. . . movements echo speech

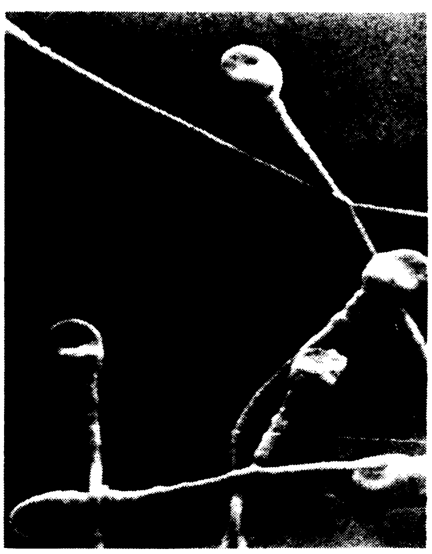
Guy's Hospital Medical School in London discovered in 1972 that X sperm swim slower than do sleeker Y sperm.

Roberts took sperm from a tube of seminal fluid, then poured the sperm back in the tube. He found that Y sperm moved down the tube more rapidly than X sperm did. Since male babies outnumber female babies in the ratio of 106 to 100, Roberts suggested that the difference might be due in part "to preferential progress of the lighter Y sperm through the female reproductive tract."

R. J. Ericsson, C. N. Langevin and M. Nishino of the A. G. Schering Co. in Berlin, Germany, have now built upon the work of Roberts and some other investigators. They have come up with a technique that progressively culls Y sperm from X sperm.

First they collect semen from human volunteers. They then spin sperm out of the seminal fluid and place the sperm in a special solution. The solution is dense and resists sperm swimming in it. So Y sperm are able to swim through the solution faster than X sperm can. As a result, the sperm they collect at the bottom of the solution are mostly Y sperm. They confirm this fact by fluorescence microscopy (sample sperm are stained and viewed under a fluorescence microscope, where Y sperm show up as bright dots). Then they reprocess the solution of Y-rich sperm, and again. Each time the resulting solution is richer in Y sperm. So far they've been able to collect sperm that are up to 85 percent the Y variety. Although they have not tested the sperm for fertility, they assume the sperm are fertile. Rabbit sperm subjected to similar isolation procedures are fertile.

". . . the isolation procedure," Ericsson and his co-workers report in a recent issue of NATURE, "is one that adapts to practical applications." In other words, provided Y sperm collected by this method are healthy and fertile, there is little reason why they could not be injected in the reproductive tracts of women and result in the conception of baby boys. □



A. G. Schering/Nature

Male-making Y sperm is more mobile.

Getting the rhythm of human speech

People talk with their hands. They also talk with their arms, legs, torso and almost every movable part of the body. An elliptical sentence is completed with a wave of the hand. An exclamation point or a question mark is added with a movement of the head. But there are hundreds of micromovements that go unnoticed. These also are important parts of speech. A frame-by-frame analysis of sound films of someone talking reveals these movements and shows that they are highly organized and specifically related to the structure of speech. This interaction of speech and body movement is called "self-synchrony."

People listen with their eyes. They also listen with their hands, arms, legs. . . . A close analysis of a listener reveals micromovements that are not detectable at normal communication speed. The listener, like the speaker, moves to the rhythm of the speech pattern. This is called "interactional synchrony."

Researchers at the Boston University Medical Center have found that infants begin learning these movements—and, therefore, the rhythms of speech—as soon as they are born and possibly in the womb. William S. Condon and Louis W. Sander report in the Jan. 11 SCIENCE experiments performed on infants, some only 12 hours old. Films of these infants showed that the movements of even the youngest correspond to adult speech patterns. It is hard to pick out the relationship, Condon explains, until you examine the films. But he says the total organization of the infant's behavior seems to synchronize with the speech pattern of the adult. The infant seems to be dancing to the rhythm of the articulatory structure of the adult voice. If the child is in motion before the talking starts, its movements lock into the sound. Head, elbows, shoulders, feet, hips and toes all pick up the rhythm.

The children did not respond in this fashion (though they did move) to the sound of disconnected vowels or tapping. They did respond to the Chinese language and to a tape recording of someone talking. It seems, says Condon, that they only synchronize with human speech patterns. The tape experiment showed that the children were not responding to the movement of the speaker and that the speaker was not talking in time to the child's movement.

If the infants are moving in precise, shared rhythm with the organization of the speech structure of the culture, they are participating in and practicing (millions of times) the form and structure of the language they will eventually learn. This, the researchers point out, may help explain how the richness and syntactic complexity of language behavior are learned.

Condon believes there may also be other implications. His work with autistic children, for instance, seems to indicate that they hear things twice and, therefore, react twice. Other children may react slowly or not at all. Eventually, he and his colleagues hope to be able to analyze an infant's movements in relation to speech and detect brain damage or developmental problems much earlier than is now possible. □