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Fundamental Frequency (F0) Variability in L2 Vocabulary Learning and L1 Word Identification

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This is a psycholinguistic study investigating the effects of variability in fundamental frequency (F0) on second language (L2) vocabulary learning and first language (L1) spoken word identification, specifically for native Mandarin speakers. F0 is an acoustic property of speech that roughly equates to pitch. Previous research has shown that acoustic variability improves L2 vocabulary learning and hinders L1 word identification when it is phonetically relevant to the listener but has null effects when it is phonetically irrelevant. F0 is phonetically irrelevant to native English speakers because pitch does not change meaning in English. However, we predict F0 is phonetically relevant for native Mandarin speakers because Mandarin is a tone language; therefore, we expect to see significant effects of F0 variability on L2 vocabulary learning and L1 word identification. We will ask native Mandarin-speaking participants to learn 24 Russian concrete nouns by listening to the spoken words and looking at pictures of the referents (L2 vocabulary learning). Next, we will ask them to identify 150 disyllabic Mandarin words in noise (L1 word identification). The F0 of each of the pre-recorded stimuli (i.e., Russian or Mandarin words) was digitally altered by ±10%, ±20%, and ±30%. In low variability conditions, all stimuli within a group are presented at the same F0 level; in moderate variability conditions, three different F0 levels are present; and in high variability conditions, all six different F0 levels are present. We predict that higher F0 variability will improve L2 vocabulary learning but hinder L1 word identification. The results of the study could have implications for foreign language instruction for native Mandarin speakers and for understanding how native language background affects speech perception.