

Syllable structure vs. segmental phonotactics: The phonetics and phonology of segment duration in Italian

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Various studies have claimed that prosodic structure is manifested through segment duration: e.g. closed syllable vowel shortening (Maddieson 1985); moraic timing hypothesis (Maddieson 1993, Hubbard 1995, Broselow et al. 1997). Three duration phenomena are claimed to be correlated with prosodic structure in Italian. Stressed vowels are claimed to lengthen in open syllables (Fava & Magno Caldognetto 1976, Vogel 1982, Chierchia 1982, 1986, Farnetani & Kori 1986, D'Imperio & Rosenthal 1998). Coda consonants are claimed to be longer than onset consonants (Farnetani & Kori 1986). The application of *Raddoppiamento Sintattico* (RS), the gemination of a word initial consonant when preceded by a stressed vowel, is claimed to depend crucially on the syllabification of word initial consonant clusters. Specifically, the initial consonant of tautosyllabic clusters (e.g. CL) undergoes RS, while the initial consonant of heterosyllabic clusters (e.g. SC) does not: *cittá triste* -> *cittá.t.triste* 'sad city' vs. *cittá strana* -> *cittá.s.trana* 'strange city' (Vogel 1982, Chierchia 1982, 1986, Repetti 1989, 1991, Davis 1990).

This paper will present a syllable-independent approach to segment duration in Italian focusing on two main findings of recent experimental research. 1) Stressed vowel duration in paroxytones is inversely correlated with the duration of the following intervocalic consonants, regardless of the location of syllable boundaries. 2) Speakers are consistent in the production of consonant duration in phonotactic environments where consonant length is contrastive (and maximally perceptible): in V __ [+son, +cont].

Fifteen Pisan speakers participated in a duration experiment producing 6 repetitions of bi-syllabic paroxytones of different syllable types with various intervocalic consonant sequences (CVCV, CVCRV, CVRCV, CVSCV, CVCSV, CVCNV, CVCTV). The results show that vowels are not categorically lengthened in stressed open syllables in Italian. Instead, a syllable-independent inverse correlation between vowel duration and the following intervocalic consonant cluster duration was found [P27: R2=.71; P23: R2=.67; P1: R2=.65]. While intervocalic consonants are generally shorter, coda consonants are not longer than onset consonants. However, durational differences were found in non-nasal stops in the onset [*pa.ta*= 101ms.; *pa.t.ra*=108ms.; *pal.ta*=149ms.] showing that speakers are consistent in the production of consonant duration in the context V __ [+son, +cont], where the geminate vs. singleton contrast is possible. The syllable-based analysis of consonant duration has no way of accounting for this result since onsets do not contribute to syllable weight.

Five Pisan speakers also participated in an RS experiment producing 6 repetitions of stimuli containing various initial clusters (e.g. *scortése*, *presidénte*) in -RS and +RS conditions. The main finding is that RS only affects stop + vowel (CV) and stop + liquid (CL) sequences. An syllable-independent analysis of RS is proposed that draws on cue based segmental constraints governing the context where geminates are permissible (where length is maximally perceptible): TT / in V __ [+son, +cont] and SS / in V__ V.

The conclusion is that the conditioning factors for these central processes of Italian phonology are segmental, contrast-based conditions, and that syllable structure is not implicated in these phenomena.