

Cross-dialect versus cross-language discrimination in early infancy: A look at rhythmic and segmental properties

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Infants as young as two months of age have already built a primary level of representation of their native language sound system based on its general rhythmic properties, i.e. duration and intensity information carried by vowels in connected speech. However, this primary level of representation of the familiar language is not sufficient to succeed in a discrimination task comparing languages from the same rhythmic category. A positive result will only be attained after longer language experience: by five months of age same rhythmic category languages can be differentiated. Evidence of an early dialectal differentiation has also been attested at this age (American versus British English, by Nazzi et al., 2000) suggesting that access to more subtle prosodic cues could possibly help infants perceive these cross-dialect differences. Yet, no precise information about the specific cues that infants used to discriminate between these two dialects was offered in that study.

Dialects might differ in terms of some specific prosodic properties, but they can also present non-trivial differences at the segmental level (vowels, consonants or both). Thus, examining cross-dialect discrimination in young infants can reveal relevant information regarding the early availability of cues other than, or simply beyond global rhythm and intonation. Tracking distributional information relative to specific segments such as vowels might be a basic strategy that can not only improve infants' native language representation, but also trigger the perceptual reorganization processes that will lead to the setting of the native phonetic categories.

The Central and Western dialects of Catalan and Castilian Spanish offer the appropriate comparison to disentangle the effects of global rhythm from those of segmental statistics. On the one hand, the two Catalan dialects differ in the number of vowels that can appear in unstressed positions e.g., [i, ə, u] in Central versus [i, e, a, o, u] in Western dialects (Veny, 1986), while rhythmic information may still remain comparable across dialects. On the other hand, Castilian Spanish and Western Catalan dialect share identical vowels repertoires but differ in their rhythmic properties. Previous data from our lab revealed that five-month-old Catalan-learning infants exposed to the Central variant of this language were able to differentiate it from the Western dialect while they were not differentiating Castilian Spanish from Western Catalan. Mean orientation latencies to utterances in the native dialect were significantly faster than latencies to utterances in the non-familiar dialect and Castilian Spanish. In order to explain this familiarity effect, the vowel and rhythmic patterns of the utterances used in the discrimination experiment were analyzed (14 utterances * 3 dialects/languages * 4 speakers). Utterances were about 4 seconds long in average and had been extracted from spontaneous speech recordings in a story-telling context.

Data from Castilian Spanish is currently being analyzed. Results for Central and Western Catalan show that vowel metrics – namely, number of [ə] per sentence, and [ɛ]/[e] and [ɔ]/[o] ratios -- rather than rhythm metrics -- i.e., %V, ΔV and ΔC as in Ramus et al., 1999 and rate-normalized measures as suggested by White and Mattys, 2007 – account for most of the variability encountered in the infants' perception data. These results suggest that frequency and distributional information about vowels in the native language/dialect might be available early in development and facilitate cross-language and dialect discrimination.

References:

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