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Sounding tall: Listeners can distinguish the voices of tall versus short people

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Our voice can reveal a lot about us: our age, our gender, and now – it seems – our height as well. A new study by researchers at Washington University, UCLA, and Indiana University found that listeners can accurately determine the relative heights of speakers just by listening to them talk. The key clue may be contained in a particular type of sound produced in the lower airways of the lungs, known as a subglottal resonance.

John Morton, a psychologist at Washington University in St. Louis, will present the study at the 166th meeting of the Acoustical Society of America, to be held Dec. 2-6 in San Francisco, Calif.

"The best way to think about subglottal resonances is to imagine blowing into a glass bottle partially full with liquid: the less liquid in the bottle, the lower the sound," Morton explained. The frequency of the subglottal resonance differs depending on the height of the person generating it, with resonances becoming progressively lower as height increases.

"In humans, the resonances are part of a larger group of sounds, which are sort of like an orchestra playing over the sound being made from the glass bottle. [The glass bottle] sound is still there, but it isn't easy to hear."

Despite the masking of the subglottal resonance by other voice sounds, Morton and his colleagues wondered if the key information it contained could still be heard by listeners.

Through two sets of experiments, he and his colleagues put the theory to the test. In the first, pairs of same-sexed "talkers" of different heights were recorded as they read identical sentences. Later, the recordings were played to listeners who guessed which of the two speakers was the tallest. In the second experiment, listeners ranked five talkers (again of the same gender) from tallest to shortest, after hearing them read.

The researchers found that participants were able to accurately discriminate the taller speaker 62.17 percent of the time, which is significantly more often than they would by chance alone. "Both males and females were equally able to discriminate and rank the heights of talkers" of both genders, Morton said.

The research, Morton says, has criminal justice implications. "One would certainly like to know if, when an 'ear witness,' as they are often called, says that a talker's voice seemed 'tall' or 'large,' this information can be trusted. The answer seems to be yes."

More information: Poster 2pSCb14, "Acoustic features mediating height estimation from human speech," will be featured on Tuesday, Dec. 3, 2013, at 1 p.m. PST. The abstract describing this work can be found here: asa2013.abstractcentral.com/planner.jsp

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