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The development of measurable speech rhythm during second language acquisition

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It has been demonstrated repeatedly that durational characteristics of consonantal (C) and vocalic (V) intervals are robust acoustic correlates of rhythm class (stress-timed, syllable-timed, mora-timed). Here, we investigate how objective rhythm measures develop during the acquisition of a second language. In a longitudinal study, 9 native speakers of Spanish were recorded reading a text in English before and after a year of English language training at university level. A control group of 9 native English speakers read the same text. Automatic forced alignment of speech segment boundaries using hidden Markov models allowed the calculation of C and V interval durations. Standard rhythm metrics (%V, deltaC, deltaV, PVI) were calculated for all recordings. First results show that durational C interval characteristics between native English and Spanish English (pre and post training) do not differ. However, V interval characteristics (deltaV, nPVI, %V) are lowest for English natives, higher for the Spanish post training group and highest for the Spanish pre training group. The results suggest that a) deficits of speech rhythm competence in a second language are mostly revealed on a vocalic level and b) an increase in competence in a second language is reflected well by measurable speech rhythm.