

The Effects of Accented Speech on Knowledge Acquisition

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Research on perception of accented speech has found both that listeners readily adapt to speech spoken in an unfamiliar accent (Bradlow & Bent, 2008), but that they also process this speech differently (Hanulikova, Alphen, van Goch, & Weber, 2012). Thus, even though there is some accent adaptation, listeners may still find unfamiliar accents challenging to comprehend. We investigated whether accented speech impairs understanding and retention of spoken input. 58 native American English speakers and 55 native Mandarin Chinese speakers listened to 10 classroom-style spoken passages (1-2 min each) about animal behavior (Figure 1). After each passage, participants answered 6 multiple-choice questions with 4 choices (chance performance is 25%). The passages were recorded in English by two speakers, one a native American English speaker and the other native speaker of Mandarin Chinese who had a detectable Mandarin accent. The speech was controlled for grammatical errors, disfluencies, and sound quality. Participants heard the half the passages in each accent, alternating between American and Mandarin accents, with passage accent and order counterbalanced across subjects. A mixed effects logistic regression analysis on question answering accuracy showed significant effects ($p < 0.05$) for both Listener Native Language and Spoken Passage Accent (Fig. 2). Overall, native American listeners were more accurate than native Mandarin listeners and all participants were more accurate on American than Mandarin accented passages. While numerically it is true that the accuracy difference between questions about American and Mandarin accented passages is smaller for Mandarin listeners than American listeners, this interaction did not reach significance. Our results suggest that speech with less familiar accents may impair knowledge acquisition, even for listeners who speak with that accent themselves. We will discuss implications for accent adaptation research.

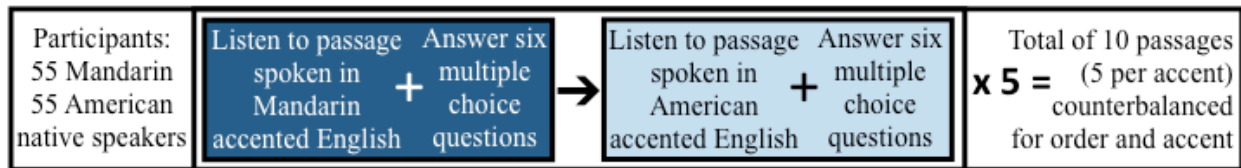


Figure 1. Overview of experimental design.

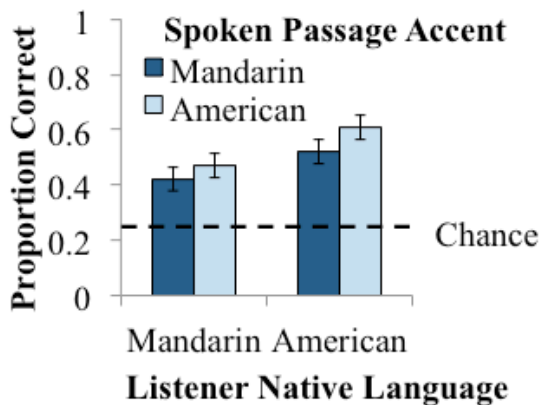


Figure 2. Average proportion of questions answered correctly in all conditions. Error bars represent Standard Errors.

References:

- Bradlow, A. R., Bent, T. (2008) Perceptual adaptation to non-native speech. *Cognition* 106. 707-729.
 Hanulikova, A., van Alphen, P.M., van Goch, M.M., & Weber, A. (2012). When one person's mistake is another's standard usage: The effect of foreign accent on syntactic processing. *Journal of Cognitive Neuroscience*, 24, 878-887.

Immediate feedback is critical for learning from your own productions

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While producing language is helpful for language learning (Hopman & MacDonald, in press), the role of feedback in learning from your own productions is unclear. Research on non-language materials suggests that feedback is particularly useful when provided immediately after participants produce their responses (Kang, McDermott & Roediger, 2007). To test the role of feedback in how people learn from their language productions, we ran an experiment in which participants ($n = 88$) learned names for novel ‘alien’ creatures. Participants received passive exposure to the aliens and their names in three rounds of cross-situational word learning trials. They also completed one production learning trial for each alien, in which they had to type the name. Each production trial was followed by a feedback trial in which an alien and its name were presented together. For the 44 participants in the *immediate feedback condition*, this was the alien from the production trial immediately preceding it (Fig. 1). For the 44 participants in the *asynchronous feedback condition*, the feedback trials were randomly scrambled, meaning that the disambiguating feedback trial provided the name of a different alien than the one participants had just attempted to produce. After learning, participants were tested in a three-alternative forced choice task for each name. In a generalized linear mixed effects model predicting test accuracy, we found a significant interaction between the Levenshtein distance of the production attempt – a measure of how close the word produced was to the correct word - and feedback condition (Fig. 2). In the asynchronous feedback condition, the accuracy of the production attempt is predictive of performance at test, whereas in the immediate feedback condition, test accuracy is uniformly high, even for words participants struggled to produce. Our results suggest that receiving immediate feedback when attempting to produce novel language supports successful learning.

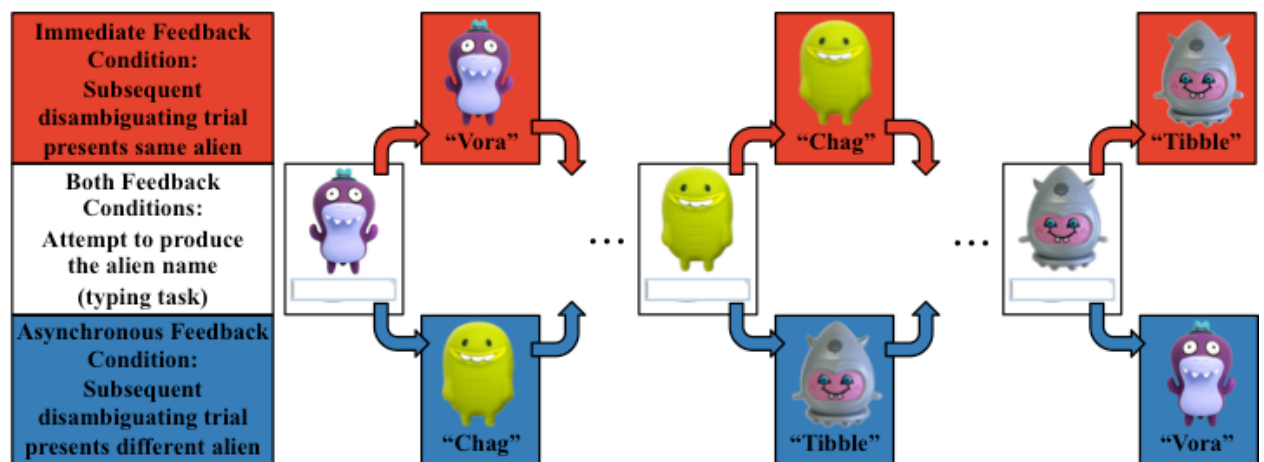


Fig. 1. Experimental design.

References

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- Kang, S.H.K., McDermott, K.B., & Roediger III, H.L. (2007). Test format and corrective feedback modify the effect of testing on long-term retention. *European Journal of Cognitive Psychology*, 19 (4/5), 528-558.

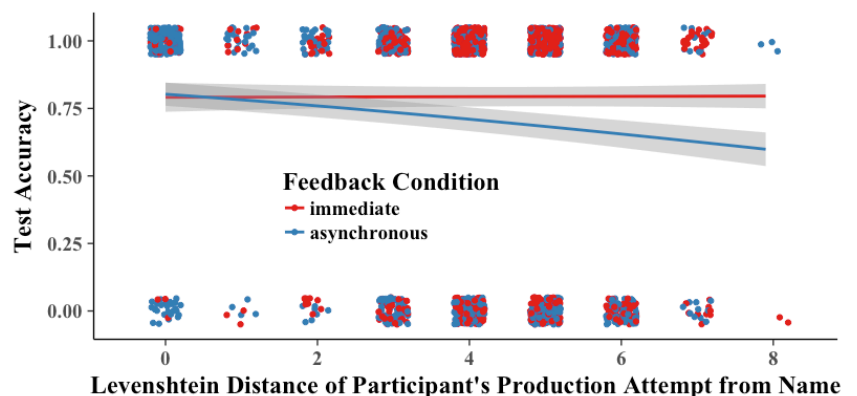


Fig. 2. Model predictions for accuracy on test item as a function of feedback condition and Levenshtein distance of production attempt on that item during training. Error margin represents standard error.