Hearing through regional accent variation:
The role of perceptual assimilation in L1 and L2 listening

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Unfamiliar regional accents disrupt spoken word recognition by L2 and L1 learners and L1 adults, and confuse ASR and smart systems. Little is known, however, about which aspects of non-native accents hinder word recognition, or what processes are involved. In a series of four eye-tracking experiments, we used a modified version of the Visual World paradigm to assess how accent differences influence the time course of word recognition. We selected our accent differences to fall into two broad categories. Category Shifting (CS) accent differences describe those that are likely to be perceived as different phonological categories across accents, such as the initial sound in Cockney-accented *thieves*, which is often heard by Australian listeners as [f]. Category Goodness (CG) accent differences describe differences that are likely to be perceived as deviant pronunciations of the same phonological categories. For example, initial /t/, as in *tiny,* has a fricative-like release in Cockney. It is unlikely to be perceived as anything but /t/ to Australian listeners but may be recognized as a deviant or marked pronunciation. Two groups of listeners, those with Australian English as their L1 and those with Mandarin Chinese as L1 (L2 learners of Australian English), heard words spoken in Australian English (AusE), a familiar accent, and two unfamiliar accents, Cockney-accented English (CknE) and Jamaican Mesolect-accented English (JaME). These unfamiliar accents were chosen because they include both CS and CG differences. The accent differences between JaME and AusE are primarily in the vowel system. The differences between CknE and AusE are primarily in the consonant system. While listening to words over a loudspeaker, listeners selected from among four printed choice words on the computer monitor: the target word, competitors that differ at the start of the word (onset competitors), competitors that differ at the end of word (offset competitors), an unrelated distracter, and a "not there" option located in the centre of the screen. We analysed fixation proportions to onset and offset competitors.

For Australian listeners, word recognition was slower for unfamiliar accents. Both competitor types (onset and offset) were considered more often (greater proportion of fixations) for unfamiliar accents, JaME and CknE, than for familiar AusE pronunciations. These effects were stronger for CS than for CG differences. We conclude that, for L1 listeners: 1) perceptual assimilation plays a key role in cross-accent word recognition; 2) lexical competition involves not only onsets but also later aspects of words; 3) vowel and consonant variations affect lexical competition similarly.

For the Chinese listeners, the effect of accent familiarity and assimilation type patterned with the Aussie listeners. Fixations to competitors increased for both unfamiliar accents relative to AusE, and this increase was greater for CS accent differences than for CG differences. This indicates that the Chinese learners have obtained similar tolerance to phonological variation as the Aussie listeners. However, there was a difference between listener groups in how offset competitors influenced fixation patterns. For Chinese listeners, the effects of accent and assimilation type (CS vs. CG) showed up only in looks to onset competitors when hearing CknE words. Thus, while our L2 listeners have achieved English-like categories for vowels and for word-initial consonants, they pay less attention to consonant information at the ends of words than do L1 listeners, a pattern that suggests an influence from L1-Chinese phonotactic constraints.