L1 influence on the perception of consonantal and vocalic length contrasts
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Phonemic length contrasts, which are signaled mostly by durational cues, are quite common in the segmental inventories of the world’s languages. In phonological theory, they are encoded by means of one or two timing slots. The current study aimed at testing (a) whether listeners can redeploy an existing phonemic length distinction in their L1 to a new class of sounds in an L2 (e.g. from vowel length contrast in L1 to consonantal length contrast in L2 and vice versa) and (b) whether there is a correlation with level of proficiency in the L2 (Hayes-Harb & Masuda 2008).

Previous research has shown that vocalic length contrasts in the L1 aid perception of this contrast in L2 (Hisagi et al. 2010). In cases without vocalic length contrasts in the L1, however, the literature is inconclusive: On the one hand, such contrasts have been found to be problematic (e.g., McAllister et al. 2002, Nenonen et al. 2003); on the other hand, vowel length distinctions in L2 perception are argued to be accessible independently of their existence in the L1 (Bohn 1995; Cebrian 2006). For consonantal length contrasts, there have also been mixed findings. While the absence of phonemic consonant length in the L1 yields poorer discriminability of this kind of contrast (Pohl & Grijzenhout 2010), Kingston et al. (2009) indicate little influence of L1 durational properties on L2 consonant length discrimination.

In our study, three listener groups performed a speeded same-different task (inter-stimulus interval 1600 ms) involving vocalic and consonantal length contrasts as well as segmental contrasts: 14 native Italians, 11 native Germans with no knowledge of Italian, and 10 advanced German learners of Italian. Italian, but not German, distinguishes between singleton and geminate consonants (Esposito & Di Benedetto 1999) while German, but not Italian, distinguishes between phonemically short and long vowels (Hall 2000). CVC and VCV nonce words, differing in vowel quality (/a/,/e/) and in consonant quality (/t/,/b/,/m/,/n/,/f/,/s/) as well as in the respective duration of the medial element, were recorded by a German-Italian bilingual (average durational ratio was 1.8). In VC(V) nonce words, the initial vowel was of constant, ambiguous length so that listeners could only rely on consonantal cues.

Analysis of responses showed no effect of language group or trial type (same/different) in the segmental contrast condition or in the vocalic length condition (both over 85% correct). The consonantal length condition yielded an interaction between language and trial type: in ‘different’ trials, the hit rate improved significantly (p<0.05) from German monolinguals (14%) to learners (37%) to Italian natives (75%). In ‘same’ trials, learners (87% correct) were significantly worse (p<0.05) than both monolingual groups (94% average). In addition, all three groups’ reaction times (RTs) for consonantal length contrasts were significantly longer (50 ms on average, p<0.05) than RTs for vocalic length contrasts or for segmental contrasts.

Apparently, having vowel length contrasts in the L1 does not guarantee successful discrimination of consonantal length, while vocalic length appears to be more salient and is perceived even when this contrast is not phonemic in the native language (confirming Bohn 1995). In our case, however, either experience with allophonic vowel duration differences or the existence of contrastive consonant duration could have influenced Italians’ vowel length discrimination scores positively.

In conclusion, similar durational ratios yielded differential rates of discriminability for vowels and for consonants; therefore the association of a certain type of segments with multiple timing slots in the L1 cannot simply be transferred to another type in an L2. More specifically, L1 vocalic length contrasts could not automatically be transferred to an L2 consonantal length contrast (but are learnable), while transfer from consonantal to vocalic length seems to be possible. Furthermore, consonantal length contrasts require more complex processing than vocal length contrasts. Finally, increased exposure to novel L2 contrasts may lead to overdifferentiation in learner interlanguage systems.
References