Vowel perception and production in Turkish children acquiring L2 German

First language (L1) categories strongly influence adult learners’ perception and production of second language (L2) categories. This L1 influence is assumed to be substantially reduced (or at least more variable [1, 2, 3, 4]) for early learners whose learning starts before age 6, possibly because children’s L1 categories are still in formation [9]; more fully developed L1 categories exert a stronger attraction on L2 sounds, rendering their acquisition as independent categories more difficult for adults than for children. In other words, the nature of the interaction between L1 and L2 categories might be different in adults vs. children. A perception and production task provides evidence that Turkish children learning German as an L2 since Kindergarten categorized German contrasts in the same way as Turkish adults did, and differently from age-matched native speakers. At the same time, their vowel productions were mostly target-like.

German distinguishes long tense vowels [i:] and [e:], [a:] (as in *schiefl ‘inclined*, *Schnee ‘snow*, *Hahn ‘rooster’) and short lax vowels [I], [E], and [a] (*Schiff ‘ship*, *schnell ‘fast*, *Hand ‘hand*). Turkish [i], [e] and [a] are acoustically closer to the German lax vowels but do not have a tense counterpart. The duration feature is absent. Participants are 10-year-old children, either German speaking monolinguals (N=14), or Turkish native speakers acquiring German (N=14) who have been exposed to German since Kindergarten (age 3-4), are schooled in a bilingual elementary school, but speak only Turkish at home.

Stimuli are four contrasts chosen according to the way they are categorized by Turkish adults [5]. The control contrast [a:]-[i:] is categorized into two different categories by adults, and is predicted to be easy to discriminate (see [6]). Two other contrasts, [e:]-[E] and [i:]-[I], are acoustically quite close but still distinguished by both length and spectral cues. However, Turkish adults categorized them differently: [e:]-[E] into two different categories; [i:]-[I] as members of the same Turkish [i] category, with [I] being a slightly less good exemplar. Discrimination is predicted to be more challenging. Finally, [e:]-[i:] is our test contrast, differing only in spectral cues, and therefore the most difficult. Absent from Turkish, [e:] is often categorized as Turkish [i:] and confused with German [i:].

In Experiment 1 (categorization task, “pick the odd one out”), all contrasts were embedded in non-word syllables (k k, p_p; three different speakers), and presented auditorily as triads in “same” (N=48) or “change” (N=48) trials on a computer. For the picture naming task (Experiment 2, *Memory game* where they are asked to name the pictures loud), stimuli were three common German minimal pairs for each vowel pair [i:-I], [e:-E], [a:-a]. Children’s vowel productions (N=1008) were acoustically measured. Experiment 1 (as measured by d’ sensitivity values) reveals that L2 learners discriminate the [i:]-[I] and [e:]-[i:] contrasts – predicted to be difficult – significantly worse than monolinguals (monolinguals’ d’: 2.59 and 2.30 respectively, L2 learners’ d’: 1.62 and 0.90. The group difference is significant for both contrasts (Mann-Whitney for [i:]-[I]: U=52.5, p<.05; Mann-Whitney for [e:]-[i]: U=16.5, p<.0001). L2 learners were like the monolinguals on both other contrasts ([a:]-[i:]), monolinguals’ d’: 2.76, L2 learners’ d’: 2.69, Mann-Whitney U=97.5, p>.05; [e:]-[E] monolinguals’ d’: 2.38, L2 learners’ d’: 2.30, Mann-Whitney U=87.5, p>.05). The effect of group for the [e:]-[i:] pair was significantly larger than all others, indicating that the lack of the salient duration cue is an additional hindrance for L2 learners to discriminate this pair.

Production data indicate that for most vowels under scrutiny, German-specific articulatory patterns were adequately acquired (appropriate tense-lax distinction and duration differences). Between-group-differences were found for [a:-a] only; other subtle differences suggest that L2 learners lack the flexibility found in native speakers to adapt to coarticulatory influences. In children and adults alike, L2 vowel categorization is subject to L1 influence very early (earlier than 3-4) and is difficult to modify despite early intensive exposure to L2. Production seems to be different [7, 8]. Additionally, perception difficulties are not reflected directly in production, and do not seem to impede the establishment of lexical contrast.
References:


