

Glottalization, prosodic boundaries and *focus* in Italian: a perception study

In several languages around the world, the glottalization of segments at the beginning or end of a word has been documented as a marker of prosodic boundaries [1], and the glottal stop [ʔ] is attested as an epenthetic segment even in languages where it is not part of the phonological inventory. This phenomenon is also found in the Romance language area: although glottal consonants are not phonemes in these languages, acoustic analyses show the presence of glottalization and glottal stops in specific contexts [2, 3].

In Italian, glottalization primarily occurs at phrase boundaries, especially after stressed vowels [4, 5, 6]. This phenomenon is interpreted as a marker of constituent boundaries, preventing cohesion processes like *raddoppiamento fonosintattico* and vowel coalescence.

Moreover, some authors have shown that glottalization occurs more frequently in contexts where pitch accents are present (see 7, 8 for English, 9 for French). Since pitch accents are often cited as a prosodic cue for focus in Italian [10 among many others], this research could suggest a link between glottalization, pitch accents, and focus. A recent study on parallel data in Italian and French [11] revealed in fact a strong correlation between glottalization/epenthetic glottal stop insertion and focus: it is much more likely to observe a glottal stop at the boundary of a focused constituent rather than a non-focused one, especially for constituents at the end of an utterance (e.g., “Maria compra il giornale ʔ[in edicola]_F”) in response to the partial question “Dove compra il giornale Maria?”). Qualitatively, this study also notes that glottal stops often appear in the absence of pitch accents, seeming to function as sole cues for focus.

In light of these findings, some questions remain: can the glottal stop be interpreted as a focus marker on its own, or is it simply a physiological and functional effect linked to other prosodic markers, such as fundamental frequency or intensity [12]? Is the glottal stop only realized as an articulatory “aid” to reset pitch or intensity, and therefore not exploited in perception by speakers in the absence of these other focus markers? To answer these questions, we are conducting a perceptual study using *stimuli* selected from the same corpus as [11]. These production data have been manipulated to act on a single variable, namely the presence or absence of a glottal stop at the left boundary of the final constituent of the sentence, to determine whether this feature alone can influence the interpretation of the informational structure of the utterance. The *stimuli* used are broad-focus utterances (i.e., responses elicited by a question such as “What’s happening?”), with canonical word order and no dislocations, and which exhibit a prototypical tonal profile for utterances with topic-comment articulation. We provide an example in (1).

- (1) a. Che cosa succede qui ? (*broad focus*)
b. [Maria dà il giornale a suo fratello]_F.

We manipulated these broad-focus utterances by adding a glottal stop at the left boundary of the final constituent (in the example, “a suo fratello”), thus creating a prototypical broad-focus utterance, but with a cue typically associated with narrow focus on the final constituent. The two spectrograms in Figure 1 show an example of the non-manipulated *stimulus* (left) and the manipulated version of the same *stimulus*, with the insertion of the glottal stop (right).

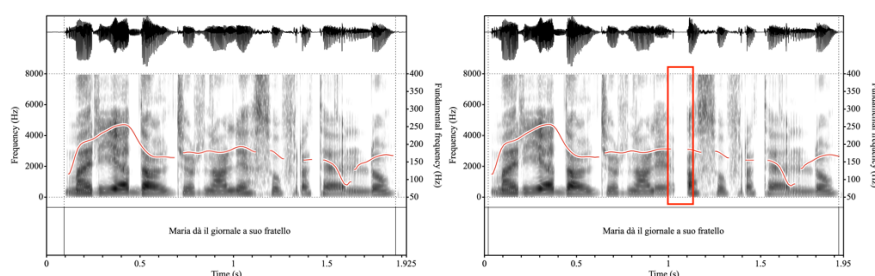


FIGURE 1 – Examples of *stimuli* used for the test, featuring the sentence “Maria dà il giornale a suo fratello” (Maria gives the newspaper to her brother).

In the test, participants are asked to listen to a sentence and associate it with the preceding question they believe best corresponds to it. Aside from familiarization questions and fillers, participants hear two types of *stimuli* throughout the test:

- Condition 1 (BF): Sentence in a broad-focus condition, elicited by a question like “What’s happening here?”, with canonical word order;
- Condition 2 (GS): The same sentence as in Condition 1, with a glottal stop placed before the final constituent (indirect object or circumstantial).

Participants respond through an ABXY multiple-choice task. The chart in Figure 2 shows the results of the pilot study, conducted with a set of 20x2 stimuli and 10 participants.

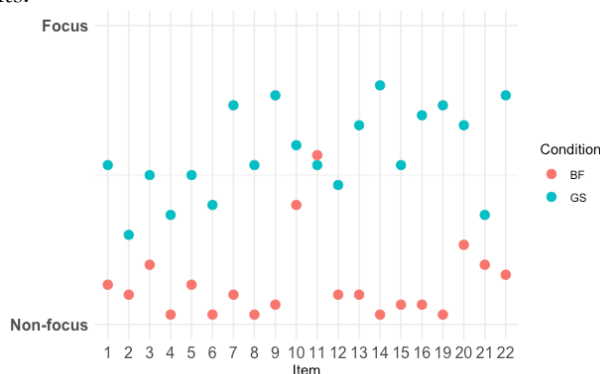


FIGURE 2 – Interaction plot of GS and BF conditions by item.

The chart illustrates the interaction between the presence or absence of a glottal stop and the participants’ responses. The red points correspond to the average responses for the unmanipulated *stimuli*, while the blue points represent the responses for the *stimuli* featuring a glottal stop. Of the 20 comparisons made, 16

show a statistically significant difference between the sentences in BF condition and those in the GS condition. These results suggest that the presence of the glottal stop may influence participants to perceive narrow focus on the final constituent. In contrast, when the same sentence lacks the glottal stop, the interpretation tends to align more with broad focus. This pattern could imply that the glottal stop indeed functions as an independent cue for focus, even when other cues typically associated with focus, such as increased intensity or specific pitch configurations, are absent. Further research would be necessary to determine the generalizability of these findings, and also to identify the elements potentially responsible for the ambiguity in *stimuli* that did not show a significant difference. In future research, we plan to refine the testing procedure and expand the sample of participants to further investigate and substantiate these preliminary findings.

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