

From manual gesture to speech

Michael C. Corballis
Department of Psychology
University of Auckland

I will present the view that language is better understood as a gestural system than as an acoustically-based one. The lack of any acoustic invariants underlying the perception of phonemes has led to the so-called “motor theory of speech perception,” in which speech is regarded as comprised of gestures, and speech perception as recovery of the gestures that produce speech rather than as the analysis of speech sounds. This view is supported by the discovery in primates of so-called “mirror neurons” in the homologue of the speech-production area (Broca’s area) in humans. Mirror neurons map the perception of gestures onto the production of those gestures. This work leads naturally to the view that language began as a system of manual gestures, progressively incorporating movements of the face, and eventually of the vocal tract, with the addition of voicing to make the system accessible to sound production. This argument is supported by studies of the manual and facial gestures that accompany speech, and of the sign languages of the deaf. Language itself probably evolved as a grammatical but still largely manual system during the Pleistocene from around 2 million years ago, but genetic and other evidence suggests that the final transition to autonomous speech occurred only with the emergence of our own species, *Homo sapiens*, within the past 200,000 years. Once speech became largely autonomous, the hands were freed for the advancement of manufacture, and the development of material culture. Communication could occur at night, or otherwise without visual contact. Equipped with these advantages, modern humans radiated from Africa some 60,000 years ago, creating what has been termed a “human revolution” in Europe, and leading to the eventual extinction of other hominin species, including *Homo erectus* in Asia and the Neanderthals in Europe.