

---

## Prominence or domain marking: what can Spanish and Portuguese tell us about gesture to speech alignment?

---

Camila Barros<sup>1</sup> & Uli Reich<sup>1</sup>

<sup>1</sup>*Freie Universitaet Berlin*

c.antonio.barros@fu-berlin.de, uli.reich@fu-berlin.de

Timing is the key feature for the interface between language and gestures in multimodal communication, both in production and perception. This becomes apparent in cases in which gesture is aligned with stress and pitch excursions (Esteve-Gilbert & Prieto, 2013; Bosker & Peeters, 2021). However, the prosodic alignment is more complex. McClave (1994) pointed out that gestures do not coincide with stressed syllables, but seem to be rhythmic. We argue that the placement in time of gestures is governed also by a symbolic timing association in which gestures follow a metrically projected pattern in close to isochronic distances of beats in time. One of the key roles of gestures, then, can be a way to establish a metrical grid that allows the interlocutor to make predictions on following speech events. Thereby it creates a domain which can be manipulated to cue prominence, given the appropriate context.

Spanish and Portuguese varieties share many phonological patterns but diverge strongly regarding their rhythmic patterns, i.e. the timing in which they instantiate phonological events: the former preserves vowel quality and syllable structure, while the latter tends to strongly reduce vowel quality and modify the syllable structure (Abaurre & Galves, 1998; Dufter & Reich, 2003). We conducted a production experiment with speakers from Bogotá, Madrid, Lisbon and São Paulo. We analyzed different excerpts of these varieties in which the speakers were instructed to explain a recipe, without the mention of a gesture study. The audio was annotated regarding prosodic domains and gesture apex ('kinematic goal of a gesture'). What we observe is that there is a strong inter-speaker variation regarding what they can align their gestures with: in some cases with prominent syllables, in others with pitch accents, in others with prosodic boundaries.

**References:** • Abaurre, M. B. & C. Galves (1998). As diferenças rítmicas entre o português europeu e o português brasileiro: uma abordagem otimalista e minimalista. *DELTA* 14(2):377–403. • Bosker, H. R., & D. Peeters (2021). Beat gestures influence which speech sounds you hear. *Proc. R. Soc. B.* 288:20202419. • Dufter, A. & U. Reich. 2003. Rhythmic differences within Romance: identifying French, Spanish, European and Brazilian Portuguese. In: M. J. Solé & D. Recasens i Vives (eds.), *Proc of the 15th IcPhS*, 2781–2784. Barcelona: UaB. • Esteve-Gibert, N., & P. Prieto (2013). Prosodic Structure Shapes the Temporal Realization of Intonation and Manual Gesture Movements. *J. Speech Lang. Hear. Res.*, 56(3):850–864. • McClave, E. (1994). Gestural beats: The rhythm hypothesis. *J. Psych. Res.*, 23(1):45–66.