RESEARCH

Initial lenition and strength alternations (v/b) in Neapolitan: A laryngeal Branchingness condition

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In Central and Southern Italian dialects, the word-initial position plays host to a large number of strength-based alternations involving voiced stops. In this paper we look specifically at the v/b pair in Neapolitan. Strikingly, the absolute initial position appears to be weak with the voiced stop patterning phonologically like a singleton in word-medial position (v). After a variety of morphemes however, roots surface with the strong version of the consonant (b). These root-initial consonants (which would otherwise surface as weak) pattern phonologically like word-internal geminates. The strong form of the alternating consonant is a voiced stop. The initial position, although it hosts the weak allophone, is neither prosodically nor positionally weak. Voiceless stops, whose lenition actually is positionally conditioned, surface with their strong variant in this position. Rather than initial positional weakness, we identify a specific condition on the voiced stop variant (b). The voiced stop alternations that characterise *initial-weakness* are caused by a *Branchingness* (feature sharing) condition that plays a crucial role in determining strength. The alternating pairs are subject to a condition by which they must be bipositional in order to be strong. The (root) initial position is not weak, indeed only a positionally strong position could host such a contrast. Positional strength and *Branchingness* weakness have a quasi-morphological interplay that potentially aids the identification of morpheme boundaries. Though the pattern we describe is phonological, we speculate that it could constitute an intermediate step in the morphologisation of initial strong/weak alternations, a typological step toward developing initial mutation.

1 Introduction

Southern (and Central) Italian dialects such as Neapolitan are characterised by a large set of strength-based alternations in initial position. See, for instance, the *Linguistic and Ethnographic Atlas of Italy and Southern Switzerland* (AIS) I.67 for Standard Italian (St. Ita.) *baciare/bacia*. Southern Italian type: [v]asare *baciare* 'to kiss'.[1]

(1)   Strong weak alternations in Southern Italian dialects

    a.   **Strong**
        b
        d
        g

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[1] Merlo 1920; Weinrich 1958: 43–104; Rohlfs §§ 150, 153, 155, 167, 215–217; Tulleners-Bloemen 1983; Fanciullo 1976; 1997; 2018; Andalò & Bafile 1991; Russo & Aprile 2001. This variation involves also weak [j] from Lat. which alternates with strong [ɟː]: [ˈjwornə] 'day' vs. [(e) ɟ̞ɟ̞wornə] '(the) days' (see Fanciullo 1997; 2018; Russo & Aprile 2001). The standard Italian forms (e.g. *baciare/bacia*) do not represent a previous stage of the obstruent phonology of Neapolitan, they developed in Southern Italian dialects through a parallel with Italian (b/v alternations directly from Latin (cf. Adams 2013) (see also section 2).

b. Weak
  v ~ β ~ ∅
  r ~ ð ~ l ~ ∅[2]
  j ~ w ~ v ~ ∅

In order to restrict the subject matter, this paper will focus exclusively on the alternations of the b ~ v in Neapolitan. This is because this particular alternation has a special history (known as *betacism*), which will be of interest to diachronic phonologists.

The situation described for b ~ v will be similar for other word-initial strong/weak alternations both in Neapolitan and in other dialects, but the precise details of each alternation in each dialect deserves its own study.[3] In fact, it is especially theoretically interesting that not all the voiced stops have the same lenition pattern (despite them all having strong/weak pairs in these dialects). This fact in itself is worthy of future study.

Even though the discussion is limited to the v/b alternations, the implications for the aid to morphological parsing (and the development of word-initial strength-based alternations) and the implications to the theory of phonological lenition are all sufficiently embodied by discussing just this alternation in this dialect.

As shown in (1), voiced stops alternate between strong or weak forms, depending on their morpho-phonological surroundings; these are presented in (2). Although there are some synchronic lexical exceptions (2b), a large bulk of the lexicon makes up this alternation.[4] Even if synchronic productivity has been sometimes disputed (Andalò & Bafile 1991; Bafile 2014), we believe that this process is still synchronically active (see Fanciullo 1997; 2018; Russo & Aprile 2001). However, this debate is not crucial for our point, since the process was synchronically active at some point, so the arguments we are making here are valid independent of that debate. It is also not within the scope of this paper to discuss the impact that loanwords, surface exceptions and inter-speaker variation has on the productivity of a phonological process. Therefore, our diagnosis of the pattern, and all of its phonological implications, diachronically and synchronically, remain unchanged.

(2)   Morpho-Phonological context (Neapolitan)[5]
  a. Strong~weak contexts

  (i)   Absolute initial (weak)
          [ˈ**v**arkə]   'boat'
          SG-boat

  (ii)   After simple proclitics (weak)
          [na-ˈ**v**arkə]   'a boat'
          INDEF.SG-boat

  (iii)   After gemination-inducing proclitics (strong)
          [tre-**b**ˈ**b**arkə]   'three boats'
          three-boat.PL

  (iv)   After nasal-final proclitics (strong)
          [m-ˈ**b**arkə]   'on the boat'
          LOC.-boat.SG

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[2] [r] in Neapolitan. The weak variant [ð] of /d/ is present in many Southern Italian areas. [l] is the realisation particularly of Ischia (an island near Naples), see Russo & Barry (2004).

[3] For instance, as an anonymous reviewer points out, the situation for /d/ and /g/ after rhotic-codas is different from the situation with /b/. We echo again, each of the strong-weak pairs is deserving of their own full length treatment exploring the *type* of lenition that they represent.

[4] The data for Neapolitan and the Neapolitan region come from primary field work carried out by the first author, who is also a native speaker of Neapolitan raised in the region.

[5] Abbreviations used in glosses: DET = Determiner, INDEF = Indefinite, SG = Singular, PL = Plural, M = Masculine, F = Feminine, 1/2/3 = number of person, PRET = Preterite, PRON = pronominal clitic, REV = malefative/reversive, LOC = Locative, COUNT = Count (Number), MASS = mass (Number).

(v) After voiced fricative-final proclitics (strong)
[z-ˈ**b**ɔta]   'to empty out/Ita. svuotare'[6]
REV.-empty

b. Lexical exceptions (in absolute initial position)[7]

(i) [ˈ**b**ɛlːə]   'beautiful'
ADJ.beautful M/F-SG/PL

(ii) [ˈ**b**ʷoːnə]   'good'[8]
ADJ.good M- SG/PL

The same alternation applies to clusters (e.g. [br]) in initial complex onsets, these surface with the weak form in absolute initial context.

Voiced stops also surface in the weak form when they occur as singletons intervocalically (3a). However, voiced stops always surface in their strong form when geminated (3b). Voiced stops also appear weak after the non-nasal sonorant coda /r/.

Though all the voiced stops exhibit parallel alternations, we will limit the data/examples to the alternation of the voiced stop [b] and its weak variant [v].

(3) a. Intervocalic singleton (weak form)
[ˈve**v**ərə]   'to drink (Lat. BĬBERE)'
INF.-to drink

b. Lexical geminate
[ˈa**b**ːələ]   'able'
ADJ.-ableM/F-SG/ PL

c. Post-rhotic coda
[ˈvar**v**ə]   'beard'
N-SG

Central and Southern Italian dialects are characterised by an external sandhi rule triggering consonant doubling referred to as *Raddoppiamento Fonosintattico* or *Raddoppiamento Sintattico* (RS). There is a rich literature on RS, amongst others we can cite (Chierchia 1986; Serianni 1989/2006; Fanciullo 1983–1986; 1997; 2002; 2018; Andalò 1991; Russo 2013a; b) the bibliography within the latter and (Passino 2013; D'Alessandro & Scheer 2015).

The process of RS greatly increases the morpheme-specific contexts that show the root-initial weak/strong alternation. In (4) we present a representative sample of synchronically active morphological contexts that show the strong/weak alternation.

(4) a. Noun   weak   [ˈ**v**arkə]   'boat'
DET.INDEF.SG   weak   [na-ˈ**v**arkə]   'a boat'
Three   strong [tre-**b**ˈ**b**arkə] 'three boats'

b. DET.DEF.SG   weak   [a-ˈ**v**okːə]   'the mouth'
DET.DEF.F.PL   strong [e-**b**ˈ**b**okːə] 'the mouths'

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[6] There are few opportunities for testing voiced fricatives before /b/ but those that can be found often show the strong variant: [va ˈkantə] 'empty'/[ʃ**b**acanˈta] 'to empty' (though the weak variants are sometimes attested: [ʃvakanˈta]). Crucially, the argument in this paper does not rest on these forms, though our analysis does predict the strong form /b/ after voiced fricatives.

[7] Loporcaro (2004: 119; 2016: 285). The alternations are synchronically active in the Neapolitan region. Despite some lexical exceptions (see 2b), the bulk of the data exhibits these alternations.

[8] Though see Procida (island, near Naples): [ˈvɛrə] 'beautiful' and [ˈ**v**ʷonə] in absolute initial position (author's fieldnotes).

c.	PRET.1P	weak	[adʒːə-ˈvipːətə]	'I drunk'
d.	PRON.ACC.F.PL	strong	[se-lːe-**b**ˈ**b**epːərə]	'they drunk them'
e.	NEG	strong	[nu-ˈ**b**ːerə]	'don't drink'
f.	REV	strong	[**z**ˈ**b**ɔta]	'to empty out'
g.	LOC	strong	[ᵐˈ**b**ɔːlə]	'in flight'
		strong	[**m**ˈ**m**oːkːə] (/nb/[9])	'in mouth'[10]
h.	DET.DEF.COUNT	weak	[o-ˈ**v**iːnə]	'wine (count)'
	DET.DEF.MASS	strong	[o-**b**ˈ**b**inə]	'wine (mass)'[11]
i.	PRON.ACC.MASS	strong	[o-**b**ˈ**b**onnə]	'want it'[12]
	PRON.ACC.F.PL	strong	[e-**b**ˈ**b**onnə]	'want them'

2 β/v-b and the diachronic sources of the alternation

The alternation between strong and weak voiced labial obstruents: b and v has a special diachronic origin in Southern Italian. We summarise their development/phonologisation here.

The Southern Italian weakening of voiced stops seems to go back to the loss of the Latin opposition between /b/ and /w/ (<b> and <v> – /w/ is graphically <v>). This is a historical phase with reflexes across Romance languages including Catalan, Spanish, Occitan. In Occitan today the betacizing area (where <b> replaces <v>) covers Gascony, Languedoc and a large area of Auvergne (see Sauzet & Olivieri 2016: 325).

The *Appendix Probi*, a manual on the correct pronunciation of certain words (see Asperti & Passalacqua 2014), shows the Latin confusion between /b/ and /w/ in the third century. The Latin orthographic <v> is often replaced by orthographic <b> already in the first century (Adams 2013: 183): *Iobe, dibi* (*Archive of the Sulpicii* from *Pompeii*) and in the Pompeian graffiti: *berus* (*verus*). Claudius Terentianus (first century) also presents fourteen cases of *b* in place of *v* (Adams 1977: 31; Russo 2013a).

As the *Appendix Probi* shows, orthographic <b> and <v> were confused for each other in initial, post-consonantal and intervocalic position. This signals a complete phonological merger. This indicates that the pronunciation of Latin <v> and <b> at this stage was fully merged, and probably [β] (see discussion in Adams 2013).[13]

(5)   Latin confusion between /b/ and /w/
       Appendix Probi (III–IV A.D.)[14]
       a. 9   *baculus*   non *vaclus*
       b. 70   *alveus*   non *albeus*

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[9] Neapolitan has taken this a step further, where underlying nas + voiced stop sequences can become geminate nasals, as they do elsewhere in Southern Italy.

[10] Nas + voiced stop sequences are actually so featurally similar that in Neapolitan that they can fuse together as geminates. Word-medially, there are no alternations with nas + voiced stop sequences these have merged with the etymological geminate nasals. However, in C_1 position there is a chance for alternations (though they only ever see the weakened singleton C and the strong geminate nasal: [ˈ**v**okka] 'mouth' vs. /NAS + root/ [**m**ˈ**m**okka] 'put into a mouth' UR: /√boka/ 'mouth'. Even though we don't see a phonetic [b], we know that [b] does not lenite after nasal codas: *[mˈ**v**okka] for 'put into the/a mouth'.

[11] The RS and strong form apply only with non-feminine Mass nouns.

[12] Proclitics can generate a strong/weak pattern from a voiced stop [b, d, g]. For instance, a lexical /r/ (e.g. Ita. *rompere* 'to break') preceded by PRON.ACC.MASS becomes [o-**d**ˈ**d**ombənə] *lo rompono* '(they) break it'. The [r] is replaced by the strong form [d], even though the /r/ is in the underlying form and we may not expect it to alternate. Therefore, /r/ is captured in the Neapolitan alternations involving [d] and functions in the same way as the 'regular' [d] (e.g. Ita. *dire* 'to say', PRON.ACC.MASS: [o-**d**ˈ**d**iʃi] *lo dici* 'you say it'. But when an RS triggering proclitic/W_1 is absent, such as in absolute initial position (##_), we get weak [r]: [ˈriʃi] *dici* 'you say'.

[13] See also Väänänen § 89; Lausberg § 300; 366; 373; Fanciullo (1997: 38).

[14] The number is the order the item appears in the list.

c.	215	*vapulo*	non	*baplo*
d.	91	*plebes*	non	*plevis*
e.	93	*tabes*	non	*tavis*
f.	298	*tolerabilis*	non	*toleravilis*

At this point in time, the merger had also affected the rest of Southern Italy, see also *Pompeii Inscriptions* (near Naples).[15]

(6)   /b/ and /w/ merger, *Pompeii* (Pompeian Inscriptions) (I A.D.)
    a.   4874 **b**aliat = **v**aleat
    b.   4380 **B**erus = **V**ērus

After this period, during the 2nd century (Lausberg § 300), the bilabial fricative [β] became a labiodental /v/ in some of the Romance languages. In Italian (and elsewhere, such as in French) /b/ was lexically established in initial and post-coda position: *bacio* 'kiss' or *erba* 'grass' vs. *cavallo* 'horse' Lat. CABALLU.

As we see in (5b), the *Appendix Probi* 70 *alveus non albeus* already shows a tendency to establish strong /b/ after coda /l, r/ (cf. Ita. *serbare* 'to store' from Lat. SERVARE or Fre. *corbeau* 'crow' from Lat. CORVELLU). However, some substitutions in the other direction also exist in Medieval French: *arvoire* arbiter 'referee' from Lat. ARBITRU.[16] Therefore, despite the Latin merger of <v> and <b> into [β], French and in Italian innovated /b/ in the disjunctive contexts of absolute initial and the post-consonantal position: {C_, #_} (cf. the Coda Mirror, Ségéral and Scheer 2001; Scheer & Ségéral 2008).

As will become theoretically significant later, Tuscan and Neapolitan have non-overlapping patterns of /v/, /b/ in post-coda position. Tuscan typically presents strong allophones in this position, while in post-rhotic-coda position Neapolitan presents the weak allophone (v). Northern and Central Italian dialects innovate the strong form of the voiced stop: /rb, lb/: Ita. car[**b**]one 'charcoal' or er[**b**]a 'grass'. However, Neapolitan and Southern Italian dialects have generally opted for a weak consonant in this position: Neap. va[**rv**]a 'beard', ca[**rv**]one 'charcoal'.[17] This difference is consistent with our account (even predicted), as we will explain in section 3.

Spanish, Catalan, Occitan (including Gascon), Southern Italian dialects and Sardinian neutralized the contrast between Latin <v> and <b> word-initially. Thus, from the starting point of the confusion between Latin <b> and <v>, the realization of the Latin <v> and <b> has been established in various places by a phonotactically controlled allophony. In Spanish, Catalan, Gascon, and parts of Occitan (Languedoc and Auvergne) and Sardinian, the fricative [-β-] is the reflex of Latin <-v-> and <-b-> in three contexts: intervocalically, word-internally and at morpheme boundaries (Spa. [a**β**a] *haba* 'broad bean', nue[**β**]o *nuevo* 'new'). These languages have a [b] realization in absolute initial position (##_): Spa. [**b**]oka 'mouth' Lat. BUCCA, [**b**]a[r**β**]a 'beard' Lat. BARBA, [**b**] ino 'wine' Lat. VINU, [**b**]aka 'cow' Lat. VACCA. The data suggest that after the complete merger of Latin's /w/ and /b/, <-v-> and <-b->, in some Latin regions (as in Spanish), the historical sound change worked by changing initial [β] into initial [b]. This occurred in the strong initial position, whereas intervocalically, the weak variant [β] remained.

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[15] To this we could also add the inscription (Rome) **B**ittoria R I 304 < Lat. victoria or, as we said above, some examples from the Letters of Claudius Terentianus (regional Latin spoken in Syria, Ist c.): im**b**oluclum 468.9,14 = inuolucrum, im**b**enire 469.7 vs. imueni 471.19 3, see Russo (2013a).

[16] Väänänen §89.

[17] This again is partly parallel with Spanish, which has [-lβ-] and [-rβ] in post-coda position, after both /l, r/.

This process and result have been called *betacism* (Sabatini (1966; 1996: 216 and no. 66; Loporcaro 2004).

In Central and Southern Italian dialects, the initial position hosts either [v] (but also [β] see below) or [b:] depending on the phonological environment. This process is already attested in Latin inscriptions, as we have seen above, and see for instance the following early example of strengthening via RS (Sabatini 1966: 214–216; 1996: 23–25, no. 66–67):

(7)   Commodilla's graffiti, Rome
        non dicere ille secrita *ab^boce* (850 A.D.)
        a bboce Lat. AD VOCEM
        RS trigger /a$_{\varnothing c}$/ + [β] = [b:][18]

In this intriguing inscription, the author of the graffiti wanted to transcribe the vulgar expression 'loudly' (lit. 'at high voice' with AD as an instrumental). At a second point in time, the author added a second <b> to the inscription in the form of a small <b>: *ab^boce*. This eliminates the ambiguity in interpretation left by using a single <b>, which could have stood for the bilabial fricative interpretation of the grapheme (Sabatini 1966: 217; 1996: 195). This example shows that the vernacular of Rome was already fully committed to this process by this time period. So, Sabatini (1966; 1987: 25) suggests that, in the betacistic Central and Southern Italian area, the graphical opposition between <b> and <bb> was a way to make a phonological distinction between weak intervocalic [β] = <b> and strong [b:] = <bb>.[19]

(8)   Doubling and RS triggered use of strong form of [b:]
        a. Proper name frequent in late inscriptions: Quo**bb**uldeus < QUOD-VULT-DEUS
        b. RS after Prefix /a$_{\varnothing c}$/ <AD>
            (i)   *abbenit*   Rome
            (ii)   *abbena*   Calama (Numidia)
            (iii) *abbocatore*   Campania (10–11th c.)[20]

Meanwhile, the Cassino area of the middle ages shows a phonotactic alternation closer to Spanish, Catalan and Gascon (Western Romance). It concerns at least the quality of the two variants [b] and [β] outside of RS and absolute initial position. The medieval text *Ritmo cassinese* (13th century) (Formentin 2007: 74) contains what has been called *betacismo cassinese*.[21]

(9)   Cassinese betacism (13th century) graphic <b> replaces <v> in all the positions
        a. [β]
            (i)   ##_   **B**oltier(a) 51   'I would like'
            (ii)   #_   questa **b**ita 3   'this life'
            (iii) V_V   fa**b**ello   1 'I speak'

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[18] The notation for RS triggers with an empty position and subscript c /a$_{\varnothing c}$/, follows Russo (2013b).

[19] Only later did the intervocalic singleton <b>, [β], shift to the labiodental [v].

[20] See *abbocatore* (1034) in *Codex Cavensis*, De Bartholomaeis 1901 (cf. LEI 1,950). Further evidence for the RS in forms such as those of (7c) comes from the hypercorrections <tb>, <db> that ought to represent [b:] from Latin <v>, for instance these from the Medieval Latin of Southern Puglia: <at**b**ocatorem> (Polignano 992, CDPugl XX.25), <a**db**ersus> (Conversano 1053, CDPugl XX.39), <a**db**eni> (Conversano 994, CDPugl XX.27). For more on this topic see Russo (2013a).

[21] See Baldelli (1958); Castellani (2000: 261, n. 20); Formentin (2007: 74–75). See Sabatini (1966: [216]/1996: [25] and no. 66): "L'uso di rappresentare la variante [β] col simbolo grafico b costituisce il betacismo grafico: quest'uso s'è potuto mantenere per qualche tempo anche quando l'articolazione era diventata labiodentale" (see also no. 67).

b. [b]
(i)   C + _   est **b**eritate   '(it) is truth'
(ii)   C_   com**b**engo 41   'I agree upon'
(iii) C_   a**bbib**atio 12   'I hurry'[22]

According to Baldelli (1958: 35) graphical <b> corresponds to [β] (and it is maintained in the area of *Montecassino* to this day).[23]

As suggested by Formentin (2007: 74), the weak [β] is found in initial position (##_ *Boltiera* and #_ *questa* **b***ita*) and V_V (*fa***b***ello*), whereas strong [b:] is located in the derived environment of RS, after a lexically-specified trigger: ($_{\varnothing_c}$).[24]

Having explained the diachronic circumstances from which Tuscan Italian/Standard Italian and Neapolitan were forming, we now move to a formal phonological explanation of the strong/weak alternations. Specifically, it is not the case that Tuscan/Standard Italian has a positionally strong initial position, while Neapolitan does not. Though this may appear to be the case, because in Neapolitan the initial position was phonologised with the weak variant of the b ~ v pair. However, phonologically there are different types of lenition and, despite all appearances, the so called *initial weakening* of Neapolitan is not a product positional weakness.

3 Initial weakness and theories of phonological strength
3.1 Types of lenition

Considering Neapolitan/Central and Southern Italian dialects from a typological and theoretical perspective, the pattern of strength and weakness seems to fall across an unexpected boundary.

The root-initial position appears to be weak, patterning with intervocalic singleton consonants and some post-coda positions. However, there is a typological tendency for a consonant in Initial and post-coda position to be strong relative to the intervocalic singleton position. However, there are various sources of phonological strength. In representationally-minded models of phonology there are in fact three different kinds of 'strength'.

(10)   Factors in lenition
(a) (Pure) Positional
(Charette 1990; Harris 1990; Kaye et al. 1990; Ségéral & Scheer 2001)

(b) Prosodic
(Harris 1997)

(c) Feature sharing/Bipositionality
(Scheer 2000; 2004; Honeybone 2001; 2002; 2005; Bucci 2013)

Theoretical models of positional strength and weakness have long taken the initial position to be inherently strong. This finding has been confirmed experimentally (Becker et al. 2012). Also, there are many phenomena that speak to this conclusion. In English for instance, even though aspiration looks like it ought to be foot-initial (cf. Anderson & Ewen 1987), *non-pretonic* initial consonants are also aspirated: [kʰ]oréa 'Korea' cf. [kʰ]at 'cat' (cf. Harris 1994).

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[22] From the Lat. VIVACIUS from where also Tusc. *(a)vaccio* 'soon' (Formentin 2007: 89).
[23] Cassino is in between Latium and Campania. The situation to which Baldelli (1958: 35) refers to corresponds to a synchronic development in Tagliacozzo and Trasacco, Southern Latium (Sonnino), and Northern Campania (Ausonia), all around Montecassino.
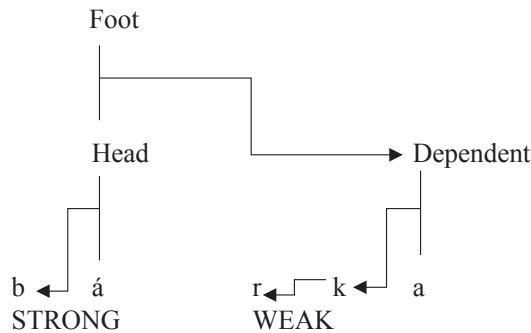[24] This interpretation is reinforced by the example *guita* 23, where a nasal consonant precedes the despecified <v>/<b> replacing it with <g>: non guita 23 'vita'.

Prima facie, Neapolitan voiced-stop lenition of /b/ looks like it hinges on positional factors. This, however, will be shown to be false, even though positional terms have so far been crucial to describing the pattern (absolute initial position, intervocalic etc…). Moreover, the pattern of lenition is completely at odds with prosodically-driven lenition.
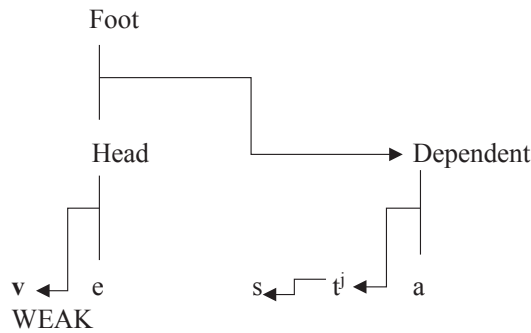
3.2 Ruling out prosodic lenition

Licensing Inheritance (Harris 1997) is a framework of strength and weakness that focuses on prosodic factors. In this model, initial positions are not inherently strong, but foot-initial positions certainly should be. The diagram in (11) shows how phonological strength, the ability to license features is proportional to the proximity to the head of the domain (the stressed nucleus).

(11)   Strength and weakness according to *Licensing Inheritance*

```
                    Foot
                  ┌──────────┐
               Head         ──────►  Dependent
                ┌─┐                   ┌──┐
          b ◄─┘ á            r ◄─┘ k ◄─┘ a
          STRONG              WEAK
```

However, this model cannot account for this pattern of weakening in Neapolitan because the weak alternant is found in foot-initial position.

(12)   ##__, povera__   *(b)/**v**(éstia) '(poor) beast'

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                    Foot
                  ┌──────────┐
               Head         ──────►  Dependent
                ┌─┐                   ┌──┐
          v ◄─┘ e            s ◄─┘ tʲ ◄─┘ a
          WEAK
```

3.3 Ruling out positional lenition

Taking pure positional factors into account, typically strength and weakness are distributed as shown in (13). Initiality, either of the word or syllable, is taken as being inherently strong. Word-initial onsets, particularly those in absolute-initial position, will be taken to be strong. Meanwhile, the intervocalic onset context is assumed to be weaker, and the disjunctive context of being pre-consonantal and word-final {_.C, _#} is taken to be weakest of all.[25]

(13)   Strong and weak positions
    (a) Strong positions (onsets)
        # [$_\sigma$ **C** V   C [$_\sigma$ **C** V

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[25] There is a complication to this that will be presented in the next section.

(b) Weak positions (intervocalic onset, coda)
V [$_\sigma$ **C** V   [$_\sigma$ V**C**#

3.3.1 Introducing strength and weakness in Strict CV

Strict CV phonology, sometimes called CVCV or Lateral phonology (Lowenstamm 1996; Ségéral & Scheer 2001; Scheer 2004; 2012), is an offshoot of the framework of Government Phonology (Kaye et al. 1985; 1990; Charette 1990; 1991; Harris 1990; 1994). Strict CV built these strength and weakness relations into its theory. The following paragraphs serve as an introduction to the principles of representation of the framework, with special emphasis on how it analyses strength and weakness.

In Strict CV, positional strength derives from its syllabic environment. Specifically, it obtains from a calculation of the contradictory forces of strength (licensing) and weakness (government) (Ségéral & Scheer 2001). Fittingly, positions receiving the strong force will be strong and positions receiving the weak force will be weak.[26] These conditions give rise to the following constellation of strength and weakness contexts, the outcomes are listed in (14), while the structures that give rise to the outcomes are shown in (15).

(14)   Summary of phonological strength in Coda Mirror
        a.   C is weak when it is: [–Lic, –Gov]   word-final, coda
                              or: [+Gov]   intervocalic
        b.   C is strong when it is: [–Gov, +Lic]   initial or post-consonantal

(15)   Positional strength in the Coda
        a.   Weakness in the Coda-Mirror (unified disjunctive context {_.C, _#})[27]
             (i)   Word-internal coda [–Gov, –Lic]
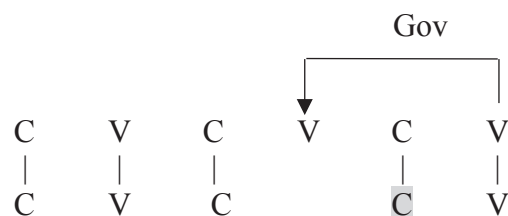
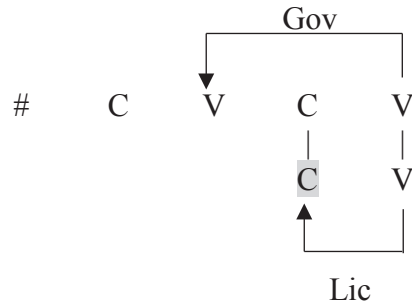   (ii)   Word-final coda [–Gov, –Lic]
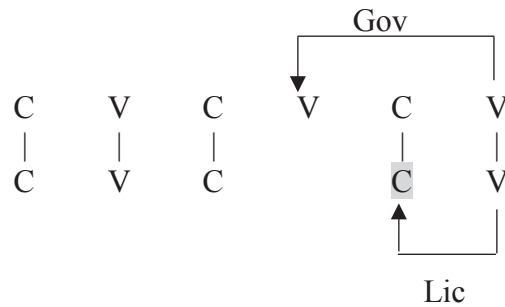

             (iii) Intervocalic [+Gov]

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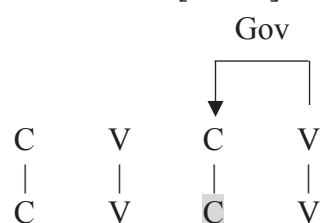
[26] Since Scheer & Ziková (2010), it is further understood that a position which could in principle be *both* licensed and governed is only governed (only weak), (but see Balogné Bérces & Honeybone 2012).

[27] There is a slight complication because word-final codas can be stronger than word-internal codas, but this has no bearing on Neapolitan.

b. Strength in Coda-Mirror
  (i) Initial [+Lic, –Gov]

$$\begin{array}{ccccc} & & & \text{Gov} & \\ \# & \text{C} & \text{V} & \text{C} & \text{V} \\ & & & | & | \\ & & & \boxed{\text{C}} & \text{V} \\ & & & & \\ & & & \text{Lic} & \end{array}$$

  (ii) Post-consonantal [+Lic, –Gov]

$$\begin{array}{cccccc} & & & & \text{Gov} & \\ \text{C} & \text{V} & \text{C} & \text{V} & \text{C} & \text{V} \\ | & | & | & & | & | \\ \text{C} & \text{V} & \text{C} & & \boxed{\text{C}} & \text{V} \\ & & & & \text{Lic} & \end{array}$$

In this model, the post-coda position can never be weak because Gov will always be needed to silence the preceding empty V. However, the presence of the initial empty CV (15b i) is parametric, which means that the initial position can be either strong or weak (from a positional perspective). However, there is an important typological implicational hierarchy where the post-coda position will either be equal in strength to the initial position or it may be stronger than the initial position (when the initial position is not preceded by an empty CV). Wherever there is an empty CV, the initial position and post-coda position must be of equal strength (from a positional perspective). As we will show in the next section, though Neapolitan does have an empty initial CV, when it comes to the b ~ v alternation we still see (a) the weak alternant in initial position (when this should be strong) and (b) either weak or strong alternants in post-coda position depending on the nature of the coda consonant. From this it will be concluded that positional factors are not sufficient to handle the Neapolitan b ~ v alternations.

3.3.2 Positional lenition and the Initial CV are not enough

The structure in (15b i) shows the initial position. It is strong because it is preceded by an Empty CV. This Empty CV is inserted into the representation at the beginning of each phase/string (Scheer 2012; cf. Lowenstamm 1999 for a precursor). The Initial Empty CV (henceforth the Initial CV) absorbs the destructive force of Government, leaving the initial consonant in a strong position (14b i). However, the possibility of having an Initial CV to mark the beginning of a domain is parametric. Therefore, it is conceivable to have either strong or weak initial positions (the weak is shown in (15b ii)). In Tuscan, the presence of the Initial CV is confirmed by other properties of the language (16a). Spirantisation and de-affrication do not occur in utterance initial position, though they do follow vowel-final proclitics (Agostiniani & Giannelli 1983; Marotta 2008; Ulfsbjorninn 2017). Elsewhere both Spirantisation and De-affrication are blocked in post-coda position (after an empty V slot) creating the natural class between initial and post-coda position expected according to the Coda-Mirror (Ségéral & Scheer 2001).
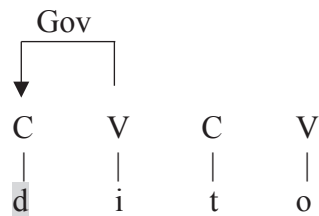
However, the fact that Neapolitan had initial weakening does not automatically imply that it does not have an initial CV and that (16b) is the right representation. After all, the external sandhi effects are very similar in the two varieties, so it would be hasty to merely assume (16b).

(16)   a.   Tusc: CV + /dito/
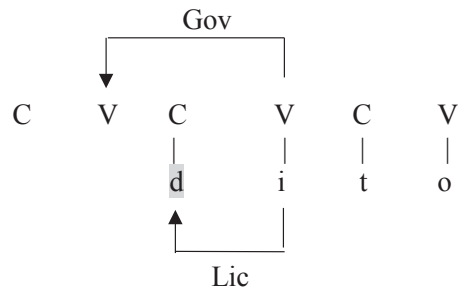
Outcome: strong [d]

    b.   Neap: /dito/

    weak [r]

In fact, there is a phonological process that strongly suggests that (16b) is not the correct representation for Neapolitan. This comes from the pattern of the voicing of voiceless stops (Andalò & Bafile 1991: 250).

(17)   Voiceless stop voicing in Neapolitan (ibid.)
    a.   [k]asa   a-[ǧ]asa   'house/the house'
    b.   [p]orta   la-[b̥]urtato   'bring/brought it'

This kind of intervocalic voicing (like spirantisation in Tuscan) is clearly positional. This is confirmed by the fact that it does not apply after rhotic codas: [kɔrpə] * [kɔrb̥ə] 'body'. In Strict CV terms, singleton voiceless stops become voiced in the context of Gov. This unites the initial position with the post-coda position as being *positionally* strong, while the intervocalic is positionally weak (as expected).

(18)   Positional strength in Neapolitan showing a positionally strong initial position

    a.   Absolute initial and post-coda positionally strong [–gov]
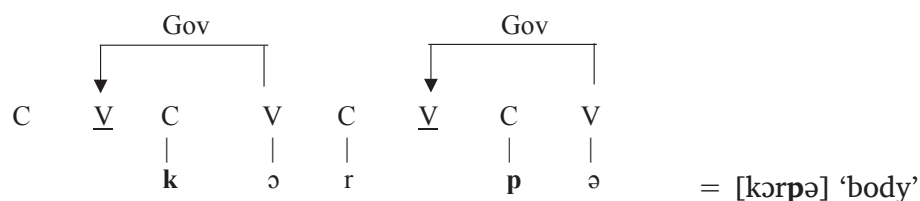
b.   Post-vocalic and intervocalic positionally weak [+gov]

Gov

C   V   C   V   C   V

| | | | |

a   g̊   a   s   a   = a-[g̊]asa 'the house'

Gov

C   V   C   V   …

| | | |

l   a   b̥   u   …   = la-[b̥]u… 'brought it'
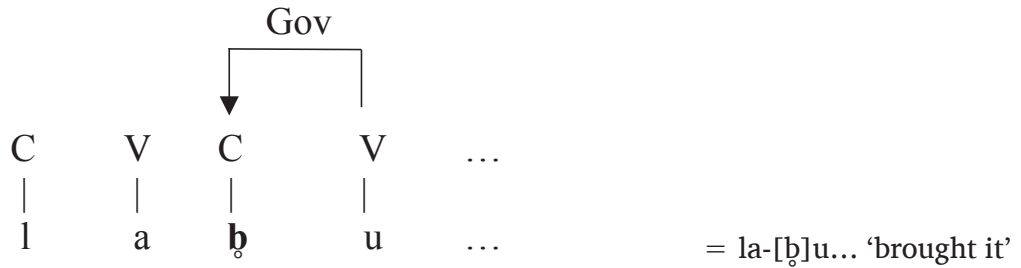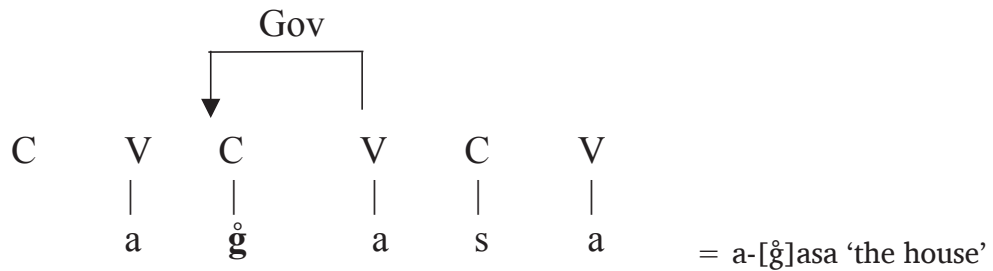
The fact that Neapolitan can be demonstrated to have an initial CV shows that whatever caused initial weakening in the language, it was not positional lenition. The b ~ v distribution does not follow the distribution of Gov, unlike voiceless stop voicing which clearly does (the strong alternant appears in initial and post-coda positions).

This is confirmed by the fact that the voiced stop lenition (b ~ v) in Neapolitan does not pattern either like voiceless stop lenition in Neapolitan nor Spirantisation in Tuscan. The latter two processes are clearly tied to the distribution of Gov. The b ~ v alternation that we see in initial position is recapitulated in both intervocalic position and post-rhotic-coda position.[28]

The post-rhotic-coda position of Neapolitan is a context of voiced stop weakening – akin to the initial position *β: *βarβa > Tusc. bar**b**a and Neap. *βarβa > **var**v**a 'beard'.[29] This shows that the b ~ v alternation cannot be positional. In this context, Tuscan and Neapolitan (and voiceless stop voicing in Neapolitan) ought to have identical licensing conditions but they lead to different strength outcomes.
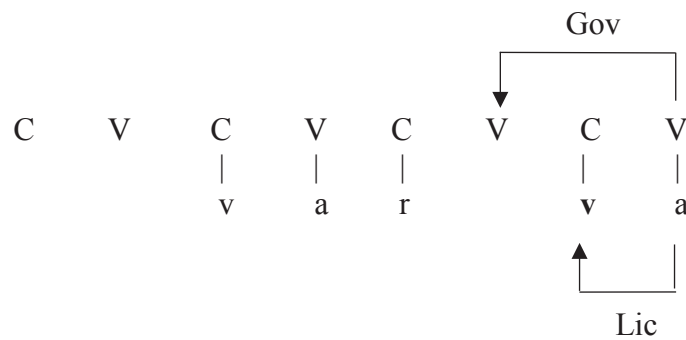
(19)   Tuscan and Neapolitan, difference in post-coda stops
       a.   Tusc. *barba* 'beard' (Initial CV omitted)
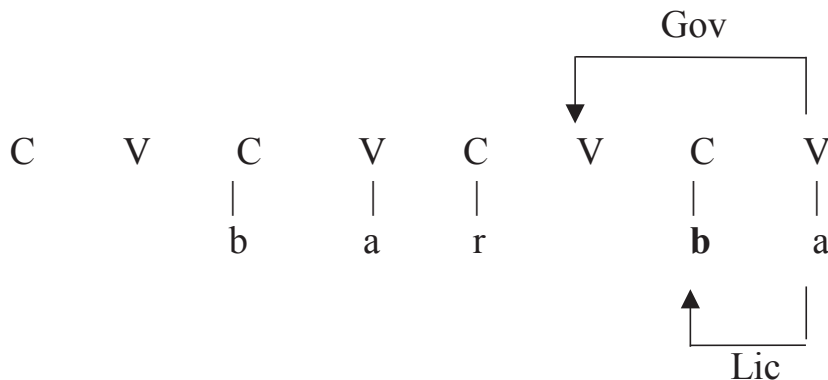
Gov

C   V   C   V   C   V   C   V

| | | | | |

b   a   r   **b**   a

Lic

---

b. Neap. varva[30] 'beard'

This diagnoses the Neapolitan b ~ v weakening alternations as being the third type of lenition, not prosodic, not positional, but *Bipositional* lenition (cf. 10c).

This conclusion is shown schematically in the diagram beneath. It shows the overlapping spaces in the formal characterisation of the diachronic path from Latin's single phoneme /β/ to Tuscan and Neapolitan /b vs. v/. In (20) the bilabial fricative is a 'place holder' for b/v/ and their variants.

(20) Background: Latin /β/ and the split into /b/ in Tuscan and Neapolitan
      a. Tokens:
          βarca   'boat'   *aβa:β:ja* 'to outwit'
          amβasciatore 'ambassador' *caβallo* 'horse'
          zβigna   'escape'

      b. Split by formal environment
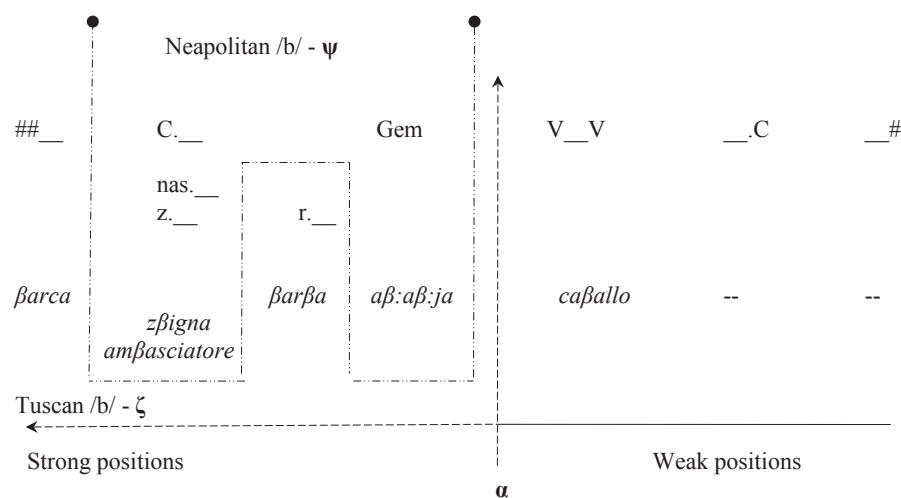
The whole diagram is the distribution of the original Latin /β/, as a single phoneme. The environments it occurred in are listed with an example word. Line (α) the diagram separates the space according to what is understood to be positional strength. To the left of line (α) are the positionally strong contexts, and to the right of line (α) are the positionally weak ones.

As the diagram shows, Tuscan generally conforms to this *positional* split. Though some /rb/ clusters were lexicalised as /rv/: cor**v**o, ner**v**o, ser**v**o… This was not categorical or uniform in Tuscan and, as we will see, synchronically the post-rhotic-coda environment is

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[30] See §2.1 and no. 32. (Rohlfs §262; Fanciullo 1976). This alternation renders Southern Italian dialects similar to Spanish/Catalan, where [β] is also realized in post-coda position (after /l, r/). Though it is not clear if this is due to the same phonological causal factors.

categorically strong yielding synchronic [rb] sequences and not the weak alternants: *[rβ].[31] For Tuscan, the environments to the left of line (α) (labelled as area (ζ)) often resulted in the strong form: /b/ and correspond synchronically with a positionally strong position.

Meanwhile, the Neapolitan split does not conform to notions of positional-markedness. Its /b/ (demarcated by area ψ) does not align with positional-lenition, therefore, a different kind of factor must be responsible for the pattern.

4 Morphological consequences of the strength alternations

Before we turn to formally explaining the phonological factors involved in this bipositional lenition, we wish to briefly illustrate an interesting implication that this pattern has.

Specifically, there is an interplay between bipositional lenition and classical positional strength that acts as a reinforcement to the morphological parsing, in what looks very much like a beginning step in the morphologisation of the phonological pattern into one of initial strength mutation.

Though it may at first appear paradoxical, the abundance of utterance initial weak-initial forms in a positionally strong position could actually be a manifestation of the inherent strength of that initial position because it is only a strong position that can host a weak/strong contrast.

4.1 Indirect signaling of morpheme boundaries

Despite what appears to be a general ban on initial voiced stops, these sounds are, in a sense, still allowed in initial position (in the first phonological onset of the word), but only under certain morphological contexts. Consider this from the perspective of contrast. Once the full set of morpho-syntactic contexts has been listed, the first onset of roots can hold *any* consonant phoneme of the language, including voiced stops. Therefore, all consonant contrasts are permitted in the initial onset position once the full set of word-initial environments have been considered. This is sharply different from an actually positionally weak syllabic position, such as the word-internal coda. Typically, an internal coda hosts a dramatically reduced set of consonant contrasts, and this remains true when all the morphological contexts are considered. That is because this is a truly positionally weak position and it leads to extensive neutralisation (via devoicing, sonorisation, debuccalisation, limit to coronality etc…).

In Neapolitan, the conditions by which voiced stops are allowed in the first onset of a root are as follows: (a) they form a complex with a voiced fricative or a nasal consonant, (b) they form a geminate. These conditions are invariably created by preceding morphemes. Therefore, the strong variant of a voiced stop in root-initial position reinforces the presence of a morpheme boundary to its left. This creates alternations where a morpheme in isolation surfaces with the weak form of a voiced stop and the multi-morphemic form shows up with the strong form. The fact that C_1 is a strong position allows it to be a good position for expressing patterns of morphology that are signalled exclusively by the amount of phonological material in C_1. The argument is as follows: if a morphological paradigm is defined by melodic complexity in the form of a large amount of phonological material, this necessarily requires that elsewhere, related stems do *not* contain those same feature combinations. Therefore, in such systems, C_1 will be simple in paradigm alpha (*i.e.* basic, unsuffixed word-initial) and complex in beta (*i.e* negation). Importantly then, even a simplex alternating root such as [**r**]ito 'finger' (weak), *systemically* the C_1 position

---

[31] And, as we will see, the categorical (synchronic and productive) strong/weak alternations of Tuscan conform exactly to this positional split.

is exercising its positional strength in that: C_1 is simplex in a quasi-paradigm that helps signal the morpheme boundary by C_2.

(21)   Initial strength alternations in Neapolitan (repeated from 3)

|				
a.	NOUN	weak	['**v**arkə]	'boat'
	DET.INDEF.SG	weak	[na-'**v**arkə]	'a boat'
	Three	strong	[tre-**b**'**b**arkə]	'three boats'
b.	DET.DEF.SG	weak	[a-'**v**okːə]	'the mouth'
	DET.DEF.F.PL	strong	[e-**b**'**b**okːə]	'the mouths'
c.	PRET.1P	weak	[adʒːə-'**v**ipːətə]	'I drunk'
d.	PRON.ACC.F.PL	strong	[se-lːe-**b**'**b**epːərə]	'they drunk them'[32]
e.	NEG	strong	[nu-**b**'**b**erə]	'don't drink'
f.	S-	strong	[**z**'**b**ɔtə]	'to empty out'
g.	LOC	strong	[ᵐ'**b**ɔːlə]	'in flight'
h.	DET.DEF.COUNT	weak	[o-'**v**iːnə]	'wine (count)'
	DET.DEF.MASS	strong	[o-**b**'**b**inə]	'wine (mass)'
i.	PRON.ACC.MASS	strong	[o-**b**'**b**onnə]	'want it'
	PRON.ACC.F.PL	strong	[e-**b**'**b**onnə]	'want them'[33]

The contrast between Count and non-feminine Mass nouns (21h) shows some of the strongest evidence for root-initial consonants alternating according to a strong and weak paradigm.

These Count vs. non-feminine Mass nouns (and certain clitics and determiners) are only distinguished by the root-initial consonant (C_1). C_1 must be geminated, leading to a contrast for the v/b alternating pairs based on the weak (v) and the strong (bː).

The details of the syntactic structure are not crucial for the paper, we suppose the number and gender features are introduced by the appropriate syntactic heads, however these are not represented in (22). What is crucial is that when Det is valued for Count the exponent is /o-/ which does not trigger RS, while if it is valued for Mass [-fem] then it will be exponed by /oCV-/.

(22)   Morpho-syntax and phonology of 'wine'
    a.   [o-'**v**iːnə] 'wine (COUNT)'
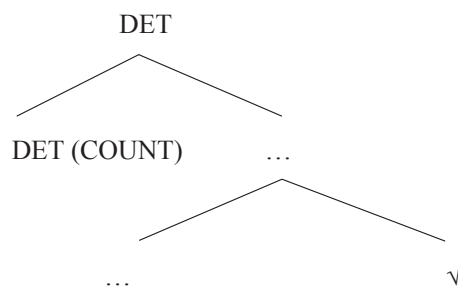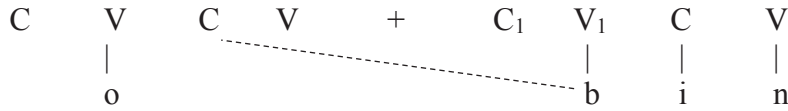

    b.   [o-'**b**ːinə] 'wine (MASS) [-fem]'
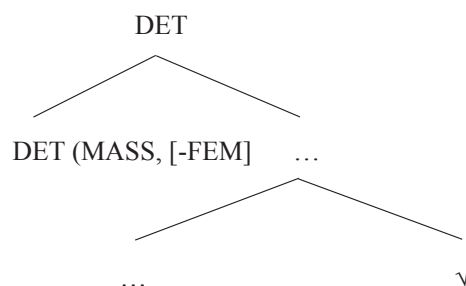
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[32] Medieval Neapolitan (but also modern), text De Rosa, Formentin (1998: 190, no. 526).
[33] Only [-F] Mass nouns appear in the strong form.

c. DET + NUM (MASS, [-fem])   <=>   oCV-
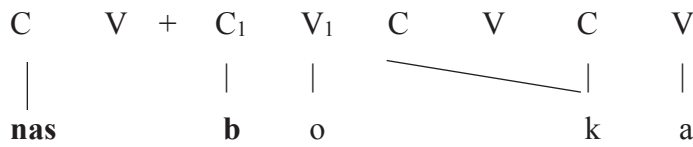   DET + NUM (COUNT)   <=>   o-
    √   <=>   vin-
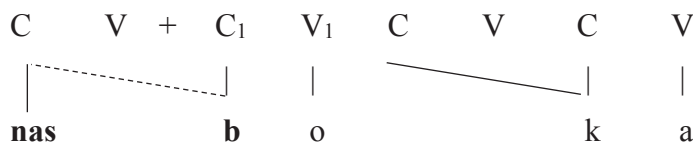
(23)   RS in the output of [o-**b**:inə] 'wine (MASS) [-fem]'[34]

C   V   C   V   +   C$_1$ V$_1$ C   V
| | | | |
o   b   i   n

The Locative is another domain where the phonology appears to contain a nearly fully morphologised weak/strong alternation. The exponent of the Locative is presumably just a piece of syllable structure linked to a nasal feature. This allows the root-initial consonant to surface in its strong form.

(24)   Derivation of Locative + nouns
        a. UR /CVnas/ + /√bok: + a/

        C   V   +   C$_1$ V$_1$ C   V   C   V

        | | | | |

        nas   **b**   o   k   a

        b. Computed form (branching) [**m****b**ok:a] = [**m****m**ok:a] 'in mouth'

        C   V   +   C$_1$ V$_1$ C   V   C   V

        | | | |

        nas   **b**   o   k   a

To a lesser degree, this is also the case with the (quasi)prefix S-: [z-**b**iɲ:ə] 'escape'. The S- forms a semi-productive quasi-paradigm, the semi-fossilised inheritance from Latin EX- 'out of'. This alternation can only be maintained *because* C$_1$ is a phonologically strong position and it is able to license the contrast and its strength reinforces the parsing of a morpheme boundary to its left.

Although, Neapolitan has not made the final step toward a true morphological pattern based on the strength of C$_1$, and maybe never will be given the influence from Italian (Andalò & Bafile 1991), there are some striking parallels here with languages that did.

4.2 Typological connections

Typologically, this initial strength-based alternation is strikingly similar to a family of fully morphologised initial-strength alternations called *consonant mutations*.

These are found in many unrelated language families and are not instances of positional lenition. Instead, they constitute a paradigmatic effect based on whether C$_1$ is simple or complex (for a certain feature): Bantu (Kula 2002), Nivkh (Shiraishi 2006), West Atlantic (McLaughlin 2000) and Celtic (Breit 2015).

The following data show how paradigms can be defined in this way. Roots undergo weak-initial vs. strong-initial alternations depending on their morphemic context. These patterns occur in a wide range of language families from all over the globe, including

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[34] As is generally the case in Italian/Tuscan, an empty CV only causes gemination in non-utterance initial position: ##CV + porta [##ˈpɔrta] *[##ˈp:ɔrtalo] 'bring.3P.SG it' vs. [pepːɔrˈta] /peCV + porta/ 'to bring'. We assume from this (non-controversially) that Cs do not spread into the utterance initial empty CV. This is reiterated in footnote (31).

isolates such as Nivkh spoken in North-Eastern Asia, or Niger-Congo languages from Africa, especially West-Atlantic such as Seereer-Siin, and Celtic languages such as Manx from North-Western Europe.

Clearly this type of morphology recurs in human languages (it is not a product only of relatedness or areal effects) and our discussion of the Neapolitan data shows a case where historical and phonological processes could have led (or perhaps are still leading) to this pattern. We hope this could trigger interest in the formal diachronic stages of consonant mutation in language families where it is less well understood.

(25)   Strong weak Initial C_1 alternations in other languages – *Bantu* (Kula 2002)

Verb stem	N-Vstem	Alternation	Language	
leka	ⁿ**d**eka	l ~ d	Bemba	'I stop'
vevela	oᵐ**b**elela	v ~ b	Kwanyama	'dip into'
reheete	ⁿ**d**eheete	r ~ d	Kikuyu	'have paid'

(26)   *Seereer-Siin*, West Atlantic (partial pattern) (McLaughlin 2000)

Initial	Nominalised	Alternation		
waːɗ	o**b**aːwaːɗ	w ~ b	'search'	'researcher'
fec	o**p**eːfec	f ~ p	'dance'	'dancing'
reːf	o**t**eːreːf	r ~ t	'follow'	'follower'
xaʃ	o**q**aːxaʃ	x ~ q	'shoot'	'shooter'

(27)   *Manx* (Broderick 1985; cf. Trommer 2011)

Initial	Mutated	Alternation		
bedn	ən **v**edn	b ~ v	'woman'	'the woman'
tʰai	mə **h**ai	tʰ ~ h	'house'	'my house'
muːr	bedn **v**uːr	m ~ v	'big'	'woman big'
suːl	mə **h**uːl	s ~ h	'eye'	'my eye'
fai	mosən ai	f ~ 0	'homefield'	'in the …'

In all these cases, we see that the inherent strength of the initial position is recruited as the property that expones or reinforces a certain morphological pattern. The fact that C_1 is recruited for this purpose is probably not coincidental, as only (a) a positionally strong position or (b) a position that is optionally/parametrically strong ~ weak could bear this alternation.

The difference between Neapolitan and the consonant mutation systems listed above is that the consonant mutation patterns are always phonologically *irregular*. In Neapolitan that is not the case. The alternations we see word-initially are basically the same phonological conditions that hold word-medially. However, this does not change the fact that the phonological system helps identify morpheme boundaries (on the left edge – and only the left edge, because it is a strong position). The less regular the Neapolitan phonological pattern becomes, the more likely it is that the morphology will exploit the huge set of existing root-initial alternations.

5 The Phonology of the strength alternation
5.1 Strength and bipositionality

Returning to the phonology of Neapolitan and Central/Southern Italian, we will now show what kind of specific phonological process is responsible for the pattern.

As we concluded in section (3), the clue to understanding the phonological cause of the pattern is the post-rhotic coda context: Tusc. **bar**b**a** vs. Neap. **var**v**a** 'beard'. This datum is not caused by positional nor prosodic factors, it is caused by the third type of phonological strength and weakness: feature sharing.

Feature sharing, or *branchingness/bipositionality,* is an effect whereby the features/segments that are bipositional (shared across syllable structure) have a far greater chance of remaining in the phonological forms over time and being phonologically 'strong' (Scheer 2000, 2004; Honeybone 2001; 2002; 2005; Bucci 2013; Ulfsbjorninn & Lahrouchi 2016). Synchronically, these bipositional features/segments are also more resistant to phonological tampering/manipulation.

There is both a substantive and formal component to the Honeybonian principle: *sharing makes us stronger.* Substantively, features in multiple positions are more likely to receive strong cues in the phonetic form. As such, they are more likely to be perceived by listeners, therefore lexicalised and preserved over time. Formally, interrupting segmental material that is shared across two positions requires intervening between association lines. Disrupting association lines brings its own formal difficulties and so it is also avoided (the no crossing condition/geminate inalterability (Goldsmith 1976; Hayes 1986; Hammond 1988; Blevins 2004; Russo & Ulfsbjorninn 2017).

5.2 Bipositionality of voiced stops in Neapolitan

The strong/weak alternations in the Neapolitan data can be understood to be caused by a specific phonotactic on voiced stops.

These sounds are subject to a phonotactic called a *Melody-to-Structure Licensing Constraint* (MSLC). These are a family of licensing constraints (cf. Charette & Göksel 1998) that specifically regulate the associations between melodic features and certain types of syllable structure (Ulfsbjorninn & Lahrouchi 2016; Lahrouchi in prep.).

According to the relevant MSLC of Neapolitan, in order to be phonetically interpreted, voiced stops (or at least /b/) must be bipositional. This means that the features of a voiced stop are obliged to attach to two pieces of skeletal structure.

(28)   *Branchingness* condition (to be elaborated)
         Voiced stops must branch across two C positions
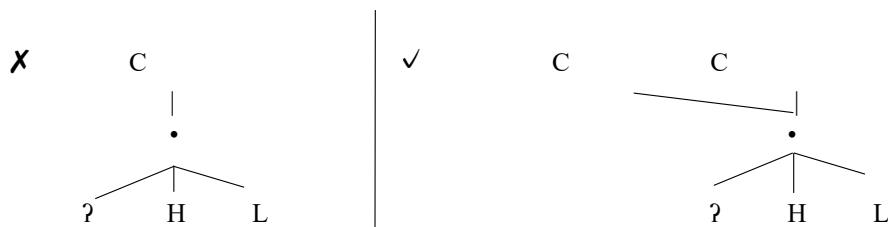
The *Branchingness* condition in (28) means that, with the exception of some recent loans, underlying singleton voiced stops cannot be phonetically interpreted. Geminate voiced stops on the other hand are permitted because they are bipositional (connected to two pieces of syllable structure) (cf. stop lenition in Ulfsbjorninn & Lahrouchi (2016)).

However, interestingly, it is not necessary for the all of the features of the voiced stop to branch in order to satisfy the MSLC. The pattern of post-consonantal voiced stops is shown in (29).

(29)   Voiced stops allowed nasal, fricative vs. rhotic (c)
         a.   nasals   [m-ˈ**b**arkə]   'on the boat'
         b.   voiced fricatives [z-ˈ**b**arkə]   'get off the boat'
         c.   rhotic codas   [ˈvar**v**ə]   'beard'

The data in (29) shows that full gemination is not necessary to license the voiced stop. Instead, even some kinds of partial gemination are sufficient. The features that are required for this partial geminate hypothesis are surprisingly simply to state in Element Theory.

Element Theory (ET) (Kaye et al. 1985; Harris & Lindsey 1995; Backley 2011) is a model of featural representation based on monovalent primes, unlike the articulatory grounded binary features inherited from SPE (Chomsky & Halle 1968).

(30)   **Table 2**: Elements (with some typical mappings to phonetic signal)
         |ʔ| <=>   Abrupt sustained drop in amplitude
         |H| <=>   Aperiodic energy
         |L| <=>   Voicing/Nasality Murmur
         |A, I, U| <=>   Resonance features (formant transitions) (place)

	Edge	Noise	Voice	Nasality	Place	Example	
Oral stop	|ʔ|	|H|	(|L|)		|A, I, U|	/p/	{(ʔ), H, U}[35]
Affricate	|ʔ|	|H|	(|L|)		|A, I, U|	/pf/	{(ʔ, H), U}
Fricative		|H|	(|L|)		|A, I, U|	/v/	{(H), L, U}
Nasal	|ʔ|			|L|	|A, I, U|	/m/	{L, ʔ, U}
Lateral	|ʔ|				|A, I, U|	/ɫ/	{ʔ, U}
Rhotic					|A, I, U|	/r/	{A}
Glide				(|L|)	|A, I, U|	/w/	{U}
h		|H|		(|L|)		/h/	{H}
ʔ	|ʔ|			(|L|)		/ ʔ/	{ʔ}

As shown in the table in (30), nasality and voicing are often exponed by the same Element (Kula 1998; Ploch 1999; Nasukawa 2005; Breit 2017): |L| or |N| (frequently labelled with the acoustic signature: murmur (Harris & Lindsey 1995; Backley & Nasukawa 2010).

Voiced obstruents carry this feature, as do nasals, however, other sonorants do not. In ET, non-nasal sonorants are taken to be passively voiced (cf. the distinction in Halle & Stevens 1971). Therefore, a rhotic such /r/ does not share a phonological voicing feature with voiced stops.

The implication of this for Neapolitan is that nasals and voiced fricatives will be able to share a phonological feature with voiced stops (|L|), and as such they can come together to form a partial geminate. The rhotic, however, does not share a voicing feature with voiced stops and, therefore, it cannot form a partial geminate with this class of sounds. This leaves voiced stops completely monopositional after rhotic-codas (just as they are as singletons in an intervocalic context).

It seems, therefore, that the *Branchingness* condition in Neapolitan is specified for the branching of a specific feature: |L| (voicing in obstruents, nasality in sonorants).

(31)   *Branchingness* condition (revised)
   The |L| of a voiced stop (|ʔ, H, L|) must branch across two C positions

In the absolute-initial position (##_) of a monomorphemic form, a Neapolitan voiced stop-onset has no choice but to be monopositional. Therefore, utterance-initial voiced stops will always surface in their weak version (32b). Conversely, the condition in (31) is straightforwardly satisfied by the structure in (32a) where the whole segment branches

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[35] The elements in round brackets indicate headship, however, this has no bearing on the analysis here.

and forms a voiced-stop geminate. This is why any RS trigger that induces gemination will allow the strong from of the root-initial consonant to surface.

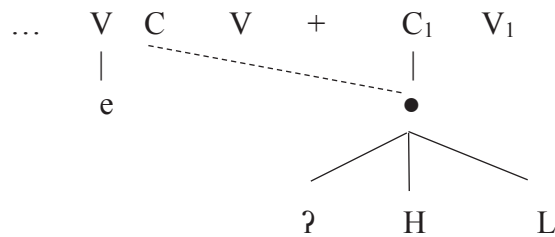(32)   *Branchingness* condition and structures
         a.   *Branchingness* condition satisfied by a geminate
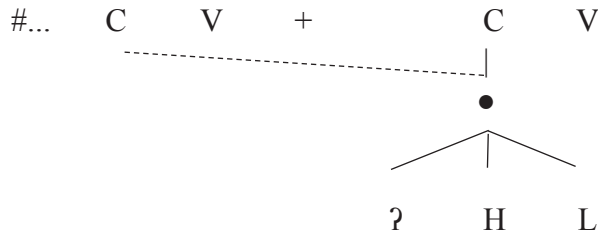
         b.   /barka/ *[ˈbarkə] 'boat'[36]
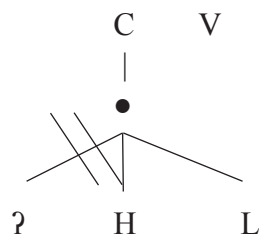
   c.   /tre$_\varnothing$c + barke/ [tre-bˈbarkə] 'three boats'

Many morpheme types cliticise onto the domain with the root-initial consonant (C_1), this allows the *Branchingness* condition to be satisfied. Under these conditions, the licensing of the voiced onset's whole Element set (|ʔ| |H| |L|) is guaranteed. C_1 surfaces in its strong form.

(33)   Morphemes interacting with the *Branchingness* condition

         [DET: MASS, -F] + ROOT

         /oCV + √vin + ə/   [o-bˈbinə] 'the wine.MASS'

_____
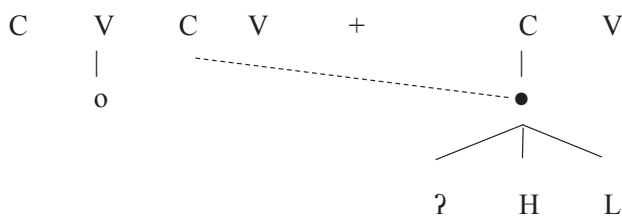
[36] Neapolitan does have an initial-CV in utterance initial position, however, just as in Italian this does *not* lead to spreading. Therefore, while the initial position is positionally strong, it does not allow the *Branchingness* that is required for the survival of the voiced stop.

However, *Branchingness* does not require full gemination to interpret the voiced stop. A nasal or voiced fricative occurring to the left of a voiced stop will allow the branching of the feature |L|, thereby the whole structure will be licensed. These will be supplied by various morphemes.
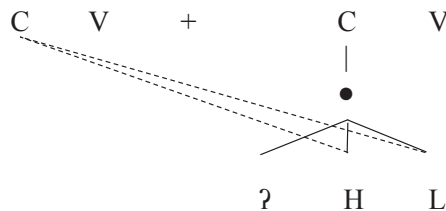
(34)   Nasalisation allows Edge |ʔ| and Voice |L| to branch (bipositionality):[37]

/CVnas + √bark + ə/   [ᵐ-ˈbarkə] 'in the boat'
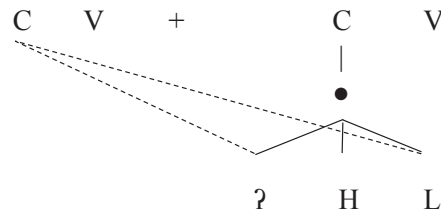
(35)   Fricative allows Noise |H| and Voice |L| to branch

/z- + √bɔt/   [z-ˈbɔta] 'empty out'

As also stated in the table (30), in ET sonorants are taken to be devoid of laryngeal features. Their voicing is automatic, non-contrastive and therefore not featurally represented (cf. passive voicing Halle & Stevens 1971; Dresher 2009). Therefore, even word-internally, Neapolitan /r/ will have no |L| to share with a voiced stop that follows it. So items like /barba/ 'beard', shown in (36) result in an ill-formed sequence from the perspective of the *Branchingness* condition. Because the complex (ʔ, H, L) does not share its |L| feature. Consequently, the /b/ is doomed to be monopositional and therefore surfaces as its weak equivalent.

(36)   Equivalence of utterance-initial[38] and post-rhotic coda
        No spreading of |L|, so *Branchingness* condition is not met
        [v]ar[v]a *barba 'beard'

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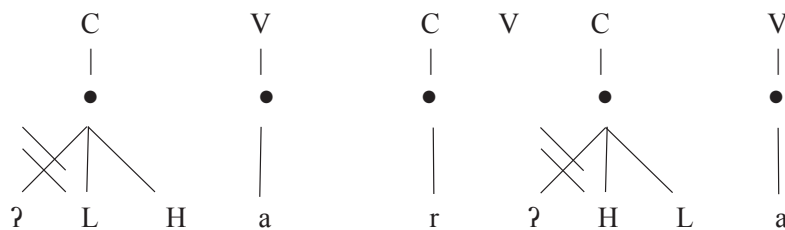
[37] These structures show the phonological result after any OCP of identical underlying features has applied. There is a further phonetic condition that makes nasal + voiced stop into a geminate nasal. In this structure, the /b/ was not reduced to *v*: *[mˈvarkə].

[38] Neapolitan has an initial CV that makes the initial position positionally strong. However, like in Standard Italian and Tuscan, consonants do not spread into the utterance initial CV. Therefore, even if there is an initial CV it will not trigger RS, unlike an empty CV in other contexts.

6 Conclusion

The initial position of Neapolitan hosts a large number of strength-based alternations involving voiced stops. In this paper, we focused on the b ~ v alternation as a strong ~ weak pair. In what is traditionally described as *initial weakening*, we show that it is the weak alternant that appears in absolute initial position. In fact, the initial position patterns like a singleton in word-medial position and one of the post-coda positions (after a rhotic). However, the initial position of Neapolitan is not positionally weak, as can be demonstrated by the distribution of underlyingly voiceless stops which are strong in initial and all post-coda positions. Instead, the voiced stop alternations that characterise initial-weakness are diagnosed as a case of a *Branchingness* (feature sharing) condition, that plays a crucial role in determining the distribution of underlyingly voiced stops in Neapolitan (Honeybone 2002; 2005).

The *Branchingness* condition is trivially met in cases of gemination (supplied by processes such as *Raddoppiamento Sintattico*), however, when analysed in Element Theory, we see that voiced stops are preserved in Neapolitan not only when they geminate, but also when they share their voicing feature with a preceding consonant: [ᵐˈbɔːlə] 'in flight' and [zˈbiɲːə] 'escape' vs. [ˈvarva] *[ˈvarba] 'beard'.

As a consequence of the data, the *Branchingness* condition that enforces bipositionality of a certain feature in branching onsets, potentially plays a role in the identification of morpheme boundaries. As the strong version of the alternant in root-initial position will always coincide (and therefore potentially reinforce the parsing of) a morpheme boundary to its left. This is interesting because it is only a positionally strong position that can host such a contrast. Though these alternations are still phonological in Neapolitan, the less phonologically regular the more likely it is that the pattern could become morphologised. We speculated that this stage of Neapolitan could be an intermediate step in the morphologisation of initial strong/weak alternations (cf. initial mutation).

Competing Interests

The authors have no competing interests to declare.

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