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HOW DO ADULTS AND INFANTS ADAPT TO ACCENTED SPEECH?

People typically think of phonemes as being constant and uniform: Everyone knows what sound the letter *f* makes. But, in fact, there is a great deal of acoustic variability in speech sounds caused by, for example, differences in vocal tract size. Adults are remarkably good at accommodating such variability, relying on context to resolve ambiguous phonemes. For example, an ambiguous sound between /s/ and /f/ presented in the context *gira[f/s]* is interpreted as /f/ because *gira[f]* is a word but *gira[s]* is not. Learning to disambiguate phonemes using context influences later categorization of ambiguous phonemes, a phenomenon known as *phonetic retuning*.



Hearing a foreign-accented speaker read a familiar book helps infants recognize foreign-accented speech. Photo: Kraig Scarbinsky/Digital Vision/Thinkstock.

[Reinisch and Holt \(2013, JEP:HPP\)](#), by embedding ambiguous phonemes in a global foreign accent, investigated whether phonetic retuning could explain how adults learn to understand foreign-accented speech. In the exposure phase, American English-speaking participants listened to a Dutch female say English words and nonwords. For 40 critical words, the final /f/ was replaced with an ambiguous sound between /f/ and /s/, although only an /f/ would create a valid English word (e.g., belief). Thus, the word context could be used to disambiguate the final sound. In the test phase, participants heard the Dutch speaker from the exposure phase, another Dutch female, and a Dutch male say English words that ended with the ambiguous sound and were asked to decide whether the words ended in an /f/ or /s/. Critically, test words could validly end in either /f/ or /s/ (e.g., elf or else). Consistent with phonetic retuning, participants who heard words that ended in /f/ during the exposure phase

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were more likely to judge ambiguous sounds as /f/ in the test phase. This retuning generalized to the other female speaker, but it generalized to the male speaker only when his range of speech sounds was sampled to be equated with that of the female speaker. These results suggest that listeners use phonetic retuning to adapt to foreign-accented speech and that generalization is not speaker specific but rather depends on the similarity of the perceptual space across speakers.

Infants are less able to adjust to foreign accents. [Van Heugten and Johnson \(2013, JEP:G\)](#) replicated previous work and showed that 15-month-old Canadian English infants were unable to recognize familiar words produced by an Australian speaker. In subsequent experiments, the infants heard the Australian speaker read a story prior to the test phase in which single words were produced. Despite the fact that the test words were not included in the story, this brief exposure facilitated recognition of Australian-accented words. However, this was only the case when parents read the story to their infants at home for several weeks prior to the experiment. In other words, the benefit of exposure to the Australian speaker was effective only when infants were familiar with the exposure materials, suggesting that infants were using lexical feedback to provide context for disambiguating new phoneme pronunciations.

Together, these findings reveal that infants and adults rely on similar processes to adapt to and ultimately understand foreign-accented speech: Lexical knowledge is used to provide a context for disambiguating new phonemic sounds, which can then be used to scaffold later phoneme perception.

Other interesting reading: Alertness impairs performance in interference paradigms because it reduces stimulus encoding time, and cognitive control takes time to develop ([Nieuwenhuis & de Kleijn, 2013, JEP:HPP](#)). Glucose administration facilitates performance in interference paradigms, particularly on trials where interfering information must be ignored (i.e., incongruent trials; [Brandt et al., 2013, BehavNeuro](#)).

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