Metrical prodosy: A template-and-constraint approach to phonological phrasing in Italian. Based on the poetry of Giuseppe Ungaretti and Eugenio Montale
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Foot Minimality
and
Stress-Final Words

8.0 Introduction

This chapter presents an optimality theoretical analysis of the Italian external sandhi phenomena that are triggered by stress-final words. As before, I shall refer to the recorded poems of Montale and Ungaretti. The phenomena of interest are listed in (1).2

(1) a. Destressing (DS)
   b. Stress Retraction (SR)
   c. Raddoppiamento Sintattico (RS)
   d. Vowel Doubling (VD)
   e. Pitch Jumping (PJ)
   f. Pause Insertion (PI)

In the light of the Italian MinΣ template, defined as the syllabic trochee in section 4.1.2, stress-final words are potentially troublesome. Since these words lack a final unstressed syllable, they may trigger a violation of the constraint which ensures that the positions of the foot template are properly filled. For the sake of exposition, let me repeat the MinΣ template and the definition of FILL-Σ from section 5.1.2.

(2) MinΣ template FILL-Σ: a foot template must be properly filled

\[ \{ \}_\sigma, \{ \}_\sigma \]

1 Parts of this chapter were presented at Going Romance, Utrecht 1994 (cf. Helsloot 1994).
The objective of this chapter is twofold: (a) to show that by virtue of the relative ranking of FILL-$\Sigma$ we are able to formally account for the phenomena listed in (1), and (b) to determine why in a given context phenomenon $\alpha$ is observed rather than phenomenon $\beta$. A first step towards answering these objectives is achieved by grouping the phenomena into two sets:

\[(3)\]
\begin{itemize}
  \item **Set I:** Stress Retraction, Destressing
  \item **Set II:** Raddoppiamento Sintattico, Vowel Doubling, Pitch Jumping, Pause Insertion
\end{itemize}

While the phenomena in *Set I* share the property that they satisfy the FILL-$\Sigma$ constraint, the phenomena in *Set II* share the property that they violate the FILL-$\Sigma$ constraint. The observed generalization is that (a) FILL-$\Sigma$ satisfaction occurs in a $\phi$-internal neutral position, and (b) FILL-$\Sigma$ violation occurs either in a $\phi$-edge position or in a $\phi$-internal focused position.

Before outlining this chapter, I will provide a rough sketch of the above phenomena. I will refer to just one textual input: a stress-final word is immediately followed by a stress-initial word (here presented as $\omega$-head features associated with either syllable nodes or CV sequences).

\[(4)\]
\begin{itemize}
  \item **Destressing:**
    \[
    \begin{array}{cccc}
    \omega & \omega \\
    \Sigma & \Sigma \\
    \sigma & \sigma \\
    \end{array}
    \]
  \item **Stress Retraction:**
    \[
    \begin{array}{cccc}
    \omega & \omega \\
    \Sigma & \Sigma \\
    \sigma & \sigma & \sigma \\
    \end{array}
    \]
  \item **Raddoppiamento Sintattico:**
    \[
    \begin{array}{cccc}
    \omega & \omega \\
    \Sigma & \Sigma \\
    \sigma & \sigma \\
    CV & CV \\
    \end{array}
    \]
  \item **Vowel Doubling:**
    \[
    \begin{array}{cccc}
    \omega & \omega \\
    \Sigma & \Sigma \\
    \sigma & \sigma \\
    \end{array}
    \]
\end{itemize}
In the course of the chapter, the phenomena will be separately dealt with as well as exemplified by data from the recorded poems.

The chapter starts in section 8.1 with a presentation of the textual inputs of interest. Section 8.2 shows that word-final stress does not necessarily give rise to the surfacing of one of the above phenomena. Section 8.3 focuses on outputs which give rise to the satisfaction of FILL-$\Sigma$, at the expense of PARSE constraints, and section 8.4 focuses on outputs which give rise to the violation of FILL-$\Sigma$. The outputs to be discussed in these two sections involve stress-final words in a $\phi$-internal position. Section 8.5, by contrast, focuses on FILL-$\Sigma$ violating outputs which occur in a $\phi$-edge position.

### 8.1 Textual Inputs: Stress-final Words

A stress-final word may or may not be followed by another word within the same $\phi$ domain. If the relevant word is not followed by another word, the textual input is characterized as in (5a). If the relevant word is followed by another word within the same $\phi$ domain, a variety of textual inputs can emerge. Firstly, a stress-final word can be followed either by a stress-initial word or by a non stress-initial word. And secondly, the involved stress degrees can vary: a word-final $\omega$-head can be followed by another $\omega$-head (cf. 5b), a word-final $\Sigma$-head can be followed by a $\omega$-head (cf. 5c), and a word-final $\omega$-head or $\Sigma$-head can be followed by a $\omega$-head or $\Sigma$-head plus a $\omega$-head (cf. 5d).

\begin{align*}
(5) & \quad \omega & \quad \omega \omega \\
a & \quad \ldots \text{ CV/} & \quad \ldots \text{ CV/} \quad \ldots \text{ CV...} \\
& \quad \Sigma & \quad \Sigma/\omega \quad \Sigma/\omega \quad \omega \\
b & \quad \ldots \text{ CV/} \quad \ldots \text{ CV...} & \quad \ldots \text{ CV/} \quad \ldots \text{ CV...} \quad \ldots \text{ CV...} \\
& \quad \Sigma & \quad \Sigma/\omega \quad \Sigma/\omega \quad \omega \\
c & \quad \ldots \text{ CV/} \quad \ldots \text{ CV...} & \quad \ldots \text{ CV/} \quad \ldots \text{ CV...} \quad \ldots \text{ CV...} \\
d & \quad \ldots \text{ CV/} \quad \ldots \text{ CV...} & \quad \ldots \text{ CV/} \quad \ldots \text{ CV...} \quad \ldots \text{ CV...}
\end{align*}
These inputs are illustrated below. Input (5a) always gives rise to a FILL-Σ violation, as shown in (6) by the empty syllable position.

(6)  
\[
\begin{array}{c|c}
\omega & \sum \\
\hline
/\cosi/ & \cosi \\
\end{array}
\]

Input (5b) may also give rise to a FILL-Σ violation, as shown in (7a). In addition, the input may give rise to satisfaction of FILL-Σ, at the expense, sometimes, of PARSE-Σ and/or PARSE-e (cf. 7bc). And finally, the input may give rise to no violations of the above constraints, as shown in (7d).

(7)  
\[
\begin{array}{c|c}
\omega & \sum \\
\hline
/\ma/ /\pio/ /\foce/ & \ma \pio \foce \\
\end{array}
\]

Input (5c) may give rise to a PARSE-Σ violation, as shown in (8a), but not necessarily, as shown in (8b).

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3 The output violates, however, the structural properties of the Max template (cf. section 7.0). As stated in chapter 7, marked Max outputs typically evince a focus reading.
Input (5d), finally, generally gives rise to violation of PARSE constraints, as illustrated by the examples (9ab). A FILL violation, possibly in combination with PARSE violations, may also occur, as shown in (9c). Notice in (9c) that only the output contains three head features.

The phonetic realizations of the above illustrated input-output relations are discussed in the following sections.

8.2 PARSE and FILL

In (7d) above, all the textually specified features are properly parsed, and most of the template-specified features are properly filled. Although the input contains a stress-final word, no special grammatical account is required where proper foot realization is concerned. Some additional examples are given in (10).
The patterns underlying the outputs in (10) are: (a) the stress-final words are all followed by an unstressed syllable, and (b) a head foot is preceded by a dependent foot. 4

Regarding the theoretical issue concerning the lexical representation of stress-final words, the above examples crucially argue against representing stress-final words with a diacritic [+catalexis]. 5 The MinΣ template in Italian requires a head syllable and a dependent syllable in order to be properly filled. No restriction is imposed, however, on the lexical descent of the syllables, i.e., they may be part of one or two words. By assuming that stress-final words are enriched with a catalectic syllable position we deny the following generalization: the templatic input (here, the MinΣ template) accounts for the fact that all surface feet, whether they are filled with textual material from one or two words, are structurally disyllabic. Indeed, FILL-I can be violated. Below, I shall consider such a violation. With respect to the input in (10), foot realization is straightforward under the above account.

Phonological evidence in favor of the cross-word footing is provided by the adjacent vowels in the examples (10b) and (10c). Except for the vowels which undergo synaloephe, in (10b), each vowel fills a separate syllable position. All the adjacent vowel pairs share the same property, however: they give rise to a properly filled binary foot.

4 Recall from chapter 5 the constraint FILL-Max which I introduced in order to account for the alternation of head feet and dependent feet. In the next section, FILL-Max will manifest again.

5 Kiparsky (1991), extending the parallelism between extrametricality and catalexis, argues in favor of lexically assigned idiosyncratic catalexis.
8.3 Violation of PARSE

This section discusses three PARSE-violating outputs. The traditional names are Destressing, Total Destressing and Stress Retraction.

8.3.1 Violation of PARSE-ω: Destressing

Section 5.2.3 presented default ource outputs which gave rise to a PARSE-ω violation of the type vivo di pietre → vivo di pietre. That is, the textually specified ource heads were not parsed as such in the output. Although the examples there reported were not characterized by stress-final word inputs, the effect of the ranking dominance of Fill-Max over PARSE-ω is identical when a stress-final word is involved. That is, the violation of PARSE-ω, by virtue of Fill-Max, is phonetically interpreted as the deletion of prosodic ource features. Destressing is the classical name for this phenomenon. Consider the examples in (11).

(11)

\[
\begin{array}{c}
\text{a.} & \text{giu's'afflossciano}\quad \text{M81:43} \\
\text{b.} & \text{con'se' trascina}\quad \text{M81:47} \\
\text{c.} & \text{faro'da'guida}\quad \text{U117:26}
\end{array}
\]

The tableau in (12) illustrates the relevant constraint interaction with respect to input (7c). The TexIn is associated with the Max template in (12i), and with the Def template in (12ii).
8.3.2 Violation of PARSE-Ω: Total Destressing

When a textually specified Ω-head feature is immediately adjacent to another Ω-head feature Total Destressing can be observed. That is, in addition to the violation of PARSE-Ω, we are also faced with the violation of PARSE-Σ. FILL-Σ is satisfied, however. That is, all foot positions are properly filled with textual material. Consider the examples in (13).

In accounting for the outputs in (13), the constraint FILL-Σ must be assumed to be ranked higher than PARSE-Ω as well as PARSE-Σ. The tableau in (14) illustrates the constraint interaction with respect to input (13a). Whether the relevant FILL
constraints as well as the relevant PARSE constraints are also ranked with respect to another, is of no importance here. The TexIn is associated with the Maxq template in (14i), with the Defq template in (14ii), and with the Minq template in (14iii).

\begin{equation}
\text{Candidates} \quad \text{FILL-Maxo} \quad \text{FILL-\(\Sigma\)} \quad \text{PARSE-\(\omega\)} \quad \text{PARSE-\(\Sigma\)}
\begin{array}{|c|c|c|c|}
\hline
\text{[i]q} & \text{[o]} & \text{[a]} & \text{[g]} \quad \text{[\(\Sigma\)]} \\
\text{[\(\Sigma\)]} & \text{[i]} & \text{[\(\Sigma\)]} & \text{[\(\text{ Defq} \)]} \\
\text{[\(\text{ Destressing} \)]} & \text{[\(\omega\)]} & \text{[\(\Sigma\)]} & \text{[\(\text{ Defq} \)]} \\
\hline
\text{[\(\text{ Minq} \)]} & \text{[\(\text{ Defq} \)]} & \text{[\(\text{ Destressing} \)]} & \text{[\(\omega\)]} \\
\hline
\end{array}
\end{equation}

Candidate (14iii) is the optimal output: rhythmic alternation is achieved by destressing a textually specified main stress. FILL-Maxo and FILL-\(\Sigma\) are the two constraints ensuring the alternation: the former between feet and prosodic words, the latter between syllables and feet. Thus, the constraint Defq (= \(\varphi\) outputs are realizations of the Defq template (cf. section 7.1)) is outranked by FILL-Maxo and FILL-\(\Sigma\). In fact, the attested output is a realization of the Minq template.

8.3.3 Violation of PARSE-\(\omega\) and PARSE-\(\Sigma\): Stress Retraction

Stress Retraction involves the same constraint interaction as considered in the previous section: PARSE-\(\omega\) and PARSE-\(\Sigma\) are violated by virtue of the higher ranking of FILL-Maxo and FILL-\(\Sigma\). The difference between the former inputs and the inputs undergoing Stress Retraction is that the latter ones are segmentally more complex. That is, the ‘destressed’ \(\omega\)-head or \(\Sigma\)-head is preceded by a syllable in the same phrasal domain. By virtue of the undominated constraint PARSE-segment, a foot will arise with the preceding syllable as head and the destressed syllable as dependent. In other words, Stress Retraction is triggered by PARSE-segment as well as by FILL-\(\Sigma\). Consider first some examples.
The tableau in (16) presents a number of candidates for the input in (15a).

The template-and-constraint account of the phenomenon of Stress Retraction as outlined above captures the observation that the prominence degree of a 'retracted' stress is not necessarily the same as the prominence degree of the original stress (cf. Nespor & Vogel 1986, 1989). In fact, in (15b), a dependent Σ emerges, and not a dependent ω, by virtue of FILL-Maxω: a head foot must be preceded by a...
dependent foot. In (17), the effect of FILL-Maxω is illustrated: violation in (17a),
and satisfaction in (17b).

(17) a. *FILL-Maxω
   \[
   \begin{array}{l}
   \text{cr} \\
   \text{m} \\
   \omega \\
   \text{a} \\
   \end{array}
   \]
   \[
   \begin{array}{c}
   \text{cr} \\
   \text{m} \\
   \omega \\
   \text{a} \\
   \end{array}
   \]
   \[
   \begin{array}{c}
   \text{cosi} \\
   \text{dura}
   \end{array}
   \]

   b. FILL-Maxω
   \[
   \begin{array}{l}
   \text{cr} \\
   \text{m} \\
   \omega \\
   \text{a} \\
   \end{array}
   \]
   \[
   \begin{array}{c}
   \text{cr} \\
   \text{m} \\
   \omega \\
   \text{a} \\
   \end{array}
   \]
   \[
   \begin{array}{c}
   \text{cosi} \\
   \text{dura}
   \end{array}
   \]

To summarize, by the hierarchical dominance of the FILL constraints, FILL-Σ and
FILL-Maxω, with respect to the PARSE constraints, PARSE-ω and PARSE-Σ, we
formally account for the fact that in neutral speech textual ω-head or Σ-head features
do not always come to the surface. The phenomena that these constraints formalize
are traditionally referred to as Destressing and Stress Retraction.

8.4 Violation of FILL

This section deals with stress-final words whose textually specified Σ-head or ω-
head features are not deleted in the output. Another constraint must be assumed to
outrank FILL-Maxω and FILL-Σ. In section 8.4.1, I shall take up the phonological
phrase forms to which I referred in chapter 3 as marked Default ϕ Form and
Complex ϕ Form Ib. In accounting for these forms, a {semantics, prosody}
alignment template will be introduced. The ranking position of the FILL constraint
that ensures that this template is properly filled at the surface ensures that FILL-Σ
violating ϕ outputs may be selected as optimal. Section 8.4.2 deals with the phonetic
effects of the FILL-Σ violations.

8.4.1 {Semantics, Prosody} Alignment: Violation of FILL-Σ

Section 3.4.3.3 presented the marked Default ϕ Form, and section 3.4.3.4, the
Complex ϕ Form I. The markedness of these ϕ forms derives from the fact that the
head of the phrase is immediately preceded by a dependent ω-head rather than by a
dependent Σ-head. The ϕ forms are repeated in (18).

(18) Default ϕ Form (marked):
   \[
   \begin{array}{l}
   \omega \\
   \Sigma \\
   \sigma
   \end{array}
   \]
   Complex ϕ Form Ib:
   \[
   \begin{array}{l}
   \phi \\
   \Sigma \\
   \sigma
   \end{array}
   \]
In the Montale and Ungaretti corpora the number of occurrence of marked Def$\Phi$ outputs was 4% and 3.4%, respectively, and of Complex $\Phi$ Form 1b, 7.2% and 6.7%. These percentages differ remarkably from those representing the Default $\Phi$ Form proper, which amount to 37.2% in Montale, and to 30.1% in Ungaretti.

Generally, the textual inputs of the $\Phi$ forms in (18) contain two $\omega$-head features. Some examples are given in (19).

(19)

\[
\begin{array}{c}
\text{a.} /\text{soccano} / / \text{l'anima} \\
\text{touch-3PL the soul} \\
\end{array}
\]

\[
\begin{array}{c}
\text{b.} /\text{rossi} / / \text{formiche} \\
of \text{red ants} \\
\end{array}
\]

\[
\begin{array}{c}
\text{c.} /\text{piu} / / \text{foce} \\
\text{ma piu foce} \\
\end{array}
\]

In addition to the above two $\omega$-head inputs, prosodically less specified textual inputs are found which nevertheless give rise to the same marked $\Phi$ outputs. Such input-output instances occur in the recordings of Ungaretti only, however. The input in (20a) contains a $\Sigma$-head associated with the demonstrative pronoun $\text{quelle}$, the input in (20b), a $\Sigma$-head associated with the preposition $\text{sopra}$, and the input in (20c) contains no additional prosodic feature except for the $\omega$-head which surfaces as a $\Phi$-head.

(20)

\[
\begin{array}{c}
\text{a.} /\text{quella} / / \text{mano} \\
\text{that hand} \\
\end{array}
\]

\[
\begin{array}{c}
\text{b.} /\text{sopra} / / \text{sabbie} \\
\text{upon the sand} \\
\end{array}
\]

---

6 In table 3.44, in section 3.7, these latter percentages were taken together with those referring to Complex $\Phi$ Form 1a.

7 See table 3.44.
While output (20a) might be explained by taking into consideration the deictic function of the pronoun, a similar morpho-semantic function cannot be attributed to the dependent \(\omega\) outputs in (20b) and (20c).

To capture the prosodic regularity of the outputs in (19) and (20), I suggest that the relevant structures are instances of narrow focus. A property of items with narrow focus is that they do not constitute the head of the phrasal constituent (cf. Selkirk 1984a). Selkirk (1984a) defines the relevant phrasal constituent in terms of either morphological, syntactic or semantic constituency. However, by defining the narrow focus structure in terms of prosodic constituents, the rich set of non-prosodically defined constituent combinations displaying narrow focus is captured by one structure. More concretely, a \{semantics, prosody\} alignment template is introduced which, just as the alignment templates presented in the chapters 6 and 7, is part of the input. The template is defined as follows:

(21) TemIn: Narrow Focus

\[
(\omega \backslash \lambda_p)
\]

\[
(\ldots X \ Y)
\]

\((X = \text{element with narrow focus})\)

The template states that a Narrow Focus structure consists of a \(\omega\) position followed by a \(\lambda_p\) position. It is in principle irrelevant whether the element \(X\) that fills the \(\omega\) position constitutes (a) a lexical item, grammatical item, a bounded morpheme or no morpheme at all, or (b) a metrically simple or metrically complex item. The templatic positions must be filled with proper prosodic content, namely by a \(\omega\) feature and a \(\lambda_p\) feature. It is the constraint FILL-\(\omega\)_\(\lambda_p\) which ensures this filling:

(22) FILL-\(\omega\)_\(\lambda_p\): a Narrow Focus template must be properly filled

Obviously, to establish what determines the activation of the alignment template is a complex matter. It is beyond the scope of this research to investigate this issue. I simply conclude that on the basis of the percentages presented above, outputs which result from the activation of the Narrow Focus template are more specific than default \(\omega\)’s. Their metrical imperfection sustains this conclusion: narrow

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8 Selkirk (1984a:271) distinguishes two types of narrow focus, one with a linguistic interpretation, and one with a metalinguistic interpretation: in particular focused sub-word constituents evoke the metalinguistic interpretation (cf. the examples 20abc).
focus often gives rise to \( \varphi \) outputs in which a head foot and a dependent foot do not alternate.

Returning to the main topic of this chapter, i.e. to the behavior of stress-final words, we observe that textual inputs subject to the Narrow Focus template do not allow the relevant \( \alpha \) -head and \( \Sigma \) -head to be left unparsed in order to satisfy \( \text{FILL-Max} \alpha \) and \( \text{FILL-} \Sigma \). That is, \( \text{FILL-Max} \alpha \) and \( \text{FILL-} \Sigma \) are violated by virtue of the hierarchical dominance of \( \text{FILL-} \varphi \). The tableau in (23) illustrates the interaction between the constraints for the input presented earlier in (19c).

How the \( \text{FILL} \) violations are phonetically interpreted is what we will discuss now.

### 8.4.2 Phonetic Interpretations of \( \text{FILL-} \Sigma \) Violation

The number of \( \text{FILL-} \Sigma \) violations in \( \varphi \)-internal position is extremely small in the recorded corpus of poetry: only one instance in Ungaretti, and four instances in Montale are found. Therefore, we should be cautious about drawing too hasty conclusions about the relevant epenthetic effects.

When a \( \text{FILL} \) constraint is violated, epenthetic elements are found in the output. In the linguistic domain considered here, epenthesis implies the addition of prosodic features. The hypothesis is that Raddoppiamento Sintattico, Vowel Doubling, Pitch Jumping and Pause Insertion constitute such epenthetic phenomena: either segments are lengthened, the interval between two segments is lengthened or the difference between the target \( F_0 \) values is increased.\(^9\) More precisely, Pitch Jumping appears to be the phonetic interpretation of the violation of \( \text{FILL-Max} \alpha \), and the other epenthetic phenomena appear to be the phonetic

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\(^9\) Regarding the durational effect of Pitch Jumping, Collier (1983:242), referring to Sundberg (1979), observes that pitch changes require time: an interval of four semitones requires about 85ms if the direction of the change is rising, and 75ms if it is falling. Furthermore, it appears that pitch jumps do not exist actually: 'they happen to result in glides because of the inertia of the laryngeal structures' (Collier 1983:243).
interpretations of the violation of FILL-Σ.\textsuperscript{10} Evidence in favor of the former correlation is provided by textual inputs in which no stress-final words occur. That is, inputs that are subject to the Narrow Focus template, like those considered in (19) and (20), are all phonetically realized with two pitch accents which differ remarkably in their tonal level. Except for (19c), these inputs give rise to a FILL-Max\textsuperscript{a} violation alone. Therefore, I assume a pitch jump to be the phonetic realization of the violation of FILL-Max\textsuperscript{a}. Whether or not Pitch Jumping may also function as a phonetic realization of a violation of FILL-Σ, requires further research.\textsuperscript{11}

The examples of FILL-Σ violations found in the recordings of Montale and Ungaretti are given in (24). In addition to Pitch Jumping, Raddoppiamento Sintattico is observed in (24a), Pause Insertion in (24b) and (24c), and Vowel Doubling in (24d) and (24e).

\textbf{(24)}

\begin{center}
\begin{tabular}{c|c|c|c|c|c|c|c|}
\hline
\textit{\textsuperscript{a}} & \textit{\textsuperscript{b}} & \textit{\textsuperscript{c}} \\
\hline
\text{\textsuperscript{1}} & \text{\textsuperscript{2}} & \text{\textsuperscript{3}} \\
\hline
\text{l} & \text{l} & \text{l} \\
\text{\textsuperscript{1}} & \text{\textsuperscript{2}} & \text{\textsuperscript{3}} & \text{\textsuperscript{4}} \\
\hline
\text{M96:12} & \text{M5:6} & \text{U253:3} \\
\hline
\end{tabular}
\end{center}

\textsuperscript{10} Regarding Raddoppiamento Sintattico as a phonetic interpretation of a FILL-Σ violation, it should be stressed that reference is made to its rhythmic variant, not to its morphological variant (cf. section 4.2.2, and the references made there). Evidence in favor of the rhythmic variant is provided by Marotta (1986): the degree of consonant lengthening on the one hand, and the metrical context in which RS is observed on the other, are proportionally related to one another. No stressless syllable between two stresses causes extreme lengthening of the initial consonant of the second word, while a maximum of two stressless syllables between two stresses causes no lengthening at all. In constraint-based terms, there is a FILL-Σ violation in the former context alone. If a word-final stressed syllable is followed by one or two unstressed syllables there is no FILL-Σ violation. Hence, if any consonant lengthening is observed in these latter contexts, it should not be interpreted as epenthetic effect of FILL-Σ violation.

\textsuperscript{11} Camilli (1965) observes that Raddoppiamento Sintattico is blocked to apply after a strong melodic change. On the basis of measurements executed by Els den Os and myself it appeared indeed that Raddoppiamento Sintattico and Pitch Jumping are complementarily distributed. Whether more than one variant of Pitch Jumping needs to be distinguished is not clear at this point. Undoubtedly, however, Pitch Jumping must be considered to constitute an available epenthetic phenomenon in Italian.
Obviously, neither the durational additions nor the pitch level additions give rise to full-fledged syllables and/or feet. In fact, we are faced with FILL violations, and these \( \phi \)-internal FILL violations occur by virtue of the activation of the \{semantics, prosody\} alignment template in (21). Like the alignment templates presented in chapters 6 and 7, the Narrow Focus template is not defined in metrical terms alone. Indeed, inputs that are subject to an alignment template in principle may be expected to be metrically marked. In actual case, activation of the Narrow Focus template may give rise to a violation of FILL-Max\( \phi \) and FILL-\( \phi \): the rhythmic alternation at the \( \Sigma\)-\( \omega \) level as well as at the \( \sigma\)-\( \Sigma \) level may be disturbed.

With respect to the regional distributions of the above phenomena it has been observed that Raddoppiamento Sintattico and Vowel Doubling belong to different phonological grammars of Standard Italian (cf. Camilli 1965, Napoli & Nespor 1979, Nespor & Vogel 1979, Repetti 1991, Agostiniani 1992). More precisely, RS belongs to the grammar of the central and southern varieties of Standard Italian, and VD to the grammar of the northern varieties.\(^{12}\) Although coming from Liguria, in which the northern variety is spoken, Montale’s reading contain a single, but very clear example of RS (cf. 22a) as well as various examples of VD (cf. 22de). Ungaretti’s reading too contain both phenomena, but not in the \( \phi \)-internal FILL-\( \Sigma \) violating contexts considered here.\(^{13}\) Pitch Jumping, by contrast, appears not to be regionally distributed: both Ungaretti and Montale produce pitch changes in order to create sufficient distance between two main stresses. This fact provides evidence in favor of the above proposal to consider Pitch Jumping to constitute the phonetic interpretation of a FILL-Max\( \phi \) violation.

\(^{12}\) It is well-known, furthermore, that between the central and southern varieties there are important contextual differences with respect to the application of RS (cf. Fanciullo 1986, Loporcaro 1988, Andalo 1991, 1992, Agostiniani 1992).

\(^{13}\) As shown in 3.4.4.3, Ungaretti’s readings show up with combinations of Stress Retraction and RS. Under the approach presented here, the lengthening of the consonant cannot be seen as the phonetic interpretation of a FILL-\( \Sigma \) violation. The relevant instances argue in favor of a lexically represented ghost segment (cf. Bolognesi 1992).
8.5 Stress-final Words in $\varphi$-edge Position

At the right edge of a phonological phrase, a stress-final word input always gives rise to a violation of FILL-$\Sigma$. The number and percentages of such absolute stress-final $\varphi$'s in the recorded data are as follows: in Montale, 54 stress-final $\varphi$'s occur, which amounts to 7% of such phrases, and in Ungaretti, 24 stress-final $\varphi$'s occur, which amounts to 5.7% of such phrases with respect to the total of $\varphi$ outputs. These statistical facts provide additional evidence in favor of the MinE template as well as of the highly ranked position of FILL-$\Sigma$.

Vowel Doubling and Pause Insertion constitute the epenthetic effects when FILL-$\Sigma$ is violated in $\varphi$-edge position. Section 8.5.1 accounts for the facts in terms of constraint interaction. Section 8.5.2 confronts FILL-$\Sigma$ with the constraint *SupraMax$\varphi$, which states that supramaximal $\varphi$ outputs are prohibited (cf. section 7.0).

8.5.1 Violation of FILL-$\Sigma$: Vowel Doubling and Pause Insertion

In (25), a number of phrases are given which are characterized by the occurrence of word-final stress in $\varphi$-edge position.

\[ (25) \]
\[
\begin{array}{ll}
\text{a.} & \text{dei bambu} \quad \text{M96:27} \\
\text{b.} & \text{della citta} \quad \text{M125:8} \\
\text{c.} & \text{e cosi} \quad \text{M125:28} \\
\text{d.} & \text{di volonta} \quad \text{U226:22} \\
\text{e.} & \text{ricordera} \quad \text{U158:14}
\end{array}
\]

As mentioned in chapter 3, section 3.4.4.5, the stressed vowel in absolute $\varphi$-final position is sometimes re-articulated, sometimes lengthened and sometimes followed by a glottal stop.\(^{14}\) That is, the empty syllable positions in (25) are phonetically interpreted by durational additions.

\(^{14}\) See Vayra (1992) for an analysis of glottal stops accompanying word-final stress in Italian. The phonetic measurements I did on material collected in Florence also provide evidence of the presence of glottal stops after word-final stressed vowels.
The theoretical issue that is raised now concerns the blocking of prosodic parsing across the \( \Phi \) boundary. More concretely, how can we account for the prohibition against taking a following unstressed syllable from the following phrase to fill the dependent syllable position? I suggest that the constraint \( \text{FILL-}\Phi\text{-Head} \) is crucially involved. In section 6.1, I defined this constraint as follows:

\[ (26) \quad \text{FILL-}\Phi\text{-Head}: \text{the head of a } \Phi \text{ template is filled with a textually specified } \omega \text{-head} \]

This constraint was introduced in accounting for the fact that grammatical words are no proper fillers of the head of the phonological phrase. The definition of the constraint refers to the \( \omega \)-level of the \( \Phi \) alone. However, by enriching the definition with a specification of the foot level, we also capture the fact that the head foot of the phrase is filled with segmental material that belongs to the same word providing the \( \omega \)-head feature.

\[ (27) \quad \text{FILL-}\Phi\text{-Head (revised): (a) the head of a } \Phi \text{ template is filled with a textually specified } \omega \text{-head, and (b) the head foot of the } \Phi \text{ template is exclusively filled with the segments of the word domain providing the } \omega \text{-head} \]

Of more interest is the interaction between \( \text{Max}\Phi \) outputs and \( \text{FILL-}\Sigma \), however, to which we turn now.

### 8.5.2 *SupraMax\( \Phi \) and \( \text{FILL-}\Sigma \)

In section 7.1, I argued in favor of a constraint ranking in which \( \text{FILL-}\Sigma \) outranks \( \text{Def}\Phi \). This ranking provides an explanation for a number of maximal \( \Phi \) outputs: in order to avoid violation of \( \text{FILL-}\Sigma \), textual input words are parsed into a maximal \( \Phi \). In the present section I would like to go a step further. Can supramaximal \( \Phi \) outputs be created in order to avoid \( \text{FILL-}\Sigma \) violation?

The two examples in (28) suggest that \( \text{FILL-}\Sigma \) is indeed ranked higher than \( \text{SupraMax}\Phi \). That is, the supramaximal \( \Phi \) outputs on the left are empirically attested, not the \( \text{FILL-}\Sigma \) violating representations on the right.

\[ (28) \quad \text{a. } \text{siva sulla carrassa, si va sulla carrassa M96:19} \]

\[ \quad \text{b. avro...il tuo... passo, avro il tuo passo U117:19} \]
However, if we accept the dominance of FILL-Σ over *SupraMaxφ, we must be able to account for all the 54 and 24 φ outputs in Montale and Ungaretti in which FILL-Σ is violated. Part of these outputs can be explained by the fact that no textual material immediately follows the φ-final stress. For instance, a sentence boundary (= the right edge of a Functional Projection) follows immediately, as in (29a). Another part can be explained by virtue of the fact that the output would give rise to a ‘supra’-supramaximal φ output, as in (29b). And still another part can be explained by taking into account the activation of alignment templates whose relevant FILL or PARSE constraint is higher ranked than FILL-Σ, as illustrated in (29c) by the imperative form. The FILL-Σ violating φ outputs on the left are empirically attested, not the FILL-Σ satisfying representations on the right.

(29) 

\[
\begin{array}{lll}
\text{a. ne bonta. /colla mente} & \text{ne bonta. /colla mente} \\
\text{U117:23-4} & \\
\end{array}
\]

\[
\begin{array}{lll}
| Π & | Π & | Π \\
| [o] & [o] & [o] \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
\end{array}
\]

\[
\begin{array}{lll}
| Π & | Π & | Π \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
\end{array}
\]

(29) 

\[
\begin{array}{lll}
\text{b. non si leggeva piu in faccia al mondo} & \\
\text{M72:42} & \\
\end{array}
\]

\[
\begin{array}{lll}
| Π & | Π & | Π \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
\end{array}
\]

Another part of the FILL-Σ violating φ outputs cannot be explained, however, by making reference to the above properties. In these cases, nothing seems to block parsing the input in one supramaximal φ. In (30), the representations on the left are the attested ones, although the ones on the right satisfy FILL-Σ.

(30) 

\[
\begin{array}{lll}
\text{c. Va, per te l'ho pregato} & \text{Va, per te l'ho pregato} \\
\text{M5:17} & \\
\end{array}
\]

\[
\begin{array}{lll}
| Π & | Π & | Π \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
\end{array}
\]

\[
\begin{array}{lll}
| Π & | Π & | Π \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
| \{o\} & \{o\} & \{o\} \\
\end{array}
\]
b. vederi la primavera

In sum, on the basis of the examples in (30) a ranking in which FILL-Σ dominates *SupraMaxφ must be rejected. Since the supramaximal φ outputs presented in (28) constitute the only two examples found in the corpus which would argue in favor of this constraint ranking, a ranking in which FILL-Σ dominates Defφ, but is dominated itself by *SupraMaxφ seems to be closer to the observed patterns:

(31) *SupraMaxφ >> FILL-Σ >> Defφ

At this point, no other interactions will be considered.

8.6 Conclusions

This chapter presented a template-and-constraint based account of the classical external sandhi phenomena in Italian. The relative ranking of the constraints FILL-[ |o[ ]|φ, FILL-Maxφ, FILL-Σ, PARSE-φ and PARSE-Σ enabled us to explain the distribution of these phenomena. In neutral speech, the satisfaction of FILL-Σ accounts for the fact that textually specified φ-heads and/or Σ-heads fail to be properly parsed in the output. The external sandhi phenomena Destressing, Total Destressing and Stress Retraction are nothing but instances of violations of PARSE-φ and PARSE-Σ. In non-neutral or focused speech, FILL-Maxφ and FILL-Σ can be violated by virtue of the higher ranking of FILL-[ |o[ ]|φ. That is, the constraint that ensures proper filling of the {semantics, prosody} alignment template, called Narrow Focus template, will be satisfied at the expense of FILL-Maxφ and FILL-Σ. Pitch Jumping is the phonetic interpretation of the violation of FILL-Maxφ, and Raddoppiamento Sintattico, Vowel Doubling and Pause Insertion are the phonetic interpretations of the violation of FILL-Σ.

At the right edge of a φ, stress-final word inputs give rise to FILL-Σ violations by virtue of the higher ranking of the constraint FILL-φ-Head. Vowel Doubling and Pause Insertion constitute the epenthetic effects in this environment. In addition to FILL-[ |o[ ]|φ, I assume also that *SupraMaxφ dominates FILL-Σ. That is, although Defφ may be violated in order to satisfy FILL-Σ, *SupraMaxφ may not. This amounts to the following constraint ranking: *SupraMaxφ >> FILL-Σ >> Defφ. Table 8.1 presents the relevant constraint interactions.
Table 8.1 Prosodic Phrasing of Stress-Final Words

<table>
<thead>
<tr>
<th>Default Metrical Templates</th>
<th>Phonetic Interpretations</th>
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<tr>
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<td>i.  FILL-Σ &gt;&gt; PARSE-ω</td>
<td>i. Destressing</td>
</tr>
<tr>
<td>ii. FILL-Σ &gt;&gt; PARSE-ω &gt;&gt; PARSE-Σ</td>
<td>ii. Total Destressing</td>
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<tr>
<td>iii. PARSE-segment &gt;&gt; FILL-Σ &gt;&gt; PARSE-ω &gt;&gt; PARSE-Σ</td>
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<td>vi.  *SupraMaxϕ &gt;&gt; FILL-Σ</td>
<td>vi. Vowel Doubling / Pause Insertion</td>
</tr>
</tbody>
</table>

| (Semantics, Prosody) Alignment Template                                                   |                           |
| Constraint Ranking                                                                        |                           |
| FILL-[ ]ϕ >> FILL-Σ >> Pitch Jumping / Raddoppiamento                                     |                           |
| FILL-Maxt                                  | Vowel Doubling / Sintattico / Pause Insertion |