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## RESEARCH

## A morphophonological analysis of the velar insert in Italian verbs

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This paper analyzes a particular group of Italian irregular verbs that are characterized by the insertion of [g] between the root and the inflectional markers. Despite the apparent unetymological status of such a velar insert (Rohlf's 1968), it is shown that the allomorphy of the root depends on the internal organization of the segmental material with respect to a fixed template made of a strict alternation of onsets (C) and nuclei (V). The analyses are couched within the CVCV framework (Lowenstamm 1996; Scheer 2004) and are consistent with a syntactic approach to word-formation such as Distributed Morphology (Halle & Marantz 1993; Embick 2010).

**Keywords:** Romance velar insert; Italian verbs; root allomorphy; template; phonological government

## Introduction

In this paper, I analyze a particular group of Italian irregular verbs that display an intriguing pattern of root-alternations, as shown in Table 1.<sup>1</sup>

These verbs (henceforth G-VERBS) are characterized by the insertion of [g] between the root and the inflectional markers. This is shown in the gray cells.

According to Napoli & Vogel (1990: 491), the inflectional pattern in Table 1 is followed by four verbs: *tenere* 'hold', *svellere*<sup>2</sup> 'pluck out', *valere* 'be worth, count' and *venire* 'come'. In addition to these verbs, Rohlf's (1968: §535) includes five items: *porre* 'put, set', *rimanere* 'stay, remain', *salire* 'get in, go up', *sciogliere* 'dissolve' and *togliere* 'remove'.<sup>3</sup>

The literature agrees on the unetymological status of the velar insert (see Fanciullo 1998; Klausenburger 1984; Maiden 1995; Meyer-Lübke 1890–1902; Rohlf's 1968; Tekavčić

**Table 1:** Italian *tenere* 'hold'.

	1sg	2sg	3sg	1pl	2pl	3pl
PrInd	téng-o <sup>4</sup>	tjé:n-i	tjé:n-e	ten-já:mo	ten-é:te	téng-ono
PrSubj	téng-a	téng-a	téng-a	ten-já:mo	ten-já:te	téng-ano

<sup>1</sup> The phonetic transcriptions are consistent with IPA conventions and follow the pronunciation of standard Italian. They can be checked at the following webpage: <http://www.dipionline.it/dizionario/>. This on-line pronunciation dictionary is based on Canepari (2009).

<sup>2</sup> In contemporary Modern Italian, the regular form *svello* 1sg exists, too. This verb is extremely rare: to wit, Pirrelli & Battista (2000) don't mention *svellere* among the G-VERBS.

<sup>3</sup> Serianni (1989: 457–461) mentions five verbs: those selected by Napoli & Vogel and *salire* 'get in, go up'.

<sup>4</sup> In Italian nasals /n/ and /m/ are homorganic and realized as [ŋ] before velar onsets. As for stress-induced vocalic length, it is noted according to IPA principles and will be discussed later in the paper.

1972). In fact, Latin 1sg is TENĒO: according to the phonological changes that occurred in Italian, we expect the form [tɛɲɲo].<sup>5</sup>

Within an Item-and-Arrangements approach (Hockett 1954), the form and the function of morphemes are separated. A current formalism of such an approach, Distributed Morphology (Halle & Marantz 1993; Embick 2010; 2015), assumes that a feature-matrix (or a root) receives its (phonological) form through a mechanism called *spell-out*. At this stage of word formation, phonological strings are paired with the morphosyntactic properties. DM literature calls such pairings Vocabulary Items (henceforth VI).

In this paper, I explore the hypothesis that the surface irregularities are triggered by the systematic application of (morpho)phonological processes to the phonological strings introduced by each VI. More precisely, I show that the behavior of G-VERBS follows from the interaction of stress with the particular status of their roots. G-VERBS roots are characterized by a fixed template in their representation. The analyses presented are consistent with the theoretical framework of Government Phonology (Kaye et al. 1990) in general and the CV-hypothesis (Lowenstamm 1996) and Element Theory in particular (Kaye et al. 1985; Bäckley 2011).

I focus on the following two goals:

- (1) Goals
  - a. To propose a synchronic explanation of the velar insertion.
  - b. To show that surface-alternations are triggered by the interaction of stress and a fixed template in the root.

The paper is structured as follows. Section 1 introduces the relevant general facts about the Italian verbal system and shows the basic verb structure. Section 2 sketches out the main hypothesis, and in section 3 I show the representations of the inflected forms. Section 4 concludes.

## 1 The conjugations of Italian: roots and syntactic structures

It is generally assumed that Italian, as Romance languages in general, possesses roots made of syllabified sequences of phonological segments which do not display any limitations on the number of consonants and/or vowels they can contain (phonological constraints aside).

More in particular, Italian verbs are organized in three conjugations which derive from the Latin system based on four inflectional groups.<sup>6</sup> As is well-known, the infinitive form of the verb identifies its affiliation to either conjugation.

I assume that each verb is made of a root, followed by the theme vowel (Th) and the inflectional markers (Infl), as is generally found in Indo-European languages:

- (2)  $\sqrt{\text{ROOT}} + \text{Th} + \text{Infl}$

Interestingly, all the inflected forms end in a vowel, which is usually unstressed (this is the case in the forms we will focus on in this paper). In addition, a three person-distinction

<sup>5</sup> In Italian, the phonemes /n/, /k/ and /s/ are always realized as geminated when in intervocalic positions (cf. Nespor 1993).

<sup>6</sup> Latin verbs belonging to the 2nd (-ĒRE) and 3rd (-ĔRE) conjugations merged into Italian 2nd conjugation so that *pérdere* ‘lose’ inflects exactly as *temére* ‘fear’ shown in Table 3. Napoli & Vogel (1990: 483: ff.) show that “this single fact of stress in the infinitive is the only difference between the two types of verbs” and thus claim that there is no need to distinguish two separate inflectional classes for theme vowel -e. According to Napoli & Vogel (1990: 480), only 22 verbs have theme vowel stress (excluding those built on the same roots): interestingly, 17 out of these 22 verbs are mentioned by Serianni (1989: 437–457) as the irregular verbs in this class. We address irregular verbs later in this section.

in both singular and plural form is almost always visible. Tables 2 to 4 show the present indicative and the present subjunctive of each conjugation.

The present indicative contains six distinct forms, whereas the present subjunctive contains only four. More precisely, in the singular, the distinction between 1st, 2nd and 3rd person is neutralized. Note, also, that 1pl is identical in PrInd and PrSubj. Finally, stress falls either on the suffix (1pl and 2pl) or on the root (1sg to 3sg and 3pl). The alternation between arhizotonic and rhizotonic forms is inherited from Classical Latin (Maiden 1995).

The paradigms shown in Tables 2 to 4 represent the inflectional patterns of regular verbs. Regular verbs are those displaying a unique form of the root within the whole paradigm. By contrast, irregular verbs are those displaying more than one form of the root. Pirrelli & Battista (2000) show that Italian verbs display up to four distinct allomorphs of the root within PrInd.<sup>7</sup> In their analysis, G-VERBS fall into a “small subclass of verbs” that have three allomorphs of the roots: this subclass is characterized by both g-insertion and diphthongization.<sup>8</sup>

It is worth noting that, in Italian, irregularities are found only in the following tenses and modes:

- (3) Distribution of irregularities (Serianni 1989: 432–433):
- a. PrInd and PrSubj
  - b. Future indicative and conditional tense
  - c. Past remote
  - d. Perfect participle

Each context triggers homogeneous irregularities. For instance, PrSubj 1sg, 2sg, 3sg and 1pl are built on PrInd 1sg, thus they display the exact same irregularity found in PrSubj 1sg. This is true, for instance, for the augment *-isk*. As already mentioned, 482

**Table 2:** 1st conjugation: *amare* ‘love’.

	1sg	2sg	3sg	1pl	2pl	3pl
PrInd	á:m-o	á:m-i	á:m-a	am-já:-mo	am-á:te	ám-ano
PrSubj	á:m-i	á:m-i	á:m-i	am-já:-mo	am-já:te	ám-ino

**Table 3:** 2nd conjugation: *temere* ‘fear’.

	1sg	2sg	3sg	1pl	2pl	3pl
PrInd	té:m-o	té:m-i	té:m-e	tem-já:-mo	tem-é:te	tém-ono
PrSubj	té:m-a	té:m-a	té:m-a	tem-já:-mo	tem-já:te	tém-ano

**Table 4:** 3rd conjugation: *sentire* ‘hear’.

	1sg	2sg	3sg	1pl	2pl	3pl
PrInd	sént-o	sént-i	sént-e	sent-já:-mo	sent-í:te	sént-ono
PrSubj	sént-a	sént-a	sént-a	sent-já:-mo	sent-já:te	sént-ano

<sup>7</sup> Pirrelli and Battista refer to the allomorphs of the root as Basic Stems (BS).

<sup>8</sup> Serianni (1989) gives the following counts of irregular verbs. Conjugation 1, 4 verbs (*dare* ‘give’, *stare* ‘stay’, *fare* ‘do’ and *andare* ‘go’); conjugation 2, 138 verbs (of which 17 having theme vowel stress, cf. fn 6 above); conjugation 3, 17 verbs plus 482 verbs displaying the augment *-isk*, cf. Napoli & Vogel (1990: 492–493).

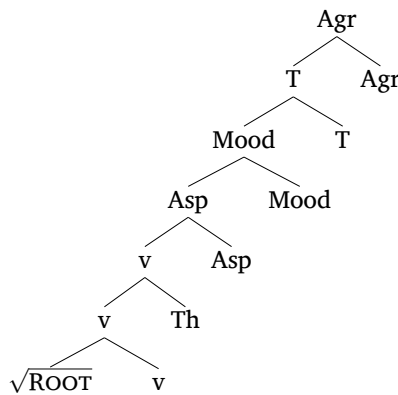
verbs belonging to 3rd conjugation display the augment *-isk* between the root and the inflectional markers.<sup>9</sup> Its distribution is shown in Table 5.

Diachronically, the originally inchoative suffix *-isk* was inserted into 3rd conjugation verbs in order to eliminate the difference between rhizotonic and arhizotonic forms (Rohlf's 1968: §523). Indeed, stress falls on either the inflectional suffix (1pl, 2pl) or the augment (1sg, 2sg, 3sg and 3pl), but never on the root *fin-*. In addition, 2sg and 3sg underwent palatalization triggered by suffix *-i* and suffix *-e*, respectively. This configuration leads us to the following observation: synchronically, the distribution of *-isk* is identical to that of the velar insert in G-VERBS. Velar insertion occurs in PrInd (1sg and 3pl) as well as in PrSubj (1sg to 3sg and 3pl). The synchronic parallelism between *-isk* verbs and G-VERBS is reinforced by the fact that the palatalized allomorph [finíʃʃ] has the same distribution as the diphthongized allomorph [tjé:n] (2sg and 3sg). Table 1 is repeated in this section as Table 6 for the sake of clarity.

In the remainder of the paper, I will be exclusively concerned with the subclass of verbs shown in Table 6. Before turning to the discussion of the distribution of each allomorph, though, let us introduce the syntactic structures which underlie Italian verbs.

I assume that Italian verbs are built in the Syntax, along the lines proposed by DM. Following Embick (2010: 20–46), I propose the complex head in (4). A complex head results from the application of syntactic movement to cyclic and non cyclic heads and underlies each verb. Each terminal node is associated with a feature-matrix that receives its phonological material during spell-out.

(4) Complex head of an Italian verb:



**Table 5:** Italian *finire* ‘finish’.

	1sg	2sg	3sg	1pl	2pl	3pl
PrInd	<b>finisk-o</b>	finíʃʃ-i	finíʃʃ-e	fin-já:mo	fin-í:te	<b>finisk-ono</b>
PrSubj	<b>finisk-a</b>	<b>finisk-a</b>	<b>finisk-a</b>	fin-já:mo	fin-já:te	<b>finisk-ano</b>

**Table 6:** Italian *tenere* ‘hold’ (identical to Table 1).

	1sg	2sg	3sg	1pl	2pl	3pl
PrInd	<b>téng-o</b>	tjé:n-i	tjé:n-e	ten-já:mo	ten-é:te	<b>téng-ono</b>
PrSubj	<b>téng-a</b>	<b>téng-a</b>	<b>téng-a</b>	ten-já:mo	ten-já:te	<b>téng-ano</b>

<sup>9</sup> According to Pirrelli & Battista (2000: 322), this group contains 450 verbs.

The structure above is consistent with current DM literature on verbal inflection (see Calabrese 1998; Embick & Noyer 2007; Embick 2000; 2010; Oltra-Massuet 2000 among others).

The theory of allomorphy developed in Embick (2010) and more recently in Embick (2015) argues that the trigger of an allomorphic VI must be adjacent to its target. In other words, no intervening object (= a phonologically realized VI) may occur between the node hosting the trigger and the node hosting the target. In case of an intervening object, the default allomorph of the root is inserted: this happens, for instance, in the imperfect indicative, where all irregular verbs behave as regular. As we will see later in the discussion, the position of each terminal node determines the possibility of triggering allomorphy of adjacent nodes.

The next section introduces one particular kind of irregular verbs, those that I call G-VERBS.

## 2 G-verbs and templatic realization of stress

### 2.1 The distribution of the allomorphs

As mentioned in the introduction, G-VERBS belong either to the 2nd or to the 3rd conjugation but never to the 1st conjugation. Table 7 illustrates the PrInd paradigm of *tenere* ‘hold’ and *venire* ‘come’, respectively from 2nd and 3rd conjugation.

We observe that, on the one hand, the inflectional markers are identical to those appearing in the corresponding regular verbs (cf. Tables 3 and 4, respectively). On the other hand, three alternating forms of the roots exist for each verb.

- (5) Three alternating forms of the root
- a. [ten], [ven] ( $\sqrt{\text{TEN}}$ ,  $\sqrt{\text{VEN}}$ )
  - b. [tje:n], [vje:n] ( $\sqrt{\text{TIEN}}$ ,  $\sqrt{\text{VIEN}}$ )
  - c. [tɛŋg], [vɛŋg] ( $\sqrt{\text{TENG}}$ ,  $\sqrt{\text{VENG}}$ )

Form (5a) corresponds to that appearing in the Inf; it also appears in the 1pl and 2pl persons. In all these cases, stress falls on the inflectional suffix. The form in (5b), in turn, is characterized by a rising diphthong and appears in the 2sg and 3sg persons. Stress falls on the base. As I show below, this diphthong is expected to appear, diachronically, in Latin stressed open syllables. Finally, we have form (5c), which is characterized by the insertion of an unetymological voiced velar stop. It appears in the 1sg and 3pl persons. In this case, too, stress falls on the base. In addition, note that forms (5a) and (5b) precede either /i/ or /e/, that is a [-back] vowel, whereas form (5c) precedes a suffix beginning with a [+back] vowel, /o/.<sup>10</sup>

**Table 7:** g-verbs, PrInd.

Conj	1sg	2sg	3sg	1pl	2pl	3pl	Inf
2 <sup>nd</sup>	tɛŋg-o	tjɛ:n-i	tjɛ:n-e	ten-já:mo	ten-é:te	tɛŋg-ono	ten-é:re
3 <sup>rd</sup>	vɛŋg-o	vjɛ:n-i	vjɛ:n-e	ven-já:mo	ven-í:te	vɛŋg-ono	ven-í:re

<sup>10</sup> Form (5c) also appears in the PrSubj, where the initial vowel of the inflectional suffixes is /a/. This vowel behaves as a non-palatal vowel in Italian, i.e. it blocks palatalization: [vínk-o] ‘I win’ (PrInd), [vín(t)j-i] ‘you win’ (PrInd) vs. [vínk-a] ‘that I win’ (PrSubj), [vínk-a] ‘that you win’ (PrSubj). For this reason, I submit that /a/ must be represented as [+back] (so does Nespor (1993: 47–51); Krämer (2009: 69) analyzes /a/ as being [dorsal]).

Before discussing further the distribution of the three allomorphs of G-VERBS, a detour into three aspects of Italian phonology is necessary. First, it is a well-known fact of Italian that stressed syllables must be heavy (Chierchia 1986; Nespor 1993; Repetti 1991). This phenomenon, usually referred to as ‘tonic lengthening’, imposes stressed syllables to be heavy. In open syllables, stress is reflected by vocalic lengthening.

- (6) Tonic lengthening (Nespor 1993: 159)
- a. *rapa* [rá:pa] ‘turnip’ vs. *foro* [fó:ro] ‘hole’ vs. *pero* [pé:ro] ‘pear tree’
  - b. *raspa* [ráspa] ‘rasp’ vs. *forno* [fórno] ‘oven’ vs. *perno* [pérno] ‘pivot’

As closed syllables in (6b), stressed syllables in both oxyton and proparoxyton words escape this generalization:

- (7) Tonic lengthening does not apply
- facile* [fátjile] ‘easy’ vs. *peró* [peró] ‘but’

Overall, length is never contrastive and depends on both syllable structure and stress placement.<sup>11</sup> In this paper, I assume an autosegmental representation of stress, cf. *infra* section 2.2.2.

Second, the phonological status of mid-closed and mid-open vowels needs to be clarified. It is usually assumed that Standard Italian displays seven vocalic phonemes in stressed syllables (Bertinetto & Loporcaro 2005; Krämer 2009; Maiden & Robustelli 2007; Nespor 1993; Rohlfs 1966; Serianni 1989; Tekavčić 1972 among the most relevant ones.) Among these phonemes, there are two pairs of mid-vowels: front vowels [e] and [ɛ] contrast with back vowels [o] and [ɔ]. Mid-open vowels (as well as diphthongs, see below) derive from Latin short Ē and Ō, respectively, whereas mid-closed vowels arise from the merge of Latin ĭ with Ē on the one side and the merge of ŭ with Ō on the other (Alkire & Rosen 2010: 13–17, Loporcaro 2011: 110–115 and Rohlfs 1966: §85, 107, 46, 66). The distinctive opposition of mid-closed vs. mid-open vowels is supported by the existence of minimal pairs:

- (8) Mid-closed vs. mid-open vowels (Bertinetto & Loporcaro 2005: 136–137)
- a. *venti* [vénti] ‘twenty’ vs. *venti* [vénti] ‘winds’ (/e/ vs. /ɛ/)
  - b. *legge* [léddʒ] ‘law’ vs. *legge* [léddʒ] ‘(s)he reads’ (/e/ vs. /ɛ/)
  - c. *botte* [bótte] ‘barrel’ vs. *botte* [bótte] ‘blows (pl)’ (/o/ vs. /ɔ/)
  - d. *foro* [fó:ro] ‘hole’ vs. *foro* [fó:ro] ‘forum’ (/o/ vs. /ɔ/)

The situation depicted in (8) is expected to occur in the standard pronunciation of Italian, yet it concerns, at most, one third of the Italian peninsula: Tuscany, Umbria, Southern Marche and Northern Lazio. In fact, native speakers from elsewhere than the above-mentioned regions of Italy have different distribution of mid-vowels (see Bertinetto & Loporcaro 2005 and Krämer 2009: 51–52). According to Canepari (1979: §13.6, §13.7), this opposition is weakly distinctive and may appear in free variation for many speakers.

In unstressed syllables, the oppositions in (8) are neutralized and only mid-closed vowels appear:

- (9) Neutralization of mid-vowels in unstressed syllables:
- a. *leggina* [led̥d̥ʒí:na] ‘little law/bad law’ vs. *leggiamo* [led̥d̥ʒá:mo] ‘we read’ (cf. (8b))
  - b. *forato* [forá:to] ‘pierced’ vs. *forense* [forénse] ‘forensic’ (cf. (8d))

<sup>11</sup> See Bertinetto & Loporcaro (2005) and Krämer (2009: 156–202) for detailed data, further observations and analyses of stress in Italian.

The third fact worth mentioning concerns the rise and distribution of two rising diphthongs, [jɛ] and [jɔ]. Historically, both diphthongs appear, like mid-open vowels, in stressed syllables, only (Rohlf's 1966: §84, 106). In fact, in the evolution from Latin to most Romance languages, Ě and Ō underwent diphthongization conditioned by stress, the quality of the final vowel, or both. For Tuscan, this diphthongization dates back to the mid seventh century (Loporcaro 2011: 119–123)<sup>12</sup> and occurred in open stressed syllables only:

- (10) Italian diphthongization  
 a. PĚDEM > [pjé:de] ‘foot’  
 b. BŌNUM > [bwó:no] ‘good’

As expected, both diphthongs in (10) are lengthened by stress.

The application of diphthongization caused allomorphic alternations in those verbs whose stems contained short mid-vowels in open syllables. For instance, the present indicative of Latin NĚGARE ‘to deny’ and \*NŌTARE ‘to swim’ gave rise to regular alternations of diphthongized vs. plain inflected forms:

- (11) Diphthongs in Old Italian present indicative  
 a. *niego* [njé:go] ‘I deny’ vs. *negamo* [negá:mo] ‘we deny’  
 b. *nuoto* [nwó:to] ‘I swim’ vs. *notamo* [notá:mo] ‘we swim’

Diphthongization is expected to occur in rhizotonic forms (1sg, 2sg, 3sg and 3pl), whereas arhizotonic forms (1pl and 2pl) remain unaffected. These diphthongs are generally known as “mobile diphthongs” in the literature (Serianni 1989; Maiden & Robustelli 2007). However, a general phenomenon of analogical leveling occurred in Modern Italian, which blurred the distribution of diphthongized forms throughout the verbal paradigms. As for the verbs in (11), for instance, *nuotare* ‘to swim’ generalized the allomorph displaying the diphthong, whereas *negare* ‘to deny’ selected for the exact opposite configuration:

- (12) Diphthongs in Modern Italian present indicative  
 a. *nego* [né:go] ‘I deny’ vs. *neghiamo* [negjá:mo] ‘we deny’  
 b. *nuoto* [nwó:to] ‘I swim’ vs. *nuotiamo* [nwtjá:mo] ‘we swim’

In the 1st conjugation, either the diphthong appears throughout the whole verb (12b), or it never appears (12a). More generally, in contemporary Italian, diphthongization does not depend on stress in verbs belonging to this conjugation. In other words, the 1st conjugation has been subject to analogical leveling (see *infra* Table 9). This is not (always) the case in both 2nd and 3rd conjugations: one such example is the distribution of diphthongs in G-VERBS in Table 7. Hence, in this case, one may suspect that diphthongization is (still) regularly induced by stress (see *infra* Table 10 for more paradigms).<sup>13</sup>

Having introduced these crucial basic facts, I turn to the alternation between stressed [(j)ɛ] and unstressed [e] in G-VERBS and focus on two questions raised by this data.

Table 8 schematizes the distribution of the three allomorphs of G-VERBS with respect to both the stress and the segmental context.

The appearance of the velar is unexpected from both a diachronic and a synchronic point of view. Latin 1sg TENĚO should have given the following derivation: TENĚO >

<sup>12</sup> Rohlf's (1966: 84) argues for later appearance: the end of the tenth century.

<sup>13</sup> Mobile diphthongs may occur in nominals, too: observe, for instance, *ruóta* ‘wheel’ vs. *rot-élla* ‘small wheel’; *uóvo* ‘egg’ vs. *ov-ále* ‘oval’, *piede* ‘foot’ vs. *ped-one* ‘pedestrian’.



**Table 8:** Allomorphy of g-verbs roots.

stress	on the root		on the suffix
	1sg, 3pl	2sg, 3sg	1pl, 2pl, Inf
pers/num	1sg, 3pl	2sg, 3sg	1pl, 2pl, Inf
context	/ ___ [+back]	/ ___ [-back]	
allomorph	√TENĠ	√TIEN	√TEN

\*TENIO > \*[teŋno].<sup>14</sup> Indeed, forms such as *teġno* [teŋno] are attested in Old Italian.<sup>15</sup> Synchronically, the question is to know why neither the allomorph (5a) (*ten-*) nor the allomorph (5b) (*tien-*) can be selected in 1sg. Both sequences / (j)en + o/ and /en + o/ are phonologically well-formed, as can be seen from the following examples: *treno* [tré:no] ‘train’, *veleno* [velé:no] ‘poison’, *fieno* [fjé:no] ‘hay’, etc. In other words, a phonologically legitimate sequence is prevented from surfacing in the context of 1sg and 3pl of a G-VERB.

These facts pose two questions. The first question involves the distribution of the allomorphs of the root:

(13) [Q1] What triggers the alternation of the allomorphs of the root?

The second question concerns the appearance of [g]:

(14) [Q2] What is the synchronic origin of the velar stop?

In order to answer these questions, one must compare the paradigm of G-VERBS to those of the 1st and 2nd conjugations. No verb from the 3rd conjugation is chosen since, as far as I know, there are no such verbs whose the root ends in either /nk/ or /ng/ in this group.

In the 1st conjugation we observe the lack of any kind of allomorphy of the root. In other words, a verb belonging to this inflectional group displays a stable root. Table 9 presents five PrInd patterns. The first two verbs, *chiamare* ‘call’ (a) and *sanare* ‘heal’ (b), exemplify roots ending in a nasal (either /m/ or /n/). None of these verbs undergo the insertion of a velar stop. Thus, the phonological sequence /no/ (and /mo/) is allowed also in verbs. The third and fourth verbs, *manicare* ‘miss’ (c) and *vangare* ‘shovel’ (d), exemplify roots ending in a sequence of a nasal followed by a velar. Given that the phonemic distinction between /n/ and /m/ is neutralized in a coda-position preceding a velar onset, we only have two possibilities: /nk/ and /ng/ (realized as [ŋk] and [ŋg], respectively.) These verbs show that the presence of a velar can be etymological, yet stable within the paradigm. Finally, we have a verb displaying diphthongization: *suonare* ‘sound’ (e). As mentioned (see (12b) above), in the 1st conjugation, diphthongization is stable and does not depend on the position of stress: a verb such as *suonare*, then, is built on a unique form of the root so that no allomorphy appears.<sup>16</sup>

The situation is more complex in the 2nd conjugation (Table 10). First, all verbs whose roots end in /m/ are regular (no G-VERBS in this class, cf. *temere* ‘to fear’ (a)), whereas all verbs whose roots end in /n/ are G-VERBS (cf. *rimanere* ‘to stay, remain’). Second, the 2nd conjugation contains a number of verbs whose roots end in /n/ followed by either /k/ or /g/, but the velar is always palatalized when followed by a [-back] vowel. This fact

<sup>14</sup> Latin Ē found in hiatus became *j* in Vulgar Latin. Because of the general phenomenon of Romance palatalization, then, *j* palatalized the preceding consonant /n/, yielding Italian [ɲ].

<sup>15</sup> Cf. Dante Alighieri’s *Divina Commedia*, Inf. II, v. 71: *Vegno di loco, ove tornar disio* ‘I come from a place where I want to return’ (translation is mine). Cf. Rohlfs (1968: §535) and Maiden (2011b: 238–239) for more data. In addition, note that the palatalized version of the root appears, for instance, in Portuguese: PrInd 1sg *tenho*, where *nh* represents the palatal nasal.

<sup>16</sup> The same situation holds for /je/: *piegare* ‘fold’ displays stable diphthongization across the paradigm.

**Table 9:** 1st conjugation verbs – PrInd.

		1sg	2sg	3sg	1pl	2pl	3pl
a	/m/	kjá:m-o	kjá:m-i	kjá:m-a	kjam-já:mo	kjam-á:te	kjám-ano
b	/n/	sá:n-o	sá:n-i	sá:n-a	san-já:mo	san-á:te	sán-ano
c	/nk/	máŋk-o	máŋk-i	máŋk-a	maŋk-já:mo	maŋk-á:te	máŋk-ano
d	/ng/	váŋg-o	váŋg-i	váŋg-a	vaŋg-já:mo	vaŋg-á:te	váŋg-ano
e	diph.	swó:n-o	swó:n-i	swó:n-a	swon-já:mo	swon-á:te	swó n-ano

**Table 10:** 2nd conjugation verbs – PrInd.

		1sg	2sg	3sg	1pl	2pl	3pl
a	/m/	té:m-o	té:m-i	té:m-e	tem-já:mo	tem-é:te	tém-ono
b	/n/	téŋg-o	tjé:n-i	tjé:n-e	ten-já:mo	ten-é:te	téŋg-ono
c	/nk/	vínk-o	vínŋ-i	vínŋ-e	vinŋ-á:mo	vinŋ-é:te	vínk-ono
d	/ng/	pjáŋg-o	pjáŋdʒ-i	pjáŋdʒ-e	pjanđʒ-á:mo	pjanđʒ-é:te	pjáŋg-ono
e	diph.	sjé:d-o	sjé:d-i	sjé:d-e	sed-já:mo	sed-é:te	sjéd-ono

is exemplified by two verbs in Table 10: *vincere* ‘win’ (c) and *piangere* ‘cry’ (d). Finally, diphthongized roots appear in the 2nd conjugation, too. In this case, however, the root has two allomorphs: one containing the diphthong, the other without it. This situation is illustrated by the verb *sedere* ‘sit’ (e).

The comparison between Table 9 and 10 is straightforward. Three differences can be detected. First, G-VERBS can be found only in the 2nd conjugation (and in the 3rd conjugation). Second, final, post-nasal velars undergo palatalization only in the 2nd conjugation, but never in the 1st conjugation.<sup>17</sup> Finally, as already noted, diphthongization alternates with monophthongization only in 2nd conjugation.

Back to *tenere* and *venire*, the appearance of the velar stop is unexpected and hard to explain. In the discussion of the distribution of the three allomorphs (cf. the lists above in (5)), we observed two interesting facts. First, the velar stop appears only in those cases where the suffix begins with a [+back] vowel (1sg and 3pl); second, the allomorphs containing either the velar stop or the diphthong only appear when the stress falls on the root. For the sake of clarity, Table 8 is repeated as Table 11.

On the basis of the comparison between the data in Tables 9, 10 and 11, we have reason to believe that the only regular forms in the paradigm of PrInd of a G-VERB are 1pl and 2pl. By “regular”, I mean a form built on the default root allomorph: I take this to be the root appearing in the Inf. This claim is confirmed by the fact that when the root alternates it generally does so because a phonological process intervenes (cf. Table 10: palatalization in the case of verbs c and d and diphthongization in the case of verb e). We’d thus expect a G-VERB to be either 1sg \*[tjé:no], 2sg [tjé:ni], etc... or 1sg [téŋgo], 2sg \*[téŋdzi], etc... In other words, G-VERBS are the only verbs where the alternation cannot be explained on the simple basis of palatalization or diphthongization.<sup>18</sup>

Palatalization seems to be excluded simply because the palatalized counterpart of /g/ never appears within the paradigm. With this respect, Fanciullo (1998) claims that [g] is a de-palatalizing phonological item which appears before velar vowels, but he does

<sup>17</sup> The 3rd conjugation contains verbs such as *cucire* ‘to sew’ where the stem ends in a non-alternating palatal: /tʃ/.

<sup>18</sup> Since diphthongs are not mobile in the 1st conjugation, 1st conjugation verbs are regular with respect to root allomorphy.

**Table 11:** Allomorphy of g-verbs roots (identical to 8).

stress	on the root		on the suffix
num/pers	1sg, 3pl	2sg, 3sg	1pl, 2pl, Inf
context	___ / [+back]	___ / [-back]	
allomorph	$\sqrt{\text{TENG}}$	$\sqrt{\text{TIEN}}$	$\sqrt{\text{TEN}}$

not discuss the origin of this velar. In other words, Fanciullo proposes a depalatalizing rule applying after the insertion of [g]. Conversely, I will show that [g] originates from a lexically-present vocalic item, the theme vowel. Klausenburger (1984), in turn, argues that the velar insert in four Romance languages (Spanish, Italian, Catalan and Provençal) depends on markedness connections and rejects the idea that [g] is a separate morphological marker. I agree with this view, specifically in considering [g] as part and parcel of the stem.

As for diphthongization, we saw that this process is restricted to some verbs and a few other roots in Modern Italian. In fact, 2nd conjugation verbs such as *sedere* ‘to sit’ (cf. Table 10, e) display diphthongization in 1sg, 2sg, 3sg and 3pl forms. These forms are those in which stress falls on the root. They correspond to those forms where, in a G-VERB, one finds either the velar stop or the diphthong.<sup>19</sup>

This fact is related to the following observation: the distribution of the irregular forms (that is *teng-* and *tien-*) overlaps with the distribution of stress. In fact, the rhizotonic forms are those displaying allomorphy. This distribution recalls what Maiden (2001; 2011a) calls the “N-pattern”. The “N-pattern” is a morpheme, that is an abstract entity at the morphological level which has neither semantic content nor morpho-syntactic values. As such, a morpheme does not necessarily have a phonological coherence: this seems to be the case, since the derivation of *teng-* from *tien-* (or vice versa) cannot be explained phonologically at first sight. Thus, according to Maiden, G-VERBS are subject to a morphomic paradigmatic pressure. Paradigmatic pressure as the cause of allomorphic variation has been advocated since Rohlfs (1968: §535–536). Rohlfs claims that [g] has been created analogically on the basis of the comparison of verbs such as *giun*[g] *o* ‘I arrive’, *giun*[dʒ]i ‘you arrive’ and *sce*[lg]o ‘I choose’, *sce*[ʌʌ]i ‘you choose’. In other words, Rohlfs argues for paradigmatic leveling of G-VERBS on regular verbs in which [g] is etymological. More recently, approaches based on paradigmatic pressure have been proposed by Pirrelli & Battista (2000) and Burzio (2004). Pirrelli and Battista claim that the allomorphic variations displayed by the Italian verbs result from a function of paradigmatic information: for instance, a G-VERB is the function connecting *tenere* to three distinct cells in the PrInd paradigm. Burzio, in turn, goes beyond Pirrelli and Battista’s analysis and proposes that the stem shapes result from both paradigmatic and syntagmatic pressure. The latter consists, in Burzio’s analysis, in claiming that the lexical entry of each verb contains the phonological indexes which surface within the paradigm. This way, a G-VERB will contain, in its lexical representation, the index /g/ and this index will be activated under specific conditions (namely, the suffix *-o*<sup>20</sup>).

In what follows, I show that if one assumes an autosegmental representation of stress in Italian (Chierchia 1986; Larsen 1998; Ségéral & Scheer 2001), one can account for the fact

<sup>19</sup> Cf. Spanish, *tenér* ‘to have’, 1sg *téngo*, 2sg *tiénes*, etc.. In Spanish, diphthongization occurs both in open and closed syllables: FOCU > *fuego* ‘fire’ and PONTE > *punte* ‘bridge’. Thus, why is *\*tiengo* ungrammatical? In other words, why is there such a distributional gap (that is the simultaneous presence of /g/ and the diphthong)?

<sup>20</sup> Burzio uses what he calls an “entailment” with the following form: /stem\_o/ ⇒ /g/ (it reads as follows: “the environment on the left of the arrow entails in it the presence of the element on the right of the arrow”, see Burzio 2004: 24

that stress and allomorphy are closely related.<sup>21</sup> In addition, I show that the exceptional-ity of G-VERBS lies simply in possessing a lexical template of two CV-units associated to their roots.

Before turning to the representation of G-VERB roots, I introduce the theoretical framework.

## 2.2 Theoretical framework

### 2.2.1 Element Theory and CVCV phonology

According to Element Theory (Kaye et al. 1985; 1990), a theory of segmental representations, segments result from the combination of basic Elements. The combination of Elements is performed via an operation called ‘Fusion’, involving a head (underlined below) and an operator (Kaye et al. 1985: 309). In particular, headedness allows for the distinction between lax and tense middle vowels. With Backley (2011), I assume that each vocalic segment is associated with at least one of the following Elements: |A|, |I| and |U|. I derive the Italian underlying vocalic system (in stressed syllables) as follows (cf. Backley 2011: 40–43):

- (15) Italian vowels
- a. [a] = |A|
  - b. [ɛ] = |I.A|
  - c. [e] = |I.A|
  - d. [i] = |I|
  - e. [o] = |U.A|
  - f. [ɔ] = |U.A|
  - g. [u] = |U|

Consonants are derived in the same manner, i.e. through Fusion of Elements. The structure of consonants is not crucial in this article. For the present purpose, it is only important that the consonant [g] results from the Fusion of velar |U| and the manner Elements |H| and |ʔ|: [g] = |U.H.ʔ|. <sup>22</sup> The interested reader is referred to Backley (2011) and the literature therein for the complete picture.

Element Theory is consistent with an autosegmental approach to phonological representations. Here, I adopt the principles of CVCV phonology (Lowenstamm 1996; Scheer 2004), in which the skeletal tier consists of a strict alternation of non branching onsets (C) and non branching nuclei (V). The distribution of V-positions is constrained by the Empty Category Principle and Proper Government, as defined in Kaye et al. (1985):

- (16) Empty Category Principle: An empty V position may be phonetically non-interpreted iff it is properly governed.
- (17) Proper Government:  
A properly governs B iff
- a. A governs B from the right to the left
  - b. A is not properly governed.

In addition, the notion of Licensing (Charette 1989; 1991; Ségéral & Scheer 2001) is crucial to understanding the relations between the onset and the nucleus: the segmental

<sup>21</sup> Cf. also Anderson (2013) for an alternative view couched within an OT approach.

<sup>22</sup> In consonants, |A|, |I| and |U| behave as place Elements, whereas |H|, |ʔ| (and |L|) behave as manner Elements (Backley 2011: 79–84, 114–ff).

expression of an onset results from the ability of its nucleus to license. This is constrained as follows:

- (18) Licensing: An empty Nucleus may neither govern nor license. A filled Nucleus may both govern and license.

Finally, following Lowenstamm (2008) and Bendjaballah & Haiden (2008), I assume that skeletal units can be the exponents of grammatical features. The minimal skeletal unit being CV, this means that a CV-unit can be a morpheme.

**2.2.2 The representation of stress in Italian**

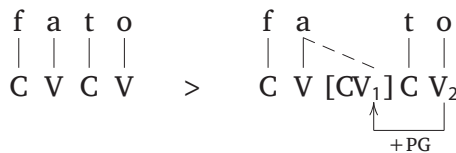
In section 2.1, it was pointed out that, in Italian, stressed syllables must be heavy. This observation, along with the fact that short vowels are never found in penultimate stressed open syllables suggests that stress introduces weight. The hypothesis that, in Italian, stress is realized through syllable weight was first put forward by Chierchia (1986) and later developed within a CVCV phonology framework by Larsen (1998). In particular, Larsen proposes that stress creates an extra CV unit. This unit must satisfy the following condition (if it does not, it is erased):

- (19) The CV created by stress must be properly governed.

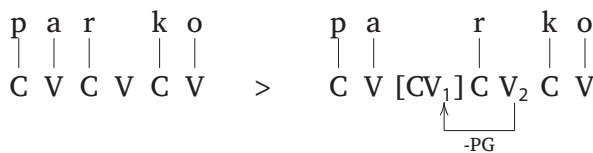
In accordance with this condition, the representation of *fato* [fá:to] ‘destiny’ and *parco* [párko] ‘park’ is as follows:

- (20) The representation of stress in Italian (examples from Larsen 1998)

- a. [fá:to] ‘destiny’



- b. [párko] ‘park’



In (20a),  $V_2$  governs and thus licenses  $V_1$ : accordingly, the CV introduced by stress is maintained and can be identified by the propagation of vowel *a*. In (20b), in turn,  $V_1$  is not governed by  $V_2$  (because  $V_2$  is empty, thus already governed by the final V position), hence  $V_1$  remains unactivated and no propagation occurs.

Armed with these notions, we can turn to the representation of the root of a G-VERB.

**2.3 A unique form of the root of g-verbs**

I will propose a templatic analysis of the root of G-VERBS. Templatic analyses are common in the study of Semitic languages, but the literature abounds in analyses extending the idea of a template to languages other than Semitic; see, among the most important ones, Bendjaballah & Haiden (2003) for German, Barillot (2002) for Somali, Caha & Scheer (2008); Scheer (2003) for Czech, Denwood (1998) for Turkish, Luo (2013) for Mandarin

Chinese, Rucart (2006) for Afar. As for Italian, Passino (2008) analyzes sandhi phenomena within the CV framework and proposes a minimal template made of three CV-units. One of these units corresponds to the CV provided by stress.

Since Kaye (1990), rising diphthongs are generally represented, in Government Phonology, as monopositional. Therefore, I assume that [jɛ] occupies a single templatic slot, namely a V-position. As the reader may recall from section 2.1, Italian rising diphthongs undergo tonic lengthening in open syllables. This fact seems to indicate that rising diphthongs behave like plain short vowels. An additional argument in favor of such an interpretation comes from the observation that rising diphthongs may be found in closed syllables, too: *piánta* [pjánta] ‘plant’. Finally, there are no restrictions on possible combinations of glide + V in rising diphthongs. In fact, except /i/ and /u/, any vocalic phoneme appears in such a context (see Krämer 2009: 54–55).<sup>23</sup> To summarize, rising diphthongs are phonologically short vowels and, as such, they are subject to tonic lengthening in open syllables.

Having established the representation of rising diphthongs, we can focus on the underlying form of each allomorph of a G-VERB. In principle, each of these forms contains either three or two CV units:

(21) The allomorphs of a G-VERB:

a.  $\sqrt{\text{TENG}}$  (1sg, 3pl):

t	ɛ	n	g
C	V	C	V

b.  $\sqrt{\text{TIEN}}$  (2sg, 3sg):

t	jɛ	n
C	V	C

c.  $\sqrt{\text{TEN}}$  (1pl, 2pl):

t	e	n
C	V	C

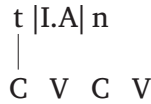
Recall that the allomorphs (23a) and (23b) correspond to stressed forms, whereas the third allomorph, (23c), to unstressed forms. As a consequence, subtracting the CV introduced by stress from both (23a) and (23b), leaves us with three identical templates, made of two CV units only. Assuming that the three allomorphs in (21) share the same number of CV-units has a clear and direct advantage: it allows for a unique representation of the three allomorphs. In other words, we assume that each allomorph is associated with a template of exclusively two CV units.

Pushing this idea further, I make the hypothesis that there is a single underlying form with respect to the segmental content of G-VERB: /t|I.A|n/. In other words, I claim that

<sup>23</sup> Unlike rising diphthongs, falling diphthongs display combinatory restrictions and never appear in closed syllables. Krämer (2009: 53–56, 85–99) analyzes falling diphthongs as closed syllables in which the glide occupies the coda-position. Rising diphthongs, in turn, are analyzed as complex onsets followed by a vowel (see Marotta 1988 for a similar view). In contrast, Nespor (1993) argues that rising diphthongs occupy complex nuclei: the representation I assume is consistent with this view. Note that Krämer argues for distinct phonological structures of glides and high vowels (see Vincent 1988 for the opposite hypothesis, namely arguing for the allophonic status of glides.) The exact phonological status of Italian glides is not crucial for this analysis, therefore I will not discuss it.

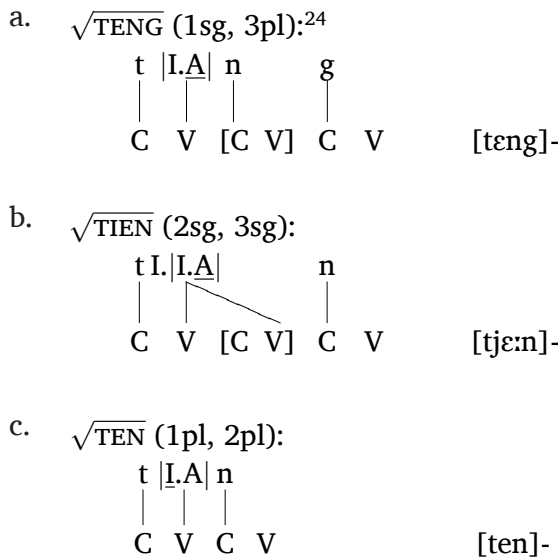
both the allomorph containing the velar insert and that containing the diphthong are derived by the phonology of the language. In addition, the complex expression |I.A| underlies the alternation between stressed [ɛ] and unstressed [e]. The unique form of a G-VERB is shown in what follows. The complex expression |I.A| as well as the segment /n/ remain afloat, for a reason that will become clear in the next section.

(22) Underlying form of a G-VERB (1/2/3sg, 1/2/3pl):



Note that the complex expression |I.A| accounts for the presence of both [ɛ] and [e]. As we saw, headedness determines the quality of mid-vowels. I submit that the distribution of headedness overlaps that of stress. When the form (22) is stressed, the Element A becomes the head of the expression, hence [ɛ] surfaces ((23a) and (23b)). In turn, when the form (22) is unstressed, the opposite situation occurs: the head corresponds to the Element |I| and [e] surfaces (23c). The squared brackets indicate the CV unit introduced by stress: this accounts for the different amount of CV among the allomorphs. The insertion of stress is explained in detail below, see section 3.2.

(23) The allomorphs of a G-VERB: revised representations



In the remainder of the paper, the surface form of each allomorph (23) will be used for the sake of simplicity.

The next section is devoted to show the internal structure of the inflected forms of a G-VERB.

<sup>24</sup> The derivation of /g/ is illustrated in section 3.2.

### 3 The representation of the inflected forms

#### 3.1 The basic exponents of inflection

As discussed in (2), I assume that an Italian verb is made of three distinct items. The first item is the root. The second and third items are Th and Infl, respectively. For the sake of clarity, I repeat the representation (2) below.

$$(24) \quad \sqrt{\text{ROOT}} + \text{Th} + \text{Infl} \text{ (identical to (2))}$$

The sequence above corresponds to the order of the terminal nodes in the complex head shown in (4). In what follows, I propose a list of the VIs that are needed to form a G-VERB.

As for the root, the VI corresponding to a G-VERB is identical to the representation in (22), where two CV units are lexically associated to the root. I propose the DM-type formalization in (25) in which the segments /y/ and /z/ are floating.

(25) VI of a G-VERB root

$$\text{a. } \sqrt{\text{ROOT}} \iff \begin{array}{c} \text{x y z} \\ | \\ \text{C V C V} \end{array}$$

b. x, y, z = segmental material

The theme vowel is an interesting morphological object. It is well-known that it has no semantic content, yet it is necessarily present on Romance verbs (and more generally in Indo-European languages).

I propose that the Element |A| marks Th in the context of 1st conjugation, whereas the Element |I| marks both 2nd and 3rd conjugation.

(26) VI of Th:

- a. Th (1st)  $\Leftrightarrow$  |A|  
 b. Th (2nd, 3rd)  $\Leftrightarrow$  |I|

The difference between the 2nd and 3rd conjugation is neutralized in a number of contexts, namely in PrInd and PrSubj. In other contexts, such as imperfect indicative (*indicativo imperfetto*) and present conditional (*condizionale presente*), Th surfaces as /e/ in 2nd conjugation and as /i/ in 3rd conjugation:

(27) Th in 2nd and 3rd conjugations

- a. imperfect indicative, 1sg: *tem-e-vo* vs. *sent-i-vo*  
 b. present conditional, 1sg: *tem-e-rei* vs. *sent-i-rei*

Given that the vowel [e] is formed by the fusion of Elements |A| and |I|, we can postulate that the allomorphy is triggered by the appearance of the Element |A| in certain contexts. I leave this question open for further study. The interested reader is referred to Boyé (2000) for an extensive analysis of Italian verbal inflection.<sup>25</sup>

<sup>25</sup> Napoli & Vogel (1990) discuss whether Italian has two distinct conjugations, the 2nd and the 3rd, or just one single inflectional group. They mention a number of arguments in favor of the latter hypothesis (cf. *ibid.*:493–495), but conclude that, despite these strong similarities, some divergences exist so that two distinct conjugations must be maintained. Similarly, Dressler & Thornton (1991) propose a two-class distinction in the morphology of Italian. In particular, the verbal system is reduced to the opposition between 1st conjugation verbs versus non-1st conjugation verbs. This question is not central in this paper, I therefore consider that 2nd and 3rd conjugation form a single group. Whenever they diverge, I assume the application of allomorphy rules, in the sense of Embick (2010; 2015). Cf. Boyé (2000: 272ff.) where an Element-based analysis of Th in Italian is provided.



Finally, we have the inflectional markers. Those corresponding to 1sg and 2sg are identical throughout the conjugations:

- (28) VI of 1sg, 2sg:<sup>26</sup>
- a. 1sg  $\Leftrightarrow$  o
  - b. 2sg  $\Leftrightarrow$  i

As for 3sg, the situation is more complex. This form surfaces as *-e* in the context of the 2nd and 3rd conjugation, whereas it surfaces as *-a* in the 1st conjugation. I propose to capture this alternation in the following manner: 3sg spells out as the Element |A| in combination with Th:

- (29) 3sg /|A|.Th/:
- a. 3sg (1st)  $\Leftrightarrow$  |A|.|A| (Th = |A|)
  - b. 3sg (2nd, 3rd)  $\Leftrightarrow$  |A|.|I| (Th = |I|)

To cover 1pl, 2pl and 3pl, we have to introduce the expression of plural number. I propose that number is marked by a CV unit which is associated with each VI. This choice will be clear later, when showing the linearization of each form, cf. section 3.4.

- (30) VI of 1pl, 2pl, 3pl:
- a. 1pl  $\Leftrightarrow$  iamo
  - b. 2pl  $\Leftrightarrow$  Th + te
  - c. 3pl  $\Leftrightarrow$  Vno, where V = a (1st conj.), o (2nd, 3rd conj.)<sup>27</sup>

In the following sections, I show how the VI's listed above are put together to build up the surface forms.

### 3.2 PrInd 1sg, 2sg, 3sg, 3pl and Inf

This subsection focuses on PrInd singular forms as well as Inf. Specifically, I show that the presence of the velar /g/ is the result of a phonological process of fortition occurring in a typical strong position.

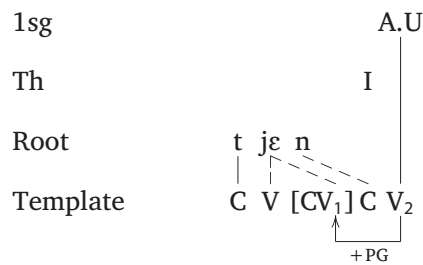
Consider the ingredients PrInd 1sg is made of: the VI of the root (25a), the VI of Th of 2nd/3rd conjugation (26b) and, finally, the VI corresponding to 1sg (28a). The linearization proceeds as follows. First, the stress CV (20) is inserted:  $V_1$  being properly governed, the stress CV is licensed and thus maintained in the representation: /tén + o/. Two logical possibilities arise: (1) the stressed vowel lengthens as by the effect of being in an open syllable. As we have already mentioned, Latin open stressed syllables diphthongize in Italian: we thus should have \*[tjé:n + o]. In this configuration, Th Element |I| has no site to associate to in the template, and remains afloat. (2) /n/ associates with two distinct C positions: that of the stress CV and the one between  $V_1$  and  $V_2$ . Th |I|, in such a configuration, associates with the C between  $V_1$  and  $V_2$ . In this case, the phonetic result is \*[térno].

<sup>26</sup> I do not use the standard way of representing person as a feature-matrix because this formalization is not important for the purpose of the paper. See Halle (1997); Noyer (1992) for such an analysis.

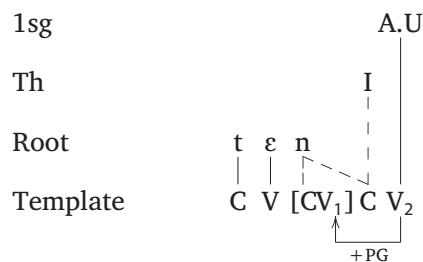
<sup>27</sup> The underlying form of both [a] and [o] contain Element |A|. A possible alternative representation of 3pl is 3pl  $\Leftrightarrow$  /Th.no/. In such a case, 2nd/3rd conjugation [o] would be derived by a specific allomorphy rule transforming Th |I| into |U|.

(31) PrInd 1sg:

a. Possibility 1: \*[tjé:no]



b. Possibility 2: \*[tɛɲno]



Both possibilities are phonologically sound. Old Italian, as we saw, opted for possibility 2 (Rohlf's 1968; Tekavčić 1972), whereas possibility 1 is selected, in Modern Italian, by 2sg and 3sg to account for *tieni* and *tiene*, respectively. I claim that the presence of 1sg -o in (31b) triggers the appearance of [g]. In other words, the presence of the velar insert is determined by the morphophonological environment.

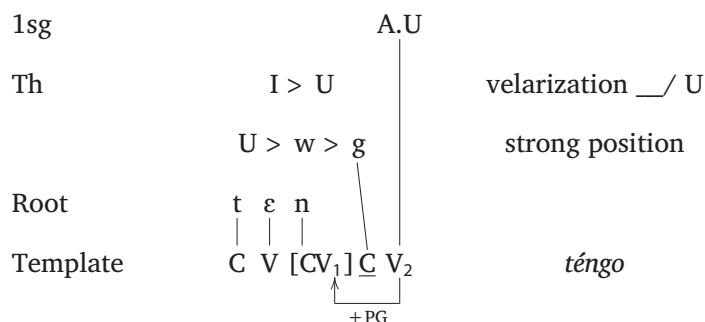
There is only one possible source for the [g] in (31b), namely Th |I|. This analysis supposes the following phonological steps:

(32) Th |I| surfaces as [g]: |I| &gt; |U| &gt; |U.H.ʔ| = [g]

The first step involves velarization, triggered by the presence of Element |U| adjacent to Th |I|; the second step is a process of fortition, caused by positional factors.

The linearization goes as follows:

(33) PrInd 1sg:



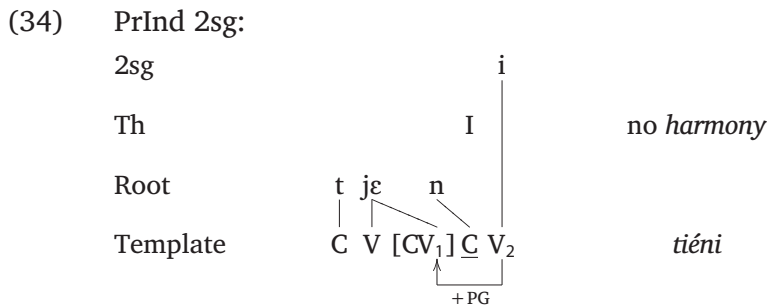
The Element |U| activates velarization so that |I| changes into |U|. Now, observe the position  $V_1$ . This slot is properly governed only when the inflectional marker -o is inserted: as a result, |U| can only be associated with the C position between  $V_1$  and  $V_2$ . The Element |U| is transformed into the glide /w/ (Kaye & Lowenstamm 1984). Finally, fortition

occurs. According to Ségéral & Scheer (2001), the C position following a governed empty nucleus is a strong position (underlined in (33)): thus /w/ undergoes fortition and surfaces as [g].<sup>28</sup> This is the answer to [Q2] above in (14): [g] originates in Th Element |I|.<sup>29</sup>

The velar [g] does not appear in 2sg, nor in 3sg. This means that the velarization transforming the Element |I| into |U| must be blocked in the context of 2sg. Recall that 2sg is marked by the suffix -i, that is a palatal vowel. As a consequence, there is no need for the Element |I| to *harmonize* into a velar Element. Velarization is then prevented from applying.

During the linearization process, the system has two possibilities: (1) Th Element |I| should undergo fortition and thus surface as [dʒ]<sup>30</sup> in \*[tɛndʒi]; or (2), as already illustrated above for 1sg, the open stressed syllable should diphthongize and lengthen to yield [tjɛ:n + i]. The latter possibility is the attested one: this happens because, as discussed for 1sg, the choice is made on a morphophonological basis: 2sg -i does not trigger velarization of Th Element |I| and thus no [g] appears. Rather, Th Element |I| remains afloat.<sup>31</sup>

The representation of 2sg is shown below:



The 3sg form is linearized in the same fashion as 2sg, whereas 3pl is like 1sg: for this reason I will not show either of them.

Neither the velar [g] nor diphthongization appear in Inf. This happens because stress falls out of the template of the root. Given the VI provided in the preceding section, we expect Inf to surface as \*[te<sup>1</sup>ni:re]: I argue for the application of an allomorphy rule (AR) à la Embick (2010), which transforms Th /i/ into /e/ in the context of Inf.<sup>32</sup>

<sup>28</sup> Fortition of Germanic /w/ into [g<sup>w</sup>] is a common process in Romance, see Alkire & Rosen (2010: 52–53) and Rohlf's (1966: 230–231). See Pagliano (2003) for a survey on consonant epenthesis within CVCV phonology with focus on French.

<sup>29</sup> The analysis presented here also predicts the alternation found in *sce*[lg]o ‘I choose’, *sce*[ʌʌ]i ‘you choose’: diphthongization is in complementary distribution with both the velar insert and palatalization.

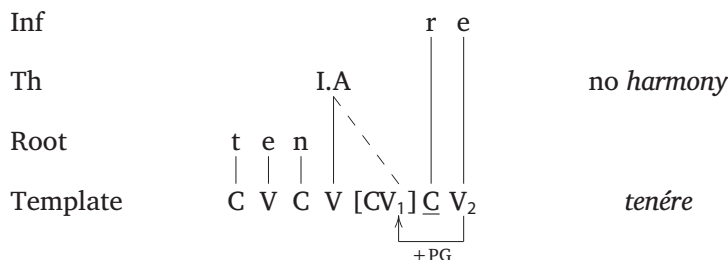
<sup>30</sup> This is a common path for initial /j/ under fortition in Italian: Latin IOCU(M) > Italian [dʒ]oco.

<sup>31</sup> The analysis presented here accounts for lengthening in open stressed syllables, but does not explain why some stems undergo diphthongization together with lengthening. I don't have a solution to this (long-debated) issue; the interested reader is referred to Krämer (2009) and Booij & van der Veer (2015) for the most recent analyses of Italian mobile diphthongs. In Krämer's analysis (2009: 97–98), the synchronic distribution of mobile diphthongs is captured through diacritics. More precisely, co-indexing is used in order to enforce paradigm leveling between allomorphs. Thus, the allomorph containing the diphthong is chosen over those lacking it, independently of stress. Booij & van der Veer (2015), in turn, claim that the distribution of these diphthongs results from paradigm uniformity and show an OT-based account in which each allomorph is stored in the lexicon.

<sup>32</sup> As already mentioned, the 2nd and the 3rd conjugations are neutralized in a number of contexts. If one claims that two distinct conjugations exist, a formal device is required in order to account for the neutralization of such a difference in some contexts. In contrast, if one claims, as I do in this paper, that a single conjugation exists, one needs some rule to describe surface differences when they occur. Either way, a certain degree of lexicality must be assumed.

(35) Infinitive:

a. Linearization



b. AR1 (2nd conjugation)

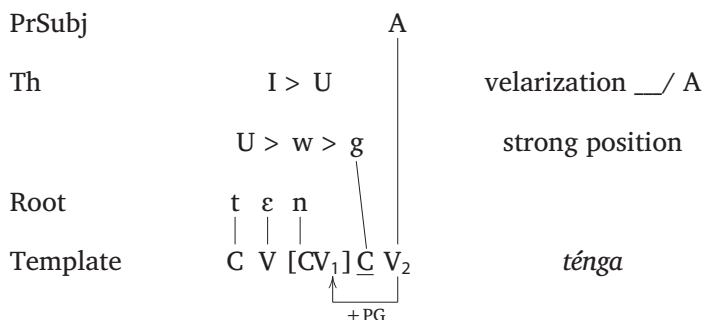
Th |I| ↔ |I.A| / Inf

The answer to [Q1] above in (13) is now clear: the allomorphy of the root depends on the internal organization of the segmental material with respect to both the position of stress CV and the morphophonological environment.

### 3.3 Present subjunctive 1sg, 2sg and 3sg

PrSubj is characterized by the neutralization of the singular forms. This happens in the three conjugations: the 1st conjugation 1sg, 2sg and 3sg are marked by *-i*, whereas the 2nd and 3rd conjugations display *-a*. In G-VERBS, the presence of the ending *-a* triggers the appearance of [g]. This means that, in accordance with the analysis proposed for 1sg above in (33), Th |I| is velarized and undergoes fortition. In other words, the Element |A| (that is the exponent of PrSubj) shares the same phonological properties of the Element |U|: it triggers velarization of the preceding Element.<sup>33</sup>

(36) PrSubj 1sg, 2sg and 3sg:



Although the phonological representation (36) is consistent with the hypothesis on the origin of velar insertion, it does not explain why PrSubj is marked by *-a* in the singular instead of the expected distinction of three different forms. In other words, PrSubj 1sg should select for the VI (28a), that is *-o* (= /|A|.|U|/); 2sg should select for the ending *-i* ( cf. (28b)) and 3sg should be marked by *-e* as in (29b). Instead, we find *-a* throughout the singular. I claim that this is a case of contextual allomorphy (Bobaljik 2000; Bonet & Harbour 2012), triggered by the presence of a particular morphosyntactic feature. In this case, this feature is PrSubj, which itself spells out as a phonological null morpheme:

<sup>33</sup> As already mentioned, [a] also blocks palatalization.

(37) VI of PrSubj: PrSubj  $\Leftrightarrow \emptyset$

In order to formalize this case of allomorphy, I propose to use another AR. This rule changes the expected VI of 1sg, 2sg and 3sg into [a] in the context of the PrSubj. The rule is activated only when, in the derivation, the morpheme of the subjunctive is adjacent to that of Infl. In the structure shown in (4), the terminal node Mood (which introduces the PrSubj) and the terminal node Agr (which introduces pers/num features) must be adjacent, given that an allomorphic process can be triggered only locally. Thus, the intervening node T is empty. An AR applies post-syntactically and operates on phonological strings. The form of this AR is the following:

(38) AR2: Infl  $\rightarrow$  |A| / PrSubj\_\_\_

The rule (38) should be more precise, as it does not take into account the fact that 1st conjugation displays |I| instead of |A| in the PrSubj.<sup>34</sup> Thus, I take the rule (38) to be a broad formalization of a general trend of Italian: this trend consists of changing Infl in the context of PrSubj.

In the next subsection, I focus on 1pl and 2pl, the regular forms.

### 3.4 PrInd and PrSubj 1pl and 2pl

In discussing Maiden's (2001) "N-pattern", Thornton (2007) claims that "the present indicative of Italian regular verbs does display the N-pattern, i.e., it is partitioned in two classes, one containing the three singular cells and the third person plural cell, and one containing the other two cells." In the present analysis, I derive the "N-pattern" from the position of the CV that realizes stress. Table 12 reproduces both 1pl and 2pl in PrInd and PrSubj.

We observe that 1pl forms are identical, both across conjugations and across moods. 2pl forms, in turn, are more complicated. In PrInd, they are formed by the Th vowel followed by /te/, whereas in PrSubj, 2pl forms are identical across the three conjugations.

According to Rohlfs (1968, §530), PrInd 1pl was built analogically on Latin subjunctive 1pl -ĒAMUS. Indeed, the vowel -i- appearing in 1pl present indicative is unetymological. The normal course of events should have yielded the suffix /mo/ preceded by the Th vowel,<sup>35</sup> because Latin 1pl is - $\check{V}/\check{V}$ MUS, where V = Th. There is no trace of the vowel -i.

**Table 12:** 1pl and 2pl suffixes.

	1pl	2pl
PrInd	-[já:mo]	-[á:te] / -[é:te] / -[i:te]
PrSubj	-[já:mo]	-[já:te]

<sup>34</sup> This situation is intriguing for the following reason. On the one side, 1st conjugation has |A| as Th, whereas 2nd and 3rd conjugation display |I|. On the other, the PrSubj paradigms shows the opposite configuration: 1st conjugation has |I| and 2nd and 3rd have |A|. We could make the hypothesis that the PrSubj changes Th instead of Infl. A case of polarity is suggested:

(39) Hypothetical Allomorphy Rules:  
 a. Th |A|  $\rightarrow$  |I| / PrSubj\_\_\_  
 b. Th |I|  $\rightarrow$  |A| / PrSubj\_\_\_

If we accept these rules, then we have to explain why Infl is erased. This happens, for instance, in PrSubj 1sg: /am + |I| + |A.U|/  $\rightarrow$  [á:mi], \*[á:mio], \*[á:mø].

Although very interesting, this issue is beyond the scope of this paper: I leave it for further study.

<sup>35</sup> For instance, in the *Romanesco* variety, 1pl has the following shapes in each conjugation: 1st conj. [majná:mo] 'we eat', 2nd conj. [tené:mo] 'we hold' and 3rd conj. [vení:mo] 'we come' (Rohlfs 1968, §530).

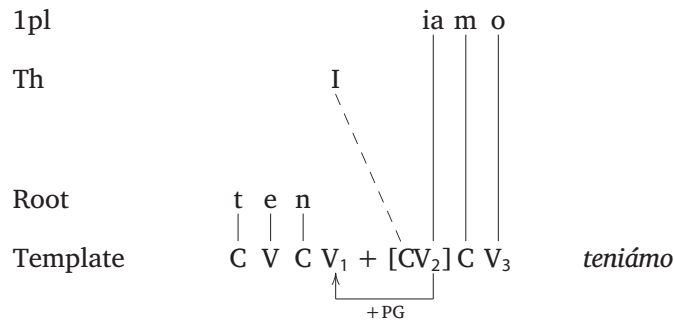
As proposed in section 3.1, 1pl selects for the VI (30a), repeated below:

(40) VI of 1pl: 1pl  $\Leftrightarrow$  iamo (identical to (30a))

This VI is spelled-out with an external template containing one CV unit (CV<sub>3</sub> below), so that the diphthong /ia/ remains afloat.

The first attempt of the linearization of PrInd 1pl is shown below:

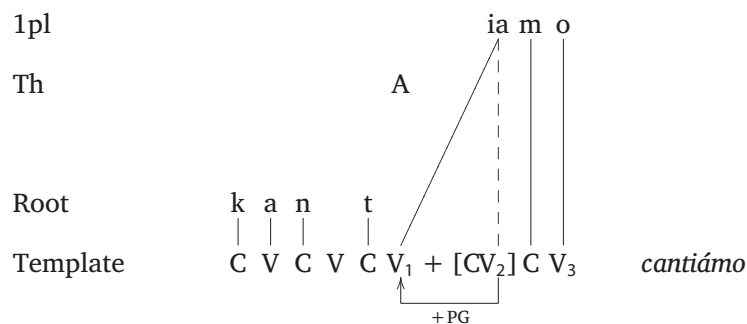
(41) PrInd 1pl (first attempt):



Since V<sub>2</sub> properly governs V<sub>1</sub>, we expect fortition to occur in 1pl. In such a configuration, the C-position between V<sub>1</sub> and V<sub>2</sub> is licensed: thus, Th Element |I| should dock on it. This is evidently not the case. In fact, fortition cannot occur because stress falls out of the template of the root (recall: both 1pl and 2pl are arhizotonic forms) and lengthens the open stressed syllable: [tenja:mo]. In other words, Th Element |I| plays no role in this form.

The comparison of a G-VERB with a regular verb from the 1st conjugation like *cantare* ‘sing’ points in the right direction. In the 1st conjugation, Th = |A|. Yet, 1pl is *cantiámo*: Th does not appear. In the autosegmental framework adopted here, then, the representation of *cantiámo* must display a floating Th Element |A|:<sup>36</sup>

(42) PrInd 1pl *cantiámo* ‘we sing’:



In (42), the derivation goes as follows. Since 1pl suffix /iamo/ is inserted exclusively with CV<sub>3</sub>, the diphthong /ia/ needs to associate with V<sub>1</sub>. Stress inserts CV<sub>2</sub> and finally /ia/ spreads to V<sub>2</sub> and lengthens as shown by the dotted line. Th Element |A| remains afloat.

Consistently with the behavior of the Th Element |A| in the 1st conjugation, the Th Element |I| must remain afloat in G-VERBS. This configuration explains why this Element cannot undergo fortition: the C-position between V<sub>1</sub> and V<sub>2</sub> is not available: as shown

<sup>36</sup> Deletion (or, in an autosegmental framework, de-linking) of theme vowel is a common process of Indo-European languages: see, for instance, Jakobson’s (1948) theme vowel deletion rule established in analyzing the Russian verbal system.



- (46) a. [Q1] What triggers the alternation of the allomorphs of the root of a G-VERB?  
 b. [Q2] What is the synchronic origin of the velar stop?

CVCV phonology allows for a unified representation of the roots of G-VERBS which, in combination with phonological processes of velarization and palatalization, paves the way for a unique underlying form. This hypothesis has the advantage of simplifying the number of VI's available in the grammar of Italian verbs. As for [Q1], I argued that stress is responsible for the allomorphic behavior of G-VERBS. This explains why, once stress does not fall on the root, the resulting form displays regularity. As for [Q2], in turn, I showed that the velar stop [g] appearing in some of the inflected forms of G-VERBS is caused by the fortition of the velarized version of the Th Element [I]. The consequence of this approach to word-formation is that surface alternations depend on the particular nature of G-VERBS roots. In other words, an allomorphic alternation follows from the regular phonological application of independently-motivated principles. In this case, I adopted the principles of CVCV phonology.

From the perspective of the morphological analysis, the irregular behavior of G-VERBS depends on both the presence of a fixed syllabic sequence in the representation of the root and the segmental realization of stress. I assert that the present analysis can be extended to cover all the other irregular verbs: all irregular verbs can be analyzed as being templatic in the sense explained here. Regular verbs, in turn, are those with no fixed template at all: this means that each regular verb selects for the amount of CV-units it needs in order to surface.

### Abbreviations

1 = 1st person, 2 = 2nd person, 3 = 3rd person, SG = singular, PL = plural, PRIND = present indicative, PRSUBJ = present subjunctive, INF = infinitive, TH = theme vowel, INFL = inflection, CONJ = conjugation.

### Competing Interests

The author has no competing interests to declare.

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