Rhythmic grouping in French and German adults: A cross-linguistic investigation of the Iambic-Trochaic Law

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Across languages, if a word has initial lexical stress, such as CONstruct, its stressed syllable is typically louder than the following. If a word has final stress, such as conSTRUCT, its stressed syllable is typically longer than the preceding. It has been suggested that this stress pattern results from a domain-general auditory preference, the iambic-trochaic law (ITL), which affects the perception of rhythmic grouping (Hayes, 1995). A recent study supporting this law (Hay & Diehl, 2007) showed that when listening to sequences of alternating syllables that vary either in intensity or duration (i.e. …gaGAgaGagaGA…), both English- and French-speakers report groupings with initial prominence (i.e. GAga) if intensity is varied, but groupings with final prominence (i.e. GaGA), if duration is varied.

Hay and Diehl did not find differences between French- and English-speakers. This is intriguing in light of research suggesting that speakers of French, a language with no lexical stress, show a reduced sensitivity to stress information relative to speakers of languages with lexical stress (Dupoux et al., 2001; Dupoux et al., 1997). These cross-linguistic differences seem to result from an attunement to the specific prosodic features of the target language that takes place at the end of the first year of life. At 6 months of age, German-learning infants demonstrate a preference for syllables with a trochaic pattern, while French-learning infants can discriminate trochaic from iambic stress patterns but do not show any preference (Höhle et al., 2009). Furthermore, at 9 months, French-learning infants show reduced capacity for discrimination of this trochaic-iambic distinction (Skoruppa et al., 2009).

Based on these findings, we hypothesized that rhythmic grouping preferences should be affected by language experience, and that Hay & Diehl may have found cross-linguistic differences if they had used more speech-like material. To explore this, we ran an experiment with 40 French and 40 German adults, all screened for exposure to other languages using a modification of the Language Experience and Proficiency Questionnaire (LEAP-Q; Marian, Blumenfeld, & Kaushanskaya, 2007). Stimuli were synthesized sequences of 16 syllables made up of 4 different consonants and 4 different vowels (e.g. …bomuzeli…), each presented twice within the sequence, once in the strong and once in the weak position. These syllables alternated in either duration or intensity while the other factor (i.e. intensity in the duration-varied condition and vice versa) as well as f0 were kept constant.

Results showed that both French and Germans group syllables as trochees if intensity is varied and iambs when duration is varied (both p < .001). However, there was an interaction between language and type of manipulation (p < .001): the German listeners gave more trochee responses in the intensity condition and more iamb responses in the duration condition, showing more sensitivity than the French listeners to both types of syllable prominence. Moreover, German but not French listeners gave more trochee responses to control (invariant) sequences, reflecting a trochaic bias (p < .05).

Thus, as both French and German listeners used intensity and durational cues for rhythmic grouping, our findings confirm the ITL to some extent. However, they also show that the strength
of the effect of the ITL on grouping preference varies with language experience. Future studies should address to what extent experience with different types of linguistic rhythm enhances or reduces an innate sensitivity to rhythm.

References:


