

Scientists make strides explaining how we discern language

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Perhaps you have been thinking of taking a foreign language course and are undecided whether to take an evening or morning class. Adding to your indecision: You are concerned about your ability to understand

someone speaking another language.

Research provides partial guidance. In her April *Physics Today* feature, "From Sound to Meaning," University of Connecticut cognitive scientist Emily Myers recounts her group's discovery that people retain what they've learned in a language class better if they go to bed before they get the chance hear a lot of their own [language](#) during the rest of the day. Evening classes are better.

That and other findings draw on big strides in a cross-disciplinary effort that is currently advancing understanding of how people derive meaning from sounds.

Myers starts off by explaining phonemes, the "abstract units of perception and production that, when swapped, produce a change in the word." Phonemes vary across cultures. For example, for an English speaker, the "r" and "l" are heard as distinct phonemes. In contrast, the Japanese do not have distinct "r" and "l" phonemes. To a Japanese listener, "play" and "pray" sound the same.

Myers is not only talking about linguistics here: Physics is important too for turning vocalizations into understanding. For example, differences in voice onset time (VOT), the speed with which a sound is vocalized, bear on how the [sound](#) is interpreted. She describes how the human mind becomes adept at working with these and other variables so that speakers and their listeners can enter a community of understanding. It is a distinctly biological ability (at least for now), an observation that Myers supports by illustrating how Siri or Alexa speech-recognition interfaces go awry when they try to interpret rapid speech.

Yet, the human system for producing and understanding speech is not terribly resilient. Myers describes how we develop a communicative ability through "perceptual narrowing," which may lead to skill and

perceptiveness for the inevitable situations where communication occurs amidst interference. What follows perceptual narrowing is "perceptual entrenchment," also an inevitability. One not-so-fortunate byproduct is adults' difficulties with new languages or unfamiliar accents.

So, if you are puzzled why Siri sometimes misunderstands you or why children learn languages better than adults do, turn to Myers's article. It's freely available on Physics Today's website, and can be accessed directly here:

More information: Emily B. Myers. From sound to meaning, *Physics Today* (2017). [DOI: 10.1063/PT.3.3523](https://doi.org/10.1063/PT.3.3523)

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