

## A Typology of Spreading, Insertion and Deletion or What You Weren't Told About *Raddoppiamento Sintattico* in Italian

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### 0. Introduction

This paper focuses on the description and analysis of the external sandhi phenomenon of *raddoppiamento sintattico* (hereafter RS) in Italian, sometimes referred to as word-initial gemination, for example:

- (1) No RS *due cani* [du:e ka:ni] ‘two dogs’
- (2) RS *tre cani* [tre kka:ni] ‘three dogs’

RS is one of the most discussed topics within Italian phonology, with the first description and treatment of the phenomenon dating back nearly 500 years. Theoretical analyses of RS since the 1970s, of whatever kind, seem to suggest that the facts of RS are clear and easy both to state and to analyze. Yet closer inspection shows RS not to occur in the manner claimed or predicted by these accounts. The aim of this paper is to highlight the empirical inadequacy of existing approaches to RS by illustrating the complex patterns that occur in RS environments.

In section 1 of this paper we provide a brief description of RS. In section 2 we present a summarized description of the two main theoretical approaches to the analysis of RS. The third part of this paper examines other processes that occur in RS contexts, which function to block the appearance of RS. These facts have for the most part been long reported in descriptive sources on Italian phonology, but have been consistently ignored in theoretical accounts of RS. Their existence, however, is critical since they invalidate existing analyses of RS. Finally, in section 4 we make suggestions as to what needs to be included in any theoretical analysis of RS, and to the kind of theoretical approach that is most appropriate for the range of variation we report as occurring in RS environments.

### 1. What is RS, and where is it reported?

The phenomenon is typically described as the “lengthening of the initial consonant of word<sub>2</sub> in a sequence word<sub>1</sub> word<sub>2</sub> under certain phonological and syntactic conditions” (Nespor & Vogel 1982: 227). The categories of words that trigger RS in a following word (at least in the Standard language) are often described as follows:

**Table 1.** RS triggers in Standard Italian and similar varieties

Words ending with a final stressed vowel (oxytones): <i>parlò</i> [bb]ene ‘she spoke well’	<b>PHONOLOGICAL RS – PRODUCTIVE, OPEN SET</b>
Certain unstressed monosyllables <sup>1</sup> <i>a</i> [mm]ilano ‘to Milan’	<b>(MORPHO)LEXICAL RS – RESTRICTED SET OF RS TRIGGERS</b>
A small set of words with penultimate stress <sup>2</sup> <i>come</i> [vv]a? ‘how’s it going?’ <i>dove</i> [vv]ai? ‘where are you going?’ <i>qualche</i> [vv]olta ‘sometimes’	

RS is found throughout the Italian peninsula below the imaginary line running from La Spezia to Rimini as well as on the islands of Sicily, Sardinia and Corsica.



**Map 1.** Geographical distribution of RS.

<sup>1</sup> For a full list of these monosyllables, see Camilli (1965) or Canepari (1991).

<sup>2</sup> For Standard Italian, this set includes *come*, *dove*, *qualche* and *sopra*.

There is regional variation in the distribution of RS across the peninsula, but this paper will focus on phonological RS, which is found in Tuscan and Roman dialects, including Standard Italian – and which has been the subject of most study in the past.

## 2. Prevalent view of RS

Theoretical approaches to RS in the literature fall into two main categories: those which are syntactically orientated and those which are phonologically orientated. We deal only briefly with the first in 2.1, focusing mainly on the latter in this paper.

### 2.1 Syntactically oriented treatments of RS

Syntactically orientated treatments of RS date back to the 1970s-1980s and focus on syntactic or prosodic (derived by syntactic constituency) conditioning. According to these accounts, purely phonological conditioning is not on its own sufficient to trigger RS.

With respect to strictly syntactic treatments of RS, the (non-)occurrence of RS is governed by the left-branch condition (Napoli & Nespor 1979), or by the notion of c-command (Kaisse 1985).

More recently, Nespor & Vogel (1982, 1986) treat RS within the framework of Prosodic Phonology which attempts to account for specific phonological phenomena through their interaction with syntactically derived prosodic constituents. Indeed, RS is used specifically by Nespor & Vogel to motivate the phonological phrase as a universal category (see also Ghini 1993, Esposito & Truckenbrodt 1995, Tokizaki 1999 for similar prosodic accounts).

It has frequently been noted by other scholars (eg. Roca 1994; Agostiniani 1992, Absalom 1995) that none of these syntactically oriented accounts of RS properly captures the reality of RS, ie they predict that RS will not occur across syntactic and derived prosodic boundaries. Yet the empirical evidence these authors cite show very clearly that it does. It is not surprising, therefore, that Vogel (1997), previously one of the main proponents of a syntactically orientated prosodic account of RS, has now had to acknowledge that:

... notably in Tuscan and romanesco, *raddoppiamento fonosintattico* [RS] seems to apply throughout sentences without regard to their syntactic (and [derived] phonological) constituency (1997: 66).

Given that syntax does not play the role in RS it was once assumed to have, then syntactically oriented accounts of the type discussed above should now be viewed as superseded.

### 2.2 Phonologically oriented treatments of RS

Phonologically oriented treatments of RS which do not appeal to syntax have varied in their approach over the years, but moraic analyses of RS currently predominate (eg. Repetti 1991; Bullock 1992, 2000, 2001). More recently, there has been a number of attempts to incorporate the same moraic approach within the framework of Optimality Theory (hereafter OT) (eg. Morén 1999; Borrelli 2000, 2002; McCrary 2002; Nagy 2000). In Moraic Phonology (Hayes 1989), the mora ( $\mu$ ) is a basic unit of weight used to determine the relative heaviness of a syllable. Short vowels are monomoraic ( $\mu$ ), long vowels, and diphthongs are bimoraic ( $\mu\mu$ ) whilst in many but not all languages, vowel + consonant sequences in the same syllable are also bimoraic ( $\mu\mu$ ). In recent years, substantial evidence has accumulated that phonological processes can be accounted for as weight-related or moraic phenomena.

Essential to all moraic accounts of RS (and therefore OT analyses) are the following assumptions about Italian phonology and RS:

1. Bimoraic norm – all stressed syllables are heavy and are equivalent to two moras ( $\mu\mu$ ) in weight in Italian. Closed syllables are always heavy, eg. /*kan.to*/  $\Rightarrow$  [*kan.to*] ‘I sing’, /*fat.to*/  $\Rightarrow$  [*fat.to*] ‘fact’, whilst in word-medial position, stressed vowels in open syllables lengthen to satisfy the weight criterion: /*fa.to*/  $\Rightarrow$  [*fa:to*] ‘fate’.
2. No long final vowels – stressed vowels in word-final position are always short in Italian, leaving an empty word-final mora at the word boundary, as seen in the left half of Figure 1.
3. RS occurs as a right-to-left mora-filling phenomenon at word-boundary to ensure that the Bimoraic Norm is satisfied. Critical to moraic treatments is the related assumption that all spreading at word boundaries in Italian is strictly right to left.

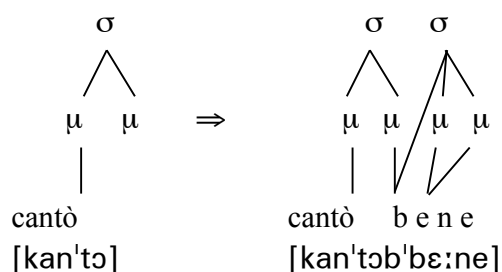


Figure 1. RS as a mora-filling phenomenon

In Figure 1 we see that the second, word-final, mora cannot be attached to the final vowel because of the ban on long final vowels described above. Thus, an empty mora is found at the end of *cantò* ‘s/he sang’. Given the ostensible ban on left to right spreading (reinforced by Principle 2 above), the vowel cannot spread to fill the mora. As a result, the empty mora must be filled by spreading of the following consonant.

Although this account of RS appears very neat and intuitively appealing from a theoretical perspective, it (and indeed all analyses of RS including syntactically oriented analyses referred to above) depends on a partial and incomplete presentation of the facts of RS in Italian. RS can be shown to be far more complicated than suggested to this point. Moreover, many of the basic moraic assumptions about Italian phonology, upon which moraic accounts critically rely, can also be shown not to hold in the manner suggested.

### 2.3 Problems with moraic assumptions

In this section we demonstrate not only that the Bimoraic Norm is less than universal in Italian, but also that stressed final vowels are neither always short nor automatic RS triggers as claimed in moraic accounts.

#### 2.3.1 Not all stressed syllables are bimoraic: Evidence of trimoraicity in word final position

With respect to the Bimoraic Norm in Italian, there is clear evidence that some stressed syllables are in fact superheavy and, therefore, trimoraic ( $\mu\mu\mu$ ). That diphthongs are overlong is traditionally recognised in descriptions, such as Chappallaz (1979), and transcriptions of Italian, where the preglide nucleus is long, eg. *fai* [fa:j] ‘you do’. The underlying trimoraicity of diphthongs is independently confirmed by their interaction with RS: in cases of optional glide deletion at word boundary (treated as loss of the third mora), the vowel remains not only bimoraic but also fully long, as seen in Figure 2.

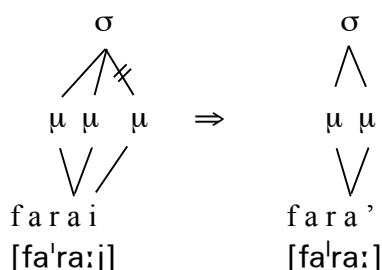


Figure 2: Overlong diphthongs and optional glide deletion

Predicted reduction to a short vowel does not occur, and most importantly it does not trigger RS, as would be predicted by existing moraic accounts (See Hajek 2000 for further evidence in support of trimoraicity in Italian). In example (3) we see clearly that the surface outcome, after loss of the glide, is a long vowel followed by a short consonant. This contrasts with example (4) where *farà* /fa'ra/ ‘s/he will do’ with final short vowel does trigger RS as predicted.

Compare the following:

- (3) *farai bene*  $\Rightarrow$  *fara' bene*      /fa'ra:j bɛne/  $\Rightarrow$  [fa'ra: bɛ:ne]  
 'you will do well'
- (4) *farà bene*                              /fa'ra bɛne/  $\Rightarrow$  [fa'ra bbɛ:ne]  
 's/he will do well'

#### 2.3.2 Not all Stressed Final Vowels are Short: Evidence of Vowel Length Contrast

The optional reduction of overlong syllables, as described above, is not the only source of final long vowels in Italian. Vowel length is, in fact, fully contrastive in word-final

position (Absalom & Hajek 1997; Valesio 1967). Example (5) illustrates one such minimal pair:

- (5) *finì* /fi'ni/ 's/he finished'      *finii* /fi'ni:/ 'I finished'

That short and long stressed vowels contrast in final position is independently confirmed by their different behaviour in RS contexts. In example (6) we see that the long final stressed vowel of /fi'ni:/ does not trigger RS, whilst its short counterpart /fi'ni/ does (example (7)).

- (6) *finii* /fi'ni: 'bɛne/ ⇒ [fi'ni: 'bɛ:ne] 'I finished well'

- (7) *finì bene* /fi'ni 'bɛne/ ⇒ [fi'ni 'bbɛ:ne] 's/he finished well'

### 2.3.3 Vowel Length after Truncation

In cases of optional truncation of the word-final syllable, the stressed vowel which remains after truncation is long as seen in (8):

- (8) *poco* ⇒ *po* ' [pɔ:kɔ] ⇒ [pɔ:] 'a little'

- (9) *un po' d'acqua* [um pɔ: dakkwa] 'a little water'

In (9) we see that the long vowel does not shorten and effectively blocks predicted RS.

The non-occurrence of RS in relation to the three phonological phenomena we have discussed, ie (a) diphthong reduction, (b) final contrastive long vowels, and (c) truncation, disprove basic moraic assumptions that all word-final stressed vowels are predictably short (but bimoraic) and that all word-final stressed vowels will, as a result, automatically trigger RS. The examples we have given show that final vowels can be long and that RS may not occur automatically at word-boundaries in the manner claimed.

## 3. The RS environment

In this section we show briefly that even where moraic assumptions about the length of final stressed vowels and syllable weight are met, RS is still not automatic. Other phenomena, never reported in theoretical treatments of RS, also occur in RS environments. These have the effect of blocking the occurrence of RS.

### 3.1 Archetypal RS: Right to left consonant spreading

The most widely recognised phenomenon in RS environments is of course 'canonical' right to left consonant spreading, eg. /fa'ra bɛne/ ⇒ [fa'ra bbɛ:ne] 's/he will do well'.

### 3.2 Traditional blocking phenomena

At least three separate phenomena that block doubling in RS contexts have been reported in the descriptive literature on RS and Italian phonology for almost a century, but have always been ignored in theoretical treatments of RS.

### 3.2.1 Pausing

Firstly, when a pause (however slight) occurs at the word boundary between word<sub>1</sub> and word<sub>2</sub> in RS contexts, doubling due to RS does not happen (Agostiniani 1992; Camilli 1911, 1941, 1965; Chappallaz 1979; Canepari 1991; Fiorelli 1958; Leone 1962, 1984; Loporcaro 1997; Norman 1937; Pratelli 1970). In example (10) we find predictable consonant doubling after the final stressed short vowel in the absence of pausing. This contrasts with the example of pausing in (11):

(10) without pausing: [fa<sup>l</sup>ra bbɛ:ne] 's/he did well'

(11) with pausing: *farà bene* [fa<sup>l</sup>ra // bɛ:ne] *not* \*[fa<sup>l</sup>ra // bbɛ:ne] (where // = pause) 's/he did well'

### 3.2.2 Final vowel lengthening

Contrary to assertions that left to right spreading does not occur in Italian at word boundaries, optional left to right final vowel lengthening is indeed possible and has long been reported to block potential RS (Camilli 1911, 1941, 1965; Chappallaz 1979; Fiorelli 1958; Norman 1937; Pratelli 1970). Loporcaro (1997:29) points out that vowel lengthening is often indicative of a pause in Italian, drawing a connection between these first two phenomena. However, vowel lengthening also occurs without pausing, as in (12), and blocks the occurrence of predicted RS

(12) *andò bene* [an<sup>l</sup>do: bɛ:ne] *not* \*[an<sup>l</sup>do: bbɛ:ne] 'it went well'

### 3.2.3 Sudden pitch movement

The last of the traditional blocking phenomena involves a sudden break or movement in the pitch contour, which has also been identified for many years as blocking RS (Camilli, 1941, 1965; Canepari, 1991; Chappallaz, 1979; Fiorelli, 1958; Loporcaro 1997; Norman, 1937). In example (13) a sudden pitch movement or disjuncture occurs at the word<sub>1</sub>-word<sub>2</sub> boundary. LH indicates that there is a pitch rise from low tone (L) on word<sub>1</sub>, to a high tone (H) on word<sub>2</sub>:

(13) *andò bene* [an<sup>l</sup>do bɛ:ne] *not* \*[an<sup>l</sup>do bbɛ:ne] 'it went well'

/	/
L H	L H

In example (13) RS does not occur, as the sudden pitch movement (LH) blocks right to left consonant spreading at the potential RS site.

### 3.2.4 A fourth RS blocker: Glottal insertion

While the three phenomena just described have long been recognised as blocking the operation of RS in the descriptive literature on Italian, a fourth blocking phenomenon, ie glottal stop insertion, has only more recently come to light. It has been noted that when a glottal stop occurs at the word boundary it blocks the potential occurrence of RS (Absalom & Hajek 1997; D'Imperio & van Santen 1999; Stevens 2001; Vayra 1994). The blocking effect of glottal insertion is seen in (14):

(14) *andò bene* [an'doʔ bɛ:ne] *not* \*[an'doʔ b:ɛ:ne] 'it went well'

In (14) we see that RS consonant lengthening is blocked by the glottal stop which occurs at the word boundary. Amongst existing moraic treatments of RS, only Vogel (1994) accepts the existence of glottal insertion and suggests it is a mora-filling device.

Recent experimental phonetic studies (Vayra 1994; D'Imperio & van Santen 1999) have found that a range of glottalization phenomena (including creaky and breathy voice and glottal stop insertion) can occur in the RS environment. However, the full extent of interaction between RS and these glottalization phenomena remains to be determined. At this stage we can only report that adequate quantitative information regarding the frequency and distribution of glottalization phenomena in RS contexts is still not available (as already noted by Absalom & Hajek 1997). We are currently in the process of investigating the phonetics of the RS environment with particular attention to the presence and effects of glottalization.

The presence of four different RS-blocking processes (vowel lengthening, pausing, pitch breaks, and glottalization), in addition to RS itself, is a challenge for any theoretical analysis of RS. These show that even when RS is predicted to occur at the word<sub>1</sub> word<sub>2</sub> boundary, it does not *always* happen. This failure of RS to occur has been consistently ignored in theoretical treatments of RS, whether syntactic or phonological in orientation. These phenomena should not be excluded as low-level phonetic effects that are irrelevant to the phonological description of RS, since it is clear that they can interact directly with RS to block it in a categorical fashion. Given the evidence, it seems plausible at this stage that they should be accorded the same phonological status as right to left RS consonant spreading in Italian.

#### 4. Towards a new theoretical description of RS

Our intention here is not to propose a new theoretical treatment for RS, but rather to highlight some important considerations for future research into this phenomenon.

##### 4.1 Revising basic assumptions about Italian phonology

We have shown in section 2 that basic moraic assumptions about Italian phonology appear not to hold in the manner their proponents suggest. Any accurate analysis of RS, within a moraic framework, should reflect more closely the facts of Italian as we have reported them. They should in particular acknowledge the presence of long vowels in word-final position and the blocking effect they have on RS. Also, the notion that syllables can be only maximally bimoraic needs to be revisited.

##### 4.2 Accounting for variation: RS, moraic phonology and OT

It is clear from the evidence we have presented that there is more than one possible outcome in the RS environment. RS is not automatic, a fact which has been consistently ignored in theoretical treatments of RS to date which all insist on the universality of right to left consonant spreading. A valid theoretical account of RS needs to deal with this variation (eg. where right to left right consonant spreading, ie RS, occurs in some cases, and vowel lengthening blocks RS in others).

Repetti (1991) has suggested that the final empty mora responsible for RS may be filled by other means (see Absalom & Hajek 1997 for a fuller discussion of the issues). While the



author did not mention left to right vowel spreading or glottal insertion as possibilities, these could plausibly fill the empty mora leaving the moraic analysis of RS intact. Unfortunately, problems arise when we try to account for the fact that in RS contexts it is possible for *nothing* to occur – neither initial consonant gemination, nor vowel spreading, nor glottal insertion. This can be the result of the introduction of a pause or tonal shift as described above. This state of affairs seriously weakens the acceptance of the final empty mora theory.

One theoretical approach that may be potentially more useful than others in dealing with the facts of RS as we have presented them is Optimality Theory (Prince & Smolensky 2002). OT offers the possibility of multiple optimal candidates or surface outputs, and could therefore handle the variation that we have described in the RS environment. The idea of having more than one possible optimal outcome is supported by McCarthy (2002) who states:

In theory, there is no guarantee that EVAL will always return a single most harmonic member of the candidate set. Suppose two candidates incur identical violation-marks from all constraints. EVAL will be unable to decide between them, and if no other candidate is more harmonic, **both will be optimal**. In this case, within-language variation ought to be observed. (McCarthy 2002:7; emphasis added)

Specific to RS, an initial attempt to describe the variation which appears in the RS environment in terms of OT was offered by Absalom & Hajek (1997). Apart from this preliminary treatment, none of the more recent OT accounts (eg. Morén 1999; Nagy 2000) have canvassed the possibility of multiple optimal candidates in the RS environment. This is not surprising since they all assume that only one optimal candidate or surface output is permitted by OT, *contra* McCarthy (2002) and Absalom & Hajek (1997). Largely based upon the same moraic assumptions that were outlined in §2.2, these recent accounts ignore the variation that we have shown to occur in RS contexts and which, more significantly, has been acknowledged in the descriptive literature for nearly a century (see Camilli 1911). As a direct consequence of this, these recent OT accounts suffer from the same empirical shortcomings as previous theoretical accounts: they continue to present a restricted and ultimately unrealistic picture of RS.

## 5. Conclusion

In conclusion, we would argue that the desire for a theoretically elegant and unique solution to RS should not be obtained at the cost of ignoring the effect of other processes which interact with and are able to block RS in Italian. We should also add that while we already know of extensive variation in RS environments, our understanding of what occurs in precisely this context remains for the present only partial. Ongoing investigation is still required, including detailed experimental phonetic analysis, in order to provide a clearer and fuller picture of the phenomenon of RS in Italian.

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