

October 2002 Meeting: Panel Discussion on the "Language Gene"

New Mexicans for Science & Reason heard a Panel Discussion featuring Distinguished Biology Professor Randy Thornhill (UNM), Retired Linguistics Professor Hank Beechhold, and Anthropologist Ted Cloak, on Implications of a New-Found "Language Gene" (re Svante Paabo's and colleagues' research on FOXP2). The October 9th meeting got started with a brief introduction by Dave Thomas. It all begins with an extended family (the KE family), half the members of which exhibit a severe hereditary language disorder. The disorder involves unintelligibility, trouble forming plurals, and more, and even shows up in physical brain scans. From genetic studies of family members, a gene, FOXP2, was found to be the likely culprit of this language disorder. Later, Paabo's team compared FOXP2 of unaffected humans and several other primates, and found that the normal human form of FOXP2 was different from that of chimps and the other apes, and other mammals as well. Earlier this year, FOXP2 was heralded as a "Language Gene" distinguishing man from the apes.

The first panelist, biologist Randy Thornhill of UNM, stressed that neither genes nor environment alone determine the development of traits, but rather the interaction of the two (the Interactionist Perspective). Both environmental determinism and genetic determinism have been tossed on the trash heap, he said. Evidence supports the now accepted Interactionist model, and so one can't consider any given trait as more environmental than genetic, and vice-versa. Language has important social causes, like learning, but it also has physical aspects involving muscles, vocal cords, and so forth. There was no question genes were involved before FOXP2's discovery, Randy said, it's that we didn't know which of the tens of thousands of genes affected language. And many genes are involved. The interesting question is not whether or not language is biological, Randy said; we knew that already! It is not whether evolution did it, but which evolutionary process did it. It could have involved direct selection for the trait or traits, or indirect ("coat-tails") selection. Genetic drift is out as an explanation because language is much too complicated. Language shows design, the hallmark of adaptation. It can be used to communicate, to deceive, or to manipulate. Because language involves multiple adaptations, Randy said, it clearly isn't due to indirect selection. Language is directly selected. We pay attention to it; it has become a Fitness Indicator. Randy mentioned his work on symmetry, and his view that facial and body symmetries are likewise fitness indicators. (This was the topic of our June 1997 meeting, and is reported in the July 1997 NMSR Reports). Thornhill also spoke to NMSR on biology and rape at our May 2000 meeting (June 2000 NMSR Reports).



Biologist Randy Thornhill

Panelist Hank Beechhold, a retired professor of linguistics, spoke about the origin of language. We don't know what form the first language took, he said. Some have speculated it developed from imitating animal sounds ("Bow-Wow Theory"), other sounds (:Ding-Dong Theory"), or perhaps grunts. Language is related to consciousness itself, Hank said, and consciousness itself is related to language. Hank's second point was that "language" is much harder to define than most people think. Communication? Even single-celled creatures communicate with their environment. Is language merely "A means of phonetic communication shared by groups of humans?" What then of writing, or signing? No, speech is simply one medium or channel, not language itself. Therefore, Hank said, language precedes speech, as competence precedes performance. While FOXP2 does affect speech, Hank said, there are undoubtedly many other genes involved. Hank mentioned an African gray parrot studied by Pepperberg, who found the bird able to actually communicate verbally at the level of a young child. It would be foolish to lay all language at the feet of FOXP2, but it's a player. Perhaps it was selected for some property like facial expressions after language and speech had appeared. Hank concluded by mentioning that adult Neanderthals had vocal tracts like those of young infants, and that their ability to articulate speech would have been quite limited. Was this related to Neanderthal extinction? Did Neanderthals have FOXP2? Is FOXP2 related to speech, or to language? (At this point, it was suggested that we might try to get some Neanderthal DNA and check it for FOXP2 differences.)



Linguistics professor Hank Beechhold

The final panelist, anthropologist Ted Cloak, commented that the panel was turning out to be more of a love feast than a hotbed of controversy. Like the other two speakers, Ted said FOXP2 is a language gene, but not the "language gene." Ted described the KE family, and the nature of their language disorders. One problem they have is generalizing about number, gender, or sex. For example, some words are easy to pluralize (dog, dogs), but others have special rules (sheep, sheep, or cow, cattle). The

affected members of the KE family see every pluralization as a "special" case. They have to learn that dogs are the plural of dog, and also, that cats are the plural of cat, and so on for all nouns.

(At this point, someone suggested that people who had trouble with tenses or plurals, or maybe even those who say "nuke-u-lar," might soon be described as "FOXP2 challenged.") Ted discussed how the gene might have been changed by a selective sweep and fixation event, but that this hasn't been proved yet. What would happen if the chimp FOXP2 was somehow injected into a human? It wouldn't necessarily be the same as what happens in the KE family, because their genetic defect is a mutation of the working human gene, and might not be "chimp-like" at all. Of course, we can't put chimp DNA into a human child, so we'll have to figure it out some other way. Ted again emphasized that FOXP2 may be a player, but it's not the only one. Language is not a necessary precursor to culture; it arises as enhancements of culture. One of the first critical human capabilities was fine imitation. Ted's conclusion was that culture most likely preceded language, not the other way around.



NMSR thanks panelists Thornhill, Beechhold, and Cloak for a most interesting discussion.