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# **A cross-linguistic rhythmic analysis of trilingual learners' speech: an exploratory study**

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## Theoretical background

- Multilingual learners' interphonology of an additional foreign language could be affected by **cross-linguistic influences (CLI)** triggered by previously learnt/acquired languages: their own L1s and any other L2s [1, 3, 4]
- Little is known about the **CLIs** in the prosodic domains, particularly in **trilingual speech rhythm** [2, 6]
- English is typologically described as a **stress-timed language**, whereas both French and Chinese are considered **syllable-timed languages** [1]

## Research Questions

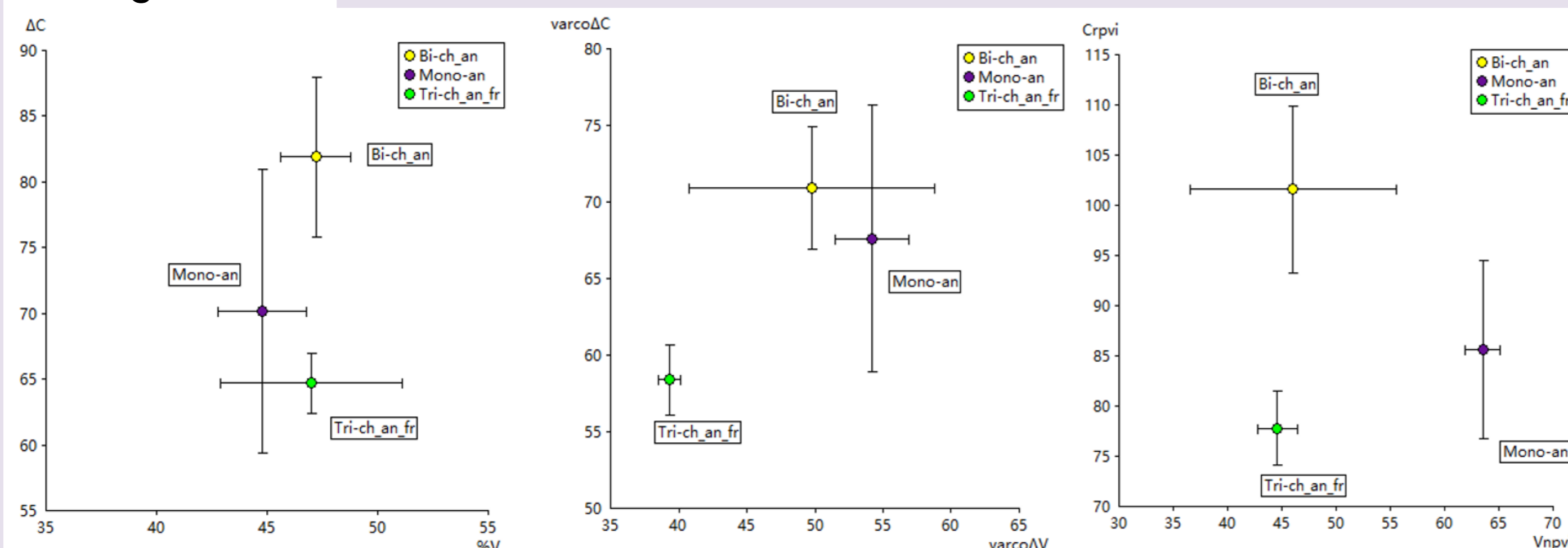
- This study focuses on the acquisition of temporal patterns in L3 French by Chinese learners for whom English is their first foreign language (L2).
- ✓ To what extent is the rhythm of Chinese learners' L3 French speech affected by the CLIs of their previous learnt languages (L1 Chinese & L2 English)?
  - ✓ Are there any regressive CLIs from L3 French to L2 English/L1 Chinese?

## Methodology

- ✓ A read-aloud task containing 18 SVO sentences in the 3 languages (Chinese, English and French)
- ✓ 30 participants (divided into 6 groups of 5 participants each)
  - 3 monolingual groups (L1-Chinese/L1-English/L1-French)
  - 2 bilingual groups with Chinese as L1 and English or French (both intermediate) as L2
  - 1 tri-lingual group with L1 Mandarin Chinese, L2 English and L3 French (both intermediate)
- ✓ The monolinguals groups performed the task in their L1s, while the bilingual groups was tested in two languages (Chinese+English/French) in a randomized order. The trilingual group performed the test in the three languages (in a randomized order, with 54 sentences in total)
- ✓ Acoustic analyses were conducted using the *Correlatore* system [5] to obtain various rhythmic features: %V,  $\Delta C$ , Varco $\Delta V$ , Varco $\Delta C$ , CrPVI and VnPVI

## Preliminary Results & Discussion

### 1. English Task

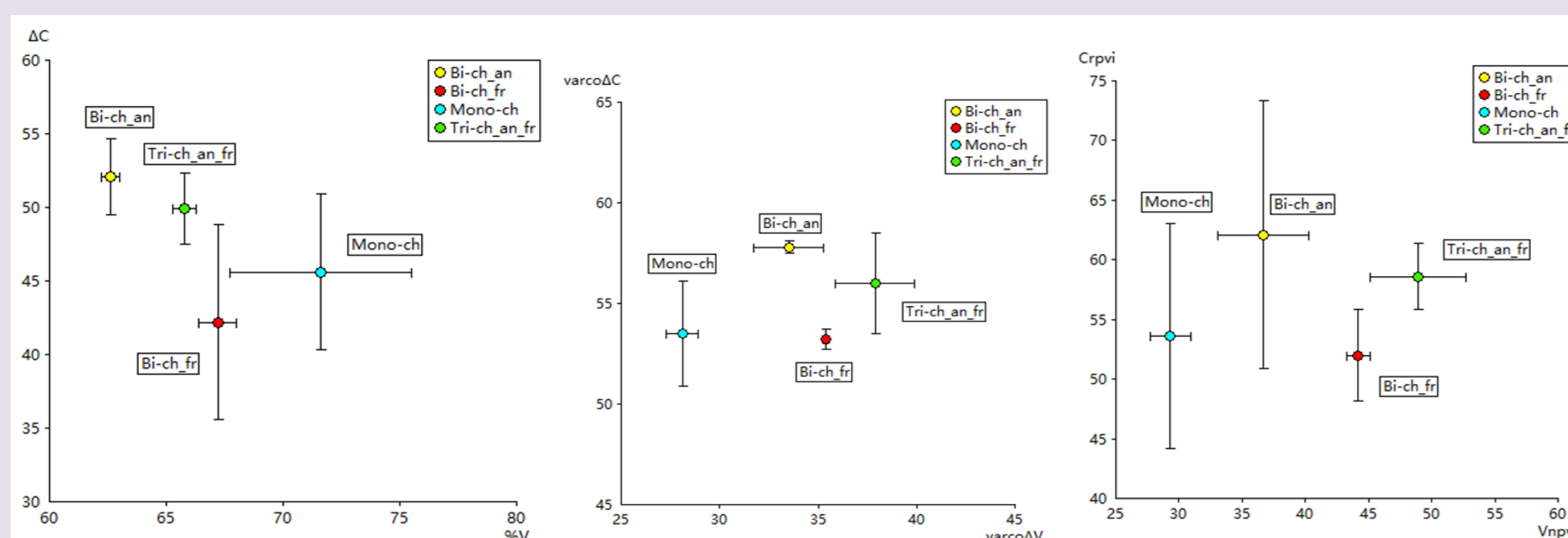
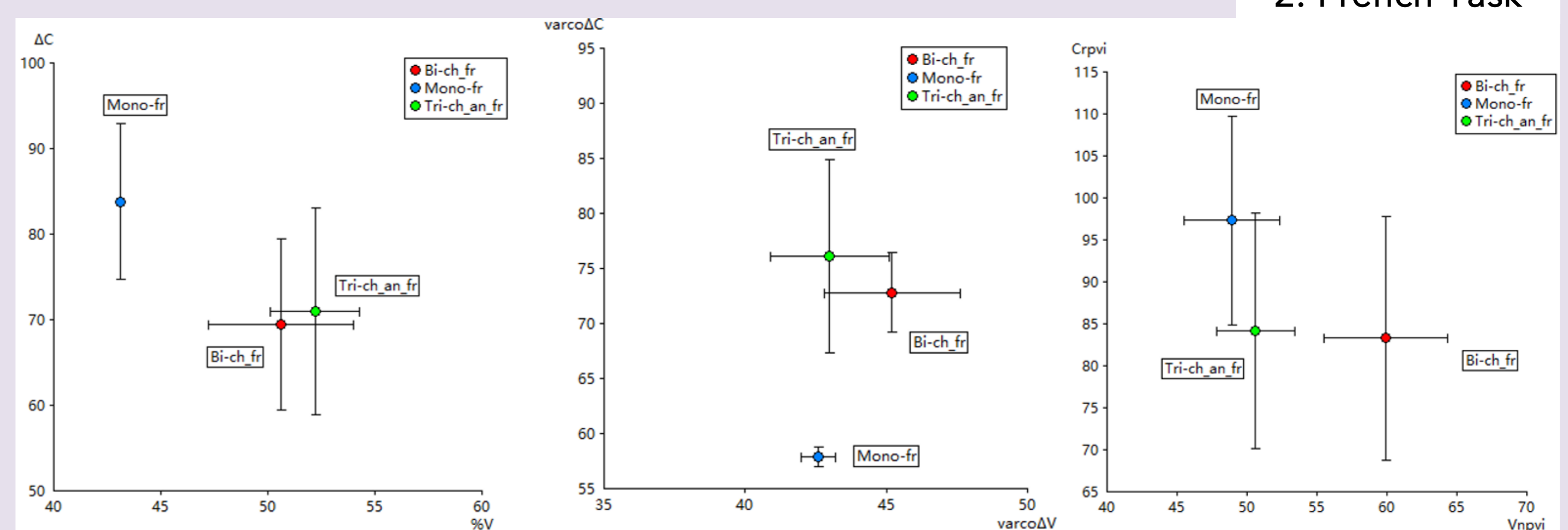


### CLIs are activated in different ways

- The bilingual group (L1-Chinese\_L2-English) performs similarly to the L1 English group in terms of both vowel & consonant variability (Varco $\Delta V$ , Varco $\Delta C$ ), and outperforms the trilingual group.
- This suggests a negative CLI from L1+L3 to L2 English.

### 2. French Task

- In the case of L3 French, vowel variability is not affected by the presence of either L2 English or L1 Chinese (Varco $\Delta V$ ).
- Neither group mastered the consonantal rhythms of French as an L2/L3 ( $\Delta C$ , Varco $\Delta C$ , CrPVI).
- Possible explanations :
  - ✓ For trilinguals, CLIs come from L2 English.
  - ✓ In the case of bilinguals, it could be a hybrid system (?).



- The L1 performance of multilingual learners is disturbed by their L2, or L2+L3 according to all metrics.
- Learning L2 and L3 triggers a partial reorganization of the L1 rhythmic patterns (regressive CLIs). This supports some claims in L3 phonological models devoted to segmental acquisition [7].

### 3. Chinese Task

### Perspectives :

- Some metrics are not consistent in our data ( $\Delta C$ , CrPVI).
- Prosodic conditions (e.g. accented vs unaccented syllables, prosodic boundaries) must be taken into account.

### References

- Bertinetto, P. M. & Bertini, C. (2008). On modeling the rhythm of natural languages. *Proc. of the 4th International Conference on Speech Prosody*, 2008, 427-430.
- Gut, U. (2003). Non-native speech rhythm in German. *Proc. of the 15th International Congress of Phonetic Sciences*, 2437-2440.
- Gut, U. (2010). Cross-linguistic influence in L3 phonological acquisition. *International Journal of Multilingualism*, 7, 19-38. 10.1080/14790710902972248.
- Llana, R., Cardoso, W., & Collins, L. (2010). The influence of language distance and language status on the acquisition of L3 phonology. *International Journal of Multilingualism*, 7, 39-57. 10.1080/14790710902972255.
- Mairano, P., & Romano, A. (2010). Un confronto tra diverse metriche ritmiche usando Correlatore. In Schmid, S., Schwarzenbach, M., & Studer, D. (eds.), *La dimensione temporale del parlato*, 79-100. Torriana (RN): EDK.
- Pillot-Loiseau, C. & Xie, H. (2018). Transfert rythmique du chinois mandarin au français dans l'apprentissage du Français Langue Étrangère : acoustique et perception. *SHS Web of Conferences*, 2018, 46, pp.09001.
- Wrembel, M., Marecka, M., & Kopeczkova, B. (2019). Extending perceptual assimilation model to L3 phonological acquisition. *International Journal of Multilingualism*, 16(4), 513-533.