The role of the lexicon in the perception of different Japanese sound categories by L2 learners

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The Speech Learning Model (SLM [1]) and the Perception Assimilation Model (PAM, [2]) argue that sound contrasts present in one’s L1 influence on the perception of L2 sounds. Previous research has shown that pitch accent contrasts are particularly difficult for L2 learners of Japanese to acquire with respect to other segmental contrasts [3]. Moreover, most of previous research on the perception of L2 sounds have focused on whether L2 learners are able to distinguish different sound categories among themselves [1, 2, 3]. However, [4] has shown that although Spanish-Catalan bilinguals are able to perceive the differences between /ɛ/ and /e/ they find it difficult to assign meaning to /ɛ/-/e/ minimal pairs. Similar results were found for native speakers of Japanese when perceiving English /r/ and /l/ [5]. In other words, although L2 learners are able to perceive two different sound categories that does not mean that they are able to access them in their mental lexicon. Based on that, this study investigates the perception of three different types of contrast by L2 learners native speakers of American English: pitch accent contrast (e.g. [áme] ‘candy’ vs. [amé] ‘rain’), voiceless vs. voiced stops (e.g. [kakko:] ‘outfit’ vs. [gakko:] ‘school’), and long vs. short vowels (e.g. [biru:] ‘building’ vs. [biru:] ‘beer’). This study takes previous research further by considering both segments and supra-segmentals and also by considering the role of the lexicon in the perception of L2 sound categories. The following research questions are explored: (1) is it more difficult for L2 learners to hear the differences between segmental categories vs. supra-segmental categories; (2) are L2 learners able to access different phonological categories in their mental lexicon? Considering previous research [3], it can be hypothesized that supra-segmental contrasts will be more difficult to be perceived than segmental ones. Moreover, it is hypothesized that although participants might be able to distinguish the different sound categories, it might be more difficult for than to assign meaning to them. [4, 5]

An ABX task and a lexical assignment task were performed. In the lexical task, participants were asked to choose one of two options showing the meaning of the word in English. Seven advanced L2 learners and six native speakers (NS) were recruited. A total of 60 words (ten minimal pairs for each type of contrast) were recorded by a NS. The ABX had 120 tokens (60 items * 4 orders) and the lexical task had 60. For both tasks, linear mixed effects regressions were performed on accuracy and reaction times. In the ABX, L1 and L2 speakers performed at ceiling in the three contrasts. However, in the lexical task, whereas for NS accuracy in all three contrast was also at ceiling, L2 speakers’ accuracy was much lower for vowel length (76%) and for accentual contrasts, in which they performed at chance (51%). Generally, L2 speakers had longer reaction times in the lexical decision task, especially for accent contrasts.

Results showed that L2 learners can discriminate tokens based on the three L2 phonological features tested. However, it is more difficult for them to identify members of minimal pairs differing in vowel length and especially accent. The results of this study indicate that SLM and PAM should should consider not only whether L2 learners are able to perceive different L2 categories, but also whether they can access them in their mental lexicon. In order to explore the second research question further, a follow-up experiment is being conducted. In the ABX task of the first experiment, the token X was exactly the same token as A or B. In this second one, a voice of another NS was also employed in X. Although results are still pending, it expected that L2 learners will not perform at ceiling in the ABX of the follow-up experiment, since it requires them to assign a sound category to a different voice, and consequently access their mental lexical for that specific sound category.