BCGL 12: Suppletion, allomorphy, and syncretism
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Allomorphy in Greek verbal inflection as result of phonological computation

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Aim

- To show that the emergence of most root alternations in Greek verbal inflection is not random but exhibits systematic patterning as a result of covert phonological conditioning

- To call attention to the fact that allomorphy is *gradient* as it reflects the "strength" of the root vocabulary item: the stronger the segments of the root exponent, the fewer the alternations in its phonological content

Introduction

- Root alternations

(1) *Greek*

	IMPFV	PFV	PASS.PFV	
a.	st**é**ln-o	st**í**l-o	st**a**l-θ-ó	'I send'
b.	kalíp**t**-o	kalíp-s-o	kalif-θ-ó	'I cover'

Two main types of analysis:

- **Stem listing** (e.g. Booij 1997; Bermúdez-Otero 2013, 2016)
  Spanning (e.g. Svenonius 2012; Merchant 2015; Haugen & Siddiqi 2016)

  - Multiple entries associated with specific morphosyntactic features / realizing chunks of structure

    E.g. /steln/$_{IMPFV}$ ~ /stil/$_{PFV}$, etc.

  - Main drawback: They miss a great deal of generalizations on systematic patterns

- **Readjustment rules** (e.g. Halle & Marantz 1993; Embick & Halle 2005; Harley & Tubino Blanco 2013; Arregi & Nevins 2014; Christopoulos & Petrosino 2018)

  - A single underlying form that may be reshaped in certain morphosyntactic environments

    E.g. √SEND ↔ stal → steln / __ ⁀ Asp[–pfv]
    → stil / __ ⁀ Asp[+pfv]
    → stal elsewhere

  - Main drawback: Unrestricted phonological alternations

Our proposal:

- A single underlying root form or, more accurately, a single vocabulary item for each root node

- Floating and non-floating Voice/Aspect exponents with various *Activity Levels* (Smolensky & Goldrick 2016) that compete with the phonological elements of the root vocabulary item

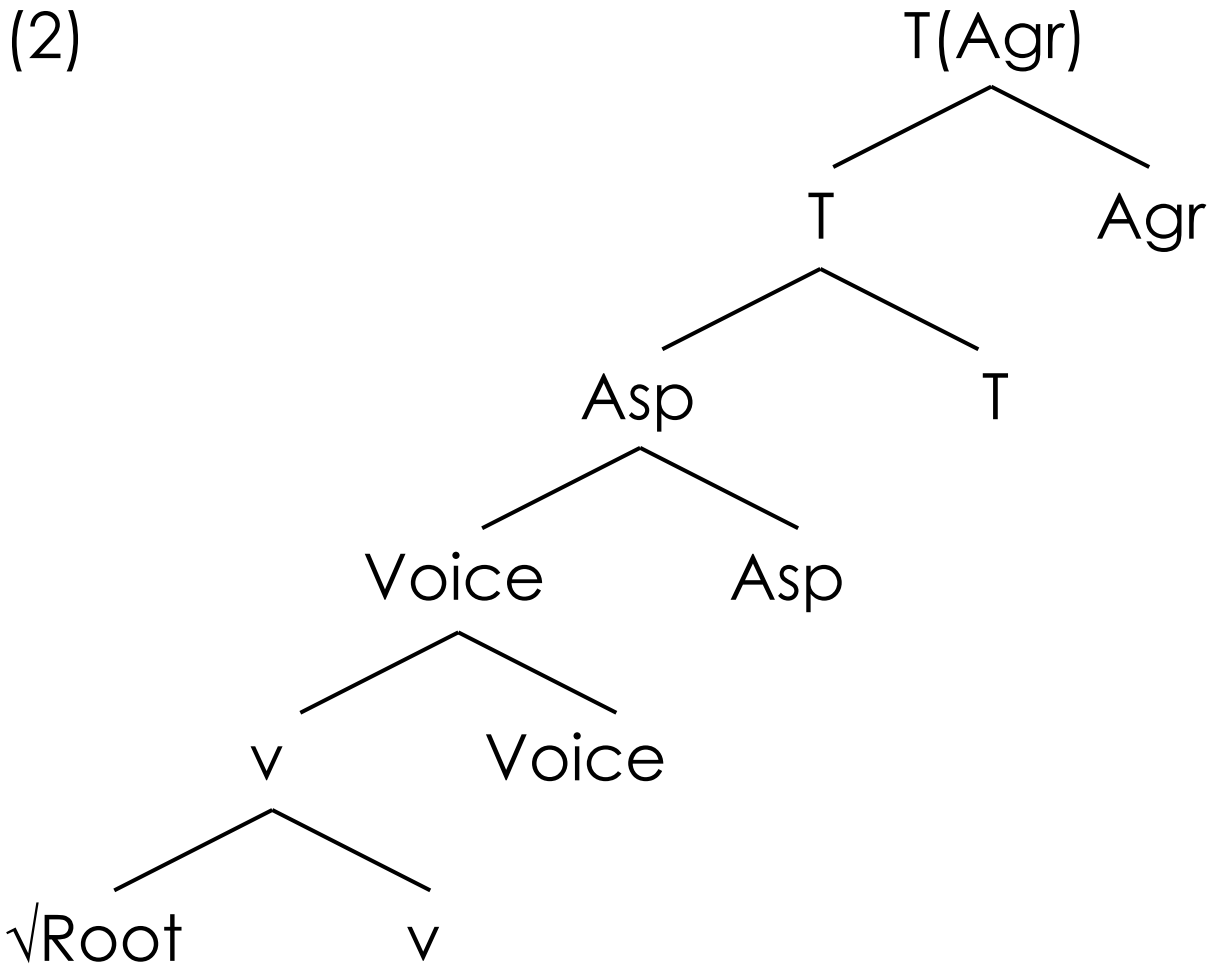
- The phonological computation of these competing elements may yield different outputs depending on the AL of the involved elements, thus giving rise to allomorphy

1. The data

1.1. Greek verbal inflection: A brief overview

- Greek verbal forms are inflected for Voice, Aspect, Tense and Subject Agreement
- Morphosyntactic structure of verbal forms after head movement (Philippaki-Warburton 1998; Philippaki-Warburton & Spyropoulos 1999, among others):

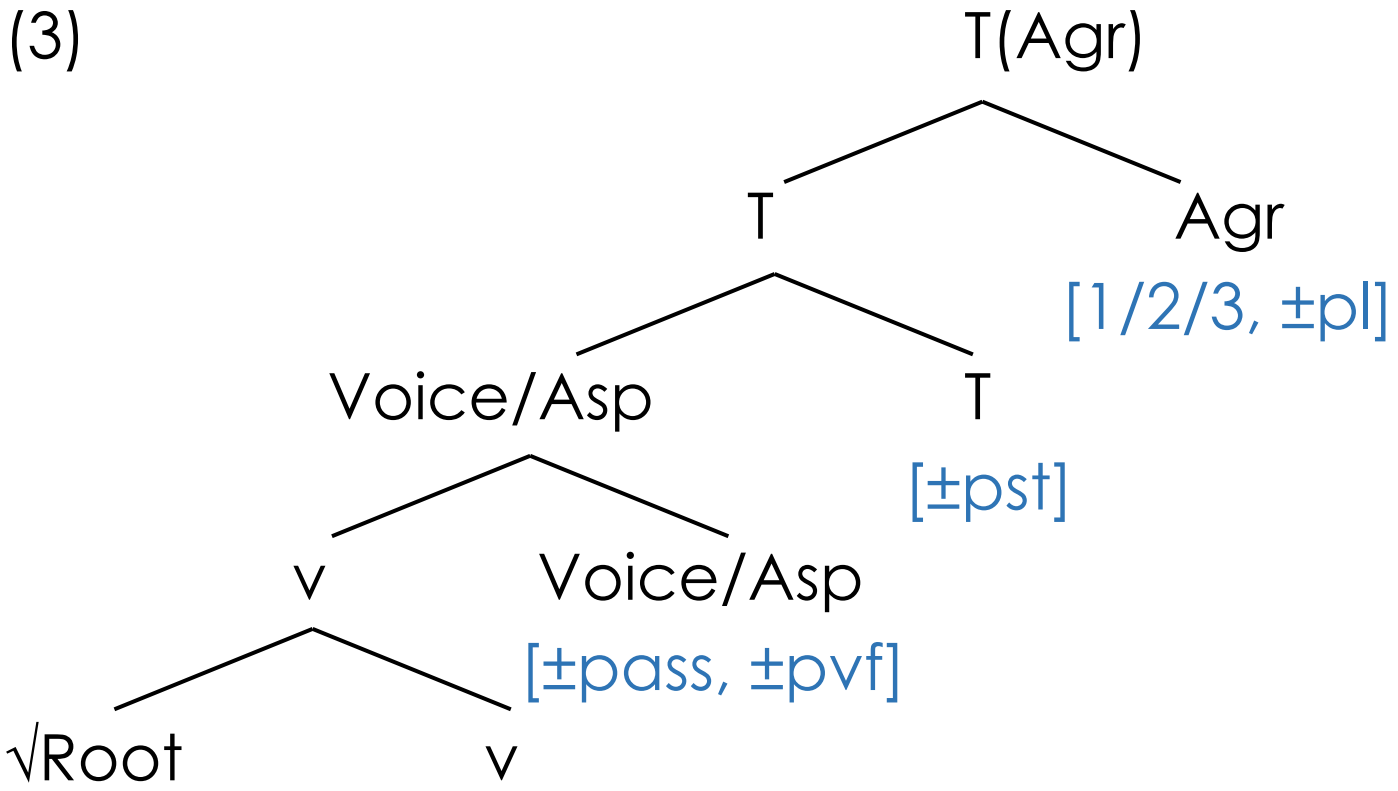
(2)



- Morphosyntactic features
  – Voice: [±passive]
  – Asp: [±perfective]
  – T: [±past]
  – Agr: [1/2/3, ±plural]

- Given the high interaction between Voice and Asp with respect to their exponence (Warburton 1970, 1973, Joseph & Smirniotopoulos 1993, Spyropoulos & Revithiadou 2009, Merchant 2015), we take them to be post-syntactically fused into a single head (see also Christopoulos & Petrosino 2018):

(3)



1.2. Regular inflection patterns

Note: We focus only on the so-called 1st conjugation verbs

(4)

	IMPFV	**PASS IMPFV**	**PFV**	**PASS PFV**	
a.	ɣráf-o	ɣráf-ome	ɣráf-s-o > ɣráp-s-o	ɣraf-θ-ó > ɣraf-t-ó	'I write'
b.	aníɣ-o	aníɣ-ome	aníɣ-s-o > aník-s-o	aniɣ-θ-ó > anix-t-ó	'I open'

- /fs/ → [ps] & /fθ/ → [ft] due to manner dissimilation
- /ɣs/ → [ks] & /ɣθ/ → [xt] due to manner dissimilation and voice assimilation

(5) *Exponent list (non-exhaustive)*

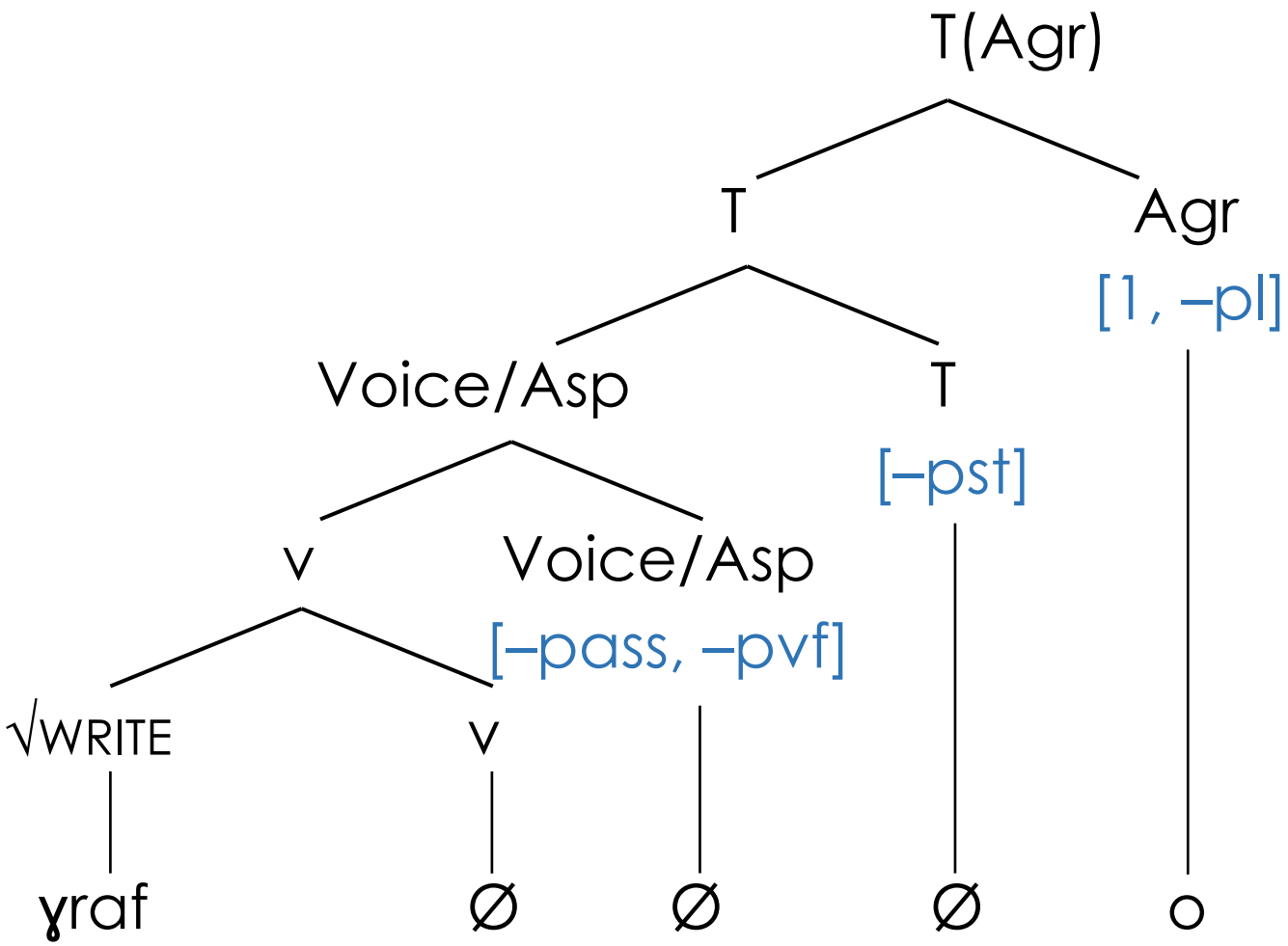
a. v ↔ ∅

b. Voice/Asp: [+pass, +pfv] ↔ /-θ/
[+pfv] ↔ /-s/
elsewhere: ∅

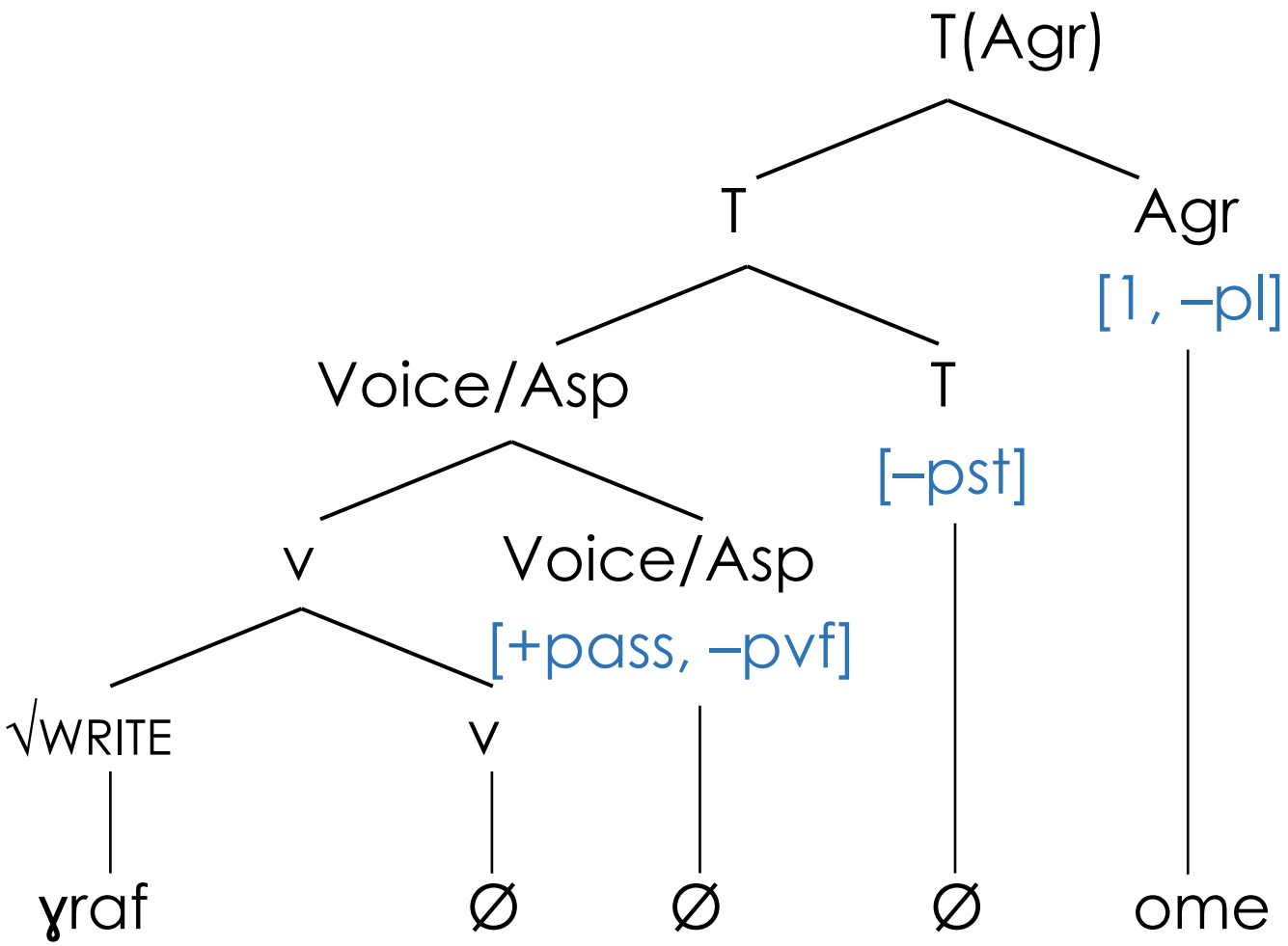
c. T: [–past] ↔ ∅

d. Agr: [1, –plural] ↔ /-o/

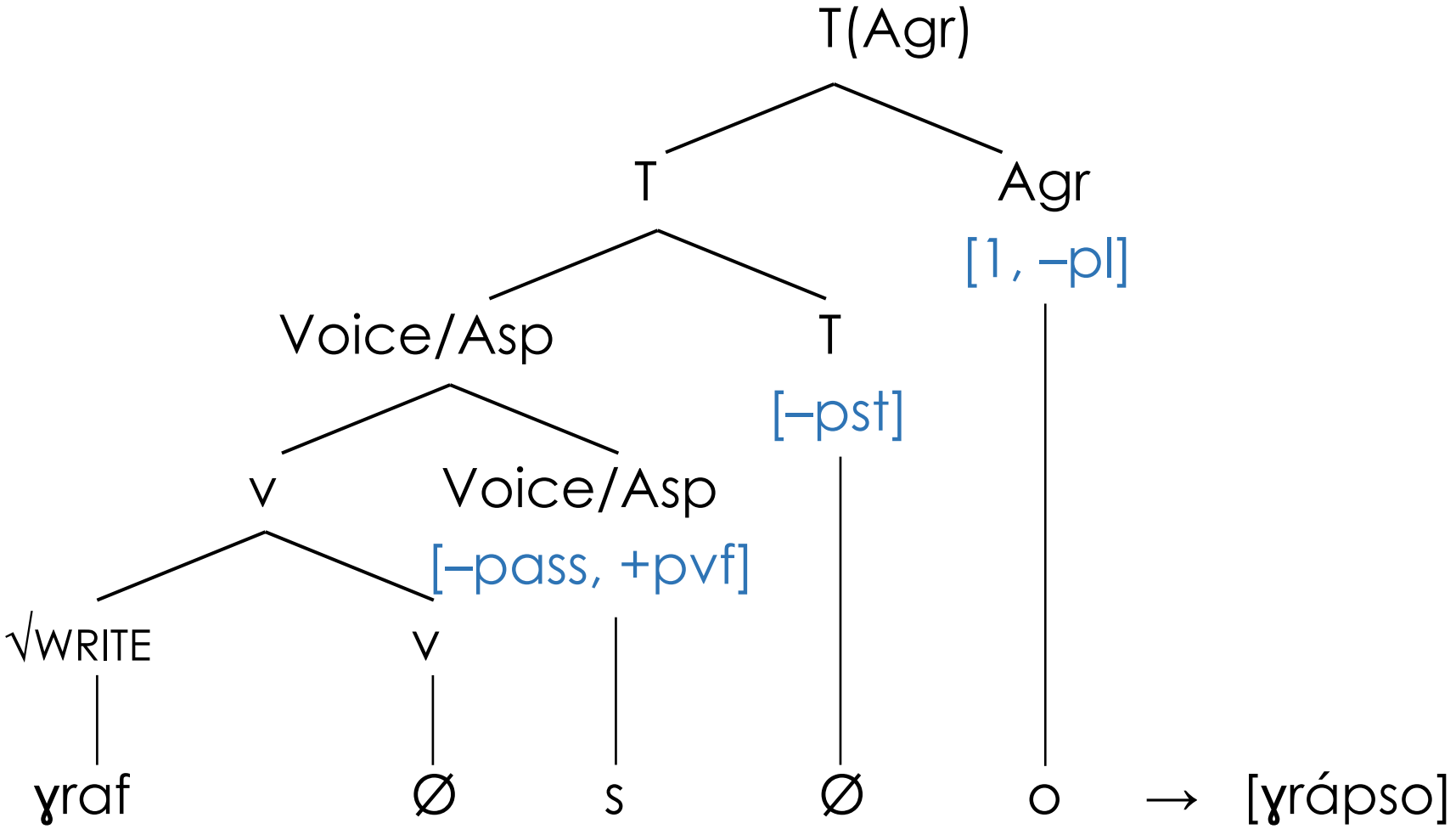
(6) *ɣráfo 'I write' (IMPFV)*



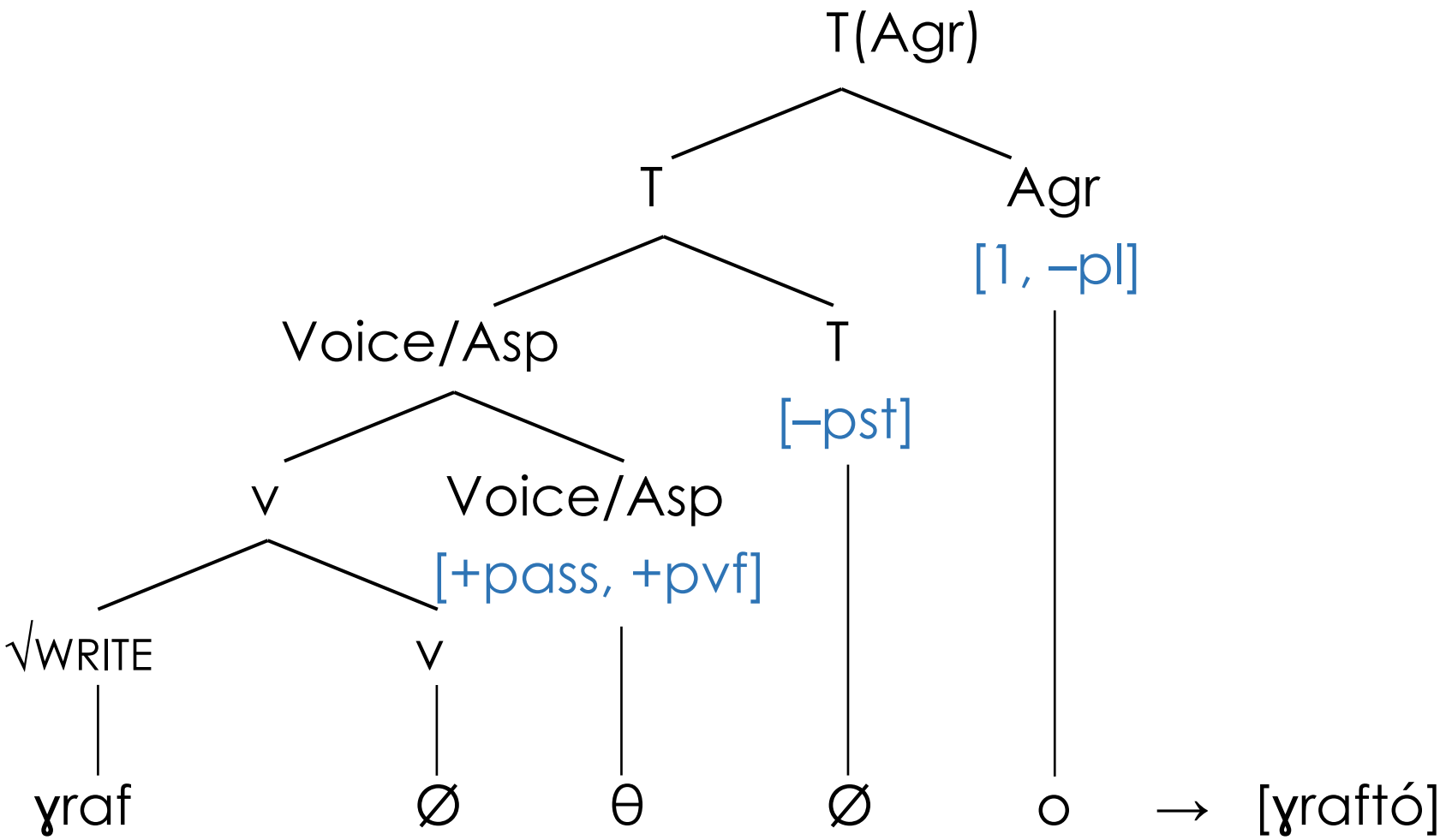
(7) *ɣráfome 'I am written' (PASS IMPFV)*



(8) *ɣráps*o *'I write' (PFV)*



(9) *ɣraftó 'I am written' (PASS PFV)*



1.3. Inflection patterns with consonant alternations

(10)

	IMPFV	**PASS IMPFV**	**PFV**	**PASS PFV**	
a.	kalip**t**-o	kalíp**t**-ome	kalíp-s-o	kalif-θ-ó	'I cover'
b.	psáx**n**-o	psáx**n**-ome	psáx-s-o	psax-θ-ó	'I search'

- Remark #1: Allomorphy applies uniformly, targeting only IMPFV forms
- Remark #2: In both cases, a coronal consonant (i.e. **/t/** or **/n/**) appears at the right edge of the Root-VI

1.4. Inflection patterns with vowel alternations

(11)

	ACT IMPFV	PASS IMPFV	ACT PFV	PASS PFV	
a.	st**é**l**n**-o	st**é**l**n**-ome	st**í**l-o	st**a**l-θ-ó	'I send'
b.	ɣð**é**r**n**-o	ɣð**é**r**n**-ome	ɣð**á**r-o	ɣð**a**r-θ-ó	'I scratch'
c.	s**é**r**n**-o	s**é**r**n**-ome	s**í**r-o	s**i**r-θ-ó	'I drag'
d.	vr**é**x-o	vr**é**x-ome	vr**é**x-s-o	vr**a**x-ó	'I wet'

- Remark #1: The emergence of allomorphy seems to be in complementary distribution with the selection of regular Voice/Asp exponents (i.e. /s, θ, Ø/); simply put, we get root allomorphy where we do not have regular Voice/Asp exponents (for the PFV forms in (11b–c) see below)

- Remark #2: Gradience in root allomorphy
  - (11a): allomorphy in ACT IMPFV, PASS IMPFV, ACT PFV
  - (11b–c): allomorphy in ACT IMPFV, PASS IMPFV
  - (11d): allomorphy only in PASS PFV

- Remark #3: The extent of allomorphy may be seen as revealing the "strength" of the root vocabulary item (Root-VI): the stronger the Root-VI, the more immune it is to any alternations in its phonological content

⇒ Allomorphy is a means of Voice/Asp exponence

⇒ It emerges only in weak Root-VIs

⇒ The extent to which it applies exhibits *gradience*; it varies from one weak Root-VI to another

2. The analysis

2.1. Strength and *Gradient Symbolic Representations*

- *Gradient Symbolic Representations* (Smolensky & Goldrick 2016): phonological elements may have a partial degree of presence in the underlying structure
- The degree of presence of each element is formalized by means of a numerical value called *Activity Level* (AL)

- AL encodes the relative phonological strength of an element: if we take strong elements to have an AL equal to 1, weak elements are those bearing an AL<1

- Strong elements with AL=1 are always pronounced

- Weak elements with AL<1 are prone to deletion

- The higher the AL, the higher the chances of a weak element to be pronounced

⇒ Weak Root-VIs are those that include an element with an AL<1

⇒ Three categories of Root-VIs:

i. Strong: /…V_1C_1/ (no allomorphy)
ii. Weak-V: /…$V_{AL<1}C_1$/ (allomorphy targets the rightmost vowel)
iii. Weak-C: /…$V_1C_{AL<1}$/ (allomorphy targets the rightmost consonant)

Back to our data:

(12) *Strong Root-VIs*

IMPFV	**PASS IMPFV**	**PFV**	**PASS PFV**	
ɣráf-o	ɣráf-ome	ɣráf-s-o	ɣraf-θ-ó	'I write'

- The segments at the right edge of the Root-VI have an AL=1, given that they appear in all environments (see also the derived noun ***ɣráf****-simo* > *ɣr**ap**simo* 'writing')

⇒ /ɣra$_1$f$_1$/

(13) *Weak-C Root-VIs*

	IMPFV	**PASS IMPFV**	**PFV**	**PASS PFV**	
a.	kalip**t**-o	kalíp**t**-ome	kalíp-s-o	kalif-θ-ó	'I cover'
b.	psáx**n**-o	psáx**n**-ome	psáx-s-o	psax-θ-ó	'I search'

- The rightmost consonants in both Root-VIs have an AL<1, given that they surface only in IMPFV forms
- They are also unspecified for place features:
  - (13a): $C_{[-voiced, -continuant]}$
  - (13b): $C_{[+sonorant, -continuant]}$

⇒ /kalip**C**$_{\textbf{[–voi, –cont]}0.7}$/, /psax**C**$_{\textbf{[+son, –cont]}0.7}$/

(14) *Weak-V Root-VIs*

	IMPFV	**PASS IMPFV**	**PFV**	**PASS PFV**	
a.	st**é**ln-o	st**é**ln-ome	st**í**l-o	st**a**l-θ-ó	'I sent'
b.	ɣðé**r**n-o	ɣðé**r**n-ome	ɣð**á**r-o	ɣð**a**r-θ-ó	'I scratch'
c.	s**é**rn-o	s**é**rn-ome	s**í**r-o	s**i**r-θ-ó	'I drag'
a.	vr**é**x-o	vr**é**x-ome	vr**é**x-s-o	vr**a**x-ó	'I wet'

- **Underlying vowel** of each Root-VI in (14a–d):
  - (14a) st**a**l- (see also *st**á**l-simo* 'sending')
  - (14b): ɣð**a**r- (see also *ɣð**á**r-simo* 'scratching)
  - (14c): s**i**r- (see also *s**í**r-simo* 'dragging')
  - (14d): vr**e**x- (see also *vr**é**k-simo* 'wetting')

- Given that these vowels do not appear in all environments, they have an AL<1
- As the AL value gets lower, the extent to which allomorphy applies increases

appears in 1 environment

each one appears in 2 environments

appears in 3 environments

To wrap up so far:

(15)

ROOT-VIS	EXPONENTS/ALLOMORPHY			
	IMPFV	PASS IMPFV	PFV	PASS PFV
STRONG	ɣráf-**Ø**-o	ɣráf-**Ø**-ome	ɣráf-**s**-o	ɣraf-**θ**-ó
WEAK-C	kalip**t**-o	kalíp**t**-ome	kalíp-**s**-o	kalif-**θ**-ó
	psáx**n**-o	psáx**n**-ome	psáx-**s**-o	psax-**θ**-ó
WEAK-V	st**é**l**n**-o	st**é**l**n**-ome	stíl-o	stal-**θ**-ó
	ɣð**é**r**n**-o	ɣð**é**r**n**-ome	ɣðár-o	ɣðar-**θ**-ó
	s**é**r**n**-o	s**é**r**n**-ome	sír-o	sir-**θ**-ó
	vréx-o	vréx-ome	vréx-**s**-o	vr**a**x-ó

Q: Which are the exponents in the yellow (allomorphic) cells as well as in the grey ones?

2.2. Voice/Aspect exponence

2.2.1. [–perfective]

- Weak-C Root-VIs

(16)

ROOT-VIS		IMPFV	PASS IMPFV	EXPONENT
STRONG	/ɣraf/	ɣráf-**Ø**-o	ɣráf-**Ø**-ome	**Ø**
WEAK-C	/kalip$C_{0.7}$/	kalip**t**-o	kalíp**t**-ome	**[COR]** → **[t]**
	/psax$C_{0.7}$/	psáx**n**-o	psáx**n**-ome	→ **[n]**

– [–pfv] is realized by a floating [COR] feature, which attaches to the closest weak consonant:

(17) [–pfv] ↔ [COR] / …$VC_{AL<1}$⁀__

– Linearized outputs of Voice/Asp realization:

(18) a. kalip**C**$_{\textbf{[–voi, –cont]}0.7}$⁀[COR] → kalip**C**$_{\textbf{[–voi, –cont, COR]}0.7}$

b. psax**C**$_{\textbf{[+son, –cont]}0.7}$⁀[COR] → psax**C**$_{\textbf{[+son, –cont, COR]}0.7}$

- Weak-V Root-VIs

(19)

ROOT-VIS		IMPFV	PASS IMPFV	EXPONENT
STRONG	/ɣraf/	ɣráf-**Ø**-o	ɣráf-**Ø**-ome	**Ø**
WEAK-V	/staˌ₁l/	st**é**l**n**-o	st**é**l**n**-ome	**e…n**
	/ɣðaˌ₆r/	ɣð**é**r**n**-o	ɣð**é**r**n**-ome	
	/siˌ₆r/	s**é**r**n**-o	s**é**r**n**-ome	
	/vreˌ₈x/	vréx-o	vréx-ome	

- Weak-V Root-VIs
  - We take the **/e...n/** exponent as consisting of two parts with different linearization specifications (see Trommer 2011):
    i. the vocalic part is a floating **/e/** that attaches to the closest V-slot
    ii. the consonantal part is a non-floating **/-n/** that is suffixed to the Root-VI

(20)

C	V	C			C			C	V			C	C	
|	|	|			|			|	|			|	|
s	i	r	-	e	n	→		s	i	e	r	n		

- Weak-V Root-VIs

  – We also take both **/e/** and **/-n/** to be weak, i.e. to have an AL=0.6
  – Given that **/e...n/** combines only with Weak-V Root-VIs, we posit the following phonological specification:

(21) [–pfv] ↔ $e_{0.6}\ldots\text{-}n_{0.6}$ / …$V_{AL<1}C\frown\_\_$

2.2.2. [–passive, +perfective]

(22)

ROOT-VIS		ACT IMPFV	EXPONENT
STRONG	/ɣraf/	ɣráp-**s**-o	**s**
WEAK-C	/kalipC$_{0.7}$/	kalíp-**s**-o	
	/psaxC$_{0.7}$/	psák-**s**-o	
WEAK-V	/vre$_{0.8}$x/	vréx-**s**-o	
	/sta$_{0.1}$l/	stíl-o	V?
	/ɣða$_{0.6}$r/	ɣðár-o	
	/si$_{0.6}$r/	sír-o	

- Strong and Weak-C Root-VIs combine only with one exponent (/**s**/) and exhibit no allomorphy

- Weak-V Root-VIs

  – There appear two different means of [–pass, +pfv] exponence in Weak-V Root-VIs:
    i. a consonantal exponent **/s/**
    ii. a vocalic element that either changes the underlying vowel of the Root-VI to **/i/** (/sta$_{0.1}$l/ → *stil*) or leaves it unaltered (/sir$_{0.6}$r / → *sir*, /ɣðа$_{0.6}$r/ → *ɣðar*)

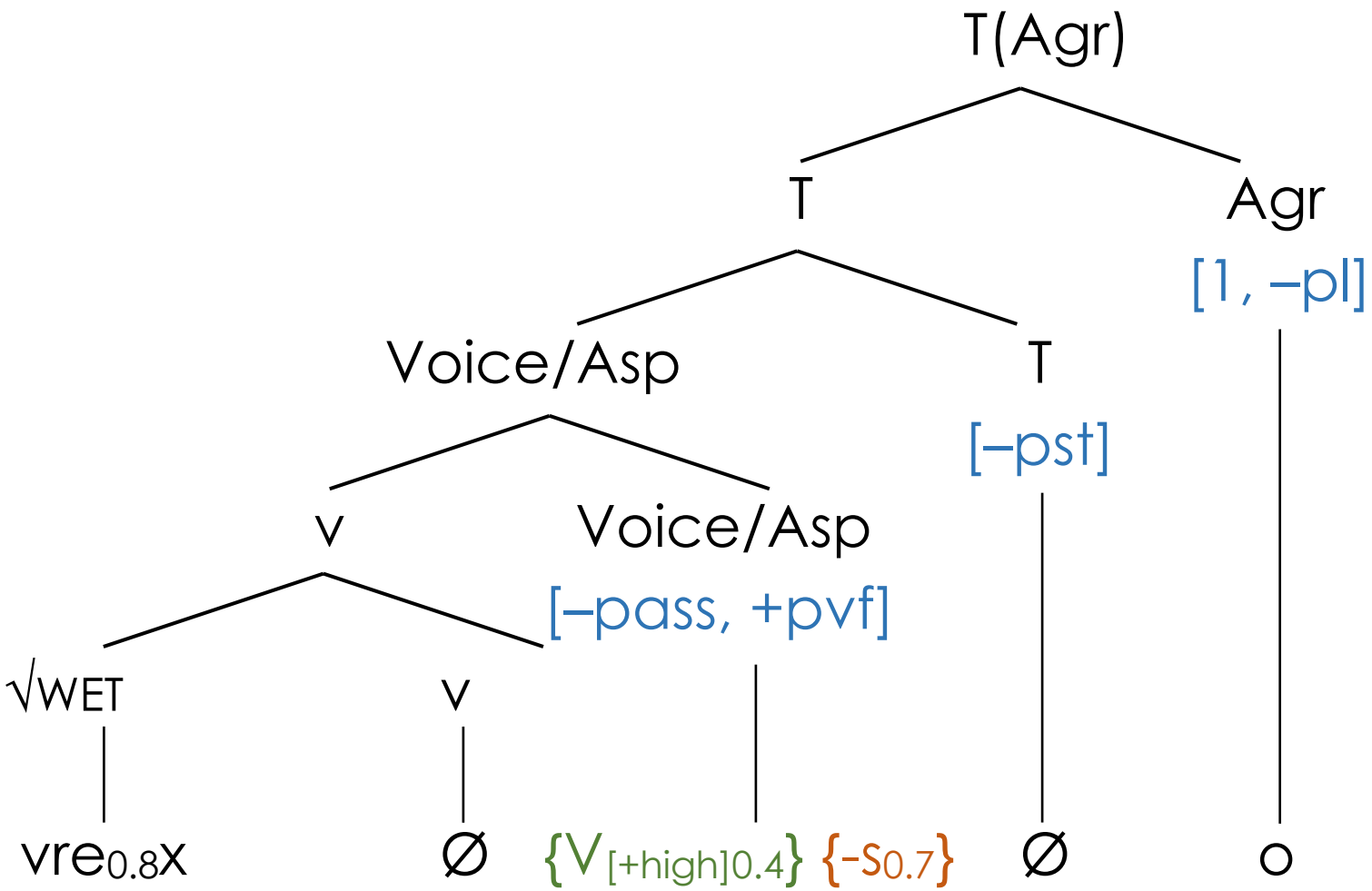
  – We therefore postulate the two following exponents:
    i. **/-s$_{0.7}$/**, which is suffixed to the Root-VI
    ii. a floating underspecified vowel **/V$_{[+high]0.4}$/**, which attaches to the closest V-slot

- Weak-V Root-VIs

  – Crucially, we maintain that **both exponents** are inserted into the Voice/Asp node during Vocabulary Insertion, because they carry exactly the same featural specification, leaving the task of selection to phonology:

(23) [–pass, +pfv] ↔ {$V_{[+high]0.4}$} {$-S_{0.7}$} / $V_{AL<1}C\frown\_\_$

(24) *[–pass, +pfv] exponence in Weak-V Root-VIs*



- Taking into account the underlying representation of the Weak-V Root-VIs and the linearization specification of each exponent, we get the following linearized outputs:

(25) a. /sta$_{0.1}$l/⌒{V$_{[+high]0.4}$} {-S$_{0.7}$} → /sta$_{0.1}$V$_{0.4}$lS$_{0.7}$/

b. /ɣða$_{0.6}$r/⌒{V$_{[+high]0.4}$} {-S$_{0.7}$} → /ɣða$_{0.6}$V$_{0.4}$rS$_{0.7}$/

c. /sir$_{0.6}$r/⌒{V$_{[+high]0.4}$} {-S$_{0.7}$} → /si$_{0.6}$V$_{0.4}$rS$_{0.7}$/

d. /vre$_{0.8}$x/⌒{V$_{[+high]0.4}$} {-S$_{0.7}$} → /vre$_{0.8}$V$_{0.4}$xS$_{0.7}$/

2.2.3. [+passive, +perfective]

(26)

ROOT-VIS		ACT IMPFV	EXPONENT
STRONG	/ɣraf/	ɣraf-**θ**-ó	**/θ/**
WEAK-C	/kalipC$_{0.7}$/	kalif-**θ**-ó	
	/psaxC$_{0.7}$/	psax-**θ**-ó	
WEAK-V	/sta$_{0.1}$l/	stal-**θ**-ó	
	/ɣða$_{0.6}$r/	ɣðar-**θ**-ó	
	/si$_{0.6}$r/	sir-**θ**-ó	
	/vre$_{0.8}$x/	vr**a**x-ó	**a**

- Strong and Weak-C Root-VIs combine only with /**θ**/ and exhibit no allomorphy

- Weak-V Root-VIs

  – Two exponents:
    i. **/-θ/**, which is suffixed to the Root-VI
    ii. a floating **/a/**, which attaches to the closest V-slot

  – Their distribution is conditioned by the rightmost consonant of the Root-VI:

(27) [+pass, +pfv] ↔ a / …$V_{AL<1}$**C**$_{[-son]}$ ⁀ ___
↔ θ elsewhere

- Weak-V Root-VIs: distribution of Voice/Asp exponents

(28) [–pass, +pfv] ↔ {$V_{[+high]0.4}$} {$-S_{0.7}$} / $V_{AL<1}C\frown\_\_$

(the selection between the two exponents is left to be decided by phonology)

(29) [+pass, +pfv] ↔ a / …$V_{AL<1}$**$C_{[–son]}$**$\frown\_\_$
↔ θ elsewhere

(the selection between the two exponents is determined during Vocabulary Insertion)

Interim summary

(30) *Outputs of Voice/Asp realization*

ROOT-VIS		IMPFV	ACT PFV	PASS PFV
STRONG	/ɣraf/	ɣrafØ	ɣráf$s_{0.7}$	ɣrafθ
WEAK-C	/kalip$C_{0.7}$/	kalip$C_{0.7}$[COR]	kalip$C_{0.7}$s	kali$C_{0.7}$θ
	/psax$C_{0.7}$/	psax$C_{0.7}$[COR]	psax$C_{0.7}$s	psax$C_{0.7}$θ
WEAK-V	/sta$_{0.1}$l/	sta$_{0.1}$e$_{0.6}$ln$_{0.6}$	sta$_{0.1}$V$_{0.4}$ls$_{0.7}$	stalθ
	/ɣða$_{0.6}$r/	ɣða$_{0.6}$e$_{0.6}$rn$_{0.6}$	ɣða$_{0.6}$V$_{0.4}$rs$_{0.7}$	ɣðarθ
	/si$_{0.6}$r/	si$_{0.6}$e$_{0.6}$rn$_{0.6}$	si$_{0.6}$V$_{0.4}$rs$_{0.7}$	sirθ
	/vre$_{0.8}$x/	vre$_{0.8}$e$_{0.6}$xn$_{0.6}$	vre$_{0.8}$V$_{0.4}$xs$_{0.7}$	vre$_{0.8}$ax

2.3. Phonological computation

- ***Gradient Harmonic Grammar / GHG*** (Smolensky & Goldrick 2016; Rosen 2016; Faust & Smolensky 2017a,b; Zimmermann 2018; Hsu 2019; Revithiadou et al. 2019; Revithiadou & Markopoulos 2019a,b, among others)

  – A constraint-based grammatical model that, unlike traditional OT-models, employs
  (a) **weighted** (instead of ranked) **constraints** (Legendre et al. 1990; Smolensky & Legendre 2006; Pater 2009, among others)
  (b) **Gradient Symbolic Representations**

– In order for an element to be realized, it needs to have or reach an AL=1

  ⇒ weak elements with inherent AL<1 need to be provided with additional activity

  ⇒ elements with an AL>1 are penalized for their excessive activity

  ⇒ both kinds of elements entail a computational cost for the phonological grammar, which seeks for the most cost-effective option

(31) *Constraints and their weights*

a. DEP-S (*w*: 40): Any amount of activity of a segment in the output has a correspondent amount of underlying activity in the input (Smolensky & Goldrick 2016)

b. MAX-S (*w*: 15): Any amount of underlying activity of a segment has a correspondent amount of activity in the output (Faust & Smolensky 2017ab)

c. UNIFORMITY (*w*: 20): No coalescence

d. *VV (*w*: 10): No hiatus

e. REALIZEMORPHEME (*w*: 10): The phonological exponent of an abstract morpheme must be fully realized

f. UNIQUEREALIZATION (*w*: 10): Abstract morphemes must be realized by a single exponent

…

(32) *Faithfulness violation in GHG (Toy example)*

/$a_{0.6}r_1$/	DEP-S w: 40	MAX-S w: 15	H
a. a_1r_1	– [(1–0.6) × 40] = –16		–16
b. r_1		– (0.6 × 15) = –9	–9

- Penalty for the violation of a DEP constraint = (1–a) × w
- Penalty for the violation of a MAX constraint = a × w
- H(armony) = sum of penalty scores

Exemplification: [–pass, –pfv]

(33) *Weak-V Root-Vls:* ***steln-***

/sta$_{0.1}$e$_{0.6}$ln$_{0.6}$/	DEP-S w: 40		MAX-S w: 15		REALM w: 10		…	H	
a. sta$_1$e$_1$ln$_1$	–1.7	–68					…	–78	
b. sta$_1$ln$_1$	–1.3	–52	–0.6	–9	–1	–10	…	–71	
c. sta$_1$e$_1$l	–1.3	–52	–0.6	–9	–1	–10	…	–81	
d. sta$_1$l	–0.9	–36	–1.2	–18	–1	–10	…	–64	
e. ste$_1$ln$_1$	–0.8	–32	–0.1	–1.5			…	–33.5	☜
f. ste$_1$l	–0.4	–16	–0.7	–10.5	–1	–10	…	–36.5	
…	…	…	…	…	…	…	…	…	

(34) *Weak-V Root-Vls:* ***ɣðar-***

/ɣða$_{0.6}$e$_{0.6}$rn$_{0.6}$/	DEP-S w: 40		MAX-S w: 15		REALM w: 10		…	H	
a. ɣða$_1$e$_1$rn$_1$	–1.2	–48					…	–58	
b. ɣða$_1$rn$_1$	–0.8	–32	–0.6	–9	–1	–10	…	–51	
c. ɣða$_1$e$_1$r	–0.8	–32	–0.6	–9	–1	–10	…	–61	
d. ɣðar	–0.4	–16	–1.2	–18	–1	–10	…	–44	
e. ɣðe$_1$rn$_1$	–0.8	–32	–0.6	–9			…	–41	☜
f. ɣðe$_1$r	–0.4	–16	–1.2	–18	–1	–10	…	–44	
…	…	…	…	…	…	…	…	…	

(35) *Weak-V Root-VIs:* ***vrex-***

/vre$_{0.8}$e$_{0.6}$xn$_{0.6}$/	DEP-S w: 40		MAX-S w: 15		REALM w: 10		…	H
a. vre$_1$e$_1$xn$_1$	–1	–40					…	–50
b. vre$_1$xn$_1$	–0.6	–24	–0.6	–9	–1	–10	…	–43
c. vre$_1$e$_1$x	–0.6	–24	–0.6	–9	–1	–10	…	–53
d. vre$_1$x	–0.2	–8	–1.2	–18	–1	–10	…	–36 ☜
e. vre$_1$xn$_1$	–0.8	–32	–0.8	–12			…	–44
f. vre$_1$x	–0.4	–16	–1.4	–21	–1	–10	…	–47
…	…	…	…	…	…	…	…	…

In a nutshell:

(36) *Output selection in [–pfv] forms*

INPUT	TOP CANDIDATES	CRITERIA		
		COST-EFFECTIVE	FAITHFUL	REALIZE MORPHEME
a. /sta$_{0.1}$e$_{0.6}$ln$_{0.6}$/	☞ **steln**	☹☹	☺	☺
	stal	☹☹	☹☹☹	☹
b. /ɣða$_{0.6}$e$_{0.6}$rn$_{0.6}$/	☞ **ɣðern**	☹☹	☹	☺
	ɣðar	☹	☹☹☹	☹
c. /vre$_{0.8}$e$_{0.6}$xn$_{0.6}$/	vrexn	☹☹	☹☹	☺
	☞ **vrex**	☺	☹☹☹	☹

(37) *Output selection in [–pass, +pfv] forms*

INPUT	TOP CANDIDATES	CRITERIA		
		COST-EFFECTIVE	FAITHFUL	REALIZE ONCE
a. /sta$_{0.1}$V$_{0.4}$ls$_{0.7}$/ [+hi]	☞ **stil**	☹	☹	☺
	stils	☹☹	☺	☹
	stals	☹☹☹	☹	☺
b. /ɣða$_{0.6}$V$_{0.4}$rs$_{0.7}$/ [+hi]	☞ **ɣðar**	☺	☹☹	☺
	ɣðars	☹	☹	☹
	ɣðars	☹☹	☹	☺
c. /vre$_{0.8}$V$_{0.4}$xs$_{0.7}$/ [+hi]	vrex	☹	☹☹	☺
	vrexs	☹	☹	☹
	☞ **vrexs**	☹	☹	☺

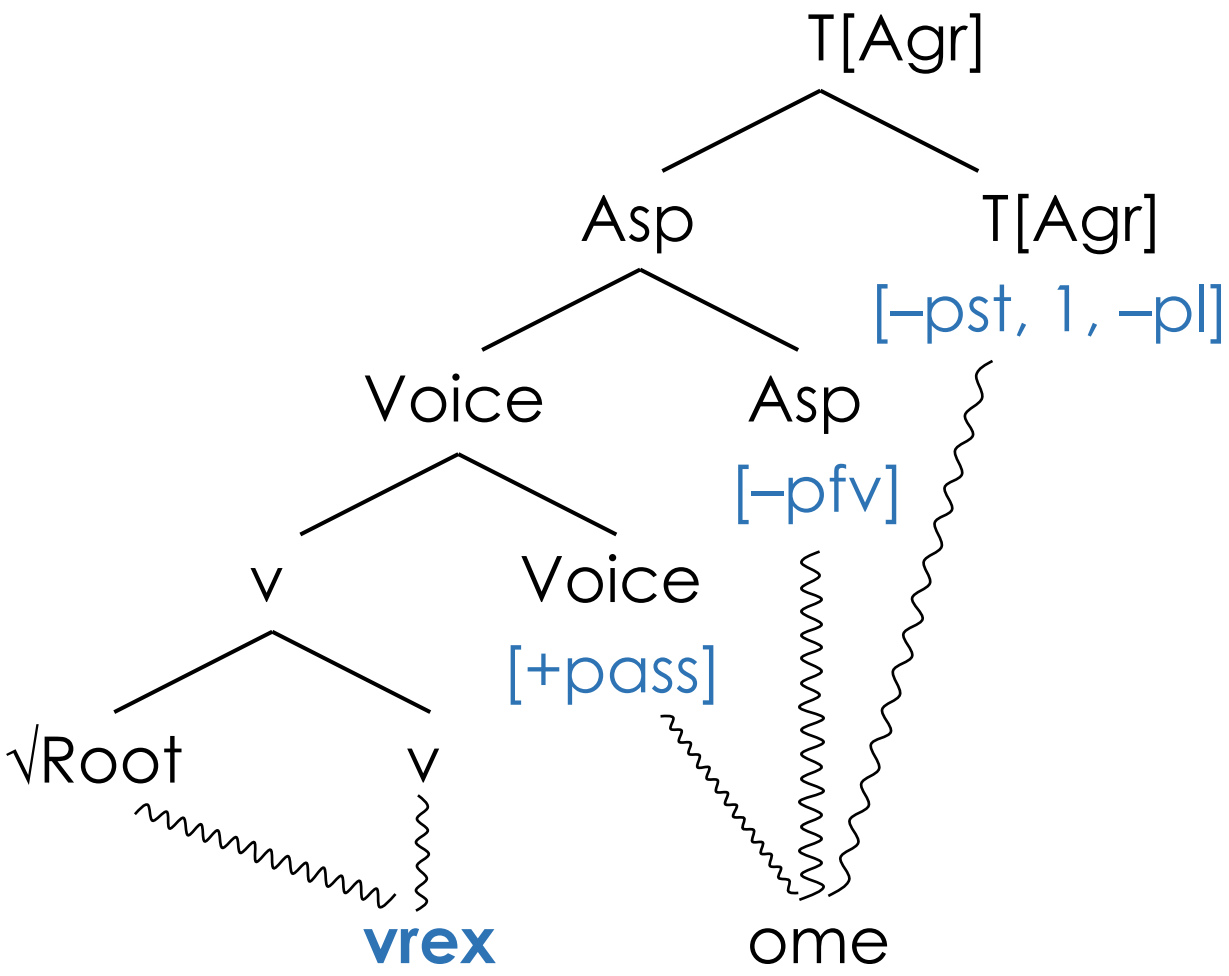
3. Discussion & Cross-linguistic extensions

Exploring an alternative: spanning and locality

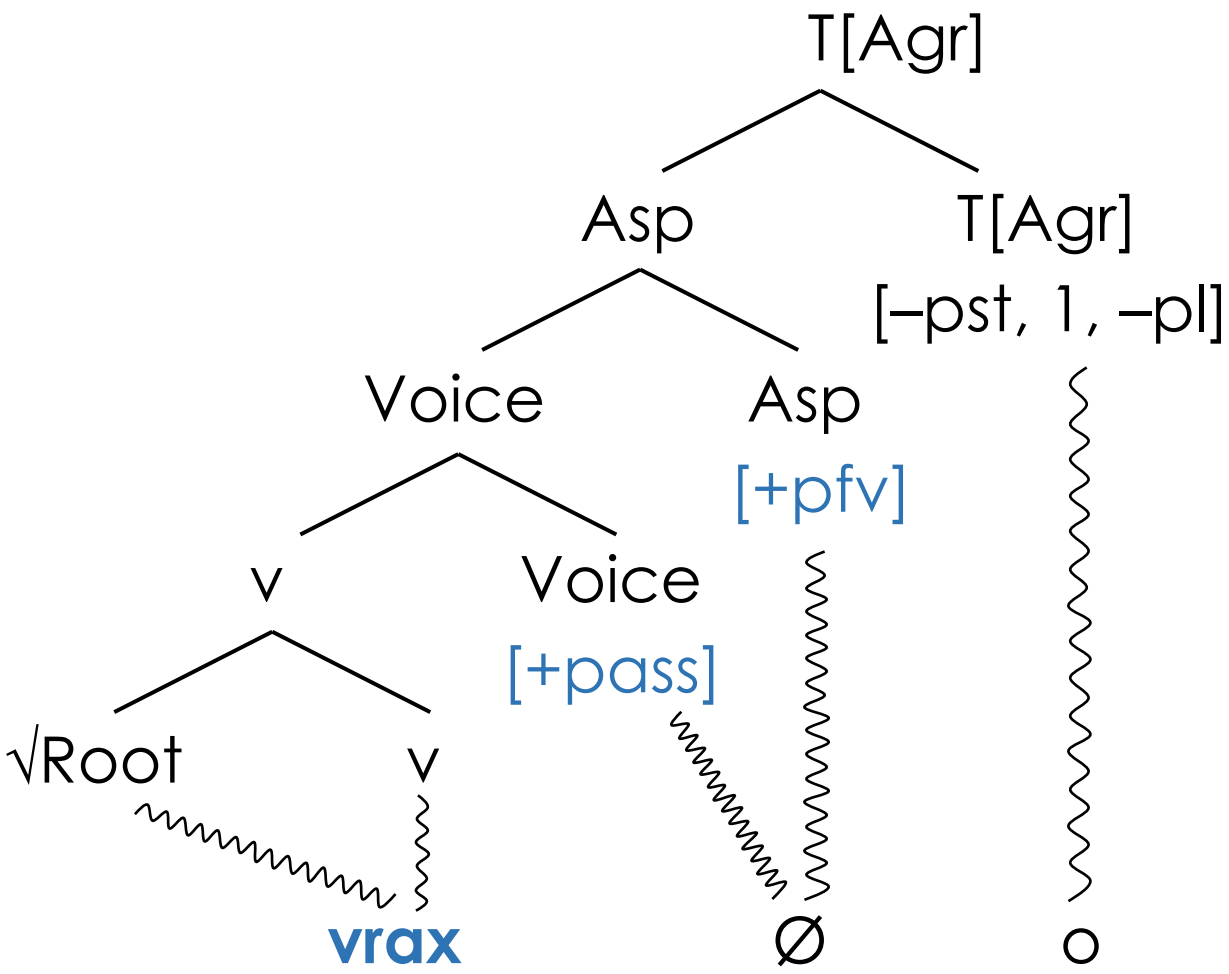
- Merchant (2015): A spanning analysis of root allomorphy in Greek verbal inflection
- Main point of difference with the present analysis: allomorphy may be conditioned by adjacent **spans**

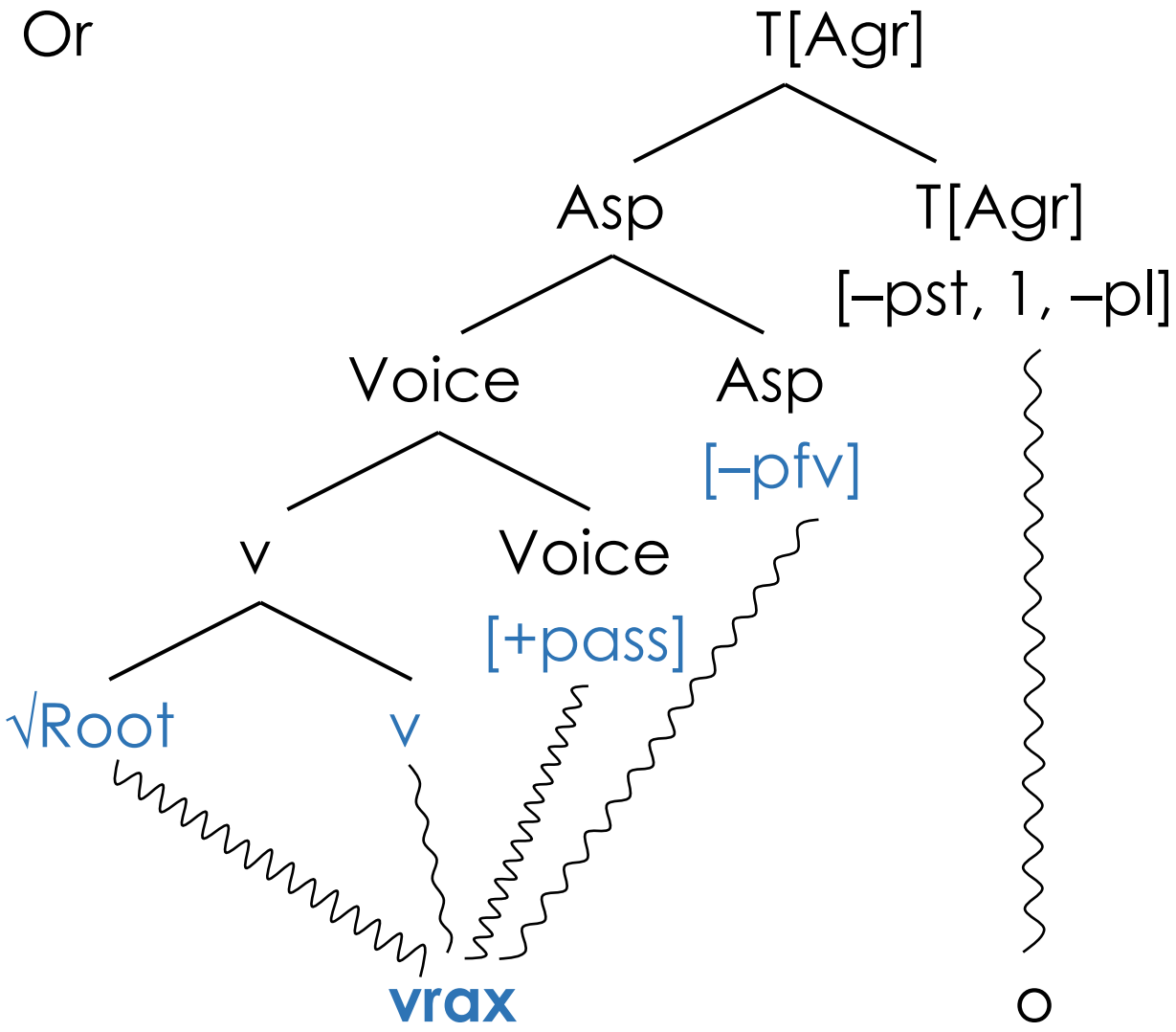
- **Spans**: sets of adjacent terminal nodes that can be either lexicalized by a single vocabulary item or locally condition as an ordered set the insertion of an allomorph in an adjacent terminal node/span (Svenonius 2012, 2016)
- "**The Span Adjacency Hypothesis**,[…], would allow N3 and N4 to jointly condition the form realizing N1and N2; it would also allow just N3 to play such a role; it would ban N4 from conditioning the form of N1+N2 if the features of N3 were not involved" (Merchant 2015: 295)

(38) *PASS IMPFV*: *vréx-ome 'I am being wet'*



(39) *PASS PFV: vrax-ó 'be wet'*

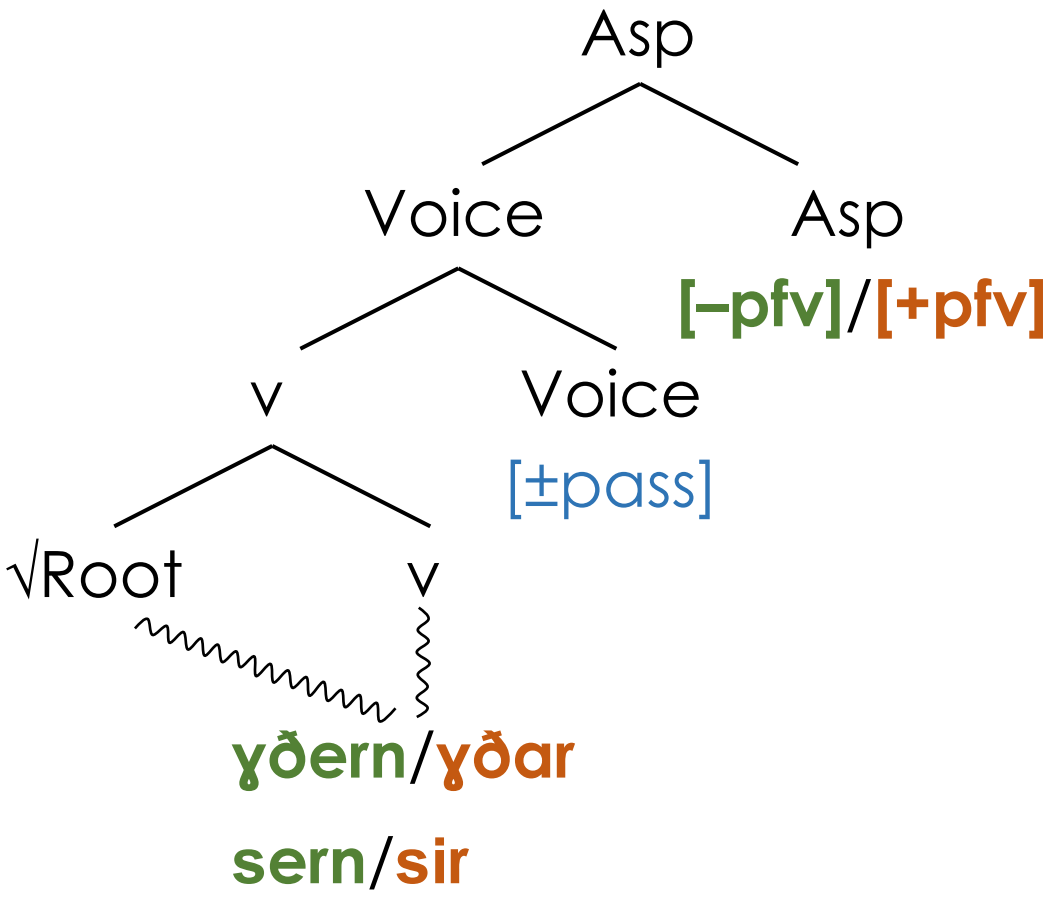



Or
T[Agr]
Asp
T[Agr]
[–pst, 1, –pl]
Voice
Asp
[–pfv]
v
Voice
[+pass]
√Root
v
vrax
o

- **Problem**: Root allomorphy conditioned by Asp to the exclusion of Voice

		-PERFECTIVE		+PERFECTIVE	
		-PAST	+PAST	-PAST	+PAST
ɣðérno 'I scratch'	-pass	ɣðérn-o	é-ɣðern-a	ɣðár-o	é-ɣðar-a
	+pass	ɣðérn-ome	ɣðern-ómun(a)	ɣðar-θ-ó	ɣðár-θ-ik-a
sérno 'I drag'	-pass	sérn-o	é-sern-a	sír-o	é-sir-a
	+pass	sérn-ome	sern-ómun(a)	sir-θ-ó	sír-θ-ik-a

(40) *Allomorphy conditioned by <Asp>*



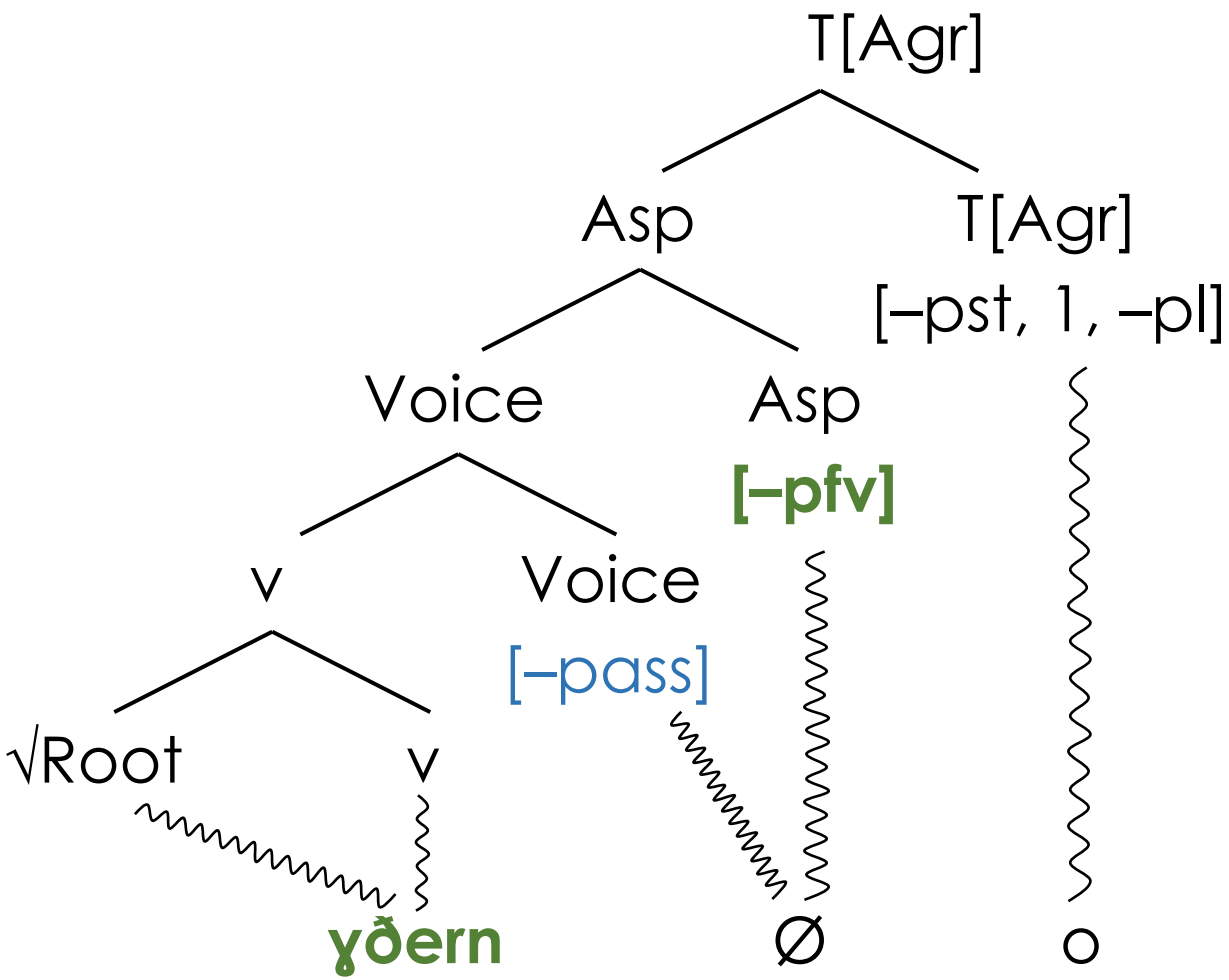
- Vocabulary Insertion in the span <√-v> is conditioned by the non-adjacent node Asp of the adjacent span <Voice-Asp>, of which the features of Voice play no role

  → **Violation of Span Adjacency Condition**

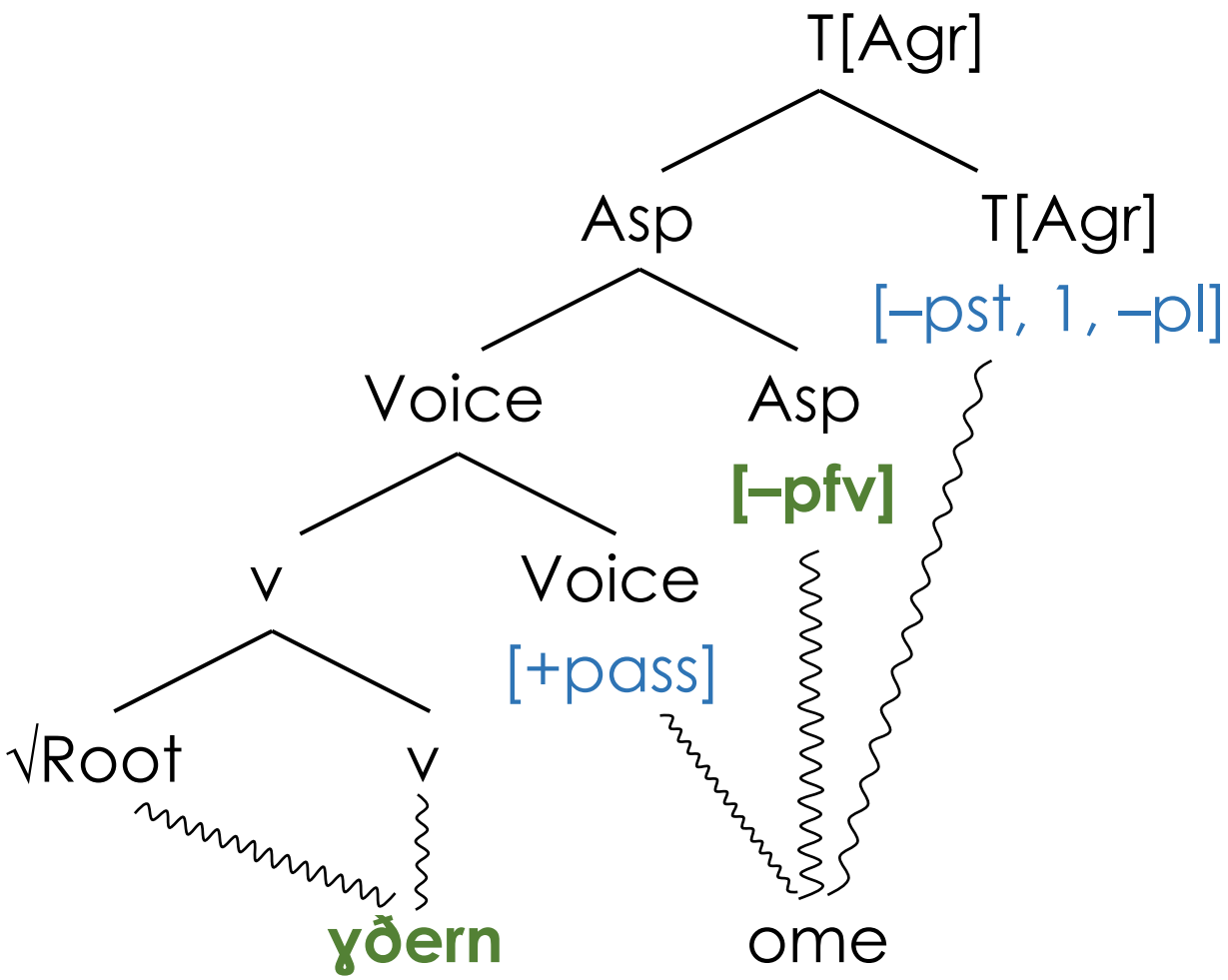
- Aspect can condition root allomorphy even across the overtly realized Voice[+pass] node by the suffix -θ

  → **Pruning cannot be an option here**

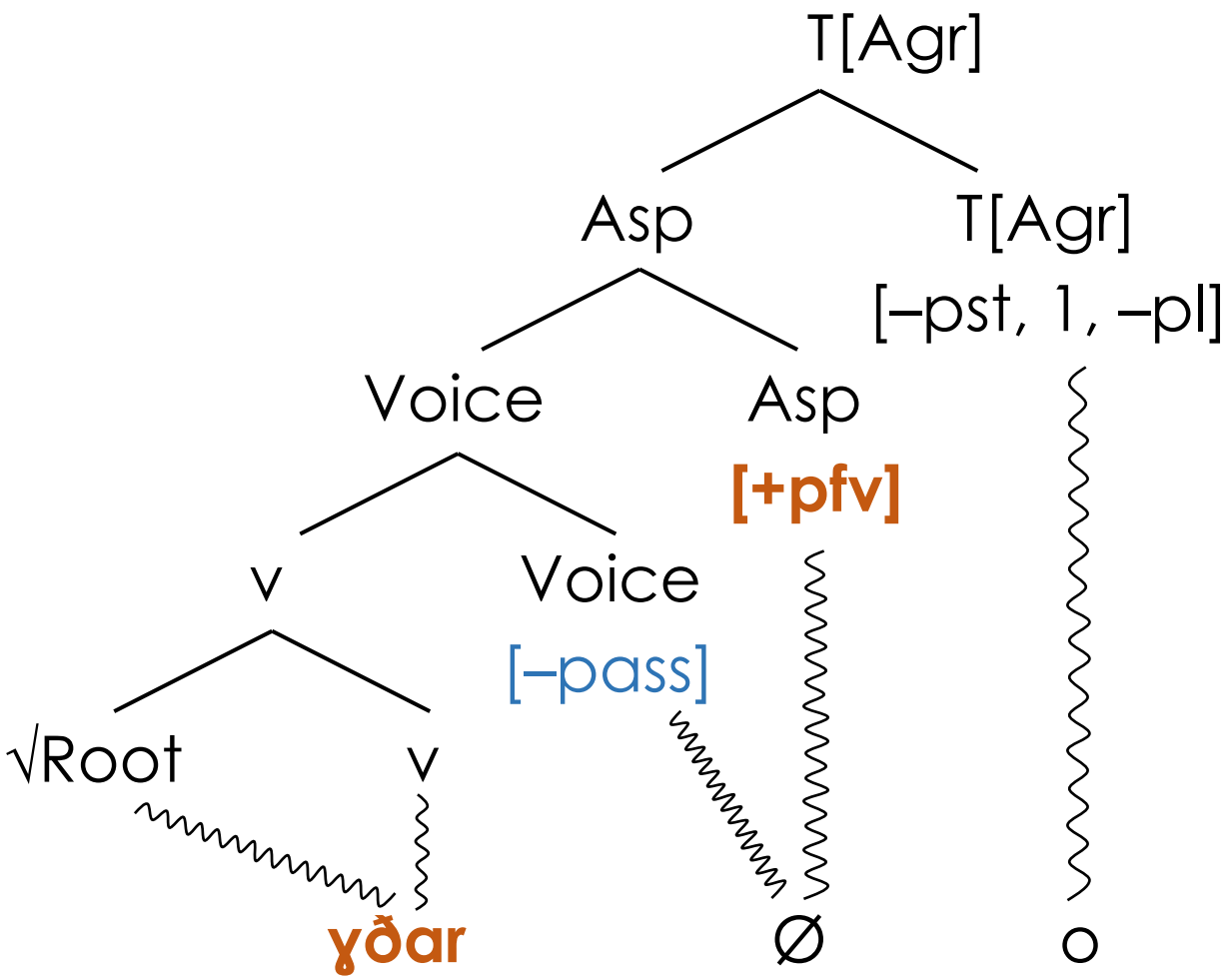
(41) *ACT IMPFV: ɣðérn-o 'I scratch'*



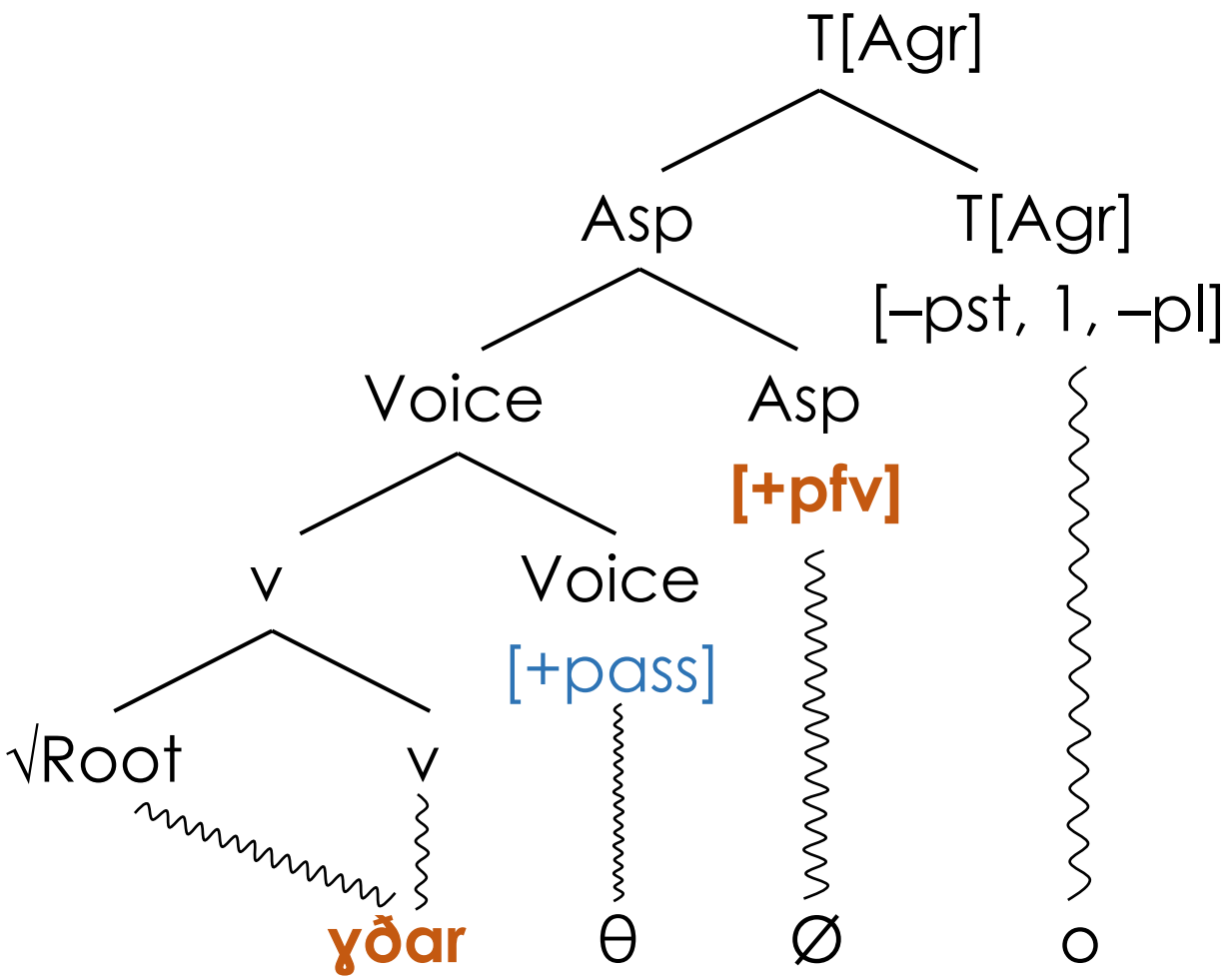
(42) *PASS IMPFV: ɣðérn-ome 'I am being scratched'*



(43) *ACT PFV: ɣðár-o 'scratch'*



(44) *PASS PFV: **ɣ**ðar-θ-ó 'be scratched'*



⇒ Solution: Fusion

- Voice and Aspect are fused post-syntactically and before Vocabulary Insertion into a single terminal node
- Fusion creates a single node with an unordered set of features, so that either Voice or Aspect or both can be lexicalized or condition allomorphy in $\sqrt{}$-v

⇒ Fusion empirically superior to spanning contra Merchant (2015)

Extension to other languages

- Root allomorphy in Icelandic verbal inflection (Einarsson 1949; Anderson 1969; Bye & Svenonius 2010)

  – Strong and Weak-V Root-VIs (Einarsson 1949: 78–79, 83; simplified presentation):

(45)

ROOT-VIS	**PRESENT**	**PAST**	
STRONG	dai:m-i	da:im-**d**-i	'I judge'
	lɪ:f-i	lɪ:f-**ð**-i	'I live'
WEAK-V (classes 4-5)	bɛ:r	b**a:**r	'I carry'
	gɛ:f	g**a:**f	'I give'

Building on Bye & Svenonius (2010), we posit the two following [+past] exponents:

i. an underspecified consonant **/-C$_{[COR,\ -son]}$/**, which is suffixed to the Root-VI, and may surface as **[d, ð ,t]**
ii. a floating underspecified vowel **/V$_{[+low]}$/**, which attaches to the closest V-slot

- Both exponents are inserted into the structure; the selection between the two is determined during phonological computation:
  - the suffixal exponent is preferred in strong Root-VIs
  - the floating exponent, which may provide extra activity to a weak vowel, is preferred in Weak-V Root-VIs

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