The Sense of Touch Can Help Hearing

NEW HAVEN — A recent study by two researchers, one of whom is a senior scientist at Haskins Laboratories -- a Yale University affiliated research laboratory in New Haven, Connecticut – shows that visual information from a speaker’s face can enhance or interfere with accurate auditory perception. By means of an innovative experiment they have shown that people’s perception of speech sounds can be influenced by their sense of touch. This is strong evidence that people integrate information from different senses (hearing and touch) during speech perception and is the first time this has been conclusively demonstrated for the tactile modality.

Drawing on the observation that some speech sounds produce tiny bursts of aspiration (such as English ‘p’), Bryan Gick and Donald Derrick applied slight, inaudible air puffs on participants’ skin at one of two locations: the right hand or the neck. Syllables heard simultaneously with cutaneous air puffs were more likely to be heard as aspirated (for example, causing participants to mishear ‘b’ as ‘p’). These results demonstrate that perceivers integrate event-relevant information across auditory and tactile modalities in much the same way as has been previously observed in auditory-visual coupling. These results complement recent work showing the involvement of the somatosensory system in speech perception, suggesting that the neural processing of speech is more broadly multimodal than previously believed.

Details of this study are reported in an article titled “Aero-tactile integration in speech perception” by Bryan Gick and Donald Derrick in the November 26, 2009 issue of Nature magazine (www.nature.com). Bryan Gick is a senior scientist at Haskins Laboratories. Both scientists are also affiliated with the University of British Columbia in Vancouver, Canada, where Gick is an Associate Professor in the Department of Linguistics and Derrick is a Ph.D. candidate in the same department.

Haskins Laboratories was founded in 1935 by the late Dr. Caryl P. Haskins. This independent research institute has been in New Haven, Connecticut since 1970 when it formalized affiliations with Yale University and the University of Connecticut. The Laboratories’ primary research focus is on the science of the spoken and written word.