PSYCHOLOGY OF LANGUAGE LEARNING

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This column is intended to promote a dialogue for teachers of Slavic languages regarding the psychological aspect of language learning.

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Why is it so hard to understand a second language in noise?

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No user of a second language (L2) needs to be told that L2 listening becomes disproportionately difficult under noisy conditions. We are all familiar with the experience. Sitting in a noisy bar among a group talking in one's native language (L1) may be a bit difficult, but it is certainly doable, in fact it is usually fun. Sitting in the same noisy environment with a group talking in one's L2 is quite a different experience - hard, frustrating, eventually exhausting.

Even though no L2 user needs to be convinced that this phenomenon is real, every 10 years or so science demonstrates it in the laboratory anyway (Gat & Keith, 1978; Nabelek & Donahue, 1984; Mayo, Florentine & Buus, 1997). But just why is L2 listening in noise so hard?

One possibility is breakdown of phoneme perception. We know that L2 listeners misperceive speech sounds (see Strange, 1995, for reviews); the difficulty of English r/l for Chinese and Japanese listeners, for instance, is legendary. Perhaps higher-quality acoustic input allows L2 listeners to achieve phoneme discriminations which are impossible when the quality of the acoustic input is poor; several researchers have suggested that this is the explanation.

The previous studies did not allow a test of this explanation, because in all of them the speech materials were real words in real sentences. Thus noise could have affected not phoneme perception but word recognition and syntactic processing. One of those studies even provided a hint that sentence-level processing might indeed be an important component; Mayo et al. (1997) found that the biggest effects of noise on L2 versus L1 listening occurred with sentences which were highly predictable. This suggests that the L2 listeners were not exploiting predictability as efficiently as the native listeners.

Cutler, Weber, Smits and Cooper (2004) tested the phonetic explanation. They constructed syllables, consisting of a vowel plus consonant (e.g. uf, ig) or a consonant plus vowel (e.g. foo, ga) – all 645 such possible syllables using all the phonemes of American English. Each syllable was presented once for vowel identification and once for consonant identification, in each of three levels of noise – very mild (16 dB signal to noise ratio), moderate (8 dB) and fairly severe (0 dB) – to American listeners and L2 listeners (Dutch, with very good English).

The results were very clear. The noise affected the phoneme identification of the L2 listeners; their performance dropped from 68% under mild noise to 62% under moderate and 50% correct under severe noise. However, it also affected the performance of the L1 listeners: they dropped from 81% to 76% to 63%. The L2 listeners in fact performed at about 80% of native performance at every noise level, i.e. the effect of noise on the L2 listeners' identifications was not disproportionate.

In other words, noise affects the phoneme identification performance of native and non-native listeners rather equivalently. Thus the especial difficulty of listening to the L2 in noise is not because phonetic processing is more disrupted for L2 than for L1 listeners, but because we cannot recover from these effects as well in our L2. In the native language, we make effective use of contextual redundancy, our knowledge of likely transitional probabilities, our large vocabulary, our greater syntactic flexibility; all this extra knowledge helps us to recover from the effects of noise on phoneme identification. L2 listening does not have the resources to support such recovery.

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