Rethinking Raddoppiamento Sintattico
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Within Italian there is a unique form of gemination that occurs at word boundaries, which is called Raddoppiamento Sintattico (RS). In all discussions on the subject, the motivation for gemination is the stress parameters of Italian, which only allows heavy syllables to carry stress (Krämer, 2009). This study follows in that vein, but makes a departure from other studies by acquiring new data for the analysis. This new data gave insight into two aspects of the language. The first is that the speaker would insert a glottal stop onto words that lacked an onset. Based on that observance one version of RS has to be reanalyzed to a form of assimilation. It is claimed that due to this difference backwards gemination needs to be reclassified.

Keywords: Raddoppiamento Sintattico, Italian, Glottal Stop, Backwards Gemination, Glottal Stop Insertion, Syllable Structure

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Consonant gemination is a common feature found among the world’s languages, but Italian has evolved a unique type of gemination which occurs at word boundaries. This has been observed for hundreds of years according to Krämer (2009) and Borrelli (2002). This process has been called in the literature by its Italian name Raddoppiamento Sintattico (RS) or more seldom syntactic doubling.

This phenomenon belongs to a family of phonological changes called sandhi, which is used to explain phonological changes at morpheme (internal sandhi) and word boundaries (external sandhi) in the larger context of an utterance. RS can be classified as an external sandhi owing to the changes that are produced at word boundaries. The centuries of discussion on RS has revealed three distinct ways in which RS occurs (Krämer, 2009).

The first manner in which RS occurs is termed rhythmic gemination or stress-induced RS. This pattern is contingent on the stress patterning of Italian. This form of gemination occurs in partner with a word that ends in a stressed open syllable (lacking a coda) which causes the onset of the following word to geminate to close the syllable to make it heavy.

\[
\text{Rhythmic Gemination}
\]
\[
città bella /cît.tá + bél.la/ \rightarrow [cît.tá.bél.la] \text{‘beautiful city’}
\]

This gemination is blocked by a complex consonant cluster involving /s/ followed by an obstruent or when there is a pause at the boundary where RS occurs. This has been found to be caused by the epenthesis of a laryngeal consonant, the lengthening of the vowel or some type of glottalization on the syllable (Absalom et al., 2002). The second form of RS is called backwards gemination and occurs when the final consonant of a word ends in a stressed closed syllable and the coda geminates to also occupy the onset of an onsetless syllable at the beginning of the following word.

\[
\text{Backwards Gemination}
\]
\[
a. \text{ tram elettrico } /trám + e.lét.trí.ko/ \rightarrow [trám.me.lét.trí.ko] \text{‘tram’}
\]
\[
b. \text{ hotel elegante } /o.té + e.le.gán.te/ \rightarrow [o.tél.le.le.gán.te] \text{‘elegant hotel’}
\]

The third form RS occurs is lexical gemination. This is caused by roughly twenty to thirty mono- and disyllabic functional words that do not fall into either of the two proceeding categories (Borrelli, 2002).

\[
\text{Lexical Gemination}
\]
\[
a. \text{ a casa } /a + ká.sá/ \rightarrow [ak.ká.sá] \text{‘at/going home’}
\]

As most of the data on RS is based on early studies and reuse of the same data, new data was collected for this study. The data shows that the phenomenon does exist in its
various versions, but casts doubt on one version of RS. The data showed that for backwards
gemination what was held to be gemination onto an onset is actually a process of assimilation
of a glottal stop in the onset to the coda consonant of the proceeding word’s word-final
stressed closed syllable. In explaining this, I employ Goldsmith (1979)’s autosegmental
theory in addition to the feature geometry as modified by McCarthy (1988). I then give
an account of RS in accord with the standard way of placing backwards gemination and
rhythmic gemination into the same grouping of phonological gemination. I then present the
data showing that a glottal stop occurs in the onset of ‘onsetless’ syllables that begin a word.
I then present my analysis into the differences that are between rhythmic and backwards
gemination. After which, I make a few concluding remarks in relation to the data and
analysis.

In illustrating RS, I will present the data in two parts. As was mentioned above, most
data and examples are the same throughout the literature and therefore will be the first
part of the data presented. For the second part of data presenting, I use data that was
collected specifically for this paper from an audio recording by a male speaker of Standard
Italian reading the New Testament. This was chosen as a good medium to use because of
the length of the audio recording\(^1\) and use of Standard Italian throughout and a text that
can be easily compared against the recording to aid in transcription. The majority of the
examples I procured were from the first 20 minutes of the recording and only stopped due to
the sheer wealth of examples obtained illustrating RS and providing new material to draw
new conclusions from. In the literature on RS there are two archetypes that are always
used to illustrate RS. The words most commonly used are, \textit{città bello} which means ‘beautiful
city’ as seen in the derivation for RS in (1) and \textit{a casa} which means ‘at home’ or ‘(general
movement towards) home’. In presenting the data, I use an acute accent mark on the nucleus
of the syllable to indicate stressed syllables and show the syllabic boundaries through the
use of periods as commonly used in transcription methods. An example of this is given in
(1).

This is a good example of the phonological occurrence of the first type of gemination,
which is stressed triggered. In this type of gemination it is seen to satisfy Italian stress
parameters which prefers stressed syllables to be heavy, or bimoraic (D’Imperio & Rosenthal,
1999; Krämer, 2009; Walker, 2011) as can be seen in (4).

\begin{enumerate}
\item[(4)] a. carino \([\text{ka.\text{	ext{"}i}.no}]\) ‘nice, pleasant, agreeable’
\item b. bello \([\text{b\text{	ext{"}e}.lo}]\) ‘beautiful, good’
\end{enumerate}

\(^1\)The total duration of the recording was just over 22 hours.
c. sporca [spôr.ka] ‘dirty, filthy, solid’

d. trista [tris.ta] ‘sad’

Because of this preference, Italian geminates the consonants at word boundaries in rhythmic gemination to produce heavy syllables, examples for this are seen in (5) from Krämer (2009) and Borrelli (2002) with some from the new data collected, but when there is a pause or change of intonation RS is blocked from applying because of the epenthesis of a [h] or [ʔ] or the lengthening of the vowel as explained in section 3.2 of Absalom et al. (2002) and illustrated with example (14) found therein and given as (6) here.

(5) a. paltò pulito /pal.tó + pu.lî.to/ → [pal.tó pu.lî.to] ‘clean coat’
   b. è carino /é + ka.rí:no/ → [ék ka.rí:no] ‘is nice’
   c. città triste /tí.tí.te + trís.te/ → [tí.tí.te trís.te] ‘sad city’
   d. è chiamato /é + kja.má:.to/ → [ék kja.má:.to] ‘is called’
   e. generò David /dʒe.ne.ró + da.vid/ → [dʒe.ne.ró da.vid] ‘he begat David’

(6) andò bene [an.dó? be:.ne] not *[an.dó? be:.ne] ‘it is well’

Krämer (2009) and Borrelli (2002) speak of backwards gemination as also relying on stress. As explained above and illustrated in (2), backward gemination occurs at the word boundary of two words, with the first word having a stressed word-final closed syllable’s coda geminate to fill the onset of an onsetless word-initial syllable. This appears to be a rather important aspect for these words that begin without a consonant. It is commonly known that languages prefer that their syllables have an onset and will insure that in any manner possible. Arabic is a well-known example of such a language that epenthizes a [ʔ] at the start of onsetless syllables in order to satisfy the constraint Onset. Italian allows syllables to be onsetless and supposedly does not try to remedy it Krämer (2009, p. 128). Evidence from the new data shows that Italian has an epenthetic [ʔ] for many of these “onsetless” syllables. This is found consistently in the data and is exemplified with the spectrogram given below.

(7) Spectrogram of ‘e tutta’
The left most section of the spectrogram shows the glottal stop which is illustrated by the dark band showing the burst of the glottal stop. This burst stands before the onset of the vowel [e] which is shown by the voicing bars or the striations.

If by taking the data to be true, that Italian prefers its syllables to have onsets and will even epenthesize to correct this, it lends weight to backward gemination needing to occur to fill that onset in satisfying this constraint. In fact, Borrelli (2002) proposed that these syllables have some form of a consonantal onset. The following items shows evidence from the data for an epenthetic glottal stop.

(8) **Examples of [ʔ] epentheses.**

a. è & e ‘is’ and ‘and’
   i. *Expected* [e]
   ii. *Actual* [ʔe]

b. Erode ‘Herod’
   i. *Expected* [e.ro.de]
   ii. *Actual* [ʔe.ro.de]

The last type of gemination, or lexical gemination, is the most prevalent and easiest to observe. This is due to the high use of these words in the language, whereas the two stressed induced gemination only is caused by words that make up about 2.5% of the Italian lexicon (Borrelli, 2002, p. 8). These words are by far the hardest to explain and most linguists bypass these words in their analyses (Borrelli, 2002). The majority of the data that was observed and collected for this paper was of lexical gemination and proved to be quit strong and easily observed in long strings such as *e da Davide* where each segment produced gemination. Data for this, and other occurrences, is found below in (9). Several of the occurrences were

\(^2\)In these examples I will not be showing stress because these words are mostly stressless (Borrelli, 2002; D’Imperio & Rosenthal, 1999) and do not rely on stress to trigger gemination.
rather interesting and did not follow the standard pattern of gemination. In these occurrence involving a [+voi] obstruent the lexical words e, [e], and a, [a] produced gemination with a [-voi] obstruent, see (9b).\(^3\) This occurred often but was not overall consistent after further collection of data. This is possibly due to the fact that these two words have underlying coda, [d], which is only manifested when those words occur before a word without an onset. This variation is so common that it is shown graphically in the orthography.\(^4\)

(9) **Lexical Gemination**

a. Normal Occurrences

\[ e \text{ da Davide } /e + da + da.vi.de/ \rightarrow [?e\text{d.dad.da.vi.de}] \text{ ‘and of David’} \]

b. Devoicing Occurrences

i. a Betleem \(/a + bEt.le.em/ \rightarrow [?a.p.bEt.le.Em] \text{ ‘at Bethlehem’} \]

ii. e da \(/e + da/ \rightarrow [?e\text{.da}] \text{ ‘and of’} \]

It must needs be that an analysis and a rule be provided to account for RS, having now provided data. Owing to the complexity and overall lack of a uniform phonological condition accounting for lexical gemination, an accounting will not be given at this time. As stated above, Italian has a preference for its stressed syllables to be heavy. In syllabic theory, it is commonly said that such heavy syllables are bimoraic. This bimoraic tendency allows RS to occur at word boundaries where the stressed syllable is not bimoraic. In fact this bimoraic nature is so strong that when RS does not occur Italian will commonly compensate by doing one of three things, as previously stated: epenthesize a [h] or [ʔ] or lengthen the vowel (Absalom et al., 2002). This general conditioning is given below in (10).

(10) **Rhythmic Gemination**

\[
\begin{array}{c}
\sigma_s \\
\# \\
\mu \\
\mu^s \\
V \\
C \\
V
\end{array}
\]

In order for this rule to apply it must be precisely stated that it is licensed only when a word that is stressed word-finally is one mora long and the following word has an onset. As mentioned above, the speaker would insert a glottal stop to every word that starts with

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\(^3\)As stated above it is possibly due to these words have the underlying forms /ed/ and /ad/. Thinking on that it is possible that for these words a type of assimilation occurs followed by a devoicing of word-final obstruents as in Catalan, German, Romansch, Dutch, Polish and several Northern Italian dialects. This seems plausible as Italian has no words that end in an obstruct, save for loan words.

\(^4\)Examples: *Tu ed io siamo fratelli*, *Ed egli insegnò*: ..., *ad essere* and *ad uno*. 

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a vowel. This is illustrated with the rule as seen in (11) which is licensed by word-initial position. By having this be an intervening step in the derivations it simplifies the process of backwards gemination by forcing the coda to share its place feature with an otherwise placeless consonant.

(11) **Glottal Stop Insertion**

![Glottal Stop Insertion Diagram]

Having thus far shown where RS occurs and does not occur, a derivation showing the rule producing the correct surface representation can be illustrated and is given below. For the derivation we will use (3b).

(12) **UR**

/é + ka.říː.no/

![UR Diagram]
(13) makes use of the same word for the derivation but shows what happens when RS is not licensed due to the glottal stop being present at a pause or change in intonation at the site of RS.

(13) UR /éʔ + ka.ří:.no/
Having shown derivations for backwards gemination the same conditioning is used with a slight variation to illustrate the gemination occurring the glottal stop of the onset of the following word totally assimilates to the proceeding coda of the word-final stressed syllable with a coda. The rule for this type of gemination is given in (14) and is licensed by the proceeding word being stressed word-finally with a coda in the syllable and the following word having a [?] in the onset.

(14) Backwards Gemination
This shows accurately what is occurring and can be seen operating in the derivation in (15) using (2a) to provide the input.

(15) UR  
\[ \text{/trám + e.lét.tri.ko/} \]
After showing these derivations and data it appears that what was originally believed to belong to the same grouping under the heading RS is actually two very completely different things. As seen in the data, rule and derivations for rhythmic gemination in (3, 7, 8 and 9) that this version of RS is trying to make a correction to its syllabic structure to satisfy various stress parameters. Whereas the backward gemination is simply a type of assimilation that only appears to be similar to RS in that it relies on stress to be the trigger for the gemination, but beyond this the similarities end. It seems only logical that these two types of external sandhi should no longer be classified as the same thing based on the data. By so doing RS is greatly simplified and is more clearly described and Indeed it is fair to say that perhaps the data showing that ‘onsetless’ syllables have an onset of in the form of [ʔ] does not accurately describe what is occurring in Italian generally and could very well belong to the idiolect of the speaker, but due to the overwhelming consistency of the occurrence it seems to indicate that it is indeed a unique, meaning widespread or common, feature of Italian. Further research is needed with more native speakers to ascertain if this is indeed a unique feature of the language or an individual occurrence. In conclusion I wish to propose that the traditional
account of RS needs to be reexamined in light of this new evidence and ask that when RS is being discussed that those researching turn to collecting new data, through which the study of RS can more easily be studied, expanded and explained in the light of new data, in order to collaborate or disprove the previous accounts of RS.


