selection because it's really useful. But you can only have selection for language once people are using it. So I tend to view language more as

an invention, or technological advance, rather than as if it were some extra limb that grew as a result of selection on genetic mutations."

To support her unconventional theory, Cowie is working to figure out what happened in our lineage after humans split off from the other great apes around seven million years ago. What gives us the capacity for the kinds of language skills we have that others do not?

"I consider myself to be a big-picture philosopher, one who tries to take a whole bunch of information that doesn't seem to make sense or add up, and synthesizes it into a broader view of something," she says.

Her case for language as a human invention rests on the concept of imitation. Early humans were living in groups, more or less just like our closest relatives, the chimps. But while chimps spend a lot of time on their mothers' backs, human infants spend a lot of time face-to-face with their mothers. In addition, human babies have much longer periods of helplessness during which they are literally looking to their parents for aid and information, Cowie says.

"There is evidence that imitation is actually a learned skill," explains Cowie. "Many people have thought that it's inborn, but if it's learned, then those years of face-to-face contact with the mother would be really crucial, because a prolonged period of imitating facial and body expressions in humans would set the ground for the idea of using symbols to represent things, which is one of the fundamental features of language. If you can imitate another individual, then that serves as a way of bringing that person to mind."

For example, if someone has a funny walk, and you do the funny walk, then other people around you will start thinking of the person you are imitating. And that's exactly what a name does: it brings to mind a specific person. So babies who imitate their mothers become adults who can bring their mothers to life in other peoples' minds by using a symbol to represent or name a thing, which is the essence of language.

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But there's more to it. After all, vervet monkeys have certain calls for particular predators, and dolphins have signature whistles that we could equate to names, and surely many other animals communicate. What makes us unique in the animal kingdom is the fact that we are able to go beyond these simple naming tools.

"The ability to introduce new words to name new things is really what distinguishes human language from the symbol systems of other animals," says Cowie. "That is the really critical innovation that we came up with."

Which brings us back to imitation. Once humans learned to imitate each other and perhaps use mimicry to name each other, the new "technology" took off, Cowie believes. People began to deliberately invent new symbols to communicate.

"You can imagine that once they have this idea that they can name things, they will start imitating sounds, like thunder, a hyena's laugh, whatever," she says. "The imitations using sound become more and more and more abstract until they are more like words, which don't imitate anything at all, and a language is born."

Cowie, who grew up and did her undergraduate studies in Australia, first came to Caltech in 1992 after receiving a PhD in philosophy of science from Princeton. At the time, she says, Caltech was not known to be a school with philosophical interests, which put her on the ground floor for helping to build a philosophy of science group.

"Now, for history and philosophy of science, Caltech is a fabulous place to be," she continues. "It's very supportive of whatever research you do. You can do what you like here."

What Cowie has done over the past 20-plus years is explore philosophical ideas about language: how we as individuals learn it, and where we as a species got it. Today, as she works on a new book on the evolution of language, she spends a lot of time taking long drives—it is, she says, her method for synthesizing the information she's gathered into an original argument before sitting down to write, which she calls "the hardest part of my work."

"I have a story in my head, but as I write things down, I need evidence to support every statement," says Cowie. "There are always disagreements in any branch of science, and my research is no different. The writing keeps ballooning out underneath. You want to say one simple thing, but then behind that thing is an entire scientific debate."

"What I like about the picture of language that I've developed—language as a discovery or invention—is that you can then understand it as a massive and transformative cognitive technology, which makes it appropriate for Caltech," says Cowie. "When people say, 'Obviously language had to be a product of mutation and natural selection,' or, 'We're too dumb to figure it out for ourselves,' I compare that to the idea of people 30,000 years in the future looking at the Internet and thinking, 'Oh my gosh, a huge cognitive transformation happened because of the Internet. There must have been some massive evolutionary breakthrough that enabled people to type.' I just don't see evidence that that's the case—now or in the past." ess

Fiona Cowie is a professor of philosophy. In addition to her current book in progress, she is the author of What's Within? Nativism Reconsidered, *which won the Gustave O. Arlt Award in the Humanities in 1999.*