Phonological exponents and allomorphy: the decompositional approach

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What am I going to talk about?

1. Introduction
2. The phonological form of morphemes
3. Surface alternations
4. Forms and structures
5. Conclusions

Outline

1. Introduction

2. The phonological form of morphemes

3. Surface alternations

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Theoretical context

An interesting debate took place online on February 18th, 2021 within the Linguistics Flash Mobs series organized by the University of Padua.

On that occasion, the discussants were Eulàlia Bonet and Pavel Caha, the moderator was Diego Pescarini.

Among the very interesting things discussed there, (at least) two are relevant to what I am about to claim:

- Is Late Insertion necessary?
- Is lexical insertion regulated by subset or superset principle?

Here's the link to the video on YouTube: ▸ https://youtu.be/fC9W46K8QAs

Assumptions and framework

Substantial parts of my work focus on the relation between the phonological form of words and their internal structure.

In this talk, I propose an approach that aims at:

(1)
a. identifying the phonological form of each morpheme
b. analyzing the (phonological) alternations occurring in a given paradigm
c. formalizing the relation between the form of morphemes and morpho-syntactic structure

Theoretical framework

- About phonology:

According to Scheer (2015), a phonological theory needs both representational and computational tools.

(2) Strict CV (Lowenstamm 1996; Scheer 2004): an autosegmental theory of phonology.

a. Provides the good tools to represent both syllabic positions and segmental/suprasegmental units.
b. Constrains the interactions between these objects through lateral forces, there is no hierarchy.
c. Does not assume any process.

Theoretical framework

- About morphosyntax:

Antilexicalist, non paradigmatic, item-and-arrangements.

(3) Distributed Morphology (Halle and Marantz 1993; Embick 2010)

a. Words are built in the syntax.
b. Morphemes are the terminal nodes in the syntactic tree.
c. Lexicon does not exist (rather, it corresponds to a set of structural relations between roots and categorial heads).
d. All phonology occurs in a single post-syntactic module, whereby linearization also occurs.

Theoretical framework

The decompositional approach that I will defend builds on two crucial things:

1. The notion of morpheme
2. The abstraction

About the morpheme

- A basic notion of linguistic structuralism, implicitly assumed by early Generative linguists (SPE, Lexical Phonology, but also many current work)
- However, the existence of the morpheme is rejected by others (see recent debates in Haspelmath (2020), but also the 'agglutinative myth' of Bauer (2017).)
- In DM, morphemes are part and parcel of the theory, see Embick (2015).

About abstraction

- Long-standing debate in phonology: Kiparsky (1982, ch.6) (first published in 1968).
- What does abstraction mean in phonology and morphology? Floatingness, empty positions, URs, zero exponence, etc.
- I shall show that abstraction is crucial in many cases, but keep in mind that the opposite stance on this exists: Pullum and Zwicky (1982): "less structure in the input allows for avoidance of Ø-exponence."

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The phonological form of morphemes

The first section of the talk deals with the phonological form underlying each morpheme (that is point (1-a) above).

- The core idea is to propose a single underlier from which the entire set of surface forms (=allomorphs) are derived.
- A single underlier means less analysis in the morphological component (if any) (See Scheer 2016 on this point).
- Things such as paradigms (Blevins, 2006) or morphomes (Maiden, 2011) can be dispensed with.

(4) Case studies

a. The velar insert in Italian verbs (aka g-verbs);
b. Vowel lengthening in the Negrons variety of Friulian (Rhaeto-Romance);
c. The inflection of Bosnian nouns.

G-verbs in Italian 1

Table: *tenere* 'to hold'

pers	PresInd	PresSubj
1sg	['tɛŋgo]	['tɛŋga]
2sg	['tjɛːni]	['tɛŋga]
3sg	['tjɛːne]	['tɛŋga]
1pl	[te'njaːmo]	[ten'jaːmo]
2pl	[te'neːte]	[te'neːte]
3pl	['tɛŋgono]	['tɛŋgono]

- *venire* 'to come', *svellere* 'to pluck out', *valere* 'to be worth', *porre* 'to put, set', *rimanere* 'to stay, remain', *salire* 'to go up, get it', *sciogliere* 'to dissolve', *togliere* 'to remove' (Napoli and Vogel 1990; Rohlfs 1968; Serianni 1989.)
- /n/ and /m/ are homorganic and become [ŋ] when preceding a velar.
- As well-known, vowel length is conditioned by stress.

G-verbs in Italian 2

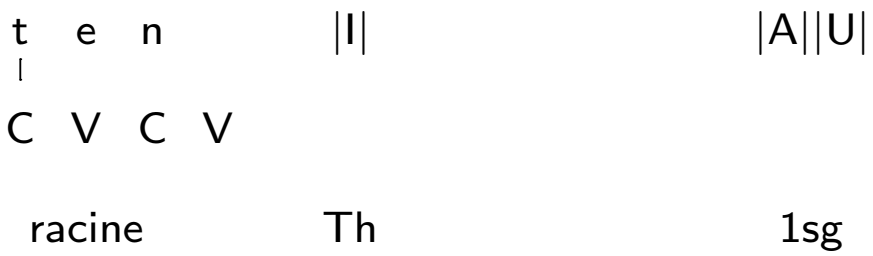
I present here some bits of the analysis of Lampitelli (2017a).

Table: G-verbs root allomorphy

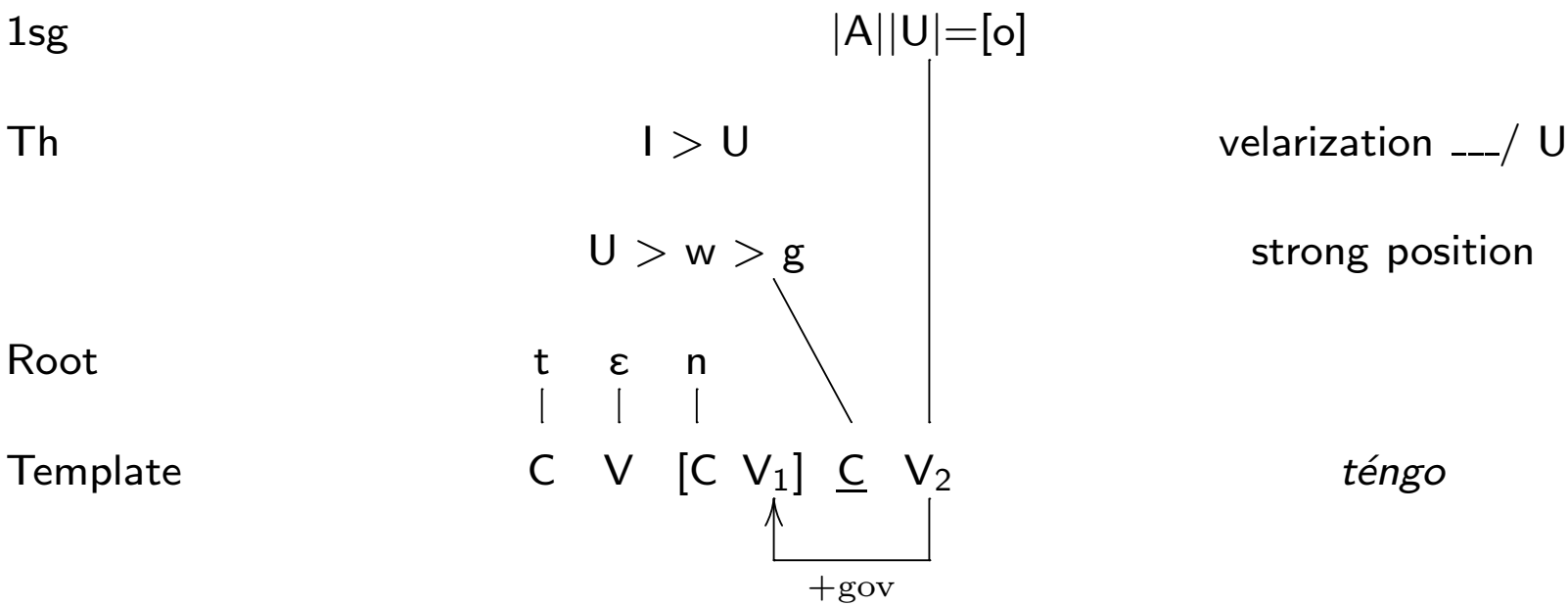
`stress`	on the root		on the suffix
`pers/num`	1sg, 3pl	2sg, 3sg	1pl, 2pl, Inf
`context`	/ ___ [+back]	/ ___ [-back]	
`allomorph`	$\sqrt{\text{TENG}}$	$\sqrt{\text{TIEN}}$	$\sqrt{\text{TEN}}$

G-verbs in Italian 3

(5) Root of *tenere*, Th vowel, affix 1sg:



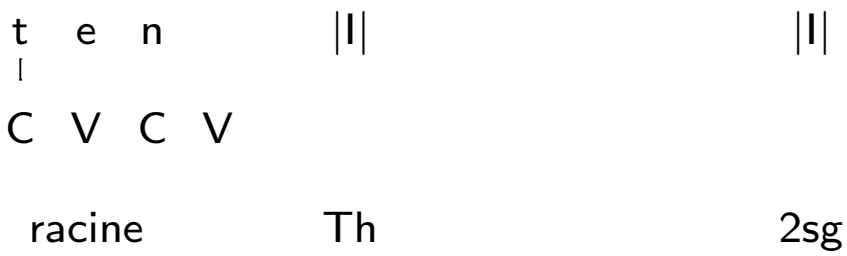
(6) PresInd 1sg:



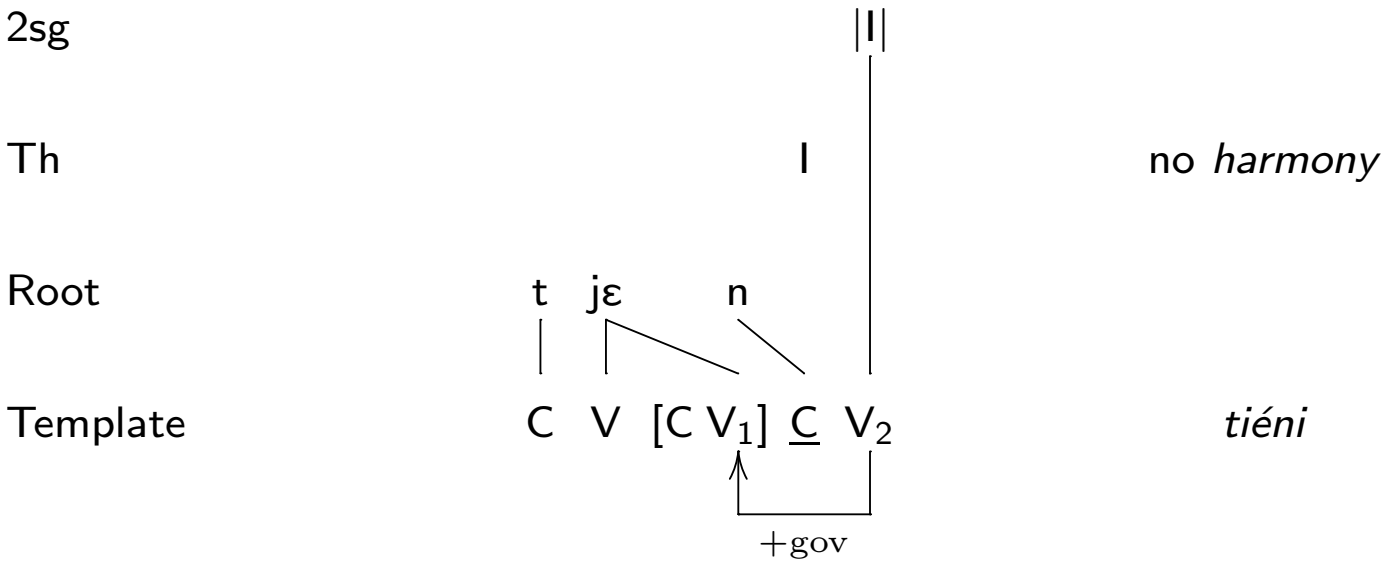
Following Ségéral and Scheer (2001), I assume that U undergoes fortition and surfaces as [g].

G-verbs in Italian 4

(7) Racine de *tenere*, Th vowel, affix 2sg:



(8) PresInd 2sg:



See recent analysis of the same pattern by Cavirani (2022): Cavirani's ultimate goal is identical to mine, there is no allomorphy, just phonology.

Vowel lengthening in Friulian verbs 1

Data from Friulian (Rhaeto-Romance) spoken in Negrons (Northern Friulian, North-eastern Italy).

	PresInd	PresInd	PresSubj	PresSubj
1sg	'naːdi	μ-i	'naːdi	μ-i
2sg	'nadas	-as	'naːdis	μ-is
3sg	'nada	-a	'naːdi	μ-i
1pl	na'diŋ	-iŋ	na'diŋ	-iŋ
2pl	na'da͡is	-a͡is	na'da͡is	-a͡is
3pl	'nad-iŋ∼aŋ	-i∼a+ŋ	'naːdiŋ	μ-iŋ

At first sight, we might want to assume a mixed morphome, i.e. an N-morphome shuffled with an L-morphome (see Herce 2019 and the literature therein).

Vowel lengthening in Friulian verbs 2

In Lampitelli et al. (2021), we hypothesize that lengthening is one of the exponents of ThV. Thus, we postulate a single underlier of the root.

	root	Th	T/M	ϕ-feat.
1sg	'nad	μ	∅	i
2sg	'nad	a	∅	s
3sg	'nad	a	∅	∅
1pl	nad	'i	∅	ŋ
2pl	nad	'a	∅	i͡s
3pl	'nad	i∼a	∅	ŋ̂

	root	Th	T/M	ϕ-feat.
1sg	'nad	μ	i	∅
2sg	'nad	μ	i	s
3sg	'nad	μ	i	∅
1pl	nad	'i	∅	ŋ
2pl	nad	'a	∅	i͡s
3pl	'nad	μ	i	ŋ̂

(9) The exponent of root [na'daː] 'to swim' in NE:
'to swim' ⇔ /nad/

Bosnian nouns 1

Table: Bosnian nouns

	groupe 1		groupe 2		groupe 3	
genre	M	M	F	F	Neu	Neu
nombre	sg.	pl.	sg.	pl.	sg.	pl.
NOM	*okvir*	*okvir-i*	*kuć-a*	*kuć-e*	*sel-o*	*sel-a*
GEN	*okvir-a*	*okvir-ā*	*kuć-ē*	*kuć-ā*	*sel-a*	*sel-ā*
DAT/LOC	*okvir-u*	*okvir-ima*	*kuć-i*	*kuć-ama*	*sel-u*	*sel-ima*
ACC	*okvir-(a)*	*okvir-e*	*kuć-u*	*kuć-e*	*sel-o*	*sel-a*
INSTR	*okvir-om*	*okvir-ima*	*kuć-ōm*	*kuć-ama*	*sel-om*	*sel-ima*
glosses	‘frame’	‘frames’	‘house’	‘houses’	‘village’	‘villages’

Bosnian nouns 2

The reasoning goes as follows:

(10) Affixes in a Bosnian noun:
Root + gender + num + case

(11) Zero-morphemes :

Root	gen	num	cas	
OKVIR	ø	ø	ø	[okvir]

Bosnian nouns 3

Table: Final vowel occurrences in Bosnian nouns

	Group 1 M		Group 2 F		Group 3 Neu	
	sg.	pl.	sg.	pl.	sg.	pl.
NOM	∅	i	a	e	o	a
GEN	a	a	e	a	a	a
DAT/LOC	u	i	i	a	u	i
ACC	(a)	e	u	e	o	a
INSTR	o	i	o	a	o	i

Bosnian nouns 4

I assume Element Theory (Kaye et al., 1985; Phillip, 2011) in analyzing vowels:

Table: Same endings but decomposed into Elements

	Group 1		Group 2		Group 3	
	M		F		Neu	
	sg.	pl.	sg.	pl.	sg.	pl.
NOM	∅	|I|	|A|	|A||I|	|U||A|	|A|
GEN	|A|	|A|	|A||I|	|A|	|A|	|A|
DAT/LOC	|U|	|I|	|I|	|A|	|U|	|I|
ACC	(|A|)	|I||A|	|U|	|I||A|	|U||A|	|A|
INSTR	|A||U|	|I|	|A||U|	|A|	|A||U|	|I|

Bosnian nouns 5

Following the algorithm (11), M sg forms are underlyingly as follows:

Table: Decomposition of M sg forms

	M	sg.	cas	VFIN
NOM	∅	∅	∅	*zéro*
GEN	∅	∅	|A|	[a]
DAT/LOC	∅	∅	|U|	[u]
ACC	∅	∅	|A|	[a]
INSTR	∅	∅	|A||U|	[o]

Bosnian nouns 6

(12) Vocabulary Items (VI) of Bosnian nouns:

a. $\text{M} \Longrightarrow \emptyset$
b. $\text{F} \Longrightarrow |\text{A}|$
c. $\text{Neu} \Longrightarrow |\text{U}|$
d. $\text{sg} \Longrightarrow \emptyset$
e. $\text{pl} \Longrightarrow |\text{I}|$
f. $\text{NOM} \Longrightarrow \emptyset$
g. $\text{GEN} \Longrightarrow |\text{A}|$
h. $\text{DAT/LOC} \Longrightarrow |\text{U}|$
i. $\text{ACC} \Longrightarrow |\text{A}|$
j. $\text{INSTR} \Longrightarrow |\text{A}|\ |\text{U}|$

Interim summary 1

The approach I am defending here allows for:

- One-to-one correspondence between one morpheme (=terminal node) and an exponent (=its phonological form)
- Simplifying the morphological component of the grammar (using DM)
- avoiding special operations such as Fission, Fusion, Impoverishment

See also Lowenstamm (2022) for criticism of competition in DM-inspired theories.

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Surface alternations

In this second part of the talk, I deal with cases of surface alternations in complex morphological systems (see point (1-b) above.)

The hypothesis I will defend here is that these surface alternations result from regular phonological processes.

(13) Case studies:

a. Italian definite article
b. Somali verbs inflectional markers

Italian definite article 1

Allomorph selection takes place exclusively in the phonology (Faust et al. 2018 et aussi Larsen 1998).

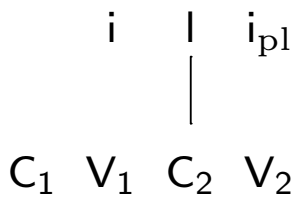
	sg	noun	pl	noun	gloss
a.	[il]	sakko	[i]	sakki	'bag'
b.	[il]	trɛːno	[i]	trɛːni	'train'
c.	[lo]	skaːfo	[ʌi]	skaːfi	'hull'
x.	[la]	rɔːza	[le]	rɔːze	'rose'
y.	[la]	skatola	[le]	skatole	'box'

(14) Theoretical tools:

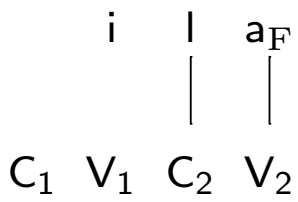
a. Government (Kaye et al., 1990).
b. Floating vs. lexically-associated
c. Empty positions (CV-unit in the representation of il+o/a)

Italian definite article 2

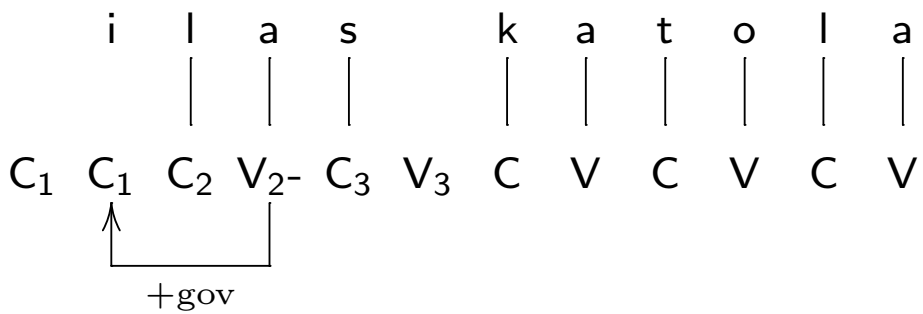
(15) M pl form: /ili/



(16) F sg form: /ila/

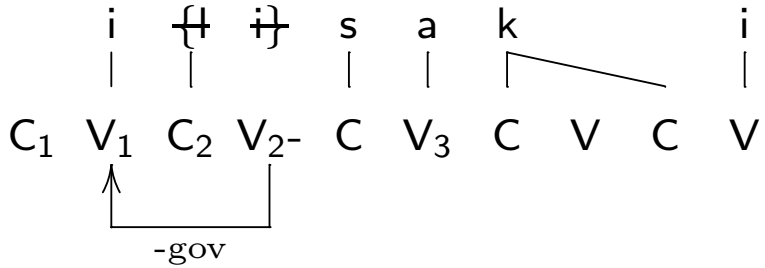


(17) [laskatola] 'box':

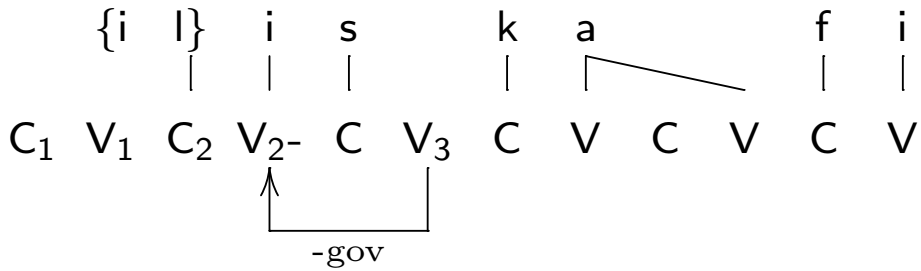


Italian definite article 3

(18) Derivation of [isakki], unlicensed material is erased.



(19) Derivation of [ʎiskaːfi], V_2 is ungoverned, /i/ associates with V_2, /i/ palatalize /l/.

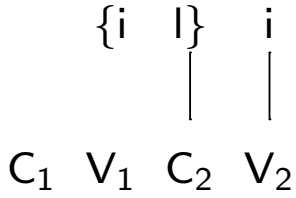


(20) Two i's:

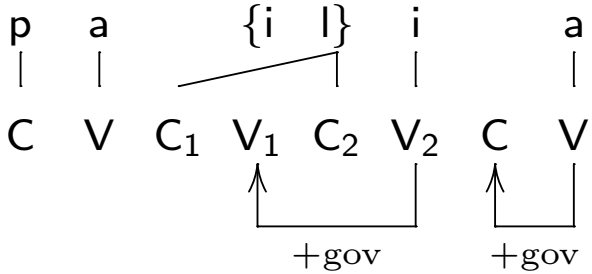
a. A palatalizer (the one to the left of /l/)
b. A palatal licensor (the one to the right of /l/)

Italian definite article 4

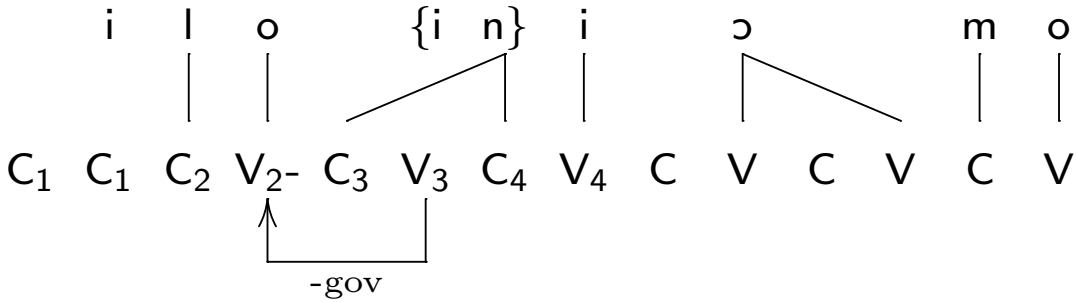
(21) Representation of [ʎ]:



(22) [paʎʎa] ‘hay’:



(23) [loɲɲoːmo] ‘the gnome’:



Somali verbs inflectional markers 1

Table: General present

conj.	1	2a	2b	3a	3b
1sg	mar-aː	mar-i-j(j)-aː	ʕar-eː-j(j)-aː	mar-sad-aː	mar-t-aː
2sg	mar-t-aː	mar-i-s-aː	ʕar-aj-s-aː	mar-sa-t-aː	mar-a-t-aː
3sgM	mar-aː	mar-i-j(j)-aː	ʕar-eː-j(j)-aː	mar-sad-aː	mar-t-aː
3sgF	mar-t-aː	mar-i-s-aː	ʕar-aj-s-aː	mar-sa-t-aː	mar-a-t-aː
1pl	mar-n-aː	mar-in-n-aː	ʕar-ajn-n-aː	mar-san-n-aː	mar-an-n-aː
2pl	mar-t-aː-n	mar-i-s-aː-n	ʕar-aj-s-aː-n	mar-sa-t-aː-n	mar-a-t-aː-n
3pl	mar-aː-n	mar-i-j(j)-aː-n	ʕar-eː-j(j)-aː-n	mar-sad-aː-n	mar-t-aː-n

Glosses: pass (1); make pass (2a); anger (2b); finish off, dress up (3a); be finished, become used up (3b).

Somali verbs inflectional markers 2

Alternations of affixes

Table: Somali affixes alternations

	Imperative	Pres, 1sg	Pres, 2sg	
UR	/kar+it/	/kar+it+a/	/kar+it+t+a/	
surface	[kari] (cl. 2a)	[karijjaː]	[karisaː]	'cook'
UR	/mar+at/	/mar+at+a/	/mar+at+t+a/	
surface	[maro] (cl. 3b)	[martaː]	[marataː]	'be empty'

Somali verbs inflectional markers 3

In Barillot et al. (2018), we show that:

- An independently-established theoretical principle accounts for presence vs. absence of /t/ at the surface: this principle is licesing (Charette, 1991).
- The notion of virtual geminate explains intervocalic [t] whereby in Somali *VtV.
- Palatalizing effect of Element |I| accounts for /it/ $\rightarrow$ [s]

Somali verbs inflectional markers 4

(24) Causative morpheme (class 2a):

CAUS I t

C V

(25) Causative morpheme (class 2b):

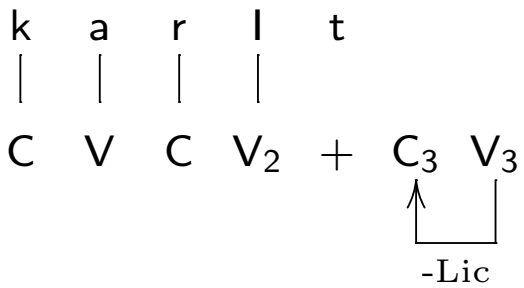
CAUS A I t

C V C V

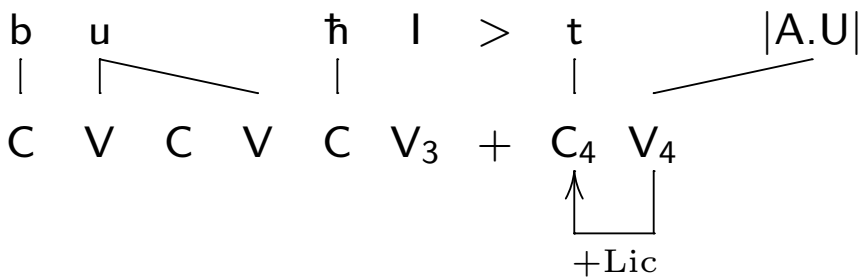
Somali verbs inflectional markers 5

(26) Three examples

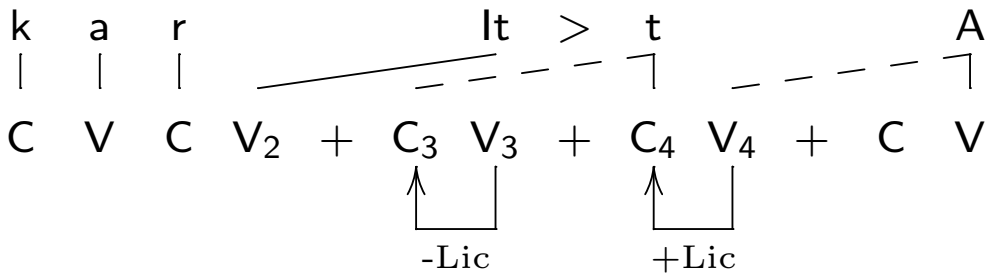
a. Cl 2a [kari] 2sg Imp ‘cook!’



b. Cl 3a [buːħso] 2sg Imp ‘(re)fill for yourself!’



c. Cl 2a [karisaː] 2sg Pres ‘you (usually) cook’



Somali verbs inflectional markers 6

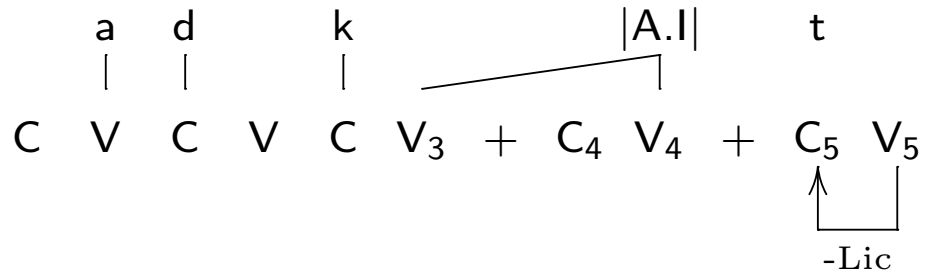
Table: Class 3a derives from class 2b

	Nom/Adj	Classe 2a	Classe 3a
a.	adag	adkeː	adkajso
	'hard, strong'	'harden, make strong'	'make strong for o.s.'
b.	af	afeː	afajso
	'sharp point'	'sharpen'	'sharpen for o.s.'
c.	bijo	bijeː	bijajso
	'water'	'add water, dilute'	'dilute for o.s.'
d.	ʕad	ʕadeː	ʕadajso
	'white'	'whiten'	'whiten for o.s.'

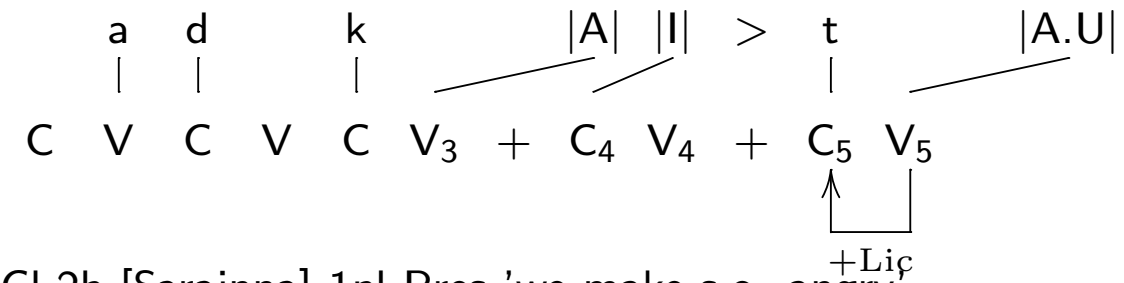
Somali verbs inflectional markers 7

(27) Class 2b inflected forms

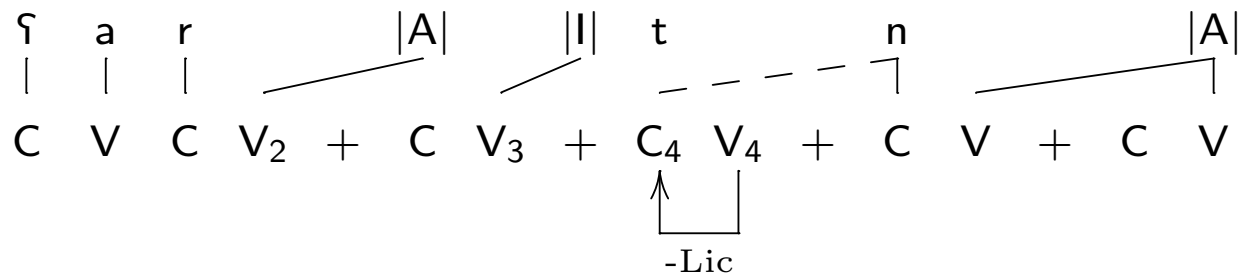
a. Cl 2b [adkeː] 2sg Imp ‘harden! make strong!’



b. Cl 3a [adkajso] 2sg Imp ‘make strong for yourself!’



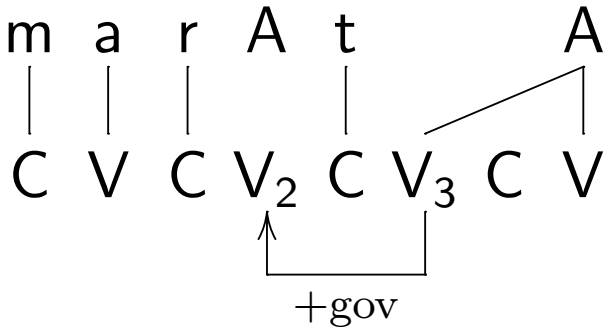
c. Cl 2b [ʕarajnna] 1pl Pres ’we make s.o. angry’



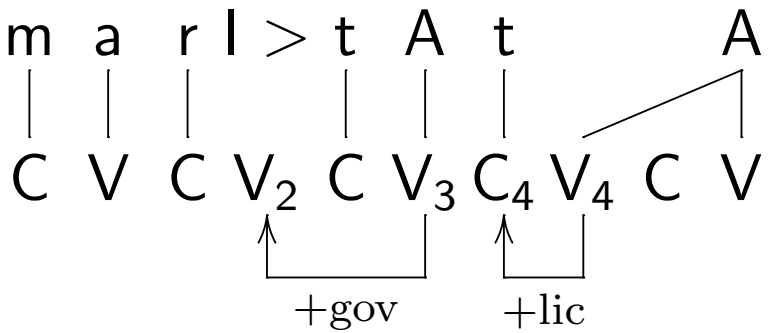
Somali verbs inflectional markers 8

(28) Class 3a/3b, 1sg:

a. Cl 3b [marta:] 1sg Pres ‘I am finished/empty’



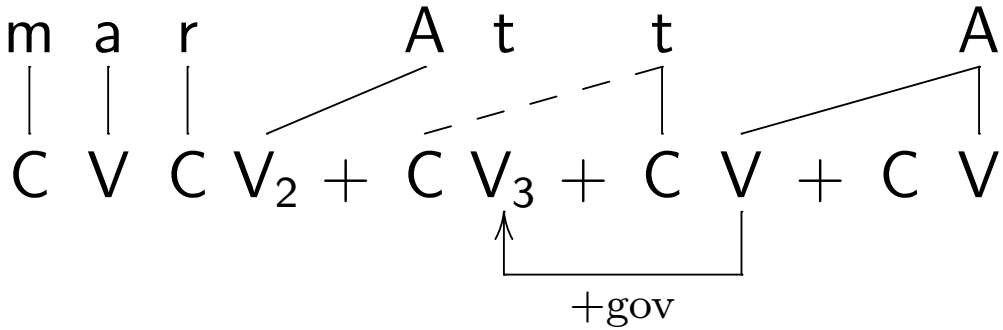
b. Cl 3a [marsada:] 1sg Pres ‘I finish off, consume, dress up’



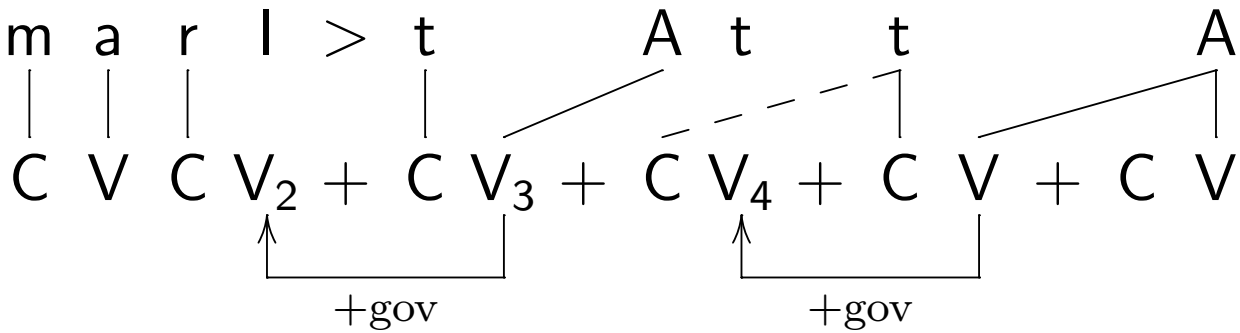
Somali verbs inflectional markers 9

(29) Class 3a/3b, 2sg:

a. Cl 3b [marataː] 2sg Pres ‘you are finished/empty’



b. Cl 3a [marsataː] 2sg Pres ‘you finish off, dress up’



Interim summary 2

- Surface alternations result from the complex representations of the inflectional markers: the definite article in Italian, the causative and autobenefactive morphemes in Somali.
- Strict CV and Element Theory easily allow for the representation of phonological primes from which those surface forms can be derived.
- Do we need operations on syntactic nodes?

Outline

1. Introduction

2. The phonological form of morphemes

3. Surface alternations

4. Forms and structures

5. Conclusions

Forms and structures

In this last part of today's talk, I turn to the relation between form of morphemes and morphosyntactic structures (see (1-c).)

The latter may very well influence the former, but also the distribution of the exponents.

Principles such as locality (as defined by Embick 2010, 2015 for instance) are used to define the perimeter within which a given object triggers allomorphy of the exponents with respect to their relative position in the syntactic tree. The derivational cycle in which these exponents are spelled-out is also crucial in defining the limits of allomorphy.

(30) Case studies

a. Bonsnian diminutives.
b. Piedmontese verbs inflectional markers.

Bosnian diminutives 1

(31) M gender exponents:

a. Nom, SG, M=Ø *okvir* 'frame' (M nouns ending in C).
b. A restricted group of nouns exist: M=[a] *sudija* 'judge'

(32) Diminutive

a. M=Ø *konj* 'horse'; *konjić* 'small horse'
b. F=[a] *čaša* 'glass'; *čašica* 'small glass'
c. NEU=[e] *pivo* 'bier'; *pivce* 'small bier'

(33) Allomorphy occurs of *sudija* 'judge'

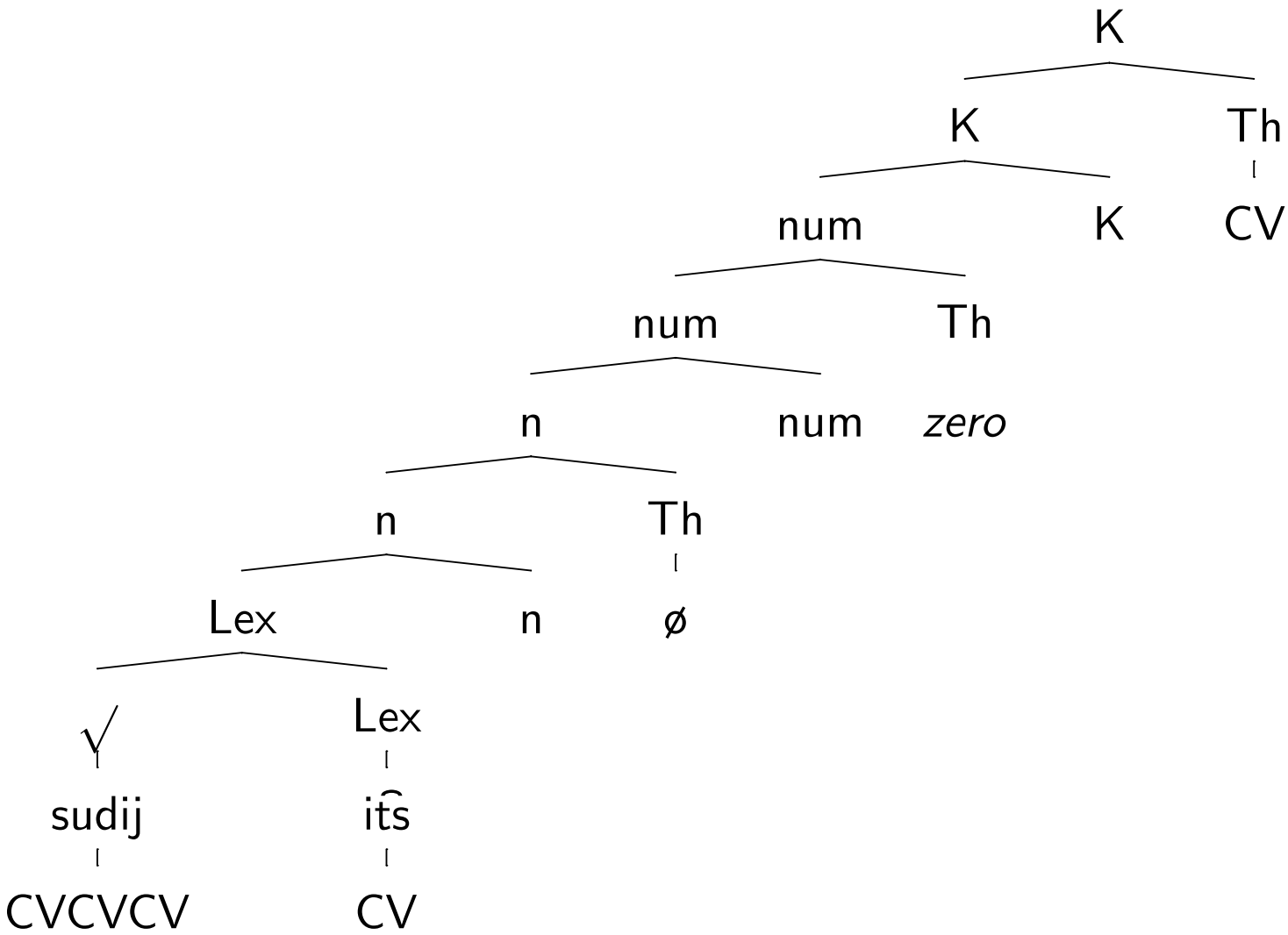
a. $\text{zero}_M \longrightarrow \textbf{A} \;/\; \sqrt{\text{SUDIJ}}$ ___
b. locality condition (=adjacency): $\sqrt{\text{SUDIJ}} \frown \textit{zero}_M$

(34) Prediction

a. (33-a) does not apply unless (33-b) is satisfied.
b. This happens when diminutive intervenes between the root and the inflectional marker.

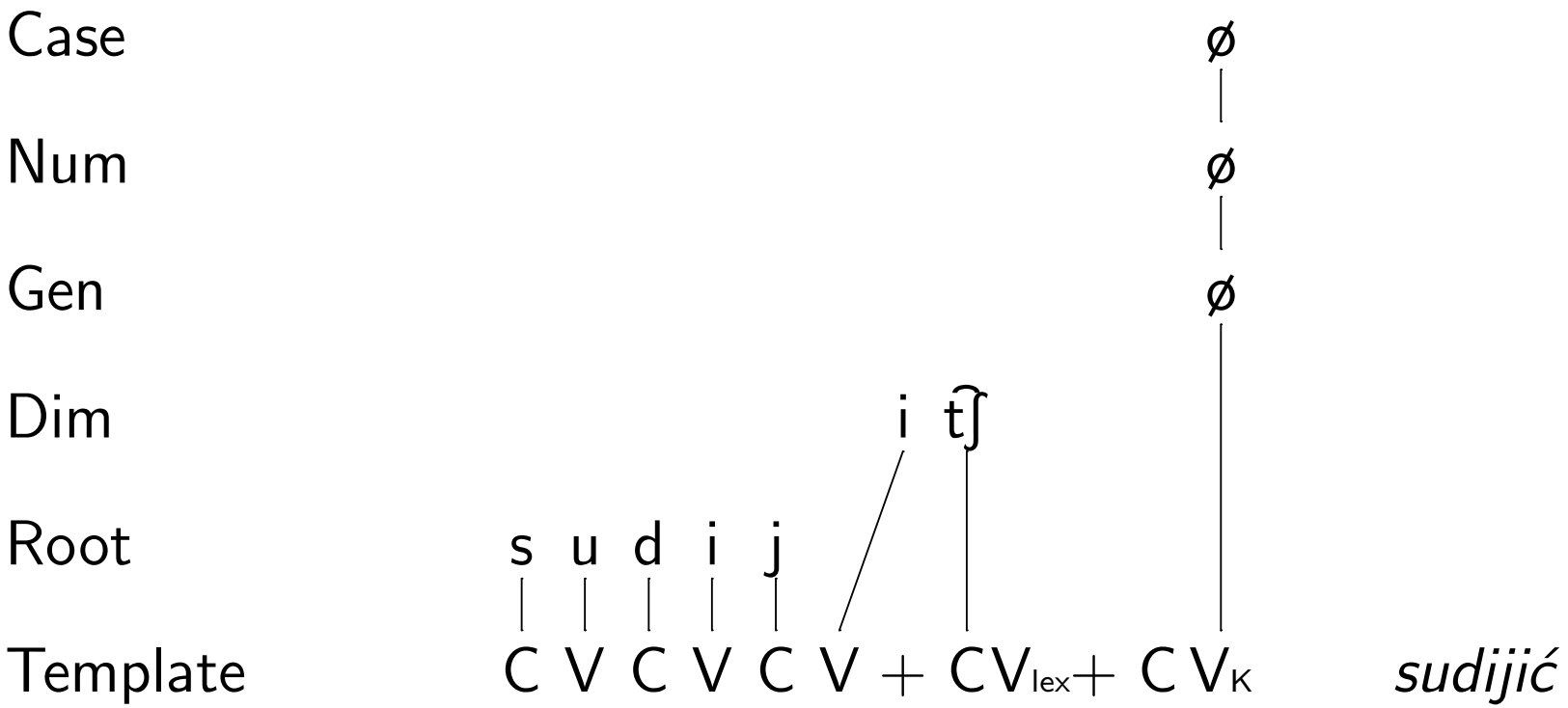
Bosnian diminutives 2

(35) Complex head of *sudijić* 'small judge' (=a bad judge):



Bosnian diminutives 3

(36) Linearization of *sudijić* ‘small judge’ (cf. **sudijica*) :



Piedmontese verbs 1

Piedmontese, a Gallo-Romance language spoken in Northwestern Italy, has intriguing verbal patterns.

In ongoing work, Lampitelli (2021, 2022), I apply the notion of "Modular PIC" (D'Alessandro and Scheer, 2015) to account for Piedmontese data: 'a PIC may or may not correlate with a phase'.

A phase associated with PIC at PF will be visible in the phonology.

Piedmontese verbs 2

Table: PresInd

conj.	1	2	3
1sg	'byt-u	'lez-u	fi'nis-u
2sg	'byt-e	'lez-e	fi'nis-e
3sg	'byt-a	'lez	fi'nis
1pl	by't-uma	le'z-uma	fi'nj-uma
2pl	'byt-e	'lez-e	fi'nis-e
3pl	'byt-u	'lez-u	fi'nis-u

Caveat: I abstract away from subject clitics, which occur obligatorily with each inflected form. See Clivio (2001), Maiden and Parry (1997, 108-ff.), Ricca (2016) for an overview on data.

(37) *mi i buto* 'I put'; *ti it bute* 'you put'; *chiel a buta* 'he puts; etc..

Piedmontese verbs 3

Table: ImpfInd

conj.	1	2	3
1sg	by't-av-a	le'z-i-a	fi'n-i-a
2sg	by't-av-e	le'z-i-e	fi'n-i-e
3sg	by't-av-a	le'z-i-a	fi'n-i-a
1pl	by't-av-u	le'z-i-u	fi'n-i-u
2pl	by't-av-u	le'z-i-e	fi'n-i-e
3pl	by't-av-u	le'z-i-u	fi'n-i-u

Piedmontese verbs 4

Table: PresSubj

conj.	1	2	3
1sg	'byt-a	'lez-a	fi'nis-a
2sg	'byt-e	'lez-e	fi'nis-e
3sg	'byt-a	'lez-a	fi'nis-a
1pl	'byt-u	'lez-u	fi'nis-u
2pl	'byt-e	'lez-e	fi'nis-e
3pl	'byt-u	'lez-u	fi'nis-u

(38) *ch'i buta* 'that I put'; *ch'it bute* 'that you put'; *ch'a buta* 'that he puts'; etc..

Piedmontese verbs 5

Allomorphic alternations (not exhaustive)

(39) 1pl
-uma (stressed) vs. -u (unstressed) reflects the opposition PresInd vs. ImpInd/PresSubj

(40) Roots (conj. 3)
fini- (unstressed) vs finiss- (stressed).

Piedmontese verbs 6

(41) Hypothesis

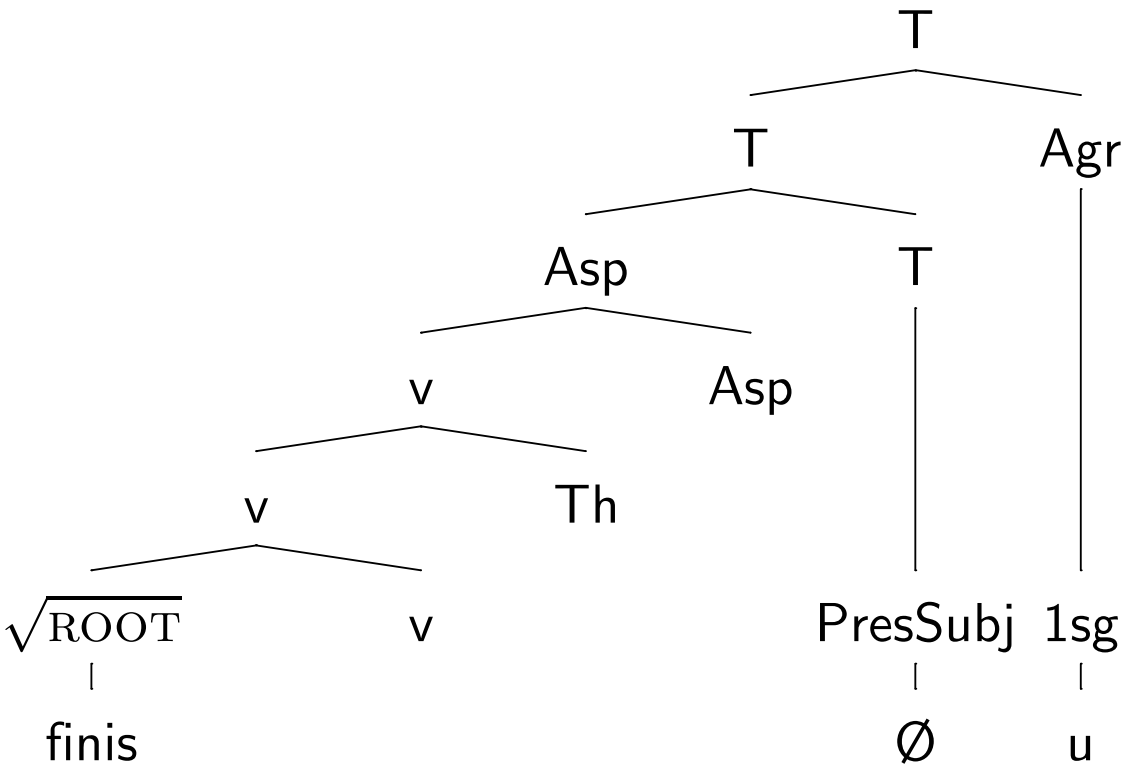
a. PresSubj (=head T) is associated with PIC at PF and triggers spell-out

b. ImpInd and PresInd, in turn, are not associated with PIC.

This allows for an analysis of the alternations (39) and (40): 1pl and fini/finis.

PresSubj, T triggers PIC at PF

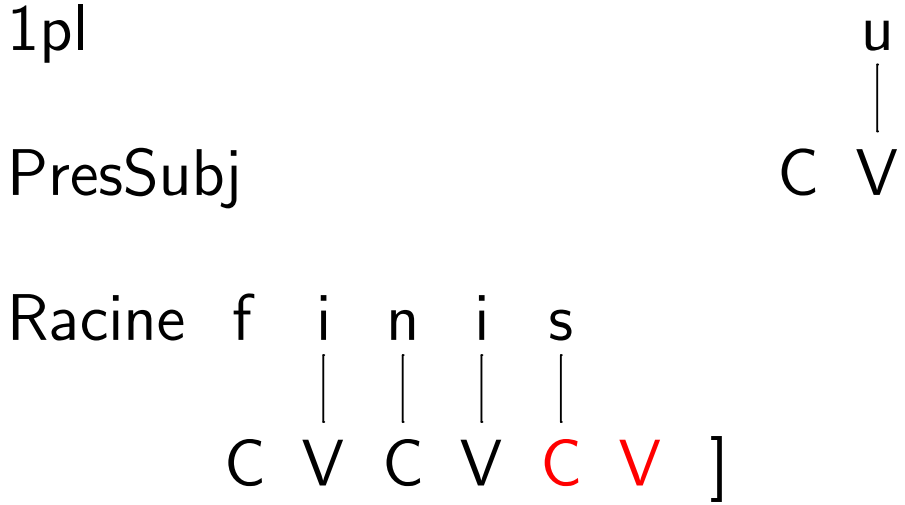
(42) *finissu* [finisu] 'that we finish' 1pl, PresSubj



Conj 3 PresSubj

Two syntactic domains (v et T), PIC at PF

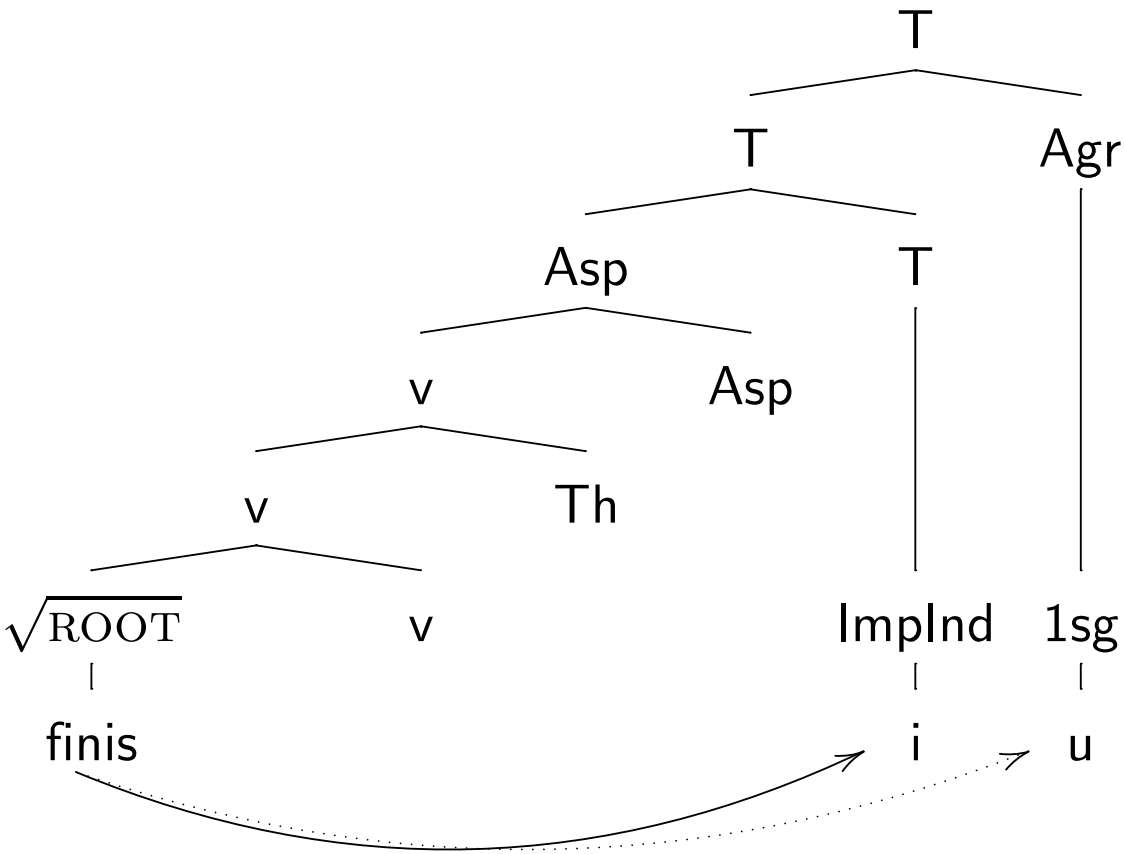
(43) PresSubj 1pl finissu [fi'nisu] 'that we finish'



The square bracket] indicates phase boundary.
The red CV is inserted by stress (cf. Larsen 1998; Enguehard 2016).

ImpInd, no PIC at PF

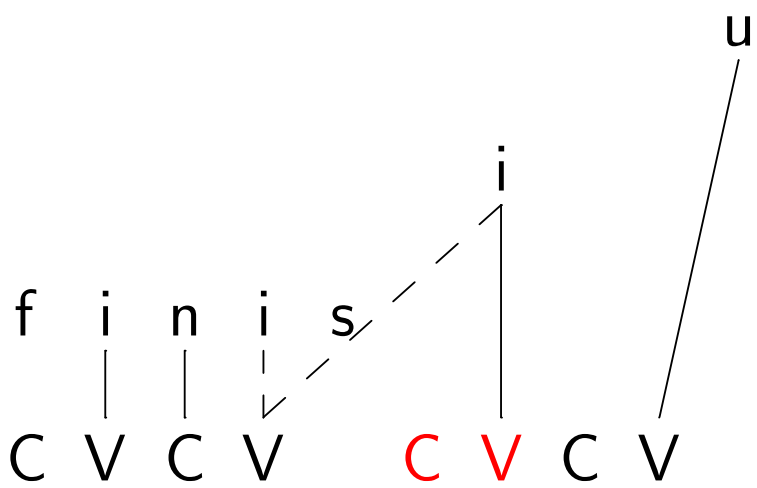
(44) *fini-ì-a* [finiu] 'we were finishing' 1pl, ImpInd



Conj 3 ImpInd

Two syntactic domains (*v* et T), no PIC at PF.

(45) ImpfInd 1pl, finìa [fi'niu] 'we were finishing'



The final consonant of the root, /s/, cannot dock onto C and remains afloat.

PresSubj 1pl vs PresInd 1pl

The comparison between PresSubj 1pl vs PresInd 1pl points to PIC being active in the former, but not in the latter:

(46) 1pl PresSubj

a. [[fi'nis] u]
b. [['byt] u]

(47) 1pl PresInd

a. [fi'njuma]
b. [by'tuma]

The allomorph -uma surfaces because stress provides it with more space, i.e. a CV-unit.

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Conclusions

- The decompositional approach I've presented today seeks at analyzing morphology from a phonological perspective.
- In other words, the decompositional approach takes a distinct point of view wrt to both DM and Nanosyntax: an allomorphic alternation results from the application of phonological principles.
- But it follows DM and Nanosyntax in assuming that syntactic structure may constrain the alternations of the allomorphs.

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