Monday, 16:00 - 17:00
Poster Session 2, #9

Synchronization of speech rhythm between Spanish-speaking interlocutors

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In spoken language communication, accommodation refers to the many processes employed by talkers to adapt to each other. Within these processes, phonetic convergence is associated with an increase in similarity in speech patterns between interlocutors over the course of a conversation. In some theoretical frameworks, phonetic convergence is thought to occur in an involuntary and automatic manner rather than intentionally [1].

The present work focuses on the interaction between speech rhythm and phonetic convergence in a semi-interactive task (understanding rhythm as a "temporally regular [iteration] of events which embody alternating strong and weak values of an observable parameter" [2]). Specifically, given that a repeated speech stimulus requires both less processing time and lower neural activation across repetitions, and that multiple repetitions significantly enhance memory and learning [3], we propose that the use of regular rhythmic structures during conversations produces more convergence between speakers with respect to irregular rhythmic structures. To our best knowledge, the only existing research on this particular topic is the one conducted by Späth et al. [4], who found more rhythmic convergence between a healthy person and a model speaker than between individuals with Parkinson's disease and the same model speaker.

To test our hypothesis, we created a set of stimuli consisting of seven groups of 16 nine- or eight-syllable Spanish sentences each. Each group had a particular rhythmic structure, obtained through the arrangement of different types of words (oxytones, paroxytones, proparoxytones and unstressed words) in feet of different length. Rhythmic structures were composed as follows (unstressed syllables are represented by a lowercase **x** and stressed syllables by an uppercase **X** and in uppercase within the sentences):

Regular structures: (1) Three feet, head to the right: **xxXxxXxxX** (e.g. la re-PÚ-bli-ca NO ter-mi-NÓ) [the republic did not end]. (2) Three feet, head to the left: **XxxXxxXxx** (e.g. E-llos es-PE-ran al MÉ-di-co) [they wait for the doctor]. (3) Four feet, head to the left: **XxXxXxXx** (e.g. JUAN es-TÁ bus-CAN-do BA-rro) [John is looking for mud].

Irregular structures: (4) Three feet, head to the right: **xxXxXxxXx** (e.g. la es-PO-sa CA-e sin VI-da) [the wife falls down dead]. (5) Three feet, head to the left: **XxxxXxxXx** (e.g. CAR-los ter-mi-NÓ mi lla-MA-da) [Charles ended my call]. (6) Four feet, head to the left: **XxXXxxxXx** (e.g. JUAN es-TÁ SIEM-pre so-me-TI-do) [John is always under control]. (7) Four feet, head to the left: **XxXXxxXx** (e.g. JUAN sa-LIÓ RÁ-pi-do SIEM-pre) [John always left quickly].

We tested four dyads of Spanish native speakers separately in a reading - repetition task with different combinations of the rhythmic structures. In the task, each member of the dyad must read a sentence and the other one must immediately repeat it. Participants alternate between reading and repeating the sentences of each group. The order of presentation of the sentences within a group, and that of the groups themselves, are randomized. A rhythmic distance score, proposed by Späth et al. [4], was then used to determine the degree of convergence between the interlocutors' rhythms.

Results indicate a greater amount of convergence between regular structures than between irregular ones, when feet nuclei are left aligned. We observed an overall tendency for the regular utterances to present more similar metrical timing patterns between interlocutors than the irregular ones, rather than a gradual augmentation of the resemblance between regular utterances' rhythms over the course of the task. Details will be given on the response patterns observed in the other conditions (right-aligned feet nuclei), and implications for current models of phonetic convergence in speech will be discussed.

[1] Louwerse, M., Dale, R., Bard, E., & Jeuniaux, P. 2012. Behavior matching in multimodal communication is synchronized. *Cognitive Science*, 36(8), 1404-1426.
[2] Gibbon, D. 2015. Speech rhythms – modeling the groove. In R. Vogel & R. van de Vijver (Eds.), *Rhythm in Cognition and Grammar: A Germanic Perspective* (pp. 108-161). Berlin: De Gruyter Mouton.
[3] Falk, S., Rathcke, T., & Dalla Bella, S. 2014. When speech sounds like music. *Journal of Experimental Psychology: Human Perception and Performance*, 40(4), 1491-1506.
[4] Späth, M., Aichert, I., Ceballos, A., Wagner, E., Miller, N., & Ziegler, W. 2016. Entraining with another person's speech rhythm: Evidence from healthy speakers and individuals with Parkinson's disease. *Clinical Linguistics and Phonetics*, 30(1), 68-85.

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On behalf of the organising committee

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