

Segmental versus structural cues in sentence processing

Duccio Piccardi¹, Sharon Peperkamp², Holger Mitterer (holger.mitterer@um.edu.mt)³

¹Dipartimento di Studi Umanistici, Università degli Studi di Urbino Carlo Bo, Italy,

²Laboratoire de Sciences Cognitives et Psycholinguistique (ENS-PSL, EHESS, CNRS),

France, ³ Department of Cognitive Science, University of Malta, Malta

Recent research has shown that sentence processing is influenced not only by prosodic cues [1] but also by segmental correlates of prosodic structure [2,3]. In English, for instance, listeners perceive an uncontracted form of *have* (i.e., *they have* vs. *they've*) as contrastive with a previous statement [2], even in the absence of a pitch accent. Here, we extend this line of research by examining a segmental process known as gorgia, whereby in Tuscan varieties a post-vocalic word-initial /k/ may surface as [h] if no major prosodic boundary intervenes (see Table A1 for examples). Because prosodic boundaries can override the well-known late-closure preference [4], we tested whether gorgia—a segmental cue to prosodic structure—modulates this preference in a web-based mouse-tracking task.

Participants (N = 30, from Tuscany) listened to sentences such as those shown in Table A1, which were prosodically ambiguous between early and late closure. As illustrated in Figure 1, two adjectives differing in grammatical gender fell from the top of the screen while wiggling horizontally. Participants were instructed to move a spaceship beneath the word that occurred in the sentence and to activate a “tractor beam” to select it, mimicking early arcade games. While both adjectives were structurally possible, Tuscan gorgia could in principle allow participants to anticipate the adjective’s gender earlier. To assess whether participants engaged in such prediction, filler trials included either two names of the same or of different gender, thereby allowing prediction of the adjective’s gender in the former case.

Mouse-tracking data were analyzed using decision times (cf. [5]). Results show that participants do engage in prediction on filler trials (see Figure 2). However, there is no overall evidence that Tuscan gorgia is used to anticipate early versus late closure (see Figure 3, left panel). While there was no main effect of cue validity, an interaction emerged between cue validity and segment: responses were faster in late-closure cases (valid [h], invalid [k]). This pattern was slightly modulated by participants’ use of Tuscan variants (see Figure 3, right panel), with frequent users showing a small but significant modulation in the expected direction, such that [h] increased the likelihood of late-closure interpretations.

These findings suggest that segmental cues influence sentence processing only when they are highly reliable. For listeners with limited exposure to the Tuscan dialect, the cues provided by gorgia appear too unreliable to affect processing. Even among frequent users, the effect is modest, indicating that strong reliability—which exposure to Standard Italian precludes—is a prerequisite for segmental cues to shape sentence comprehension.

References

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Figures and Tables

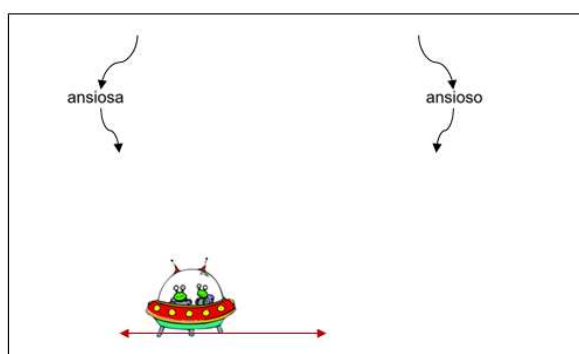


Fig. 1. A screen shot of the task set-up. Two words were falling and participants moved the spaceship to collect the word that occurred in the sentence.

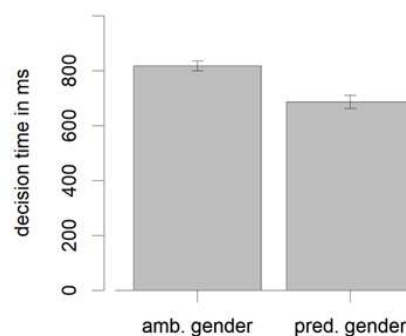


Fig 2. Decision times to filler trials, showing faster reactions to trials in which the gender of the adjective was predictable.

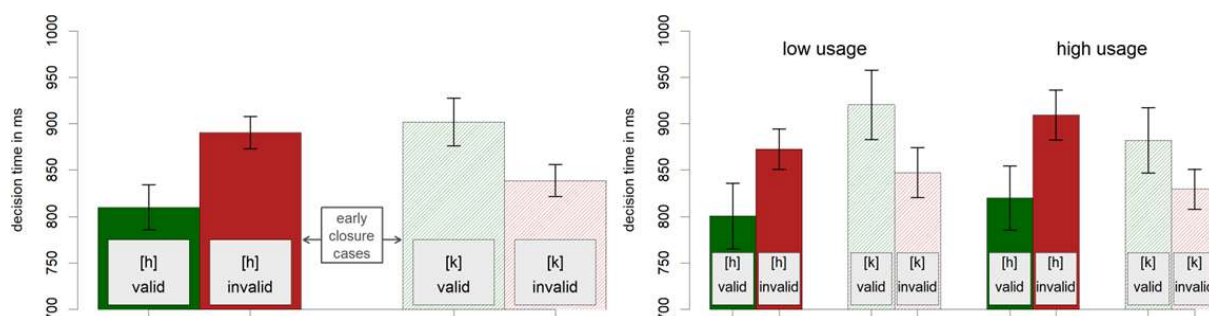


Fig 3: Decision times to main experimental trials, showing slower reactions to early-closure cases (invalid [h] and valid [k]), with little effect of the phonological gorgia cue (left panel), and a moderation of late-closure effects according to usage of Tuscan varieties of Italian.

Supplemental Information

Table A1: Main conditions (crucial consonants in blue, crucial gender suffixes in red)

Condition	Closure	Stimulus
Valid [h]	Late	[ˈkwando ˈpaolo ˈkja:ma haˈmilla ε ˈsɛmpre anˈsjɔ:zo] quando Paolo o chiam-a Camillaa (∅) è sempre ansios-o when Paolo call-3SG.PRS Camilla be.3SG always anxious-M.SG When Paolo calls Camilla, he is always anxious
Invalid [h]	Early	[ˈkwando ˈpaolo ˈkja:ma haˈmilla ε ˈsɛmpre anˈsjɔ:za] quando Paolo o chiam-a Camillaa è sempre ansios-a when Paolo call-3SG.PRS Camilla be.3SG always anxious-F.SG When Paolo calls, Camilla is always anxious
Valid [k]	Early	[ˈkwando ˈpaolo ˈkja:ma kaˈmilla ε ˈsɛmpre anˈsjɔ:za] quando Paolo o chiam-a Camillaa è sempre ansios-a when Paolo call-3SG.PRS Camilla be.3SG always anxious-F.SG When Paolo calls, Camilla is always anxious
Invalid [k]	Late	[ˈkwando ˈpaolo ˈkja:ma kaˈmilla ε ˈsɛmpre anˈsjɔ:zo] quando Paolo o chiam-a Camillaa (∅) è sempre ansios-o when Paolo call-3SG.PRS Camilla be.3SG always anxious-M.SG When Paolo calls Camilla, he is always anxious