Issues in non-concatenative Morpho-phonology

The root controversy

The Root (of all evil)

Modern Hebrew (representative of Semitic in general)

	Nouns			**Verbs**	
a.	**kódem**	'before'	l.	**kadam**	'precede'
b.	**kidum**	'promotion'	m.	**kidem**	'promote X'
c.	mi**kdam**a	'advance'	n.	hi**kdim**	'be/put ahead'
d.	ta**kdim**	'precedence'	o.	hit**kadem**	'advance'
e.	**kédem**	'antiquity'			
f.	ha**kdam**a	'prologue'		**Adjectives**	
g.	**kadím**a	'ahead!'	p.	**kadum**	'ancient'
h.	**kidm**a	'progress (tech.)'	q.	**kadm**on	'prehistoric'
i.	hit**kadm**ut	'progress (proc.)'	r.	**kidm**-i	'frontal'
j.	he**kdem**	'asap'	s.	ma**kdim**	'preparatory'
k.	**kdam**-	'pre-'	t.	mu**kdam**	'early'

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f.	ha**kd**			**es**	
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The basis for all of these words is a tripartite set <k,d,m>.
It has a vague meaning of 'precedence'

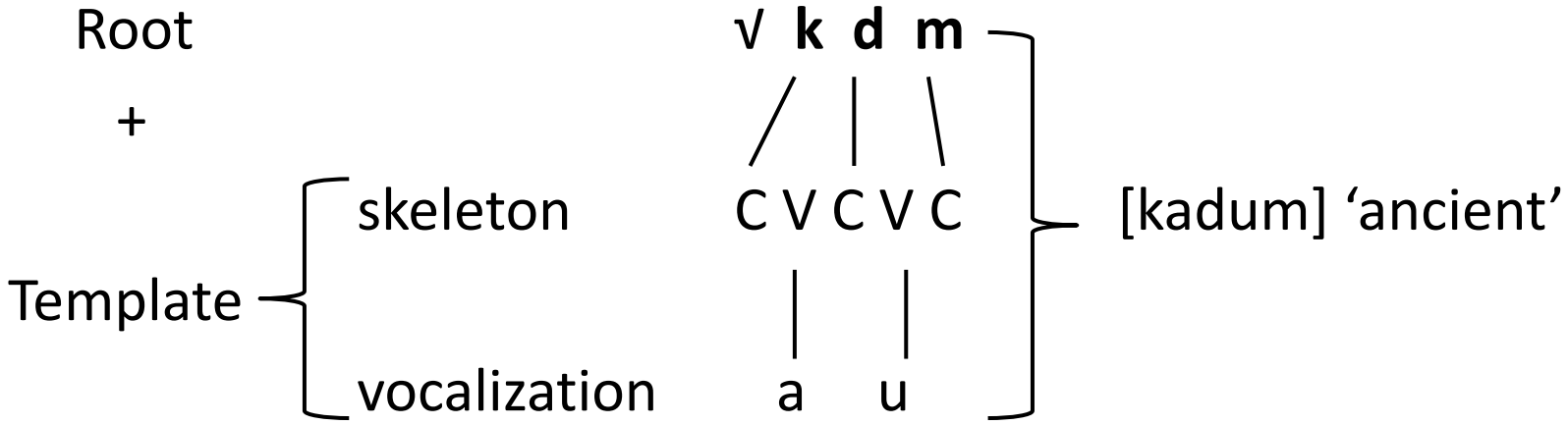
The Root (of all evil)

- This set is called “the root”.

- It is **linear**, but potentially **discontinuous** – the order matters, but things can intervene.

Root and template

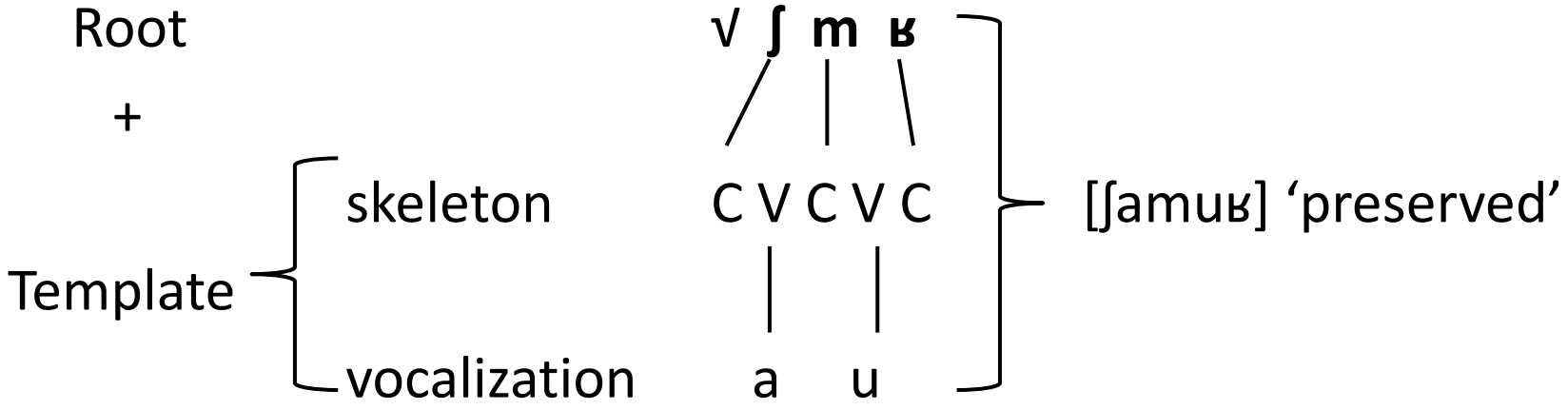
In order to derive a word in Semitic, this set is combined with a **template**.



The template is a morpheme in its own right, like any affix in less spectacular languages.

Root and template

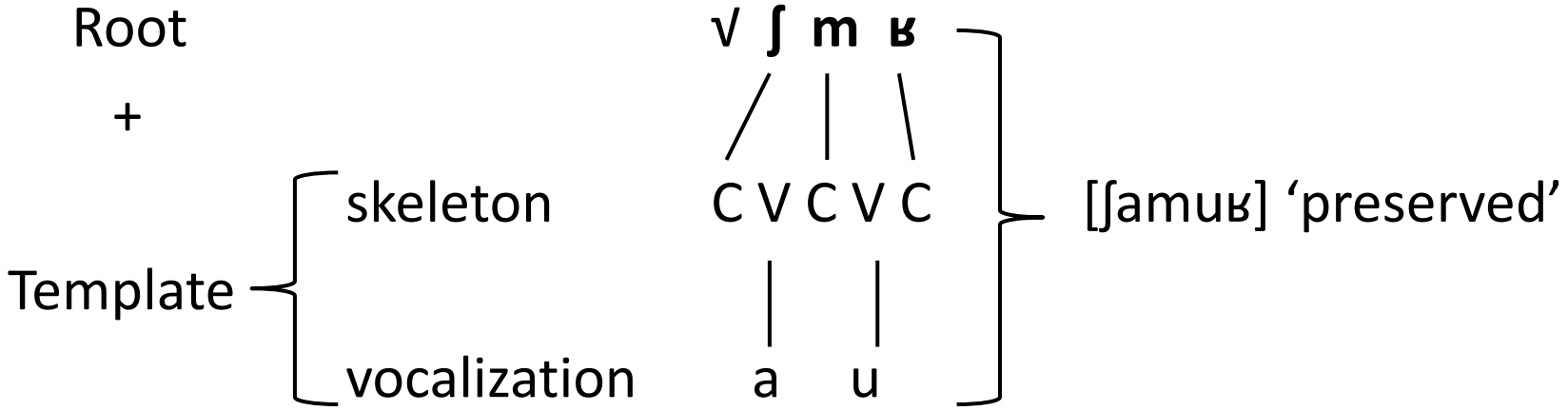
It can therefore combine with other roots:



Both words are participial adjectives: this is the morpho-syntactic import of the template.

Root and template

The process is **non-concatenative** morphology: the root and affix do not seem to be order linearily in any way.



They are simply combined with one another.

A note on non-concatenative impostors

Spanish

lok-o	‘crazy.ms’	lok-it-o	‘dim’
lok-a	‘crazy.fm’	lok-it-a	‘dim’

Breton

bʁøːʁ	‘brother’	u **p**ʁøːʁ	‘2sg poss’
mam	‘mother’	u **m̥**am	‘2sg poss’
wet	‘age’	u **hw**et	‘2sg poss’

Chaha

dɨmd	‘assemble’	dɨmd^{j}	‘2fmsg’
nɨgɨf	‘fall’	nɨg^{j}ɨf	‘2fmsg’

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These are “floating” exponents, but It is clear that they are either suffixed or prefixed, i.e. linear.

Problems with root-and-template

Only Afro-Asiatic languages, and among them principally Semitic ones, have entirely dicontinuous roots: non-root exponents can appear anywhere among the root elements, which can be adjacent or separated.

compare ***sing, sang, sung, song*** – quite common.

Problems with root-and-template

- How cognitively real is the root?
- How special are these languages?
- What is phonological in root and template and what is simply set?
- Do we really need the skeleton? maybe the vocalization is enough?
- What are the universal consequences of the existence of R&T systems?

Problems with root-and-template

Outi Bat El:

Chief proponent of the no-root approach.

Problems with root-and-template

Two main issues:

1) roots are not words, speakers do not store roots.

2) Root and template is not how Semitic morphology works. Speakers do not need to store roots.

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Background on Israeli Hebrew

Active verbs

	past	future	
Qa**T**a**L**	**d**a**f**a**k**	j-i**df**o**k**	‘knock’
	ʃa**t**a**f**	j-i**ʃt**o**f**	‘wash’
Qi**T**e**L**	**d**i**j**e**k**	je-**d**a**j**e**k**	‘be/make precise’
	ʃi**t**e**f**	je-**ʃ**a**t**e**f**	‘share’
hi**QT**i**L**	hi**fs**i**k**	j-a**fs**i**k**	‘stop’
	hi**tsʁ**i**χ**	j-a**tsʁ**i**χ**	‘necessitate’

Bat El 1994

Active verbs

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Qa**T**a**L**	**d**a**f**a**k**	j-i**df**o**k**
	ʃa**t**a**f**	j-i**ʃt**o**f**
Qi**T**e**L**	**d**i**j**e**k**	je-**d**a**j**e**k**
	ʃi**t**e**f**	je-**ʃ**a**t**e**f**
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suppose now that we wanted to make a verb out of the international word [fókus].

Bat El 1994

Active verbs

	past	future
QaTaL	dafak	j-idfok
	ʃataf	j-iʃtof
QiTeL	**dijek**	je-**dajek**
	fikes	je-**fakes**
hiQTiL	hifsik	j-afsik
	hitsʁiχ	j-atsʁiχ

Bat El showed that there seems to be a principle of **Cluster Preservation**: the verb type will be selected which preserves the syllable structure of the base.

Bat El 1994

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suppose now that we wanted to make a verb out of the international word **[klik]**.

Bat El 1994

Active verbs

	past	future
QaTaL	*kalak	j-iklok
	ʃataf	j-iʃtof
QiTeL	*kilek	*je-kalek
	ʃitef	je-ʃatef
hi**QTiL**	hiklik	j-aklik
	hitʁiχ	j-atʁiχ

Cluster preservation rules out QaTaL; rules out QiTeL, because of a preference for no initial clusters, *klikek. (moreover, hiQTiL has [i]…)

Bat El 1994

Active verbs

	past	future
Qa**T**a**L**	**d**a**f**a**k**	j-i**d**f**o**k
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suppose now that we wanted to make a verb out of the international word **[faks]**.

Bat El 1994

Active verbs

	past	future
QaTaL	**faksas**	*j-i**fks**os
	ʃataf	j-iʃtof
QiTeL	**d**ij**e**k	je-**d**aj**e**k
	fikses	je-**fakses**
hi**QTiL**	***hifksis**	***j-afksis**
	hitsʁiχ	j-atsʁiχ ‘necessitate’

Cluster preservation rules out QaTaL and hiQTiL because of a preference against 3C clusters. Reduplication in QiTeL follows.

Bat El 1994

Active verbs

	past	future
Qa**T**a**L**	**d**a**f**a**k**	j-i**df**o**k**
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Qi**T**e**L**	**d**i**j**e**k**	je-**d**a**j**e**k**
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hi**QT**i**L**	hi**fs**i**k**	j-a**fs**i**k**
	hi**tsʁ**i**χ**	j-a**tsʁ**i**χ**

suppose now that we wanted to make a verb out of an international word with both an initial and a final cluster, such as **[fliʁt]**.

Bat El 1994

Active verbs

	past	future
QaTaL	**flaʁtat**	*j-i**flʁt**ot
	ʃataf	j-iʃtof
QiTeL	**dijek**	je-**d**a**j**e**k**
	fliʁtet	je-**fl**a**ʁt**e**t**
hi**QTiL**	***hifliʁt**	***j-afliʁt**
	hitsʁiχ	j-atsʁiχ

Cluster preservation rules out QaTaL. (It is not clear to me why hiQTiL is ruled out, because final clusters are possible in denominal verbs.)

Bat El 1994

Active verbs

	past	future
Qa**T**a**L**	**d**a**f**a**k**	j-i**d**f**o**k
	ʃa**t**a**f**	j-i**ʃ**t**o**f
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What about an international word with more than three consonants, like **[katalog]**?

Bat El 1994

Active verbs

	past	future
QaTaL	**katlag**	*j-i**ktl**og
	ʃataf	j-iʃtof
QiTeL	**dijek**	je-**d**a**j**e**k**
	kitleg	je-**k**a**tl**e**g**
hi**QTiL**	***hiktlig**	***j-aktlig**
	hitʂʁiχ	j-atʂʁiχ

Cluster preservation rules out QaTaL and hiQTiL because of a preference against 3C clusters.

What is the consequence of all this?

Recall the “traditional” notion of item construction in Semitic:

1) Take a root e.g <ʃ,m,ʁ>

2) match it to a template e.g QaTuL

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So Bat El says here it should be

1) Extract a root from the base

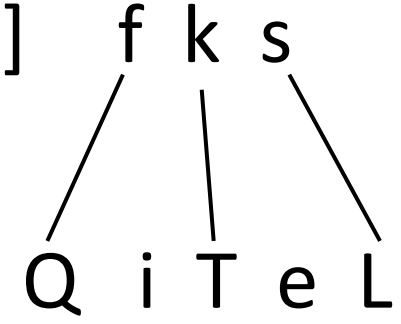
e.g. [faks] => <f,k,s>

2) match it to a template. e.g. QiTeL

What is the consequence of all this?

There must be reference to the syllabification of the base form!
But if there is an intermediary stage with only a "root", i.e. only a set of unsyllabified consonants, then there cannot be such reference!

you expect to get *[fikes]



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Bat El proposes another schema of morpho-phonological derivation which doesn't involve the root: **Melodic Overwriting**. The vowels of the template are imposed on the base word, rather than on an extracted root:

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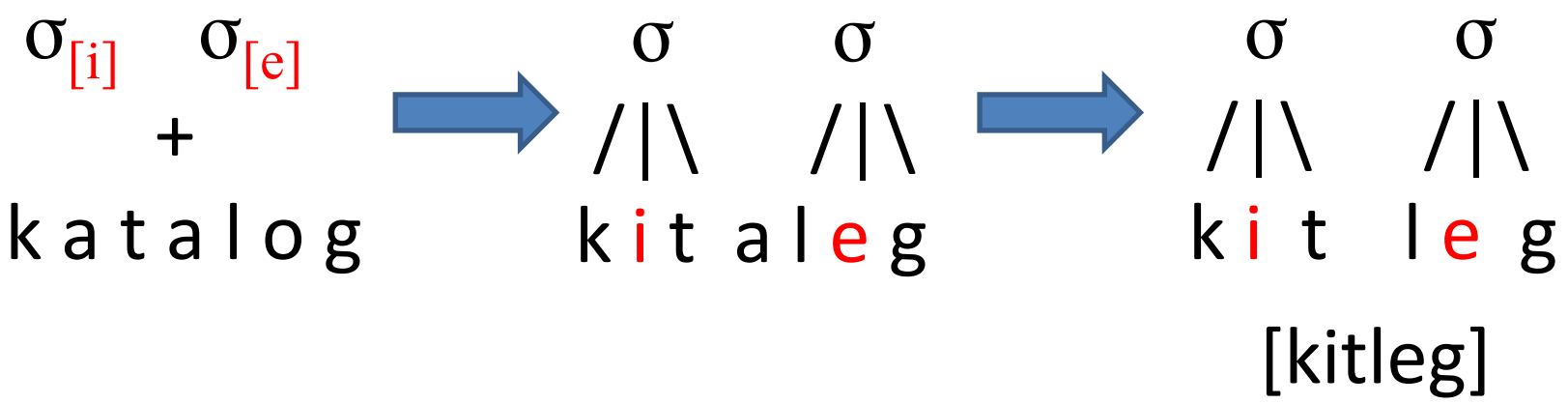
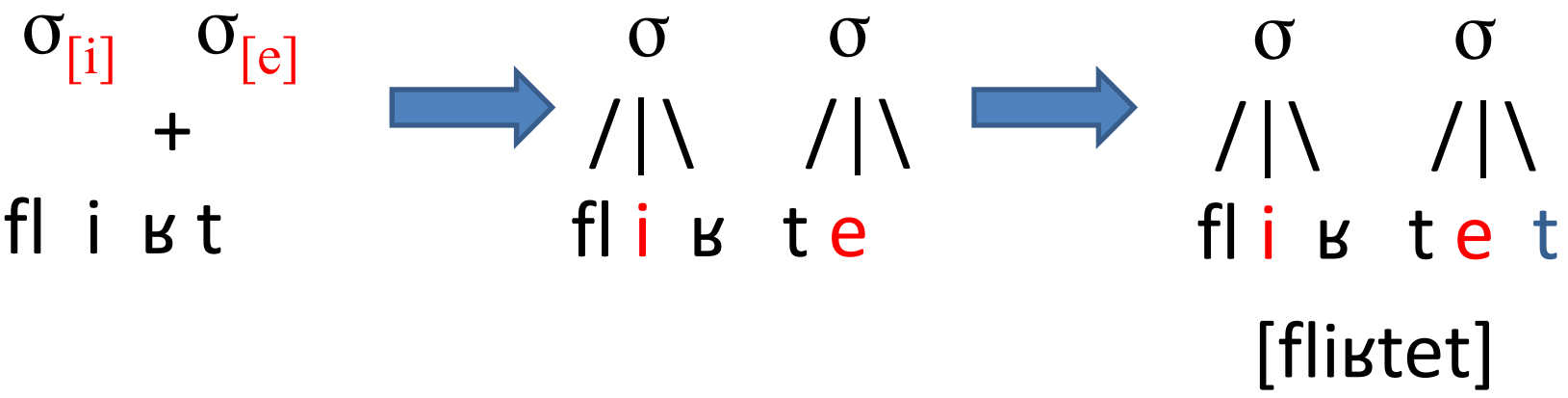
At no stage is there a "root" level.



What is the consequence of all this?

Bat El boasts another advantage, namely that <u>cluster preservation is **not** a principle of her account</u> ; it is rather a consequence of it.



What is the consequence of all this?

Bat El then makes an interesting logical leap: if there is no need for roots in this case, is there any need for them ever?

- The stored form must be the individual word.
- An individual word can serve as the base for another

What is the consequence of all this?

The belief in the consonantal root as the basic unit of meaning is due to the stability of consonants in word formation; most of the morphophonemic alternations are vocalic. The stem consonants cannot be treated as an independent unit carrying meaning since, as in any language, the meaning is associated with the entire stem and not with the consonants. In the course of derivation some of the semantic properties of the base are transferred to the derived form, yet it does not follow that these properties are associated with the transferred consonants. In a chain of derivation such as *ʔamad* 'to stand' → *ʔamuda* 'column' → *ʔimed* 'to paginate', the semantic properties transferred from *ʔamad* to *ʔamud* are not the same as those transferred from *ʔamuda* to *ʔimed*; yet the same set of consonants appears in the two derived forms.

What is the consequence of all this?

All the participating principles and processes of Stem Modification are available within general prosodic theory and are active in languages which are not considered typologically Semitic.

"It is my contention that in the light of recent theoretical developments, reconsideration of that unit is certainly opportune"

What is the consequence of all this?

All the participating principles and processes of Stem Modification are available within general prosodic theory and are active in languages which are not considered typologically Semitic. This, and the elimination of the

"It is my contention that in the light of recent theoretical developments, reconsideration of that unit is certainly opportune"

Wait a second…

Appraisal of Bat El's arguments

Falacy no. 1

- What Bat El 1994 proved was that in deriving a verb **from an existing word**, one must take into account that word, and not an extracted root.

- That is **not** proof that roots do not exist in verbs that are not clearly denominal.

Appraisal of Bat El's arguments

Falacy no. 1

- What Bat El 1994 proved was that in deriving a verb **from an existing word**, one must take ed
- That is **not** proof that roots do not exist in verbs that are not clearly denominal.

Still, Bat El could claim that she only has one mechanism of word-formation, while the traditional view has to have one for denominal verbs, one for deradical verbs.
We will return to this point.

Appraisal of Bat El's arguments

<u>Falacy no. 2</u>

- Consider IH-internal *ʃélet* 'sign' => *ʃilet* 'put signs', *knas* 'fine' => kanas 'to give a fine'
- For such verbs, the reasoning is circular. We explain cluster preservation with denominality, but take cluster preservation as a proof for denominality.
- (and it doesn't work)

Appraisal of Bat El's arguments

Falacy no. 3: **most important**

- Bat El claims cluster preseravation follows from Melodic Overwriting. But the assignment of the denominal verb to a verb type is **not** a consequence of Melodic Overwriting.
- The choice whether [stʁim] will go to QiTeL, hiQTiL or QaTaL **is** dependent on the best preservation of the phonology of the base

Alternative: template imposition

- A more traditional way of deriving denominal verbs simply imposes the right template on the base, and then lets **Template Satisfaction** do the rest of the work:

[faks] + hiQTiL / or / QiTeL

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~~hiQTiL~~ (will create new clusters)

[faks] + or

QiTeL

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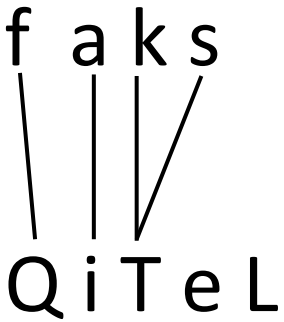

(Cluster Preservation ***is*** a principle)

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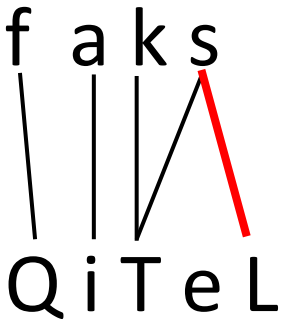

(Template Satisfaction through spreading)

Alternative: template imposition

Recall the claim that Bat El's proposal unifies the mechanisms for denominal and deradical verbs; so does Template Imposition, since the same template would be imposed on roots.

The difference will follow from the nature of the base: with only a <Q,T,L> set as a base, there is no base syllabification to adhere to. We predict distribution to be independent of phonology (correct). We also predict the simplest mapping (no clusters etc. – again correct).

Outi Bat El strikes back!!

Outi Bat El strikes back!!

- Bat El later abandoned cluster preservation as an epiphenomenon.

- But continues to ruthlessly defend a rootless view, and acquired quite a folowing.

The problem of the base

- So if there are no roots, how does one derives a non-denominal verb in Bat El's system?

- For instance, the verb *sɑtɑʁ* 'contradicted' has no base noun. The template, which we identified as a morpheme, is clearly QaTaL. What is it conjoined with to get *sɑtɑʁ*?

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Bat El's answer: nothing. The stored form is *sɑtɑʁ*. The "root" is a **residue**.

The problem of the base

- For Bat El, the morphonological complexity of *sɑtɑʁ* is misleading. Since neither QaTaL nor <s,t,ʁ> can mean anything in isolation, it is useless to say that their combination is a derivation.

- But how does one derive, say, the imperfective *jistoʁ*?

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- But how does one derive, say, the imperfective *jistoʁ*?

Bat El's answer: your favorite version of Melodic Overwriting.

Summary of the non-root view

	Nouns			**Verbs**	
a.	**k**ó**d**e**m**	‘before’	l.	**k**a**d**a**m**	‘precede’
b.	**k**i**d**u**m**	‘promotion’	m.	**k**i**d**e**m**	‘promote X’
c.	mi**kd**a**m**a	‘advance’	n.	hi**kd**i**m**	‘be/put ahead’
d.	ta**kd**i**m**	‘precedence’	o.	hit**k**a**d**e**m**	‘advance’
e.	**k**é**d**e**m**	‘antiquity’			
f.	ha**kd**a**m**a	‘prologue’		**Adjectives**	
g.	**k**a**d**íma	‘ahead!’	p.	**k**a**d**u**m**	‘ancient’
h.	**k**i**dm**a	‘progress (tech.)’	q.	**k**a**dm**on	‘prehistoric’
i.	hit**k**a**dm**ut	‘progress (proc.)’	r.	**kidm**-i	‘frontal’
j.	he**kd**e**m**	‘asap’	s.	ma**kd**i**m**	‘preparatory’
k.	**kd**a**m**-	‘pre-‘	t.	mu**kd**a**m**	‘early’

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b.					
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i.					
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All of these words have to be stored in the lexicon as full words. If the speaker makes any connection between them, it is not as “derived using the same root” but either as derived from one another, or as derived using the same set of consonants, but independently of the meaning, through homophony.

Two arguments in favor of the non-root view

past	*futur*	
ʃipeʁ	je**ʃapeʁ**	‘improve’
kipel	je**kapel**	‘fold’
viteʁ	je**vateʁ**	‘give up’
bike**ʃ**	je**v**ake**ʃ**	‘ask for’

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viteʁ	je**vateʁ**	‘give up’	**vituʁ**
bi**k**eʃ	je**v**a**k**eʃ	‘ask for’	**b**i**k**uʃ

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ki**p**e**l**	je**k**a**p**e**l**	‘fold’	**k**i**p**u**l**
vi**t**e**ʁ**	je**v**a**t**e**ʁ**	‘give up’	**v**i**t**u**ʁ**
vi**k**e**ʃ**	je**v**a**k**e**ʃ**	‘ask for’	**b**i**k**u**ʃ**, ***v**iku**ʃ**

Paradim Uniformity (PU): a pressure for inflectionally-related forms do be identical in some aspect.

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past	*futur*		*act.noun*
ʃipeʁ	je**ʃ**a**p**e**ʁ**	‘improve’	**ʃipuʁ**
ki**p**e**l**	je**k**a**p**e**l**	‘fold’	**k**i**p**u**l**
vi**t**e**ʁ**	je**v**a**t**e**ʁ**	‘give up’	**v**i**t**u**ʁ**
vi**k**e**ʃ**	je**v**a**k**e**ʃ**	‘ask for’	**b**i**k**u**ʃ**, ***v**iku**ʃ**

PU affects the realization of the root. If somehow that had access to the root, we’d expect it to affect other words derived from the root. **But there is never paradigm uniformity of roots**.

Two arguments in favor of the non-root view

Words (not CRoots) undergo semantic change (Bat-El 2001)

zarak	'to throw'	**hizrik**	'to throw'	> 'to inject'
xazar	'to return'	**xizer**	'to turn'	> 'to court'
nimlat	'to escape'	**himlit**	'to help s.o. to escape'	> 'to give birth'
avad	'to work'	**ibed**	'to process by working'	> 'to process'
kalat	'to absorb'	**hiklit**	'to cause to absorb'	> 'to record'

If somehow the root had a Semantic import, change could in priniciple affect all the forms derived from the same root. **But this never happens.**

Some criticism: Faust & Hever 2010

- If verbal forms are not derived from a root, but from a surface form, one must find that surface form. Modern Hebrew shows that it is impossible to distinguish between all sub paradigms on the basis of a single form.

Some criticism: Faust & Hever 2010

	a. Free Past	b. Past 3sg.fm.	c. Past Pre-C	d.Future	e. Infinitive	f. Present participle
a. *√krt	*karat*	*kart-*	*karat-*	*-krot*	*-krot*	*koret*
b. √kri *li-krot* 'to happen'	*kara*	*kart-*	*kari-*	*-kre*	*-krot*	*kore*
c. √krʔ *li-kro* 'to read'	*kara*	*karʔ-*	*karáː-*	*-kra*	*-kro*	*kore*
d. √krA *li-króa* 'to tear'	*kara*	*karʔ-*	*karáː-*	*-kra*	*-króa*	*koréa*

Some criticism: Faust & Hever 2010

	a. Free Past	b. Past 3sg.fm.	c. Past Pre-C	d.Future	e. Infinitive	f. Present participle
a. *√krt	*karat*	*kart-*	*karat-*	*-krot*	*-krot*	*koret*
b. √kri *li-krot* 'to happen'	*kara*	*kart-*	*kari-*	*-kre*	*-krot*	*kore*
c. √krʔ *li-kro* 'to read'	*kara*	*karʔ-*	*karáʔ-*	*-kra*	*-kro*	*kore*
d. √krA *li-króa* 'to tear'	*kara*	*karʔ-*	*karáʔ-*	*-kra*	*-króa*	*koréa*

The paradigm does not have a single entry!

Some criticism: Faust & Hever 2010

- Another criticism from the same paper also involves “weak” roots, this time in Chaha.

	perf.	imperf.	juss.	
a.	*täkäs*	*täkəs*	*təks*	‘set on fire’
b.	*zäkär*	*zägər*	*zəgär*	‘jump’
c.	*mäkär*	*mäxər*	*məxər*	‘advise’

=> “Strengthening” in the perfective

Some criticism: Faust & Hever 2010

- Strengthening affects also verbs derived from roots with unrealized radicals.

		perf.	imperf.	juss.	
a.	√b-r-s	*bä**n**äs*	*βärəs*	*bərs*	'demolish a dam'
b.	√b-r-ä	*bä**n**a*	*βära*	*bəra*	'eat'
c.	√b-x-i	*bä**k**ʸä*	*βäxʸ*	*bəxʸ*	'weep'
d.	√ä-g-r	*a**k**är*	*agər*	*(ä)gər*	'raise cattle'
e.	√0-k-s	*ä**k**äs*	*ks*	*(ä)ks*	'wait'
f.	√d-ä-r	*dar*	*där*	*dar*	'bless'
g.	√x-0-r	*xär*	*xär*	*xər*	'be, become'

Some criticism: Faust & Hever 2010

How can a process based on either the perf. or the juss. identify the second consonant?

		perf.	imperf.	juss.	
a.	√b-r-s	*bä**n**äs*	*βärəs*	*bərs*	'demolish a dam'
b.	√b-r-ä	*bä**n**a*	*βära*	*bəra*	'eat'
c.	√b-x-i	*bä**k**ʸä*	*βäxʸ*	*bəxʸ*	'weep'
d.	√ä-g-r	*a**k**är*	*agər*	*(ä)gər*	'raise cattle'
e.	√0-k-s	*ä**k**äs*	*ks*	*(ä)ks*	'wait'
f.	√d-ä-r	*dar*	*där*	*dar*	'bless'
g.	√x-0-r	*xär*	*xär*	*xər*	'be, become'

Some criticism

- The proponents of the no-root approach have never reacted to the difficulties raised by opposing authors.

- nor have they ever taken on weak roots.

- This is of course no accident. The entire rootless approach becomes extremely inelegant when it comes to account for these.

Some criticism

- Yet weak roots are an integral part of all Semitic languages…

- It may be concluded that besides the shortcomings mentioned, the rootless approach is simply not elaborate enough to evaluate.

Conclusion

- In Semitic languages, items may be grouped around tripartite sets, usually tripartite and consonantal, called “roots.”

- The question was raised late in the 20th century whether this grouping is a cognitive reality or the make-belief of linguists and dictionary-writers.

Conclusion

- Denominal verbs played a central role in the discussion, showing that one needs to take into account more than an extracted root in their case.

- But extending the analysis to regular verbs is a rash move, and is probably wrong. At least paradigms can be said to be derived from a basic discontinuous entity.

Conclusion

- Proponents of the word-based, rootless approach still claim that the root is “too abstract” and is too underspecified (semantically) to justify storage.

- In the next class we’ll see that abstraction is a necessary ingredient of any account of Semitic Morpho-phonology.

Issues in non-concatenative morpho-phonology

OCP, biradicals and correspondence

Introduction: McCarthy 1981

- Greenberg (1978) noted that in Arabic and Hebrew, There are many QTT verbs but almost no QQT ones:

<u>Israeli Hebrew</u>

QQT		QQT
gaʁaʁ	‘drag’	*ʁaʁag
χaʃaʃ	‘dread’	*ʃaʃaχ
χakak	‘carve’	*kakaʃ

Introduction: McCarthy 1981

- McCarthy sought the reason for this lacuna. First, he assumed that QTT and QQT are not possible representations at the root level:

  gamaʁ => √gmʁ but

  gaʁaʁ => √gʁ, a **biradical** root

(11) *Obligatory Contour Principle* (revised)
A grammar is less highly valued to the extent that it contains representations in which there are adjacent identical elements on any autosegmental tier.

Introduction: McCarthy 1981

- Given
  - a root √gʁ
  - a left-to-right mapping of root to template
  - Template satisfaction (no empty pos.)

…one derives only the attested pattern:

triradical root

√g m ʁ

C a C a C

biradical root

√g ʁ

C a C a C

Introduction: McCarthy 1981

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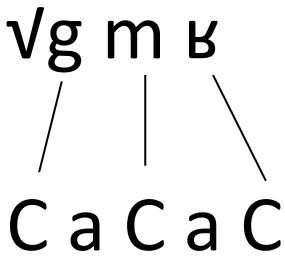
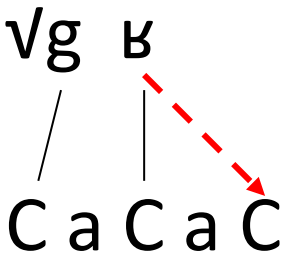


biradical root



Introduction: McCarthy 1981

- This is again an “abstract” view of root to template morphology, because it is not WYHIWYG:

- The root might sometimes be not identical to what its surface realization is.

The opposition

- McCarthy's OCP analysis has become extremey inluential, and also raised objections
- From more traditional scholars, such as Gideon Goldenberg, who denied the synchronic validity of biradicals and the OCP
- And from more empiricist linguists like Bat El, who deny the necessity of the root, which they deem too abstract.

Today

- We will start by revising McCarthy's original proposal to some extent.
- We will then examine Goldengerbg's objections and Lowenstamm's 2010 response to them.
- And we will look at Bat El's 2006 way of doing the OCP, typical of OT's way of doing Semitic Morphology

Biradicals revisited

- Consider the following triplets from Hebrew:

a.	χanak	χanan	χana
	‘strangle’	‘pardon’	‘park’
b.	kalat	kalal	kala
	‘recieve’	‘include’	‘roast’
c.	ʃalat	ʃalal	ʃala
	‘reign’	‘negate’	‘fish out’

The difference between biradicals and weak-final verbs must be stated lexically.

Biradicals revisited

- Consider the following triplets from Hebrew:

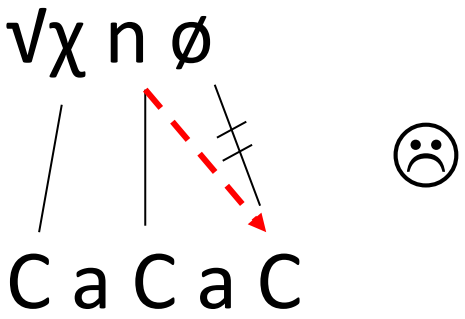
a. χanak	χanan	√χn	χana	√χnø
‘strangle’	‘pardon’		‘park’	
b. kalat	kalal	√kl	kala	√klø
‘recieve’	‘include’		‘roast’	
c. ʃalat	ʃalal	√ʃl	ʃala	√ʃlø
‘reign’	‘negate’		‘fish out’	

It must be stated somhow that in weak-final roots, the second consonant is not the last one

Biradicals revisited

- Still, when the last radical is ø, what prevents the propagation of the second root C?

weak-final root



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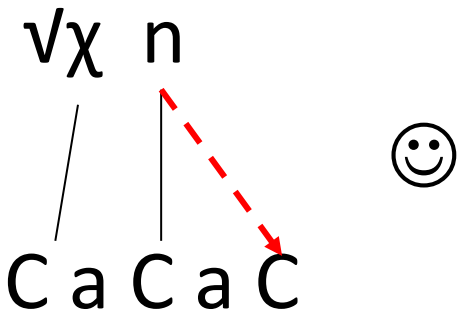
biradical root



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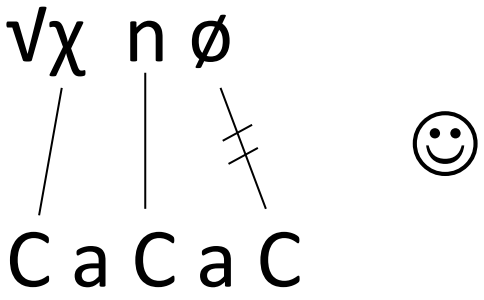
Biradicals revisited: edge-in association

- Yip (1988) and Buckley (1990) propose that templates are satisfied from the edge in. Spreading is only ever leftwards:

weak-final root



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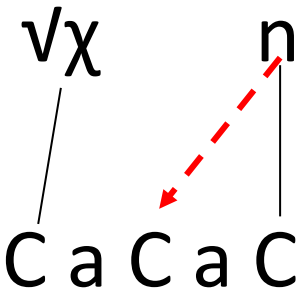
biradical root



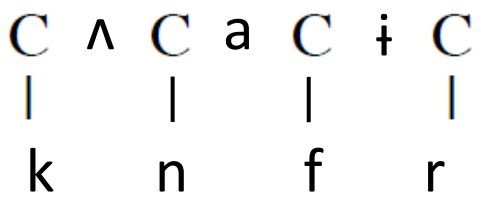
Biradicals revisited: edge-in association

- More evidence, from Tigrinya (Buckley 1990):

(1)

root	*singular*	*plural*	*gloss*
{knfr}	kʌnfʌr	kʌnafɨr	'lip'
{mndl}	mʌndʌl	mʌnadɨl	'chisel'
{kl̠sm}	kɨl̠sɨm	kʌlaš̠ɨm	'arm'

(3) *Anchoring*



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{kl̡sm}	kɨl̡sɨm	kʌla$̀$ɨm	'arm'

(2)

{tmn}	tʌmʌn	tʌmamɨn	'snake'
{grb}	gʌrʌb	gʌrarɨb	'bush'

(3)

Anchoring

C V C V C V C
| |
t m n

Filling

C V C V C V C
| \ / |
t m n

Goldenberg (1994) vs. Biradicals

- An expert of Semitic Languages, Gideon Goldenberg (1930-2013) criticized McCarthy for three things:

  1) Representation: “little more that a modest contribution to the graphic arts”

  2) The OCP: “many counter-examples in Ethio-Semitic”

  3) Biradicality: “etymon, not root”

Goldenberg (1994) vs. Biradicals

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syllabicity may change within inflection (IH *yixt**e**vu* ‘they will write’ but *ya’a**vd**u* ‘they will work’; Paelstinian *yi**kt**eb* ‘that he write’, yik**i**tbu ‘that they write’).

  3) Biradicality: “etymon, not root

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  2) The OCP: "many counter-examples in Ethio-Semitic"

  3) Biradicality: "etymon, not root"

Not active synchonically, e.g. *bear* – *born* in English. What **is** active synchronically are **triradical** roots in which R_2=R_3.

Lowenstamm (2010) for Biradicals

- Lowenstamm's nicest counter arguments come from Ethio-Semitic Chaha.

<u>Chaha floating palatalisation (McCarthy 1983)</u>

	2nd**m**sg imperative	2nd**fm**s imperative	
a.	dɨmd	dɨmd^{y}	'assemble'
b.	nɨgɨf	nɨg^{y}ɨf	'fall'
c.	dɨgɨs	dɨgɨs^{y}, *dɨg^{y}ɨs^{y}	'entertain'
d.	sɨrəf	sɨref, *s^{y}rəf	'fear'

palatalization anchors onto rightmost palatalizable C, goes only as far as the penultimate R.

Lowenstamm (2010) for Biradicals

Chaha floating palatalisation (McCarthy 1983)

	2nd**m**sg imperative	2nd**fm**s imperative	
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d.	sɨrəf	sɨref, *syrəf	‘fear’
e.	sɨdɨd	sɨd^{y}ɨd^{y}	‘drive cattle’
f.	nɨzɨz	nɨz^{y}ɨz^{y}	‘dream’
g.	*k^{ʔ}ɨfɨf*	*k^{ʔy}ɨfɨf*	‘clip’

Lowenstamm (2010) for Biradicals

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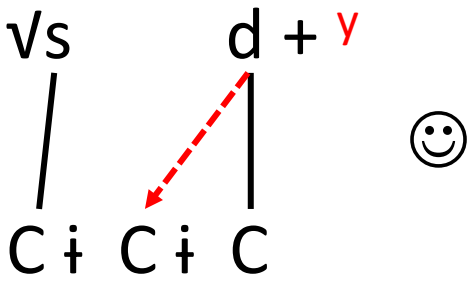
g.	*k^{ʔ}ɨfɨf*	*k^{ʔy}ɨfɨf*	‘clip’

How come palatalization does stop at the last consonant in (a,c) and gets to the first one in (g)?

Lowenstamm (2010) for Biradicals

The distribution actually follows from the biradical analysis!



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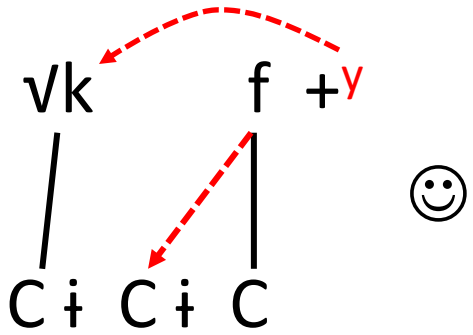

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If these roots were √sdd and √kff, there would be no reasons for this distribution of the palatal melody.

Lowenstamm (2010) for Biradicals

- Goldenberg's 2nd argument was the mere existence of QQT verbs in Ethiopic. Lowenstamm examines their distribution in Chaha..

Chaha verbal system

Type	perfective	Jussive	Jussive vocalization	
A_1	*kətəfə*	*yəkĭtĭf*	<ĭ,ĭ>	'chop meat'
A_2	*sənəxə*	*yəsĭrəx*	<ĭ,ə>	'be impure'
B	*q^{w}əmərə*	*yəq^{w}əmĭr*	<ə,ĭ>	'become strong'
	sĭrəpətə	*yəsəmbĭt*	<ə,ĭ>	'take a sabbatical'
C	*č'af^{w}ərə*	*yəč'af^{w}ĭr*	<a,ĭ>	'scratch'

Lowenstamm (2010) for Biradicals

- Goldenberg's 2nd argument was the mere existence of QQT verbs in Ethiopic. Lowenstamm examines their distribution.

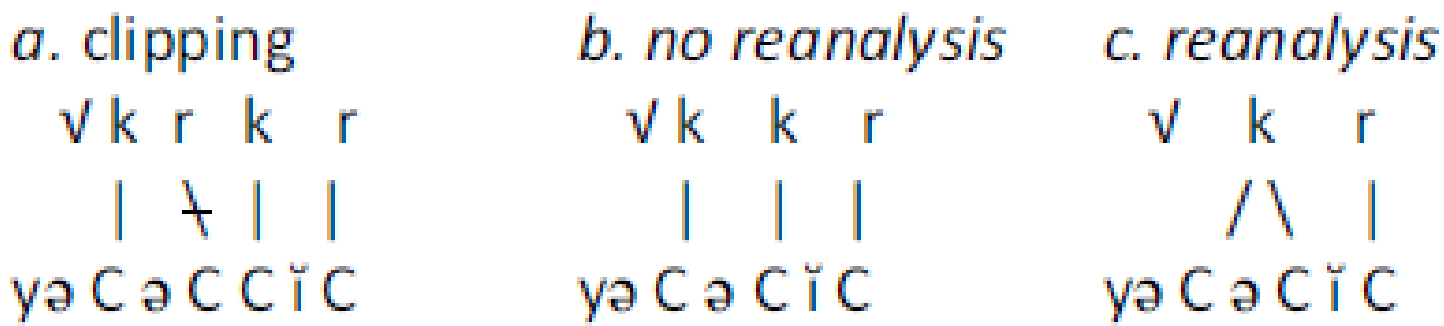
Distribution of QQT and QTT in the Chaha verbal system

Type		Jussive	Jussive vocalization	
A_1	*QTT*	*yəgĭmĭm*	<ĭ,ĭ>	'chip'
	QQT			
A_2	*QTT*	*yəfĭzəz*	<ĭ,ə>	'surpass'
	QQT			
B	*QTT*	*yəm^{w}ətĭt*	<ə,ĭ>	'coax'
	QQT	*yəkəkĭr*	<ə,ĭ>	'hug'
C	*QTT*	*yəbazĭz*	<a,ĭ>	'feel lonely'
	QQT	*yəq^{w}aq^{w}ĭs*	<a,ĭ>	'become burnt'

Lowenstamm (2010) for Biradicals

- Quadriradicals also never appear in Type A. Banksira (2000) makes the analogy: these QQT roots are quadriradicals

QQT are the result of fully reduplicated, clipped biradicals



Note that otherwise, their absence from type A is completely mysterious

Lowenstamm (2010) for Biradicals

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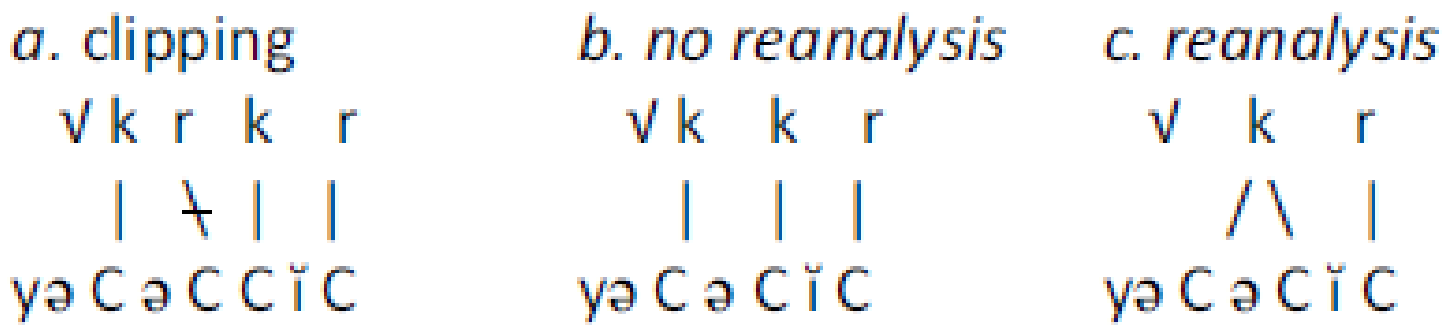

Still, (b) is a **derived** violation of the OCP. We have to show that the correct representation is (c).

Lowenstamm (2010) for Biradicals

Chaha floating Paltalization as a marker of Type B

	imperfective	Jussive	
a.	yĭsʸəkĭt	yəsəkĭt, *yəsʸəkĭt	‘fix’
b.	yĭməkʸĭr	yəməkĭr, yəsəkʸĭr	‘burn’
c.	*yĭsʸəkʸĭt		

The first radical is palatalized; if this can’t be, the second is. But never both.

Lowenstamm (2010) for Biradicals

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c.	*yĭsʸəkʸĭt		
a.	yĭkʸəkʸĭr	yəkəkĭr	‘be hugged **(3rd ms)**’

Lowenstamm (2010) for Biradicals

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a.	yĭsʸəkĭt	yəsəkĭt, *yəsʸəkĭt	‘fix’
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c.	*yĭsʸəkʸĭt		
a.	yĭkʸəkʸĭr	yəkəkĭr	‘be hugged **(3rd ms)**’

Only the analysis in (c), which does not involve an OCP violation, works

b. no reanalysis

√ k^y k r

| | | |

yə C ə C ĭ C

c. reanalysis

√ k^y r

/ \ |

yə C ə C ĭ C

Interim summary

- biradical roots are alive and well: roots of the type QTT are never primitive, always reduceable to bipartite sets QT.

- All cases of QQT have a story about them. In Ethio-Semitic, they are clipped reduplicated biradicals. As we return to Bat El's take on biradical's, we'll see another such story

Bat EL (2006): reduplication without biradicals?

- Bat El claims that roots do not play any role in Semitic Morphology. The basic unit for her is the ***stem***.

- In order to account for the effects we have seen, Bat El needs to show why, for speakers, a stem like QiTeT behaves as if it were derived from a smaller unit QT.

Bat EL (2006): reduplication without biradicals?

- Bat El fully endorses the OCP

(11) *Obligatory Contour Principle* (revised)
A grammar is less highly valued to the extent that it contains representations in which there are adjacent identical elements on any autosegmental tier.

- This means, that given two adjacent segments, speakers will want to assume that they are one:

Speaker hears	*speaker understands*
χitet	$\chi_1 i t_2 e t_2$ rather than $\chi_1 i t_2 e t_3$

Bat EL (2006): reduplication without biradicals?

- Following Correspondence Theory Bat El proposes the following constraints:

SURFACE CORRESPONDENCE BY IDENTITY (SCORRI)

If S is a stem,
C_x & $C_y \in$ S, and
C_x & C_y are identical,
Then C_x & C_y are correspondents.

Bat EL (2006): reduplication without biradicals?

- Following Correspondence Theory Bat El proposes the following constraints:

SURFACE CORRESPONDENCE BY POSITION (SCORRP)

If S is a stem,
C_x & $C_y \in$ S,
C_x & C_y are identical, and
C_x & C_y are at the right edges of the domains,
Then C_x & C_y are correspondents.

Bat EL (2006): reduplication without biradicals?

- For a stem to be percieved as having been achieved by reduplication, its domain edges must be wider than those of its base:

a. The domain structure of a reduplicated stem: $[\{ \ldots \}_{\text{Base}} \ldots]_{\text{Stem}}$
b. The domain structure of a nonreduplicated stem: $[\{ \ldots \}_{\text{Base}}]_{\text{Stem}}$

Bat EL (2006): reduplication without biradicals?

right edge of the base

right edge of the stem

kided	SCorrP	SCorrI
a. ☞ [{k_1id_2}ed_{2C}]		
b. [{$k_1id_{2C}ed_2$}]	*!	
c. [{$k_1id_2ed_3$}]		*!

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Bat El thus endorses the view that the second of the two identical C's is the copy, a view analogous to left-to-right, rather than edge-in association

Bat EL (2006): reduplication without biradicals?

right edge of the base

right edge of the stem

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a. ☞ [{k_1id_2}ed_{2C}]		
b. [{$k_1id_{2C}ed_2$}]	*!	
c. [{$k_1id_2ed_3$}]		*!

The analysis derives the existence of a base that is smaller than the stem in these cases, without the need to assume a root.

Bat EL (2006): reduplication without biradicals?

right edge of the base

right edge of the stem

kided	SCorrP	SCorrI
a. ☞ [{k_1id_2}ed_{2C}]		
b. [{$k_1id_{2C}ed_2$}]	*!	
c. [{$k_1id_2ed_3$}]		*!

But in practice, there is very little difference: Bat El says that for any stem QvTvT, there is a base which includes <Q,T>. **Why not call it by its name?**

QQT in Israeli Hebrew

- Israeli Hebrew, like Ethio-Semitic, has a handful of violations of the OCP. They are:

mimen	‘fund’
mimeʃ	‘realize’
gigel	‘google’
dida	‘limp’

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because there are only four such verbs, it is tempting to write them off as exceptions. But the grammar *should* allow for them…

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- Israeli Hebrew, like Ethio-Semitic, has a handful of violations of the OCP. They are:

mimen	‘fund’	<= mamon ‘capital’
mimeʃ	‘realize’	<= mamaʃ ‘real(ly)’
gigel	‘google’	<= gúgel ‘google’
dida	‘limp’	<= onomathopea

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Recall our prinicple of faithfulness to the base in denominal verbs: one may simply say that here the synchronic existence of a base allows the violation of the OCP.

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mimen	'fund'	<=	mamon 'capital'
mimeʃ	'realize'	<=	mamaʃ 'real(ly)'
gigel	'google'	<=	gúgel 'google'

But what if the base falls out of use, or becomes extremely rare (actually, *mamon* is aready a lot rarer than *mimen*…)?

Recall our principle of faithfulness to the base in denominal verbs: one may simply say that here the synchronic existence of a base allows the violation of the OCP.

QQT in Israeli Hebrew

- Recall that the OCP is not an absolute principle. It may yield to pressure.
- Bat El needs to show that independently of the existence of a base, a sequence QQT is **not** percieved as a case of reduplication.

But what if the base falls out of use, or becomes extremely rare (actually, *mamon* is aready a lot rarer than *mimen…*)?

Recall our principle of faithfulness to the base in denominal verbs: one may simply say that here the synchronic existence of a base allows the violation of the OCP.

QQT in Israeli Hebrew

not at the edge of **any** domain

mimen	SCorrP	SCorrI
a. $[m_1Ci\{m_1en_2\}]$	*!	
b. $[\{m_1im_1Cen_2\}]$	*!	
c. ☞ $[\{m_1im_2en_3\}]$		*

QQT in Israeli Hebrew

not the right edge of the stem

not the right edge of the base

mimen	SCorrP	SCorrI
a. [m_1Ci{m_1en_2}]	*!	
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c. ☞ [{$m_1im_2en_3$}]		*

QQT in Israeli Hebrew

Wait a second…

not the right edge of the stem

not the right edge of the base

mimen	SCorrP	SCorrI
a. $[m_1Ci\{m_1en_2\}]$	*!	
b. $[\{m_1im_1Cen_2\}]$	*!	
c. ☞ $[\{m_1im_2en_3\}]$		*

Bat EL (2006): reduplication without biradicals?

- Following Correspondence Theory Bat El proposes the following constraints:

SURFACE CORRESPONDENCE BY POSITION (SCORRP)

If S is a stem,
C_x & $C_y \in$ S,
C_x & C_y are identical, and
C_x & C_y are at the right edges of the domains,
Then C_x & C_y are correspondents.

Bat EL (2006): reduplication without biradicals?

Why not have a similar constraint for the left edge?!! In that case, *mimen* would be the prefered throughout Semitic, and we wouldn't find any *kided*. But all Semitic languages behave identically in this respect.

C_x & C_y ⊆ S,
C_x & C_y are identical, and
C_x & C_y are at the right edges of the domains,
Then C_x & C_y are correspondents.

Bat EL (2006): reduplication without biradicals?

- Bat El's response (p.c.) is that this is a difference between Templatic reduplication (reduplication driven by Template Satisfaction), and extra-templatic reduplication, e.g.

<u>Israeli Hebrew</u>

tipa 'drop/ a bit'	tip-tipa 'a little bit'
géver 'man'	gev-gever 'a ***<u>man</u>*** '

Bat EL (2006): reduplication without biradicals?

- Templatic Reduplication maintains the base on the left, whereas extra-templatic reduplication tends to prefix the reduplicated part.

Israeli Hebrew

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OK. But why?

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Bat EL (2006): reduplication without biradicals?

- Templatic Reduplication maintains the base on the left, whereas extra-templatic reduplication tends to prefix the reduplicated part.

OK. But why?

Edge-in association derives exactly that. But Bat El seems to endore rightwards spreading:

☞ $[\{k_1 id_2\} ed_{2C}]$

Bat EL (2006): reduplication without biradicals?

- Regardless of that, in OT the main issue is *not* the constraints used, but the prediction for typology: any ranking of the constraints will in principle yield a possible language. But consider what will happen if SCORRP and SCORRI were inverted:

mimen	SCORRI	SCORRP
☞ $[m_1Ci\{m_1en_2\}]$		*
☞ $[\{m_1im_1Cen_2\}]$		*
$[\{m_1im_2en_3\}]$	*!	

Bat EL (2006): reduplication without biradicals?

- Bat El has to say that her ranking is universal. This is another problem, if only because, as we have seen, non-templatic reduplication tends to be prefixal.

possible language. But consider what will happen if SCORRP and SCORRI were inverted:

mimen	SCORRI	SCORRP
☞ [$m_1Ci\{m_1en_2\}$]		*
☞ [$\{m_1im_1Cen_2\}$]		*
[$\{m_1im_2en_3\}$]	*!	

summary

- Roots with two consonants seem to support the root-and-templat hypothesis. They fly in the face of claims as to the undesirable abstractness of the root.

- McCarthy (1981) claimed that these roots illustrate a universal (cognitive) tendency against assuming multiple origins for adjacent identical specimens.

- His argument relied crucially on the root level – on the surface the consonants are usually separated.

summary

- McCarthy's analysis involved left-to-right mapping, which might need to be revised into edge-in mapping; but it remains a very solid and influential analysis.

- Goldenberg attempted to ridiculize the achievement of autosegmental representations and the OCP.

- But Lowenstamm showed that biradicals and the OCP are alive and well in exactly the same languages that Goldenberg claimed pose a problem for this view.

Summary

- Bat El, working in a root-less approach, attempted to derive the obvious correspondence between the two identical surface consonants without assuming an « abstract » root.

- But in the end, she must appeal to a “base” that is smaller than the stem and comprises of only the first two consonants. How different is this view from one that accepts a level of representation with a biradical root?

Anticipation

- The same tendencies will be apparent in the next lecture, when we examine another contested notion of Semitic –

The template

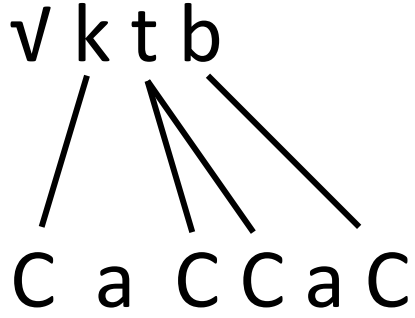
Issues in non-concatenative morpho-phonology

The template

Template

- « A fixed syllabic space »
- Must be satisifed/filled (triggers redup.)

McCarthy:



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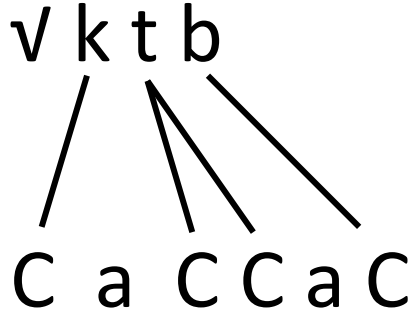


The template is composed of Cs ad Vs

Today

- Problems with this initial representation
- The CVCV solution of Lowenstamm (1996)
- The challenge of IH *ʔibstʁekt* ‘make abstract’ and the non-skeletal templates of OT
- The challenge of reduplication and the proposal in Faust (2015).

Problematizing the template

	sg	*pl*	
Palestinian	jɪ**ktɪb**	jɪ**kɪtb**u	‘write’
	jʊ**tˁlʊb**	jʊ**tˁʊlb**u	‘ask’
	jɪ**fta**ħ	jɪ**fta**ħu	‘open’
Israeli Hebrew	ja**χ**ʃo**v**	ja**χ**ʃe**v**u	‘think’
	ja**ʔav**o**d**	ja**ʔav**du	‘work’

Goldenberg’s objection: if templates were Cs and Vs then the alternating cases have to have different templates – not likely!

Problematizing the template

	sg	*pl*	
Israeli Hebrew	ja**ʔ**a**v**o**d**	ja**ʔ**a**vd**u	‘work’
	CVCV**C**	CV**CC**	

Goldenberg’s objection: if templates were Cs and Vs then the alternating cases have to have different templates – not likely!

Problematizing the template

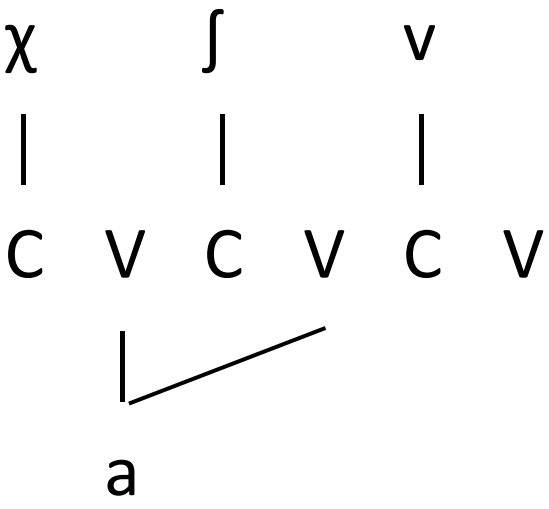
	sg	*pl*	
Israeli Hebrew	j**ɪktɪb**	j**ɪkɪtb** u	‘write’
	CC**V**C	C**V**CC	

Goldenberg’s objection: if templates were Cs and Vs then the alternating cases have to have different templates – not likely!

Lowenstamm (1996): CV as the only « syllable »

- There is only one unit in the skeletal tier: a CV unit.

[χaʃav] ‘he thought’



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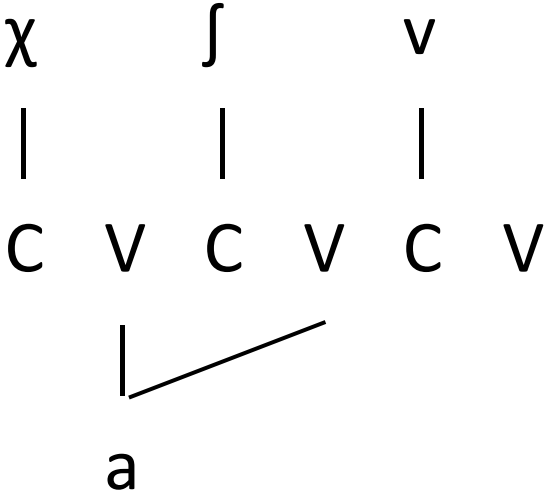
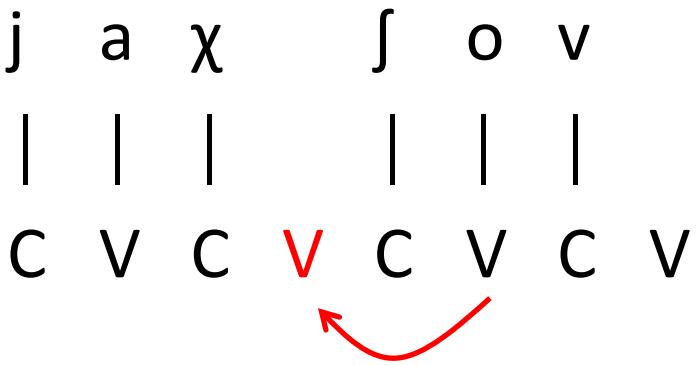


Final Empty Nucleus (FEN) allowed as a parameter (common to CVCV and Government Phonlogy, Kaye et al. 1985, 1990)

Lowenstamm (1996): CV as the only « syllable »

- Unassociated Vs are silenced by **Governement**

[jaχʃov] ‘he’ll think’



Lowenstamm (1996): CV as the only « syllable »

Recall	ja**χʃo**v	ja**χʃe**vu	‘think’
compare to	ji**ʦo**ʁ	ji**ʦ**ʁu	‘createè

=> The /o/ is absent from the plural

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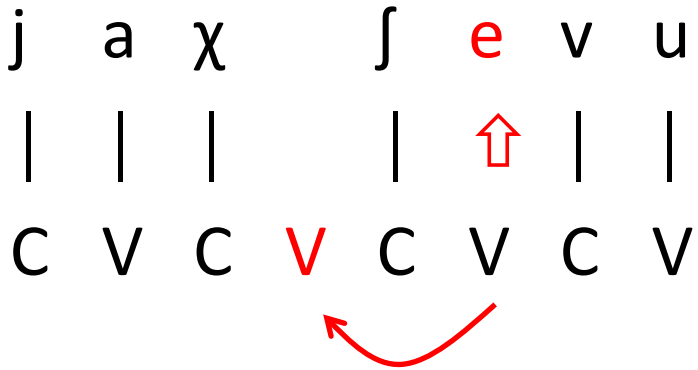
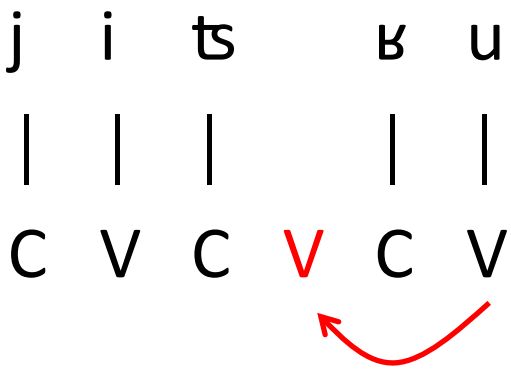


Position has a job to do, realized



Position out of a job, governed, unrealized

Lowenstamm (1996): CV as the only « syllable »

Recall	ja**χʃ**o**v**	ja**χʃ**e**v**u	‘think’
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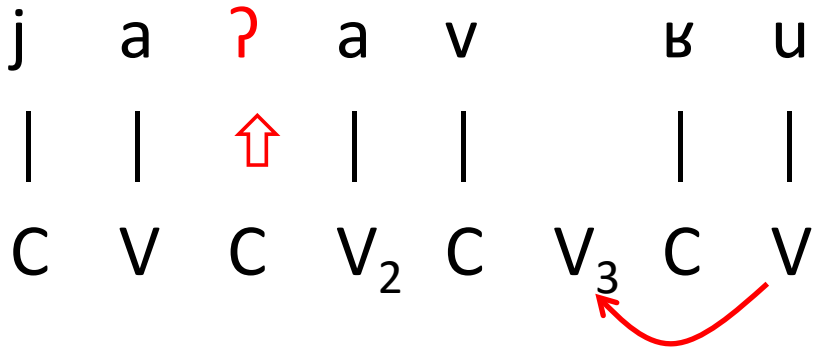

V_3 “out of a job”, governed, silenced

Lowenstamm (1996): CV as the only « syllable »

Palestinian	jɪ**ktɪb**	jɪ**kɪtb**u	‘write’
	jʊ**tˁlʊb**	jʊ**tˁʊlb**u	‘ask’

=> vowel is not exclusive to alternating position, floating

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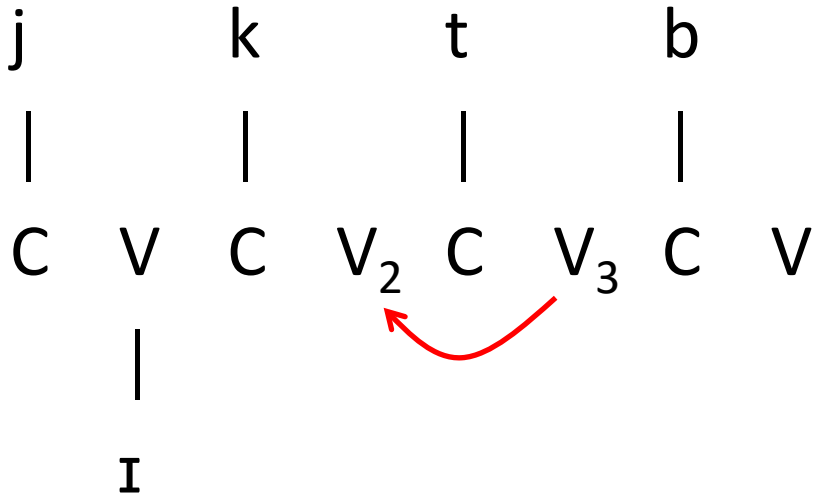

V_3 empty and ungoverned, attracts melody.

Lowenstamm (1996): CV as the only « syllable »

Palestinian	j**ɪktɪb**	j**ɪkɪtb**u	‘write’
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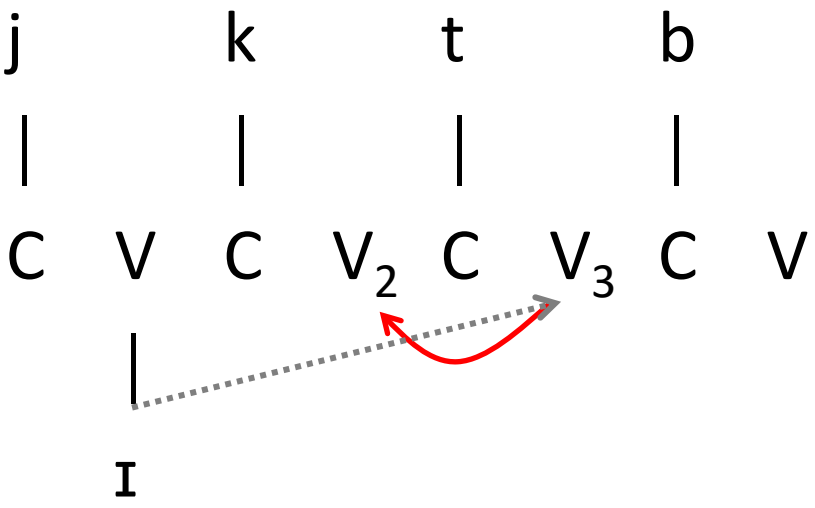

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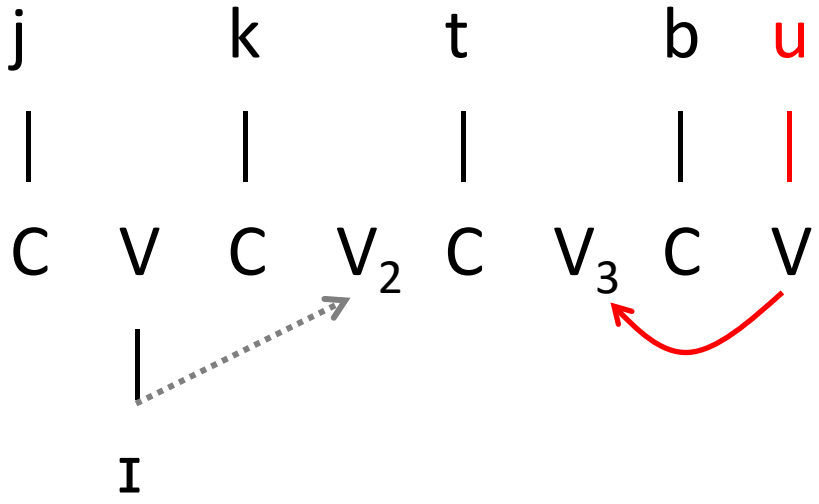

V_3 empty and governed, V_2 becomes ungoverned, attracts melody.

Lowenstamm (1996): CV as the only « syllable »

Palestinian	jɪ**k**t**ɪ**b	jɪ**k**ɪt**b**u	‘write’
	jɪ**ft**a**ħ**	ji**ft**a**ħ**u	‘open’

=> vowel *is* exclusive to position, does not float

Lowenstamm (1996): CV as the only « syllable »

Palestinian	jɪktɪb	jɪkɪtbu	‘write’
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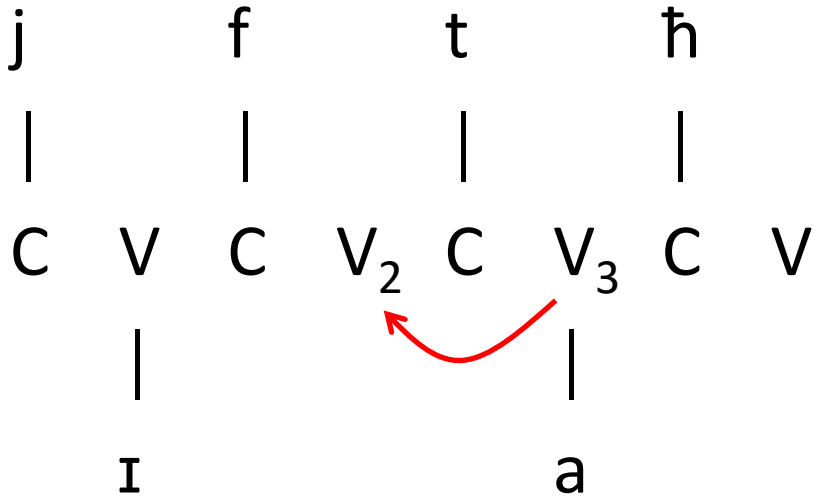
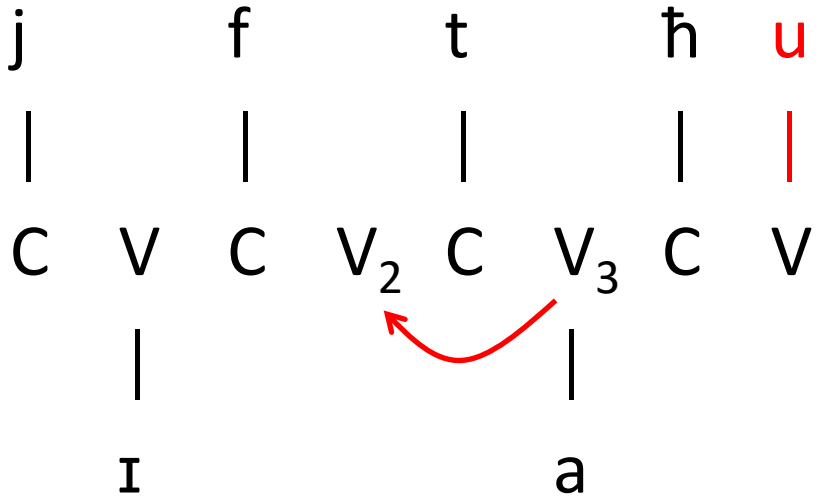


V_3 not empty, governs V_2
other melody not needed.

Lowenstamm (1996): CV as the only « syllable »

Palestinian	jɪktɪb	jɪkɪtbu	‘write’
	jɪftaħ	ji**ftaħ**u	‘open’

=> vowel *is* exclusive to position, does *not* float



Same configuration, nothing changes.

Interim Summary

- The CVCV approach to templates lives up to Goldenberg's challenge based on principles independently necessary elsewhere.

- By restricting the skeletal unit to one type, the CV unit, alternations in syllabification are not longer viewed as using different templates.

Back to denominal verbs in IH

- Both the CVCV approach and the templates of McCarthy predetermine the number of consonants in the stem.

- This was not carried over into later work in OT. In accordance with the general dismissal of representations, accounts such Ussishkin (2000) reduce the template to its vowels

“Root-and-template morphology without roots and templates”

Ussishkin (2000)

IH

gadal ‘grow (intr)’ => gidel ‘grow (trns)’

(ii) gadal+i e	FtBin	OO-Max-V
a. [gi][dela]	*!	*
b. [gadile]	*!	*
☞ c. [gidel]		**

Assuming priority for the realization of affix vowel over those of the base…

THE FATE OF THE CONSONANTAL ROOT AND THE BINYAN IN OPTIMALITY THEORY

Bat El (2003)

IH

gadal ‘grow (intr)’ => gidel ‘grow (trns)’

gadal-B4	WORDMIN	VP4{ie}	IDENTV
a. gadal		*!	
b. igadale	*!		
c. ☞ gidel			**

Morpheme realization constraint

Denominals

- A major advantage of the vowel-only view of templates is denominal verbs.

a. [ʔábstʁakt] => [le-**ʔa**b**stʁ**é**kt**] ‘make abstract’

b. [hípster] => [le-hit-ha**pst**é**ʁ**] ‘go hipsteʁ’

c. [ʔíndeks] => [le-**ʔa**n**d**é**ks**] ‘index’

d. [stʁiptíz] => [le-**stʁ**a**pt**é**z**] ‘strip-tease’

e. [stʁíming] => [le-ha-**stʁ**í**m**] ‘stream’

f. [χantaʁíʃ] => [le-**χ**a**ntʁ**é**ʃ**] ‘talk nonsense’

Denominals

- Given 1. [ʔabstʁakt]

2. the melody <i,e>,

it is easy to derive [ʔibstʁekt], whether by Melodic Overwriting or as in the previous slides.

Denominals

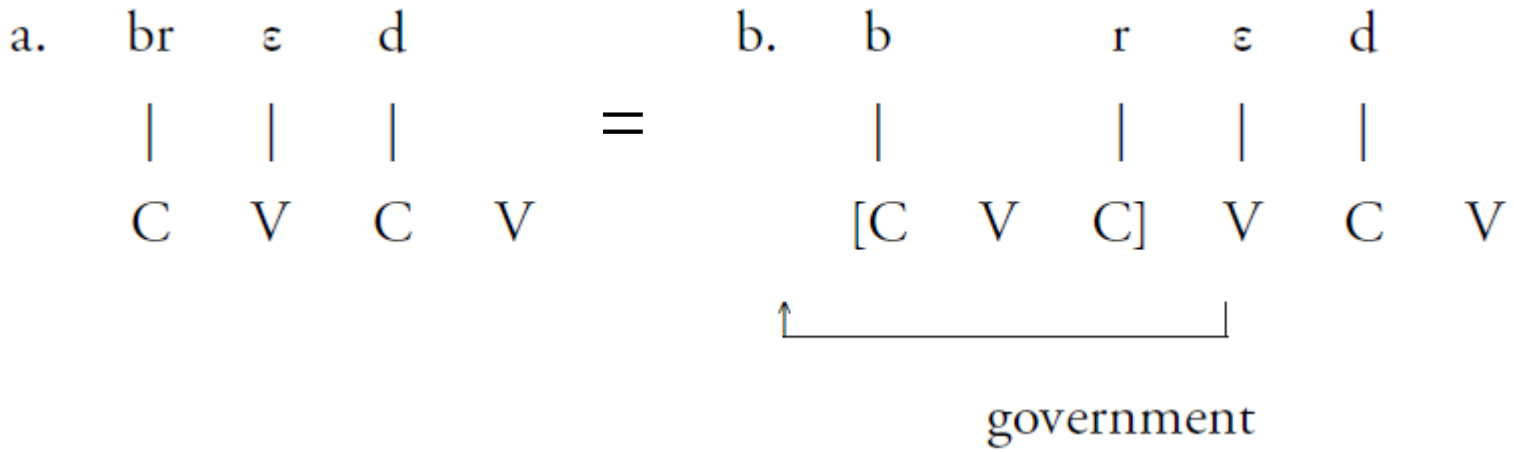
- But given [ʔabstʁakt],
  a melody <i,e>
  and a CVCVCVCV skeleton
  (the maximal domain for native verbs)

all other things being equal, we expect the derivation to crash – there is simply not enough room for all the consonants.

=> this prediction, we saw, is wrong.

Denominals

- There might be a way out. Within CVCV and GP, some sequences of consonants are condsider as a **closed domain**.



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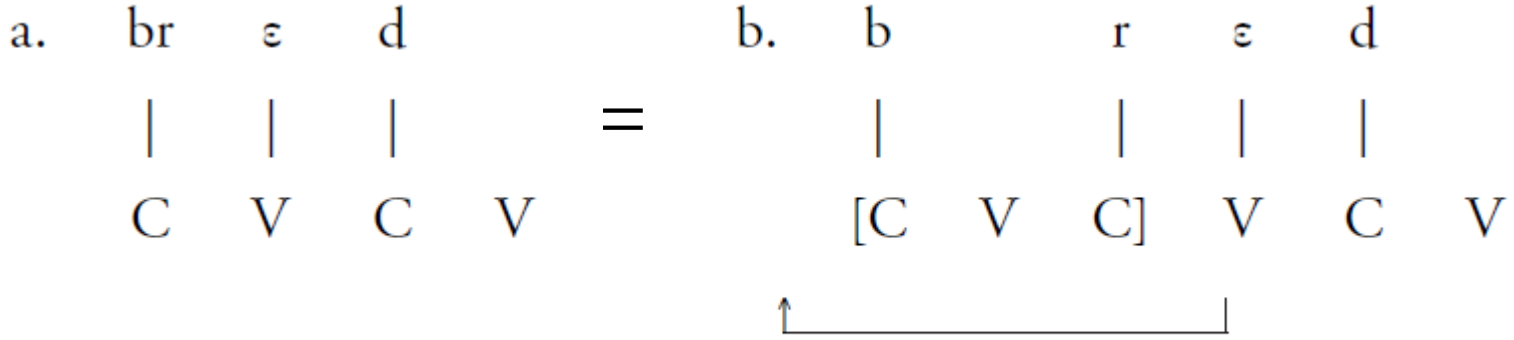
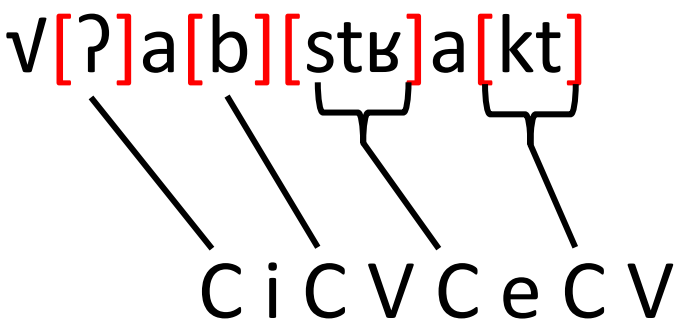


[s]-initial clusters and final clusters can be viewed on a par, as domains

Denominals

- If so, it can be proposed that every C in the template can be expanded insofar as it remains a single domain



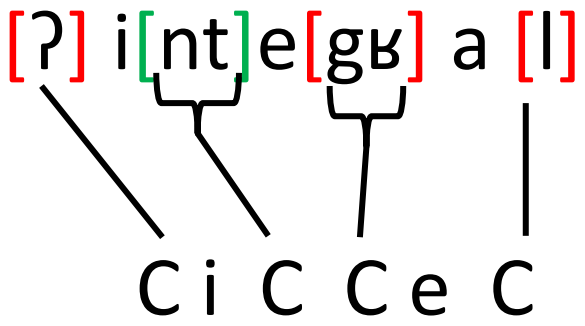
Denominals

- Although this weakens somewhat the autosegmental analysis, it does make an interesting perdiction:

Since internal codas allow only for one consonant, denominals which yield biconsonantal internal codas should crash

Denominals

- Such scenarios have to be invented, which can serve as confirmation for the proposal.
- Consider [ʔintegral]. Outside CVCV, the verb should be [ʔintgrel], because [nt] is a legitimate word-final coda cluster in IH, and [gr] is a legitimate onset cluster.



Denominals

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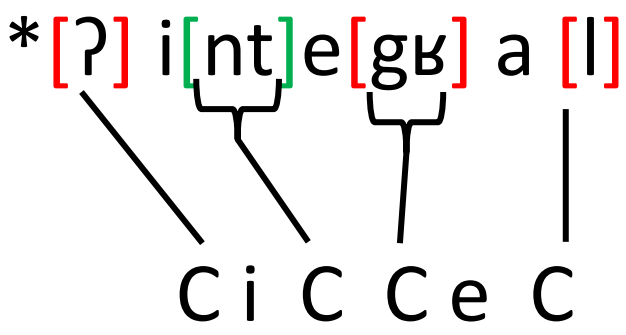
- Consider [ʔintegral]. Outside CVCV, the verb should be [ʔintgrel], because [nt] is a legitimate word-final coda cluster in IH, and [gr] is a legitimate onset cluster.

But this verb is not acceptable, becaue [nt] is not a possible domain word-internally



Biradicals and weak verbs

- Another point in favor of a theory with real templates, rather than only the vowels, comes from biradicals and weak verbs. Recall IH:

a. χanak	χanan	√χn	χana	√χnø
‘strangle’	‘pardon’		‘park’	
b. kalat	kalal	√kl	kala	√klø
‘recieve’	‘include’		‘roast’	

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‘recieve’	‘include’		‘roast’	

If the template here were only <a,a> what would motivate reduplication in biradicals but not in weak-final?

Evidence from Tashlhiyt Berber

The template uQTiL derives As and Ns from verbs (Dell & Elmdlaoui 1992):

base	*uQTiL*	
krs	ukris	'tie in a bundle/trousseau'
lmmus	ulmis	'be bland/ something bland'
mllul	umlil	'be white/ white'
ɣzzif	uɣzif	'be long/ long'
kk^{w}im	ukkim	'to strike/a blow'
!gzz	!ugziz	'to cruch/ mouthful'

Evidence from Tashlhiyt Berber

D&E show that *there are only three positions* in the template: if geminates from the base can be transfered, they are, but sometimes they can't be.

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The template cannot be reduced to its vowels; one has to specify positions that must harbor one and only one consonant.

Evidence from Qaraqosh Neo-Aramaic

Khan (2002)

Type	Past stem	Present stem	Gloss
I	qlib	qaləb	‘turn over’
II	muqlib	maqləb	‘cause to turn over’
III	mqudim	mqadəm	‘present, propose’

- The present stem of all three types has the same vocalization.

- but its appearance after the *m* or after R_1 is unpredictable through the application of the melody alone

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(Note in addition that types II is nearly always the causative of type I. Yet it is the unrelated type III that has the same syllabic structure as type I)

Interim Summary II

- Although in some data sets from some languages, representing the template as a simple vowel set is sufficient, in other cases it is crucially insufficient.

- The template, as in lexically and arbitrarily C and V positions, is an indispensable tool in the analysis of non-concatenative phenomena.

The challenge of reduplication

Consider again the data from reduplication in IH:

	Type I		Type II	
a.	*šamar*	'to keep'	*šimer*	'to preserve'
	gadal	'to grow'	*gidel*	'to cultivate'
	xašav	'to think	*xišev*	'to calculate'
b.	*laxaš*	'to whisper'	*lixšeš*	'to whisper repeatedly'
	caxak	'to laugh'	*cixkek*	'to giggle'
	(ʕ)akac	'to sting'	*(ʕ)ikcec*	'to sting lightly in many places'

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Whether the template is just <i,e> or CVCVCV with potential expansion, it is impossible to **predict** reduplication; i.e. given that template and the root/base, the mapping is partially arbitrary.

The challenge of reduplication

- A base with two consonants gives partial **or** full reduplication in this verbal type

a.	*mila*	'word, n.'	*milmel*	'to mumble'
	daf	'sheet of paper, n.'	*difdef*	'to leaf through (a book)'
	zaping	'switching channels repeatedly'	*zipzep*	'to switch channels repeatedly'
b.	*likek*	'to lick'	*liklek*	'to lick repeatedly'
	mišeš	'to feel, grope'	*mišmeš*	'to feel, grope repeatedly'
	dilel	'to dilute (trns.)'	*dildel*	'to thin down over a period'

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(b) Is especially telling : the same biradical root can appear with the same vocalization, but with two patterns of reduplication. Again- it is not enough to know the root and the template.

The challenge of reduplication

- A base with two consonants gives partial **or** full reduplication in this verbal type

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(let us note that two options exist only for biradical roots. A reduplicated triradical, in contrast, is always QiTLeL, never QiTLeTL, QTiLQTeL or anything like that)

The challenge of reduplication

- What is the extra piece of information required for the speaker to derive the reduplicated mapping?

Bat El takes up the challenge of reduplication

Bat El (2006) proposes that it is a constraint COPY, which is associated with certain entries in the lexicon.

Bat El takes up the challenge of reduplication

Indeed, by arbirarily placing the COPY constraint in a certain position among other markedness constraints, we derive QiTLeL for a triradical base…

/davar+ <i,e>/		*$_{\sigma}$][$_{\sigma}$CC	*[$_{\sigma}$CC	COPY	*CODA
a.	dvir.dver	*!	**		**
b.	dvir.ver		*!	*	**
c.	div.rver	*!	*	*	**
d. ☞	div.rer			**	**
e.	di.ver			***!	*

Bat El takes up the challenge of reduplication

…and full reduplication for a biradical base,
e.g. [**kav**] ‘word’, [**kivkev**] ‘draw discontinuous line’:

/kav+ <i,e>/	*$_{\sigma}$][$_{\sigma}$CC	*[$_{\sigma}$CC	COPY	*CODA
a. kvi.kev		*!		*
b. ☞ kiv.kev				**
c. ki.vev			*!	**

Bat El takes up the challenge of reduplication

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e.g. [**kav**] ‘word’, [**kivkev**] ‘draw discontinuous line’:

/kav+ <i,e>/	*$_{\sigma}$][$_{\sigma}$CC	*[$_{\sigma}$CC	COPY	*CODA
a. kvi.kev		*!		*
b. ☞ kiv.kev				**
c. ki.vev			*!	**

This is a welcome result, since the same configuration of the COPY constraint gives us the two attested patterns.

Bat El takes up the challenge of reduplication

How?ever, it is certainly not a very welcome move to have morpheme-specific constraints or constraint hierarchies…

/kav+ <i,e>/	*σ][σCC	*[σCC	COPY	*CODA
a. kvi.kev		*!		*
b. ☞ kiv.kev				**
c. ki.vev			*!	**

Bat El takes up the challenge of reduplication

Moreover, since Bat El has no template to satisfy, she explains the other pattern possible for biradicals with the same constraint… in another position.

[kod] ‘code’ => [kided] ‘encode’

/kod+ <i,e>/	$*_{\sigma}][_{\sigma}CC$	$*[_{\sigma}CC$	*CODA	COPY
a. kdi.ked		*!	*	
b. kid.ked			**!	
c. ☞ ki.ded			*	*

We take on the challenge of reduplication

- I will now suggest an alternative (which is somewhat similar to the proposal in Buckley 1990).

- Roots may have internal structure, a process exemplified by IH root augmentation

katav	‘write’	ʃiχtev	‘rewrite’
kafal	‘be doubled’	ʃiχpel	‘copy’
delek	‘fuel’	tidlek	‘to fuel’

We take on the challenge of reduplication

- Augmentation is affixation at the root level.
- Crucially, the now quadriradical root shifts to the QiTeL (the prototypical 4radical verb type).

- Roots may have internal structure, a process exemplified by IH root augmentation

katav	'write'	√ktv	ʃiχtev	√ʃ+√ktv	ewrite'
kafal	'be dou	√kfl	ʃiχpel	√ʃ+√kfl	opy'
delek	'fuel'	√dlk	tidlek	√t+√dlk	o fuel'

We take on the challenge of reduplication

- If roots can be augmented and have internal structure, the same can be true of templates:

Unaugmented 4R template (middle CV optional in IH):

C V C V (C V) C V

Augmented 4R template:

C V C V (C V) C V +C V

We take on the challenge of reduplication

- Templatic augmentation is a derivational morpheme. It is added to derive pluractional or diminutive verbs, e.g. *milmel* ‘mumble’, *ʦiχkek* ‘gigle’

Unaugmented 4R template (middle CV optional in IH):

C V C V (C V) C V

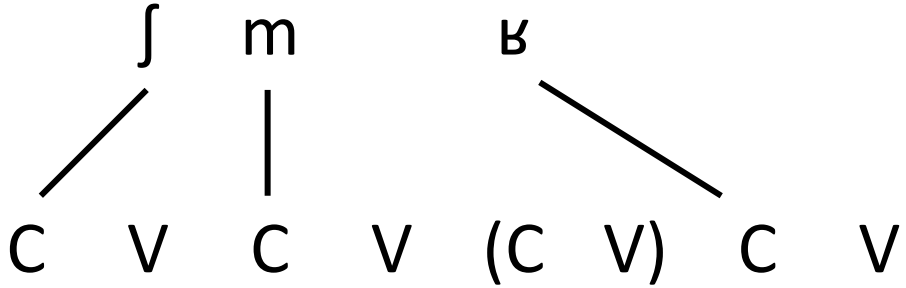
Augmented 4R template:

C V C V (C V) C V +C V

We take on the challenge of reduplication

- Recall edge-in association.

- Normal root+ Unaugmented 4R template (middle CV optional in IH):

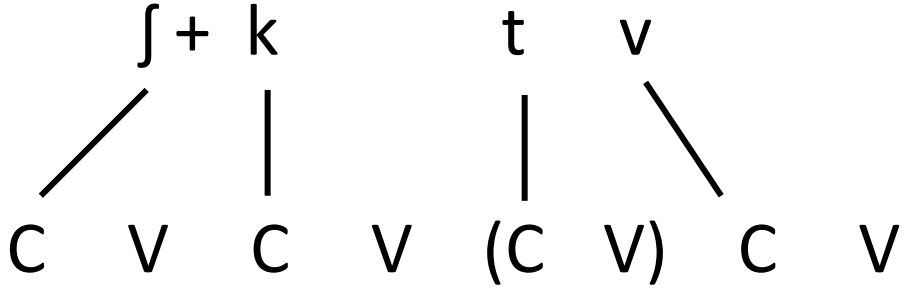


[ʃimeʁ] ‘preserve’

We take on the challenge of reduplication

- Recall edge-in association.

- **Augmented** root + Unaugmented 4R template (middle CV optional in IH):

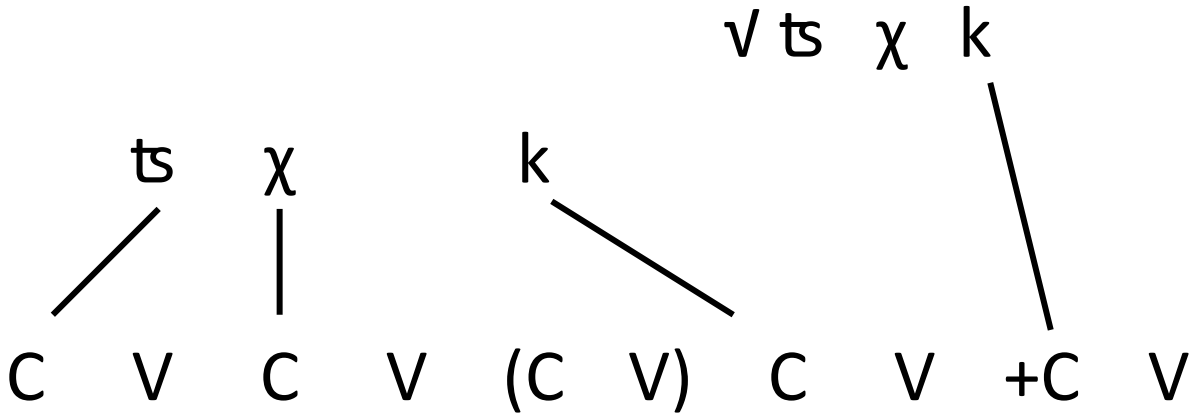


[ʃiχtev] ‘rewrite’

We take on the challenge of reduplication

- Recall edge-in association.

- Normal root+ **augmented 4R template** :



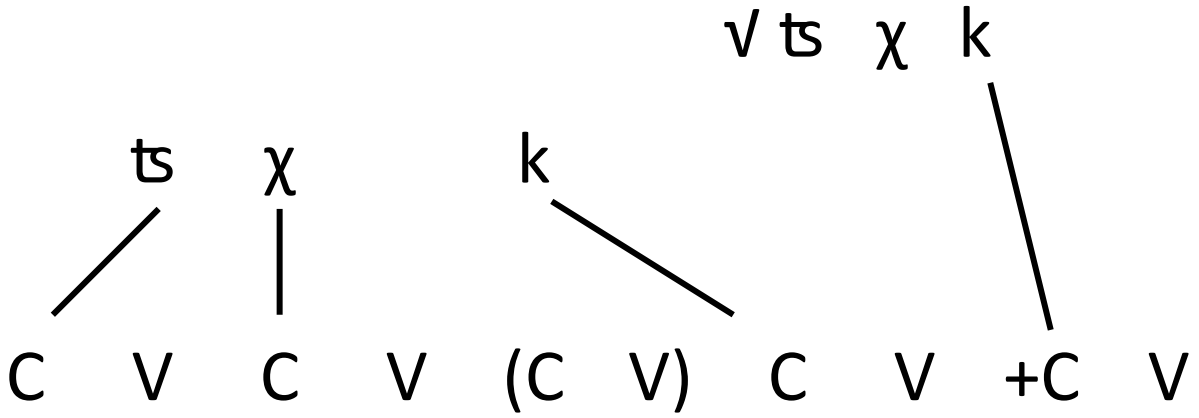
[ʦiχkek] ‘giggle’

We take on the challenge of reduplication

- Recall edge-in association.

- Normal root+ **augmented 4R template** :

Edge-in association proceeds twice.



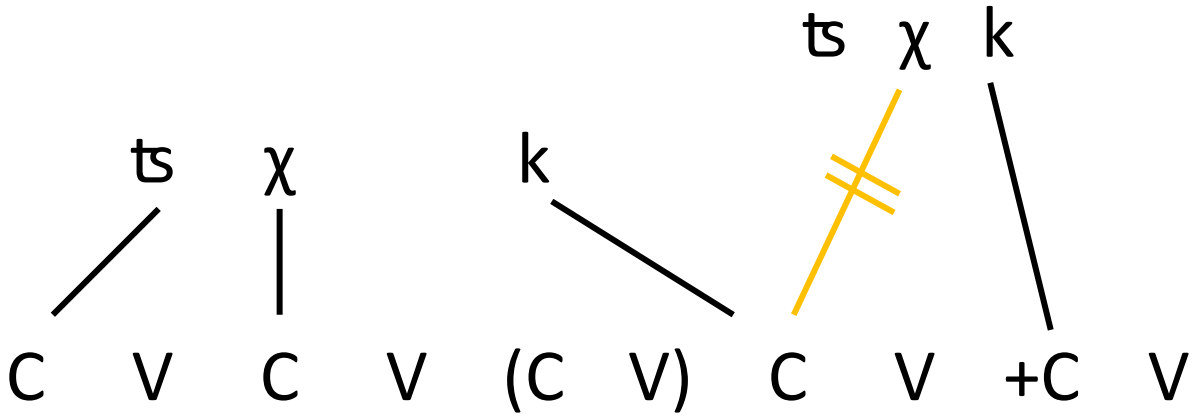
[ʦiχkek] ‘giggle’

We take on the challenge of reduplication

- Recall edge-in association.

- Normal root+ **augmented 4R template** :

The k cannot delink in favor of the reduplicant χ because this is its only association



[ʦiχkek] ‘giggle’

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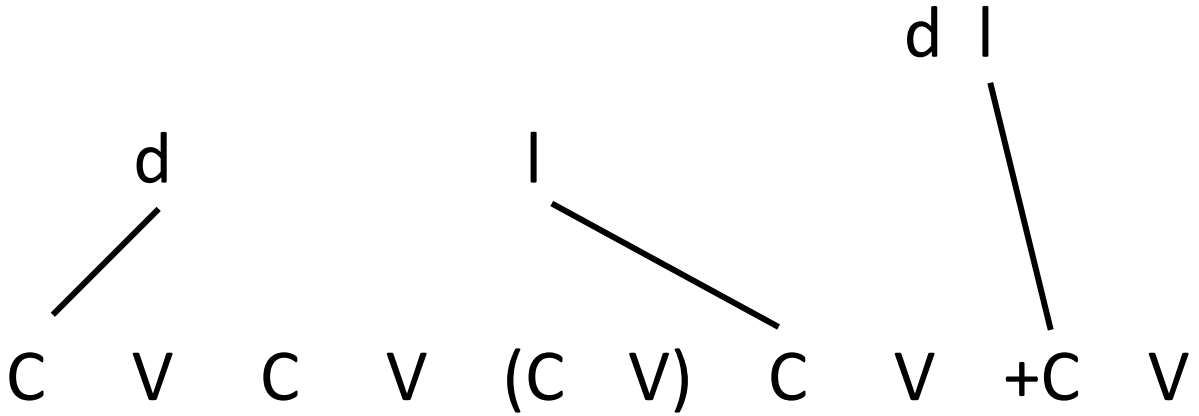

We take on the challenge of reduplication

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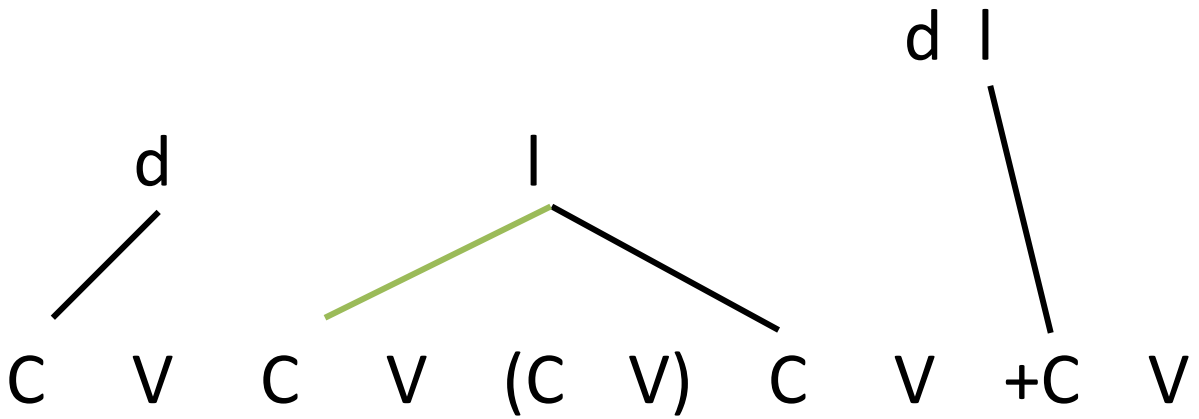
- **biradical** root + **augmented 4R template** :

leftward spreading association proceeds twice

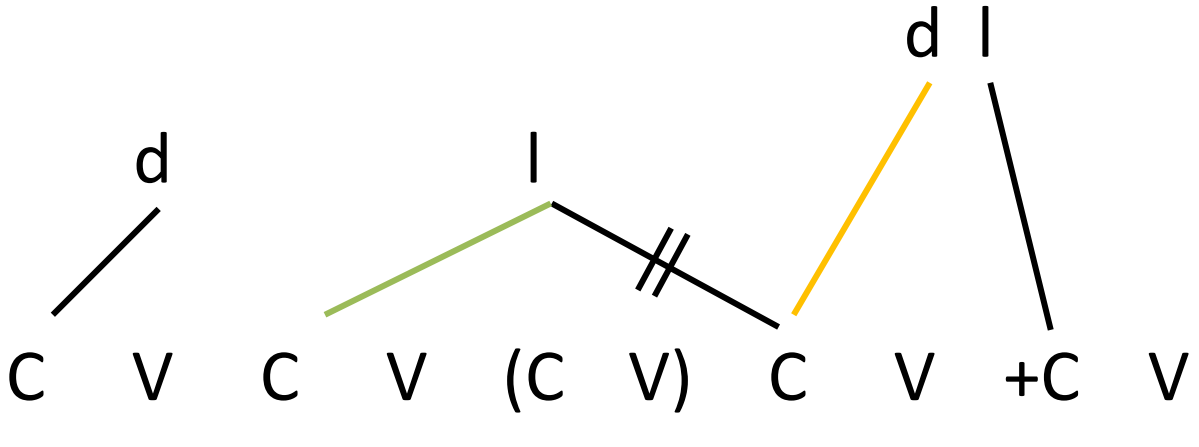


We take on the challenge of reduplication

- Recall edge-in association.

- **biradical** root + **augmented 4R template** :

The *l* delinks in favor of the reduplicant *d* because it is associated elsewhere

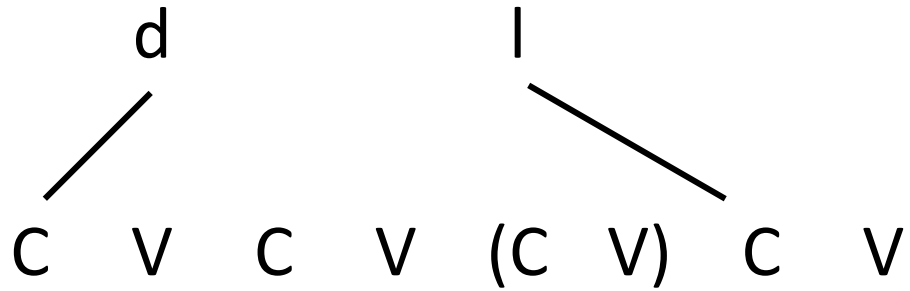


[dildel] ‘make few’

We take on the challenge of reduplication

- Recall edge-in association.

- Biradical root+ Unaugmented 4R template (middle CV optional in IH):



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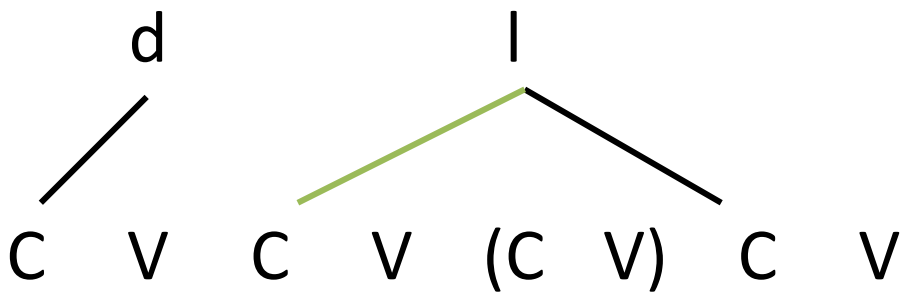
leftward spreading



[dilel] ‘make few’

Summary of our take on reduplication

Template / Root	4R	augmented 4R
DQTL	DiQTeL ʃixtev ‘rewrite’	- (same as 4R)
QTL	QiTeL ʃimeʁ ‘preserve’	QiTLeL ʦiχkek ‘gigle’
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As in Bat El, this solution has the same morpheme structure for the two pluractionals QiTLeL and QiTeT. But it doesn’t need to say anything for QiTeT (this is not copy, but template satisfaction)

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As in Bat El, this solution has the same morpheme structure for

Again, the usefulness of the template, as opposed to just vowels, is made obvious.

Summary

- There have been attempts – and we've not seen all of them – to reduce the template to its vowels.

- This does not work. Sometime it is only less economic; but other times it is outright insufficient.

Summary

- In the next lecture, we will look at the issue of roots and templates from two other angles:

  - The psycholinguistic angle
  - The consequences for a universal theory of morphology.

Issues in non-concatenative Morpho-phonology

External evidence for the Semitic root

“External”

- For the purpose of this class there are two types of external eviednce.

  1) to formal linguistics,

  2) to Afro-asiatic.

- We will discuss evidence from psycholinguistic experiments, evidence from Aphasia, and general morphological theory.

Priming

- In **psycholinguistics**, it is common to check the relatedness of words by looking for a priming effect.

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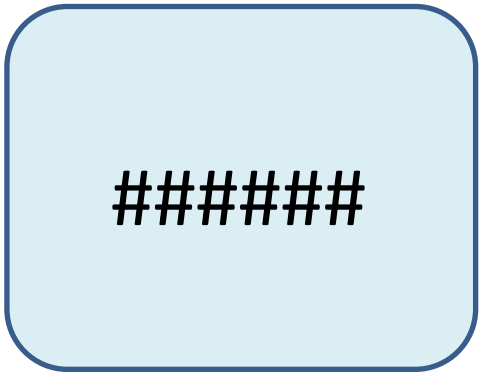
Participants are shown a screen



Priming

- In **psycholinguistics**, it is common to check the relatedness of words by looking for a priming effect.

Then a word, but very quickly, such that they are not aware that they saw it

surf

Priming

- In **psycholinguistics**, it is common to check the relatedness of words by looking for a priming effect.

Then another word, and they are asked whether they recognize the word

serfdom

Priming

- It was found that a subconcsiouly perceived word facilitates a morphologically related word.

- If you're shown "govern", even though you don't know you've seen it, you'll recognize "government" faster.

- Interestingly, this work for sing-sang too.

Priming in IH

- Priming is seen as a way of measuring relatedness. It is thus a promising criterion to check whether words in Semitic are related through the tripartite set, the root.

- If a word with a given root primes another word with that root, even though the root is not in the same place in the word (**χ**a**ʃ**a**v**-hi**χʃ**i**v**) and surrounded by other vowels, this will prove that it is a meaningful unit in lexical organization.

Priming in IH

- Frost et al. (1997) showed exactly that. They gave participant the following:

	IDENTITY	RELATED	CONTROL
Forward mask	########	########	########
prime	tzmwrt	zmr	tmr
	תזמורת	זמר	תמר
target	tzmwrt	tzmwrt	tzmwrt
'orchestra'	תזמורת	תזמורת	תזמורת

Priming in IH

Unsurprisingly, they found that the root primes a target which includes it, while the non-root doesn't.

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This was true whether the orthography of the root corresponded to an existing word, as below, or not.

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target	tzmwrt	tzmwrt	tzmwrt

Can we conclude that the final word has been said?
Not at all!

Priming in IH

- Targets such as [ti**zm**o**ʁ**et] are complex. The templat involves a prefix *ti-* and a suffix *-et.*

- Participants could have been sensitive to the stem consonants, as Bat El claims in reaction to these findings.

- Frost (p.c.) says: "*ti-* is not a prefix…"

Priming in IH – worrying results…

- Also, Frost et al. found that homophonous roots also prime each other. For instance, the words *me**ʁ**a**g**el* ‘spy’, *ta**ʁ**g**il* ‘exercise’ and ***ʁ**é**g**el* ‘foot’ were found to prime each other.

- But the semantic relations between them are completely opaque. Are we really probing the root here?

Priming in IH templates

- Frost et al. found that two items with different roots in the same verbal template prime each other, e.g. [**hi**tχ**i**l] and [**hi**fs**i**k].

- This suggest, according to them, that verbal templates are morphemes

[gil-u et amérʁika]…

discover.PST-3PL ACC America

Priming in IH templates – worrying results

- Yet there is more to say: Frost (p.c.) admits that the finding is only true for the unsuffixed form, i.e. [**ʦ**a**χ**a**k-**ti] does not prime [**k**a**t**a**v-**ti]…

- More troubling are the findings regarding weak verbs.

Priming in IH templates – worrying results

Frost et al. find no priming between weak and strong verbs in a given verbal type, or even between two weak verbs in the same type!

התחיל	h**tx**y**l**	[itxil]~[etxil]
הפיל	h**p**y**l**	[epil]
הקים	h**k**y**m**	[ekim]

They conclude that weak verbs do not use the same morpheme as strong verbs.

Priming in IH templates – worrying results

- The existence of weak roots in exactly the same number of Binyamin as triradical ones becaomes an accident…

The two types of V-final stems and their C-final counterparts in Types I-III

Type		*3past*	*1/2Past*	*present*	*future*	*infinitive*	
I	C-final	kar**ac**	kar**ac**-	kor**ec**	-kr**oc**	li-kr**oc**	'wink'
	V-final1	kar**a**	kar**a**-	kor**e**	-kr**a**	li-kr**o**	'read'
	V-final2	kar**a**	kar**i**-	kor**e**	-kr**e**	li-kr**ot**	'happen'
II	C-final	pin**ek**	pin**ek**-	m(e)-fan**ek**	-fan**ek**	l(e)-fan**ek**	'spoil'
	V-final1	kin**e**	kin**e**-	m(e)-kan**e**	-kan**e**	l(e)-kan**e**	'envy'
	V-final2	pin**a**	pin**i**-	m(e)-fan**e**	-fan**e**	l(e)-fan**ot**	'evacuate'
III	C-final	hifr**ix**	hifr**ix**	m-afr**ix**	-afr**ix**	l(e)-hafr**ix**	'falsify'
	V-final1	hikr**i**	hikr**e**	m-akr**i**	-akr**i**	le-hakr**i**	'read outloud'
	V-final2	hifr**a**	hifr**e**	m-afr**e**	-afr**e**	l(e)-hafr**ot**	'fertilize'

Priming in IH templates – worrying results

- Moreover, it is possible to show that speakers percieve weak and strong verbs as pertaining to the same class

The two types of V-final stems and their C-final counterparts in Types I-III

Type		*3past*	*1/2Past*	*present*	*future*	*infinitive*	
I	C-final	kar**ac**	kar**ac**-	kor**ec**	-kr**oc**	li-kr**oc**	'wink'
	V-final1	kar**a**	kar**a**-	kor**e**	-kr**a**	li-kr**o**	'read'
	V-final2	kar**a**	kar**i**-	kor**e**	-kr**e**	li-kr**ot**	'happen'
II	C-final	pin**ek**	pin**ek**-	m(e)-fan**ek**	-fan**ek**	l(e)-fan**ek**	'spoil'
	V-final1	kin**e**	kin**e**-	m(e)-kan**e**	-kan**e**	l(e)-kan**e**	'envy'
	V-final2	pin**a**	pin**i**-	m(e)-fan**e**	-fan**e**	l(e)-fan**ot**	'evacuate'
III	C-final	hifr**ix**	hifr**ix**	m-afr**ix**	-afr**ix**	l(e)-hafr**ix**	'falsify'
	V-final1	hikr**i**	hikr**e**	m-akr**i**	-akr**i**	le-hakr**i**	'read outloud'
	V-final2	hifr**a**	hifr**e**	m-afr**e**	-afr**e**	l(e)-hafr**ot**	'fertilize'

Priming in IH templates – worrying results

The weak final realization overrides that of the Type. past=>[a], present => [e]/[i], future => [e], inf. => [ot], **independently of the vocalization of the triradical verb.**

The two types of V-final stems and their C-final counterparts in Types I-III

Type		*3past*	*1/2Past*	*present*	*future*	*infinitive*	
I	C-final	kara**c**	kara**c**-	kore**c**	-kro**c**	li-kro**c**	'wink'
	V-final1	kara	kara-	kore	-kra	li-kro	'read'
	V-final2	kara	kari-	kore	-kre	li-kro**t**	'happen'
II	C-final	pine**k**	pine**k**-	m(e)-fane**k**	-fane**k**	l(e)-fane**k**	'spoil'
	V-final1	kine	kine-	m(e)-kane	-kane	l(e)-kane	'envy'
	V-final2	pina	pini-	m(e)-fane	-fane	l(e)-fano**t**	'evacuate'
III	C-final	hifri**x**	hifri**x**	m-afri**x**	-afri**x**	l(e)-hafri**x**	'falsify'
	V-final1	hikri	hikre	m-akri	-akri	le-hakri	'read outloud'
	V-final2	hifra	hifre	m-afre	-afre	l(e)-hafro**t**	'fertilize'

Priming in IH templates – worrying results

The weak final realization overrides that of the Type. past=>[a], present => [e]/[i], future => [e], inf. => [ot], **independently of the vocalization of the triradical verb.**

But this is not the case in Type IV, where the identity of past and present stems in the triradical version of the type forces an identity in the weak-final version.

Type		*3past*	*1/2Past*	*present*	*future*	*infinitive*	
IV	C-final	nikr**a**c	nikrac -	nikr**a**c	-ikarec	lehi-ikarec	'be made'
	V-final1	nikr**a**	nikre-	nikr**a**	-ikare	lehi-kare	'be called'

Priming - Summary

- To summarize, the results from priming speak in favor of the root and template as important in perception.

- That said, it is not clear what the units we are probing are in reality. They do not seem to be the root in the semantic sense.

Priming - Summary

- Bat El also raises the issue of orthography. It might be the case that IH speakers learned to use the triradical set in deciphering written text – this doesn't mean that this is a lexical storage strategy.

- However, more recent work on Maltese by Ussishkin & Twist replicated the findings using exclusively auditory primes…

Interim on reading

The "Cambridge University" Phenomenon

Aoccdrnig to a rseearch at Cmabrigde Uinervtisy, it deosn't mttaer in waht oredr the ltteers in a wrod are, the olny iprmoetnt tihng is taht the frist and lsat ltteer be at the rghit pclae. The rset can be a toatl mses and you can sitll raed it wouthit porbelm. Tihs is bcuseae the huamn mnid deos not raed ervey lteter by istlef, but the wrod as a wlohe.

Transposed Letter Effect

The "Hebrew University" phenomenon

The "Hebrew University" phenomenon

'The library recieved the large donation from the food factory'

hsfryya kyblh ʔt htrwmh hgdwlh mmfʕl hmzwn

[hasifʁiya kibla et hatʁuma hagdola mimfʔal hamazon]

(Velan & Frost, 2007)

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hsrfyya kylbh ʔt htrwmh hgdwlh mmʕfl hmzwn

IMPOSSIBLE TO READ!!! In IH, it is crucial that the root consonants be in the right order.

(Velan & Frost, 2007)

The "Hebrew University" phenomenon

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hsfryya kyblh ʔt htrwmh hgdwlh mmfʕl hmzwn

[hasifʁiya kibla et hatʁuma hagdola mimfʔal hamazon]

hsrfyya kylbh ʔt htrwmh hgdwlh mmʕfl hmzwn

However, note that there are other differences between the IH and English examples. In English, the first and last consonants are never suffixes. Moreover, since roots have three Cs, any change destroys the order… It should have been cheked with quadriradicals…

(Velan & Frost, 2007)

Evidence from Aphasics

- We know that aphasia attacks certain linguistic abilities, but not others.

- Prunet et al. (2000) examined a French and Arabic bilingual aphasic. They noticed that he produced 25 metatheses in Arabic

Target :/is-t-iʕtaːf/ ‘begging’

Realization: [is-t-iftaːʕ]

Evidence from Aphasics

- All metatheses were of the root consonants, never of affixal consonants.

- In French, there was only one occurrence of Metathsis

Arabic bilingual aphasic. They noticed that he produced 25 metatheses in Arabic

Target :/is-t-iʕtaːf/ ‘begging’

Realization: [is-t-iftaːʕ]

Evidence from Aphasics

Prunet et al. concluded that this follows from the consonantal nature of roots in Arabic, vs. the syllabified, continuous nature of roots in French

- Prunet et al. (2000) examined a French and Arabic bilingual aphasic. They noticed that he produced 25 metatheses in Arabic

Target :/is-t-iʕtaːf/ ‘begging’

Realization: [is-t-iftaːʕ]

Evidence from Aphasics

- Yet once again, the relevant unit can be the stem consonants, not a root…

- This would be a **surface root**, extracted from the stem whose vowels are morphemes in Semitic – something nobody contests – and not an abstract underlying root (Davis and Zawaydeh 2001, Rattcliffe 2004)

Evidence from Aphasics

- The crucial datum should come from weak verbs.

- Recall that such verbs have non-surface-true glides, such that /mawat/ => [maːt] ‘he died’

Evidence from Aphasics

- Interestingly, Idrissi et al. (2002) did find such cases in the speech of the same aphasic:

	overt:	covert:
m-resurfacing:	/qawaʕ/	/y-awʕid-u/
	→ qaaʕ 'bottom'	→ y-aʕid 'he promises'
	→ error waaqiʕ 'reality'	→ error ʕuud 'stick'
t-resurfacing:	/aḍwaʔ-a/	/aðyaʕ-a/
	→ ʔaḍaaʔ 'he lit'	→ ʔaðaaʕ 'he broadcasted'
	→ error ḍawʔ 'light'	→ error m-uðiiʕ 'radio announcer'

- This really nails the argument: the aphasic has a problem with the mapping of the ***underlying*** root.

Evidence from Aphasics

- Bat El (2011) provides evidence from her own Aphasic, who manipulates entire stems…

Target		Error	
yi-zlol ‘gluttonize’	3rd ms.sg. Fut. – FUT	**me-zalal** • **zalal** ‘glutonized 3rd ms.sg.’	Pres. – PAST
ti-kfoc ‘jump’	2nd ms.sg. Fut. – FUT	**yi-kafac-ta** • **kafac** ‘jumped 3rd ms.sg.’	Fut. – PAST – Past
yi-kfoc ‘jump’	3rd ms.sg. Fut. – FUT	**ye-kofec** • **kofec** ‘jumps ms.sg.	Fut – PRES
soxav-im ‘carry’	PRES – ms.pl.	**saxav-im** • **saxav** ‘carried 3rd ms.sg.’	PAST – Pres

(Data provided by Naama Friedmann)

Evidence from Aphasics

This of course is irrelevant; nobody claims that stems don't exist…

Target		Error	
yi-zlol 'gluttonize'	3rd ms.sg. Fut. – FUT	**me-zalal** • **zalal** 'glutonized 3rd ms.sg.'	Pres. – PAST
ti-kfoc 'jump'	2nd ms.sg. Fut. – FUT	**yi-kafac-ta** • **kafac** 'jumped 3rd ms.sg.'	Fut. – PAST – Past
yi-kfoc 'jump'	3rd ms.sg. Fut. – FUT	**ye-kofec** • **kofec** 'jumps ms.sg.	Fut – PRES
soxav-im 'carry'	PRES – ms.pl.	**saxav-im** • **saxav** 'carried 3rd ms.sg.'	PAST – Pres

(Data provided by Naama Friedmann)

Summary of non-formal evidence

- Evidence from psycholinguistic experiments and aphasia support the importance associated to the consonants of the root.

- In nearly all of the cases, the findings can be reinterpreted as arguing for a surface root, extracted online from the stem.

Summary of non-formal evidence

- It is unsurprising that consonant-extraction should be a deciphering strategy in reading or perception in general in Semitic, since in these languages the rest of the word is another morpheme.
- In my opinion, only the evidence from the aphasic that forces non-surface-true radicals to reappear poses a challenge for stem-based accounts.

Back to fromal linguistics

- How is a word like *government* stored? Is the decomposition into *govern+ment* only a linguist's passtime, or does it represent a cognitive reality?

- This is a general cross-linguistic debate.

Back to fromal linguistics

Back to fromal linguistics

- Some linguists, famously Anderson (1992) claim that since words are stored as a whole, decomposition is an illusion. Bat El was Anderson's student…

- Others might accept the decomposition of *govern+ment* because *govern* exists independently, but they won't accept *sacre+ment*.

Back to fromal linguistics

- Yet in my opinion there is overwhelming evidence for decomposition. One piece of evidence I like comes from Germanic:

Yiddish	infinitive	past part.	
No prefix	nem-ən	gə-num-ən	‘take’
	ʦeger-n	gə-ʦegər-t	‘hesitate’
Particle	ojf-nem-ən	ojf-gə-num-ən	‘absorb’
Prefix	ʦe-nem-ən	ʦe-num-ən	‘dismember’
		*ʦe-gə-num-ən	

Back to fromal linguistics

If speakers were not aware of the fact that [ʦe] (for example) is prefixed, how would they know not to add [gə-] before it? Note that when [ʦe] is not a prefix, it does not resist [gə-].

evidence I like comes from Germanic:

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		*ʦe-gə-num-ən	

Back to fromal linguistics

- More evidence from the form of the definite article in south-western Sardinian (Lai 2016):

a. s+liquid from SWM		
/is sroɣus/ 'the fathers-in-law'	is sroɣus	*izi zroɣus
b. s+liquid with s as a prefix		
/is slumbaus/ 'the cripples'	*is slumbaus	izi zlumbaus

Roots beyond Semitic

- Another objection to roots in Semitic was that they are underspecified in terms of their Semantic import.

- Yet we needn’t go far to find the same phenomena outside Afro-Asiatic

Roots beyond Semitic

Yiddish	infinitive	past part.	
No prefix	nem-ən	gə-num-ən	‘take’
Prefix	ʦe-nem-ən	ʦe-num-ən	‘dismember’
	faʁ-nem-ən	faʁ-num-ən	‘occupy’
	ba-nem-ən	ba-num-ən	‘seize’
Particle	ojf-nem-ən	ojf-gə-num-ən	‘absorb’
	on-nem-ən	on-gə-num-ən	‘begin’
	ojs-nem-ən	ojs-gə-num-ən	‘succeed’
	duʁχ-nem-ə	duʁχ-gə-num-ən	‘penetrate’
	fiʁ-nem-ə	fiʁ-gə-num-ən	‘take up’

Roots beyond Semitic

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	on-nem-ən	on-gə-num-ən	‘begin’

One must accept that the stem is the same in all these forms, because it undergoes the same allomorphy. Whatever the meaning is of [nem]~[num] in all these forms, it is pretty underspecified…

Roots beyond Semitic

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Prefix	ʦe-nem-ən	ʦe-num-ən	‘dismember’
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	ba-nem-ən	ba-num-ən	‘seize’
Particle	ojf-nem-ən	ojf-gə-num-ən	‘absorb’

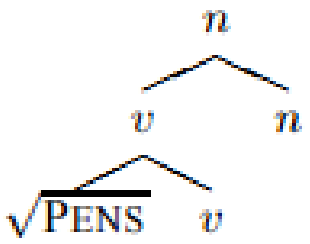
Roots are real entities outside Semitic. The major difference is that roots in Semitic are discontiuous and therefore unpronounceable, whereas roots outside Semitic are usually continuous. As a result, they can be confused with “stems”, because they and are pronounceable.

Distributed Morphology

- For reasons like these, roots have experienced a revival, in work in the theory of Distributed Morphology (DM, e.g. Embick 2010) and related theories (e.g. Hagit Borer's recent work)

- These theories assume that *all initial derivations* (i.e. non-cyclic) in *all languages* are root-based.

(11) *pensador*



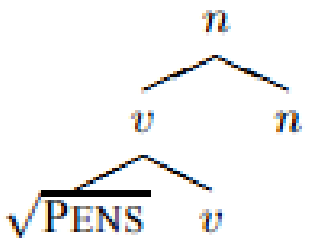
The structure of Spanish *pensador* 'thinker', in Embick (2010)

Distributed Morphology

- In such approaches, another important aspect of roots is that they are not **categorized**, i.e. not yet attributed a category.

- It is the syntactic structure that will determine the category of a given item. Roots do not have categories.

(11) *pensador*



Distributed Morphology

- Semitic languages are often mentioned to support this claim. Outside Semitic, this is less obvious…

- For instance, the root *nem* of Yiddish, however underspecified it may be, is not directly present in the nominal morphology…

- It seems that the freedom that Semitic roots have is not shared by the roots of concatenative languages, at least not to the same extent.

Distributed Morphology

- As mentioned, not all derivations are based on roots: some are based on items already having a category.

- It become an endeavor of the theory to show that derivations based on roots or based on categorized structure are essentially different.

- In a famous paper, Arad (2003) claimed that this distinction is indeed necessary.

Arad's locality

- Arad discusses two types of verbs in English noted by Kipasky (1982), represented here by *hammer* and *tape*.

- Both verbs seem to be derived from a noun. However:

a. He hammered the nail with a rock OK

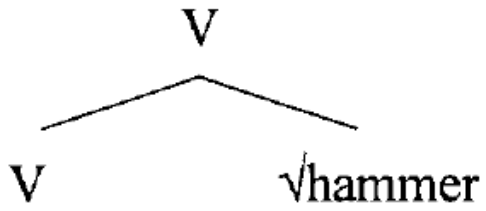
b. He taped the picture with nails OK

- Arad/Kiparsky claim that the verb *hammer* is freer in its interpretation than the verb *tape*.

Arad's locality

- This is formalized by deriving 'to hammer' from the same **root** as '(a) hammer', but deriving 'to tape' **from the noun** tape.

(24)a.



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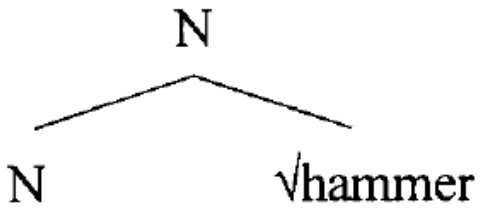
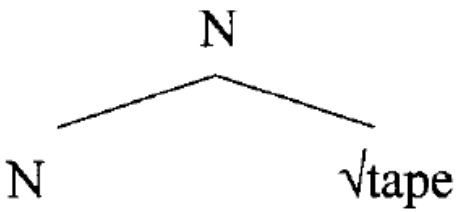


(25)a.



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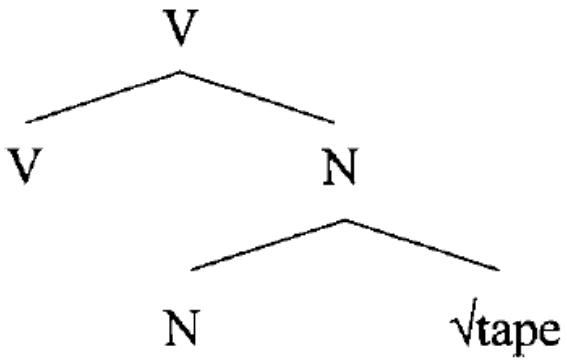
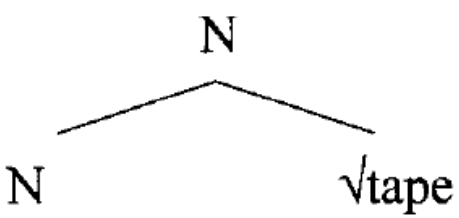


Arad's locality

- This is formalized by deriving 'to hammer' from the same **root** as '(a) hammer', but deriving 'to tape' **from the noun** tape.

But why should the derivation from the noun be constrained by the noun's meaning ?

(25)a.



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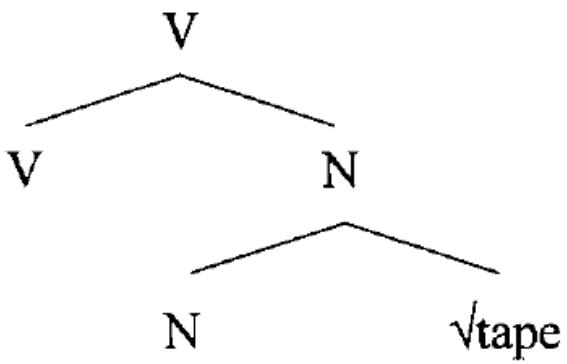
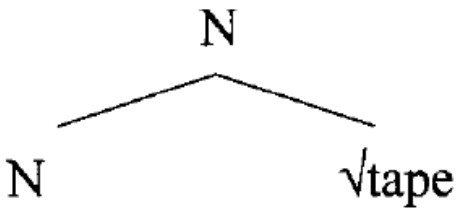


Distributed Morphology

(13) Locality constraint on the interpretation of roots: roots are assigned an interpretation in the environment of the first category-assigning head with which they are merged. Once this interpretation is assigned, it is carried along throughout the derivation.

(25)a.



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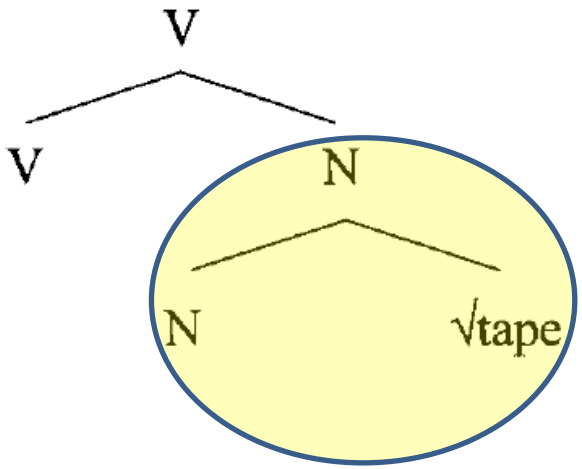


Distributed Morphology

More evidence from Kiparsky brought forth by Arad

(28)

$\text{récord}_N/\text{recórd}_V$,	$\text{súbject}_N/\text{subjéct}_V$,	$\text{óbject}_N/\text{objéct}_V$,
$\text{próject}_N/\text{projéct}_V$,	$\text{rébel}_N/\text{rebél}_V$,	$\text{digést}_N/\text{dígest}_V$,
$\text{cónduct}_N/\text{condúct}_V$,	$\text{ábstract}_N/\text{abstráct}_V$,	$\text{cómbine}_N/\text{combíne}_V$,
$\text{éxploit}_N/\text{explóit}_V$,	$\text{próduce}_N/\text{produce}_V$,	$\text{défect}_N/\text{defect}_V$,
$\text{cóntest}_N/\text{contést}_V$,	$\text{cónvict}_N/\text{convíct}_V$,	$\text{cóntract}_N/\text{contráct}_V$.

Stress shift accompanied by semantic freedom

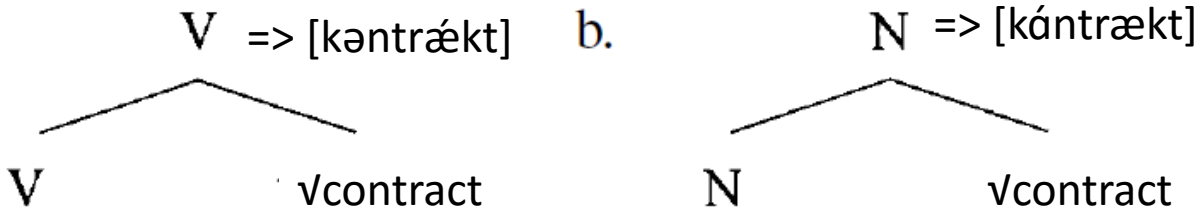
Arad's locality

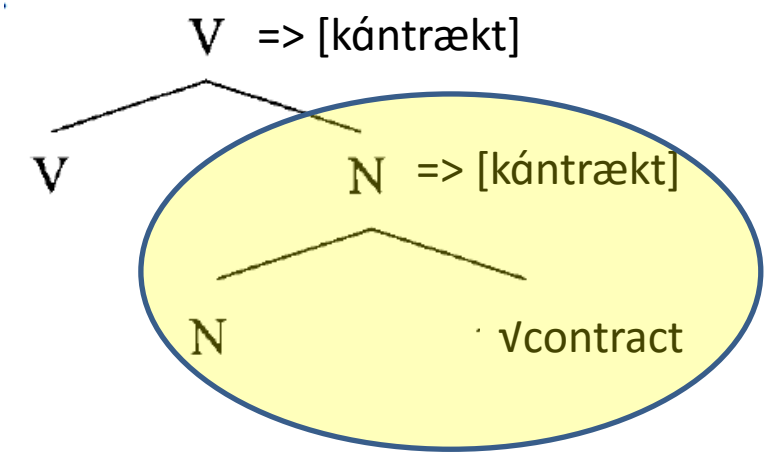
More evidence from Kiparsky brought forth by Arad

(29)a.	$\text{permít}_V - \text{pérmit}_N$	$\rightarrow \text{pérmit}_V$
b.	$\text{affíx}_V - \text{áffix}_N$	$\rightarrow \text{áffix}_V$
c.	$\text{protést}_V - \text{prótest}_N$	$\rightarrow \text{prótest}_V$
d.	$\text{digést}_V - \text{dígest}_N$	$\rightarrow \text{dígest}_V$
e.	$\text{compóund}_V - \text{cómpound}_N$	$\rightarrow \text{cómpound}_V$
f.	$\text{contráct}_V - \text{cóntract}_N$	$\rightarrow \text{cóntract}_V$

Absence of Stress shift accompanied by lesser semantic freedom

Arad's locality





Arad's locality

- To summarize, Arad claims that in many cases, the two types of derivation – root-based and word-based – are needed.

- Word-based derivation is constrained by both the meaning and the form of the base, whereas, root-based derivation is not.

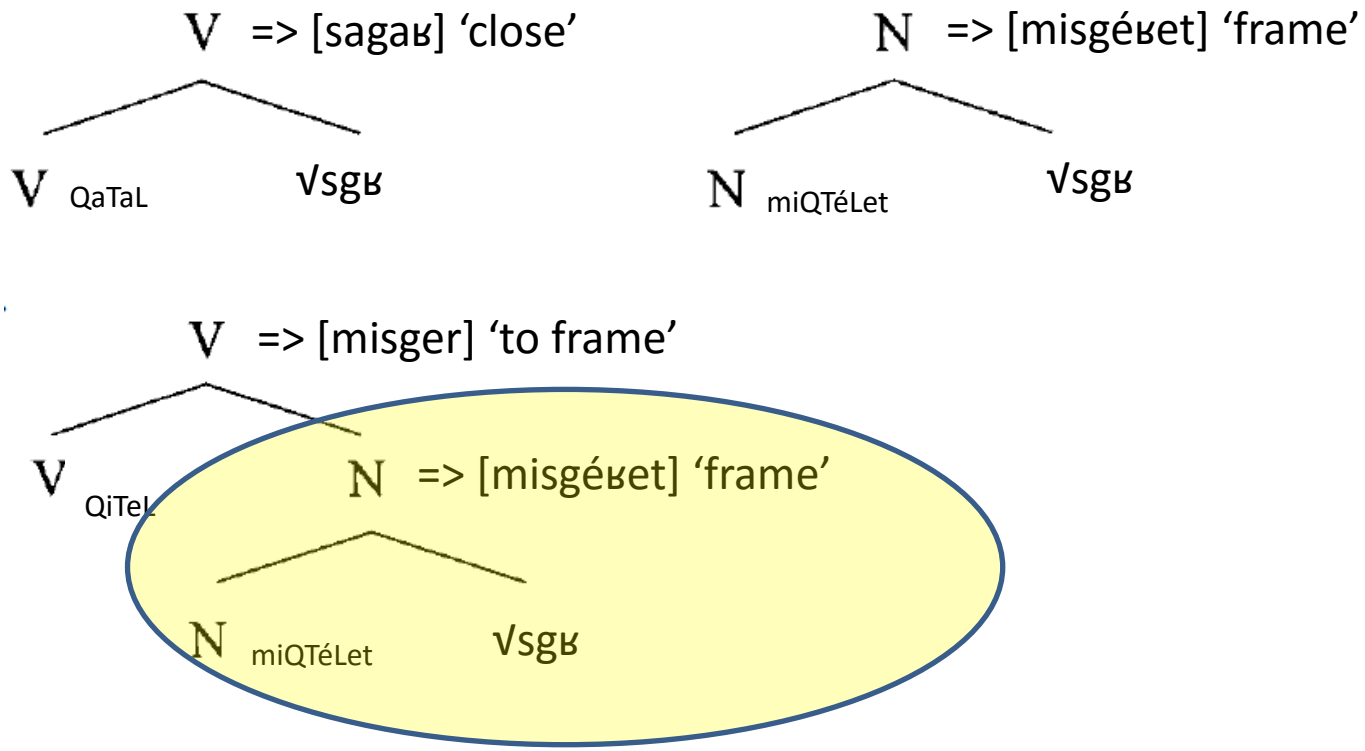
Arad's locality

- This takes us back to the beginning of the course and Bat El's generalization of her findings of cluster preservation in denominal verbs.

- One of Bat El's claim was that her view is more economic, because it only requires one mechanism (Mel.Over.), as contrasted with a view that would have one mechanism fot decategoricals and another for deradicals.

Arad's locality

- Now it seems to be independently necessary to distinguish between deradical and decategorical derivation:



Appraisal of Arad's Locality

- Arad's approach has a weak point: it is circular.

- How do we know that a verb is denominal? Because it preserves aspect of the purported base.
- Why does it preserve aspects of the base? Because it's denominal!

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- How do we know that a verb is denominal? Because it preserves aspect of the purported base.
- Why does it preserve aspects of the base? Because it's denominal!

If one finds a counter example to Arad's generalization about form preservation, she can say that it isn't derived from the categorized structure, but from the root

Appraisal of Arad's Locality

- Arad's approach has a weak point: it is circular.

- How do we know that a verb is denominal? Because it preserves aspect of the purported base.
- Why does it preserve aspects of the base? Because it's denominal!

In principle, semantics and form should coincide, but then again, the theory does not claim that deradical derivations must have additional freedom…

Appraisal of Arad's Locality

- There are quite a few counter-example to semantic preservation… From IH:

bajit 'home'	hitbajet	'home in'
zajin 'penis'	zijen	'screw'
bóʁeg 'screw'	hitbaʁeg	'insert oneself'
kélev 'tap'	hitkalev	'live in basic conditions'
ʔalef 'א'	ʔilef	'tame'
ʔalila 'plot'	heʔelil	'frame someone'

Summary

- One of the basic objections against the root is that it sets the Semitic system apart from other systems.

- Yet there are popular frameworks which also employ roots systematically in the analysis of concatenative languages. If they are correct, than that objection is moot.

Summary

- Still, what **does** set Semitic languages apart? Can we really say that roots in Semitic are like Yiddish *nem~num?*

- There are several answers to this question, but alas, not today.

Appendix regarding the coming into existence of Semitic languages

First stage:

grammatical morphemes

1sg ***=*** [a-]

past = [-u]

verbs

'write' = [ktav]

'start' = [txil]

'grow' = [gdil]

Following Deutscher (2005)

Appendix regarding the coming into existence of Semitic languages

First stage:

grammatical morphemes

1sg ***=*** [a-]

past = [-u]

verbs

'write' = [ktav]

'start' = [txil]

'grow' = [gdil]

= Spanish

Following Deutscher (2005)

Appendix regarding the coming into existence of Semitic languages

Second stage:

grammatical morphemes

1sg **=** [a-]

past = [-u]

verbs

‘write’ = [ktav]

‘start’ = [txil]

‘grow’ = [gdil]

‘open’ = [ptuħ] => [ptuaħ]

*uħ#

Following Deutscher (2005)

Appendix regarding the coming into existence of Semitic languages

Second stage

Future	***Past***
[aktav]	[aktavu]
[atxil]	[atxilu]
[agdul]	[agdulu]
[aptu**a**ħ]	[aptuħu]

Following Deutscher (2005)

Appendix regarding the coming into existence of Semitic languages

Third stage: past marking is lost

Future	***Past***
[aktav]	[aktav]
[atxil]	[atxil]
[agdul]	[agdul]
[aptua**a**ħ]	[aptuħ]

Become opaque!

Following Deutscher (2005)

Appendix regarding the coming into existence of Semitic languages

Forth stage: reanalysis

Future	***Past***
[akt**a**v]	[aktav]
[atxil]	[atxil]
[agdul]	[agdul]
[apt**a**ħ]	[aptuħ]

Becomes future marker!, stem vowel /u/ dropped

Following Deutscher (2005)

Appendix regarding the coming into existence of Semitic languages

Fifth stage: generalizing

Future	***Past***
[akt**a**v]	[aktav]
[atx**a**l]	[atxil]
[agd**a**l]	[agdul]
[apt**a**ħ]	[aptuħ]

Becomes a general future marker!

Following Deutscher (2005)

Appendix regarding the coming into existence of Semitic

This is similar to English sing-sang, though it does not depend on the past vocalization.

Fifth stage: generalizing

Future	***Past***
[akt**a**v]	[aktav]
[atx**a**l]	[atxil]
[agd**a**l]	[agdul]
[apt**a**ħ]	[aptuħ]

Becomes a general future marker!

Following Deutscher (2005)

Appendix regarding the coming into existence of Semitic languages

More information:

grammatical morphemes

adjective ***=*** [-um]

adjectivizer = [ʃa]

verbs

‘lie down’ = [pil]

‘lowered’ = ???

Following Deutscher (2005)

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More information:

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Following Deutscher (2005)

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More information:

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adjective ***=*** [-um]

adjectivizer = [ʃa]

verbs

‘lie down’ = [pil]

‘lowered’ = [ʃa-pil-um]

‘I made low’ = ???

‘I will make low’ = ???

Following Deutscher (2005)

Appendix regarding the coming into existence of Semitic languages

More information:

grammatical morphemes

adjective ***=*** [-um]

adjectivizer = [ʃa]

verbs

‘lie down’ = [pil]

‘lowered’ = [ʃa-pil-um]

‘I made low’ = [a-ʃa-pil]

‘I will make low’ = [a-ʃa-p**a**l]

Following Deutscher (2005)

Appendix regarding the coming into existence of Semitic languages

More information:

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‘I made low’ = [a-ʃa-pil]

‘I will make low’ = [a-ʃa-p**a**l]

Syncope!
V=> ø / VC_CV

Following Deutscher (2005)

Appendix regarding the coming into existence of Semitic languages

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grammatical morphemes

adjective **=** [-um]

adjectivizer = [ʃa]

verbs

‘lie down’ = [pil]

‘lowered’ = [ʃaplum]

‘I made low’ = [aʃpil]

‘I will make low’ = [aʃp**a**l]

Consonantal Emancipation!

Following Deutscher (2005)

Issues in non-concatenative Morpho-phonology

The fate of Israeli Hebrew gutturals

Today

- We will look at a case study of gutturals in IH.
- This is a misnomer, because there are no phonetic gutturals in IH.
- On the other hand, there are many guttural effects.

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- This is a misnomer, because there are no phonetic gutturals in IH.
- On the other hand, there are many guttural effects.

So what is the story?

Background: Biblical Hebrew???

Background: Biblical Hebrew

- Four “gutturals”

  Pharyngeal [ʕ, ħ]

  Glottal [ʔ, h]

- Spirantized velar [χ] < /k/

Background: Biblical Hebrew

- Four “gutturals”

Pharyngeal	[ʕ, ħ]
Glottal	[ʔ, h]

Were not good internal codas, repaired with **following** epenthetic /ᵃ/:

/ʔohvim/ => [ʔohᵃv-im] ‘love.PRT-MPL’

Background: Biblical Hebrew

- Four “gutturals”

Pharyngeal	[ʕ, ħ]
Glottal	[ʔ, h]

Were not good internal codas, repaired with **following** epenthetic /ᵃ/:

/ʔohvim/ => [ʔohᵃv-im] ‘love.PRT-MPL’

Were not good final codas, after any vowel except /a/. repaired with **preceeding** epenthetic /ᵃ/:

/ʃomeʕ/ => [ʃomeᵃʕ] ‘hear.PRT-MSG’

Background: Biblical Hebrew

- Four “gutturals”

Pharyngeal	[ʕ, ħ]
Glottal	[ʔ, h]

Were not good internal codas, repaired with **following** epenthetic /ᵃ/:

In onset position, they did not directly affect the surrounding vowels, other peculiarities are less important.

repaired with **preceeding** epenthetic /ᵃ/:

/ʃomeʕ/ => [ʃomeᵃʕ] ‘hear.PRT-MSG’

Background: Biblical Hebrew

- Four “gutturals”

  Pharyngeal [ʕ, ħ]

  Glottal [ʔ, h]

- Spirantized velar [χ] < /k/

Was well behaved

/liχtov/	=>	[liχtov]	‘write’
/limʃoχ/	=>	[limʃoχ]	‘pull’

Background: Israeli Hebrew

- Was revived using
  - The morphology of Biblical Hebrew
  - The phoneme system of **Yiddish/Russian**

Background: Israeli Hebrew

- Was revived using

  The morphology of Biblical Hebrew

  The phoneme system of **Yiddish/Russian**

  => No pharyngeals

  No [ʔ]

  Weak [h]

  Phonemic /χ/

Background: Israeli Hebrew

- As a consequence (speaking roughly)

  BH Glottal /ʔ/ => IH [ø]

  BH Glottal /h/ => IH [ø], rarely [h]

  BH Pharyngeal /ʕ/ => IH [ø]

  BH Pharyngeal /ħ/ => IH [χ]

Background: Israeli Hebrew

- As a consequence (speaking roughly)

  BH Glottal /ʔ/ => IH ø

  BH Glottal /h/ => IH ø, rarely [h]

  BH Pharyngeal /ʕ/ => IH ø

  BH Pharyngeal /ħ/ => IH [χ]

ø can also be realized [ʔ], before a vowel. Our transcription will adopt this realization, because it is more salient graphically. But this is an optional ***phonetic*** effect, so we will mark it as superscript.

Background: Israeli Hebrew

- As a consequence (speaking roughly)

  BH Glottal /ʔ/ => IH [ø]

  BH Glottal /h/ => IH [ø], rarely [h]

  BH Pharyngeal /ʕ/ => IH [ø]

  BH Pharyngeal /ħ/ => IH [χ]

- However, BH orthography was preserved, and perhaps accordingly, **all of the guttural effects**.

Guttural effects in Israeli Hebrew

IH	*Cf. non guttural*	*Cf. BH*	
moʔel	moʃel	mo**h**el	‘circumcizer’
moalim	mo**ʃ**lim	mo**h**ᵃlim	‘(pl)’

“Guttural ghost” can’t be in internal coda

ʃoméa	ʃomeʁ	ʃomeᵃ**ʕ**	‘hear.PRT-MSG’
ʃomʔim	ʃomʁim	ʃom**ʕ**im	‘(pl)’

“Guttural ghost” can’t be in final coda after [u,i,o,e]

… As in BH…

Guttural effects in Israeli Hebrew

When new words with “gutturals” are introduced through Arabic loans and internal derivations, they also follow these rules. These may thus be called both productive and exceptionless.

“Guttural ghost” can’t be in internal coda

ʃoméa	ʃomeʁ	ʃomeᵃʕ	‘hear.PRT-MSG’
ʃomʔim	ʃomʁim	ʃomʕim	‘(pl)’

“Guttural ghost” can’t be in final coda after [u,i,o,e]

… As in BH…

The question

How are these guttural ghosts represented in the knowledge of speakers of Israeli Hebrew?

How do they behave with respect to notions such as template satisfaction, government etc.?

And a more specific question

How are the vowel sequences created by the guttural effect treated?

is [oa] in *moalim* a bisyllabic hiatus [o.a] or a monosyllabic diphthong [oa]?

Preliminary Proposal

- What is left today from the historical guttural is a **consonantally-mapped /a/.**

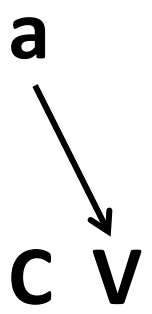
a

C V

Brame (1970) for Maltese. Prunet (1996) for Gurage. Faust (2005) for MH. See Pariente (2012) for competing mora-based analysis of MH facts.

Preliminary Proposal

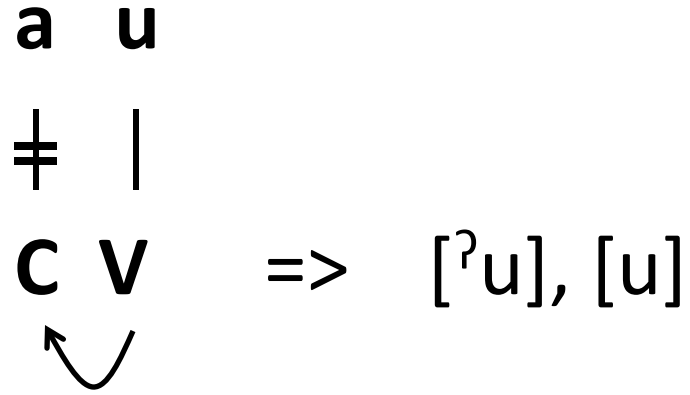
- of course an /a/ cannot be realized alone on a C position, and so it “unloads” on an adjacent V-slot.



Brame (1970) for Maltese. Prunet (1996) for Gurage. Faust (2005) for MH. See Pariente (2012) for competing mora-based analysis of MH facts.

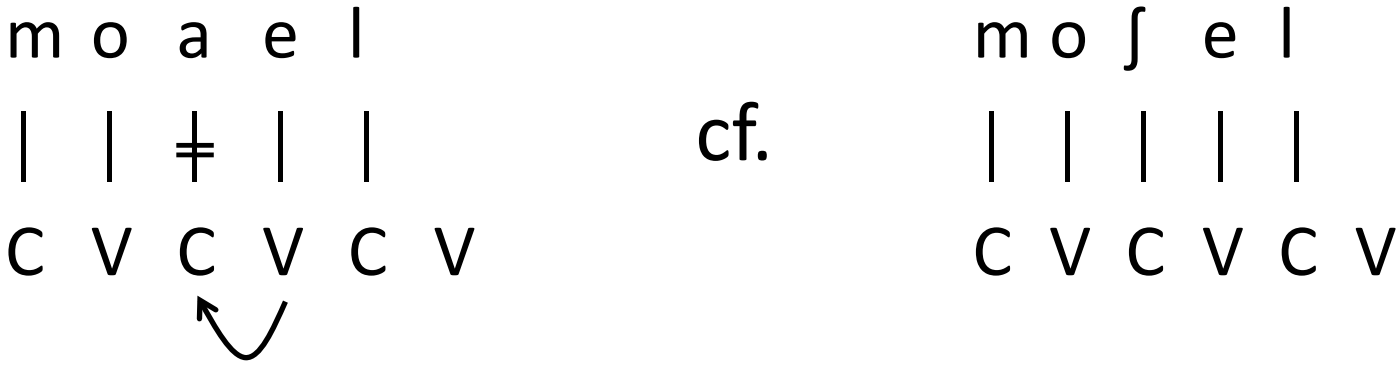
Preliminary Proposal

- When its position is governed from the following nucleus, the realization of this /a/ is inhibited. In this case, [ʔ] may be heard.



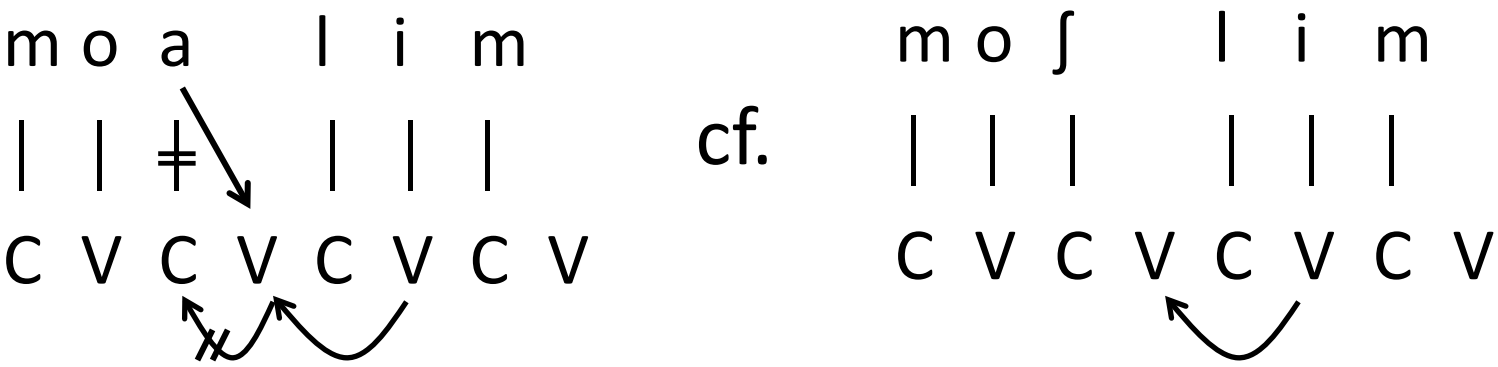
Examples

IH	*Cf. non guttural*	*Cf. BH*	
moʔel	moʃel	mo**h**el	‘circumcizer’



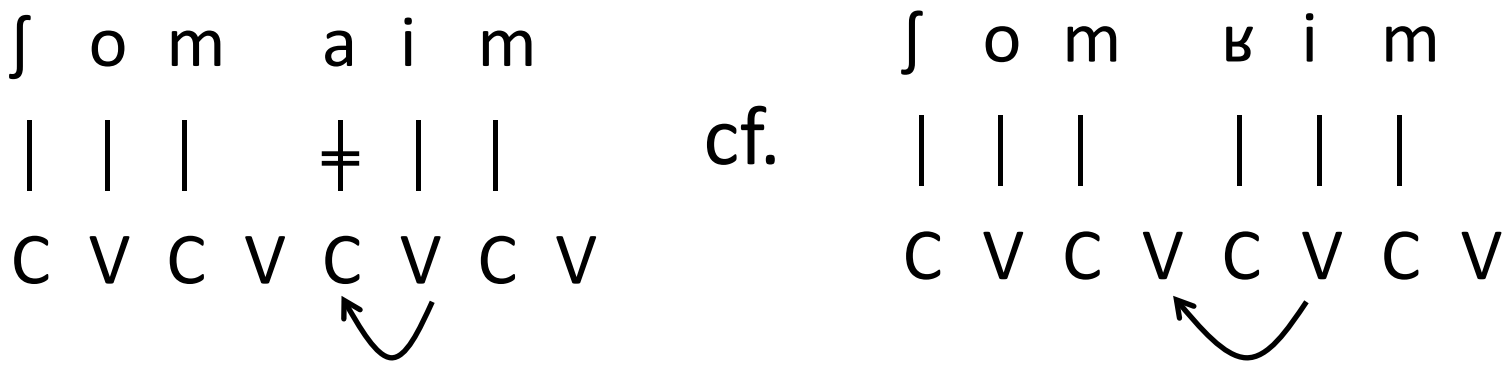
Examples

IH	*Cf. non guttural*	*Cf. BH*
moalim	mo**ʃl**im	mo**h**^{a}lim ‘(pl)’



Examples

IH	*Cf. non guttural*	*Cf. BH*	
ʃomʔim	ʃomʁim	ʃomʕim	‘hear.PRT.MPL’



Examples

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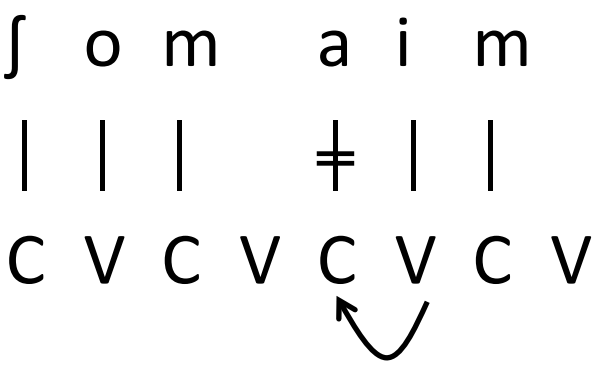
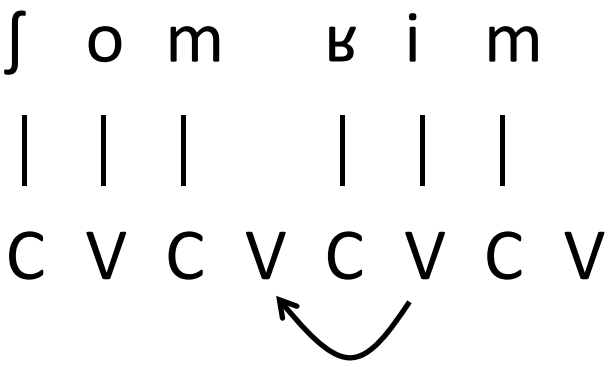


cf.



So far, so good.

A puzzle

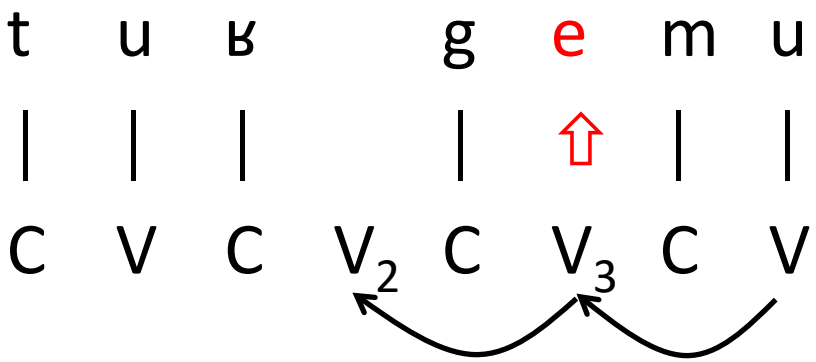
	sg.	*pl.*	
3-radical	[dugam]	[dugmu]	‘be perfected’
4-radical	[tuʁgam]	[tuʁgemu]	‘be translated’

=> /a/ absent from plural representation.

=> *CCC, epenthesis gives [CCeC]

A puzzle

- V_3 is realized despite being governed, because it has a job to do, namely govern V_2.



A puzzle

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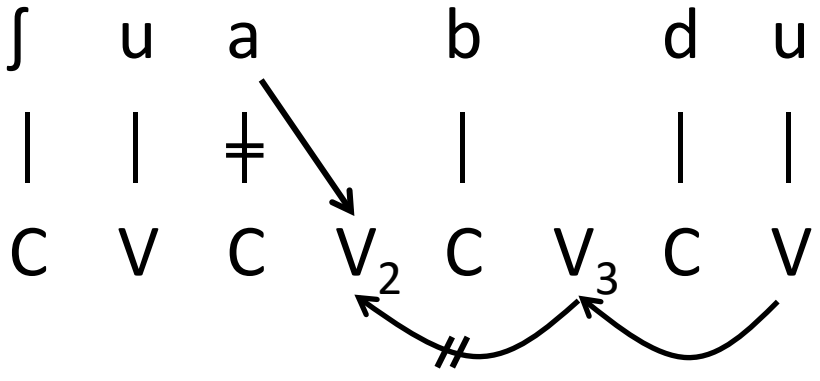
3-radical	[dugam]	[dugmu]	‘be perfected’
4-radical	[tuʁgam]	[tuʁgemu]	‘be translated’
4-radical	[ʃuabad]	[ʃuabdu]	‘be enslaved’

A puzzle

- V_3 does **not** have a job to do, because /a/ is unloaded on V_2. It is therefor silenced.



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3-radical	[dugam]	[dugmu]	‘be perfected’
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4-radical	[ʃuabad]	[ʃuabdu]	‘be enslaved’
Redup.			
2-radical	[tultal]	[tultelu]	‘be shaken’

A puzzle

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vtltl

Unproblematic

A puzzle

	sg.	*pl.*	
3-radical	[dugam]	[dugmu]	‘be perfected’
4-radical	[tuʁgam]	[tuʁgemu]	‘be translated’
4-radical	[ʃuabad]	[ʃuabdu]	‘be enslaved’
Redup.			
2-radi ⱱtltl	[tultal]	[tultelu]	‘be shaken’
2-radi ⱱʃaʃa	[ʃuaʃa]	[ʃuaʃeʔu]	‘be amused’

A puzzle

	sg.	*pl.*	
3-radical	[dugam]	[dugmu]	‘be perfected’
4-radical	[tuʁgam]	[tuʁgemu]	‘be translated’
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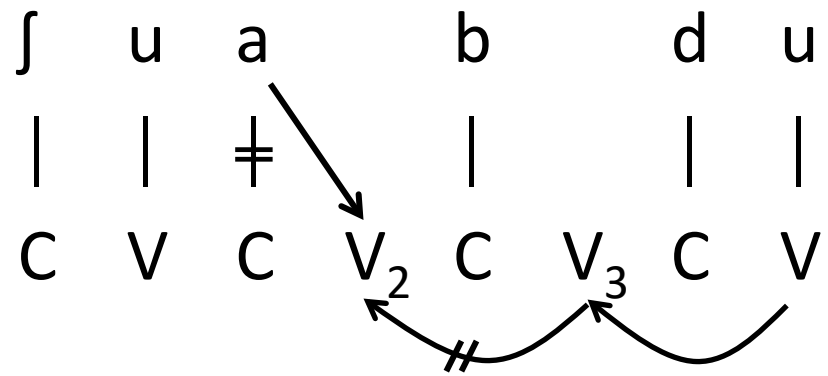
Redup.			
2-radi vtltl	[tultal]	[tultelu]	‘be shaken’
2-radi vʃaʃa	[ʃuaʃa]	[ʃuaʃeʔu]	‘be amused’

Why not *[ʃuaʃʔu], cf. [ʃamʔu]?

A puzzle

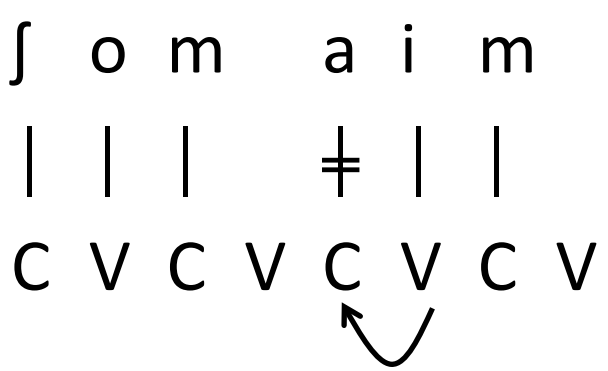
Given [ʃuabdu]

a)



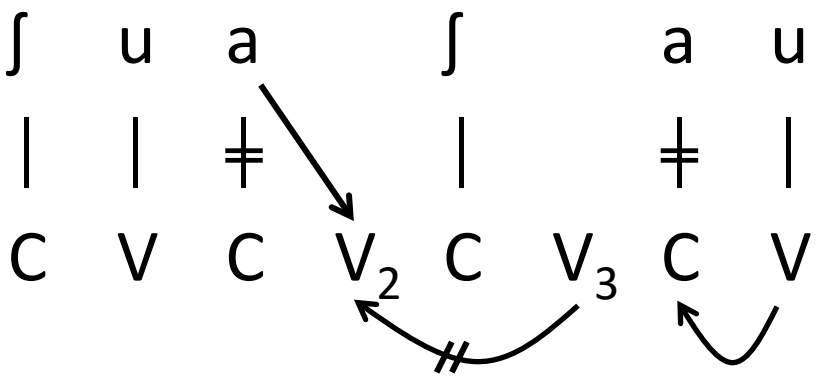
and [ʃomʔim]

b)



Why not *[ʃuaʃʔu]?

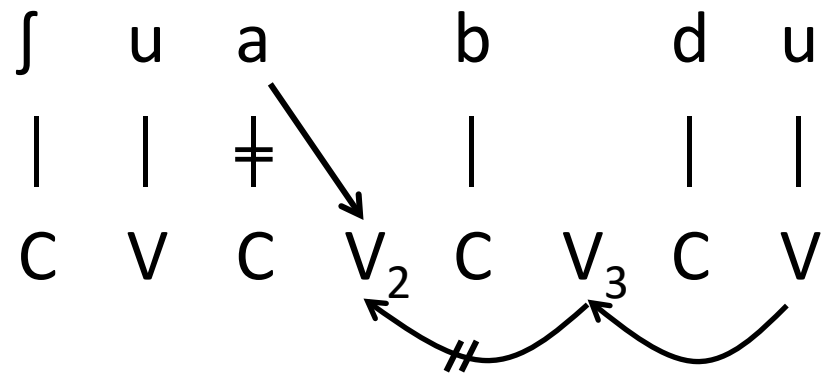
c)



A puzzle

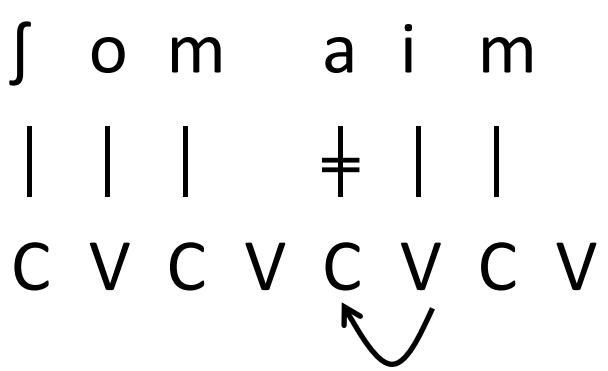
Given [ʃuabdu]

a)



and [ʃomʔim]

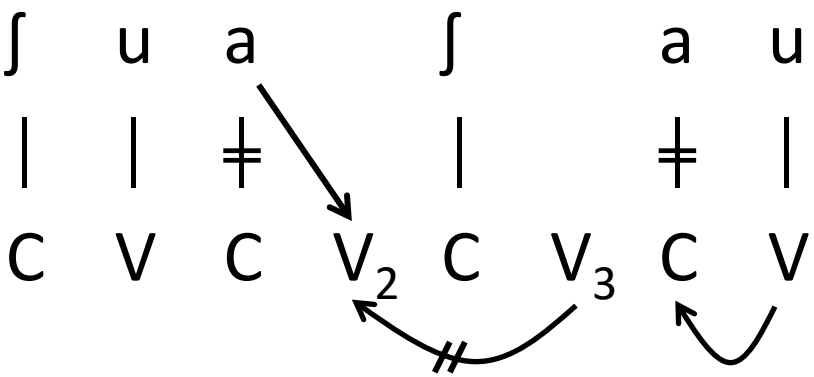
b)



Why not *[ʃuaʃʔu]?

Why does V_3 have to be realized here?

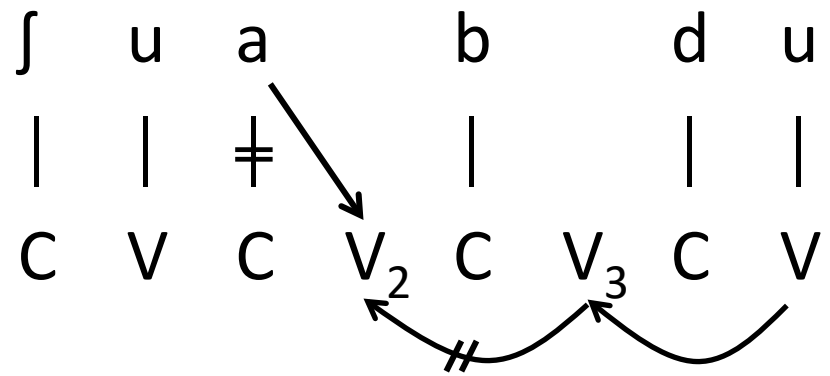
c)



The answer must have to do with **both** the preceding [ua] sequence, absent from (b)…

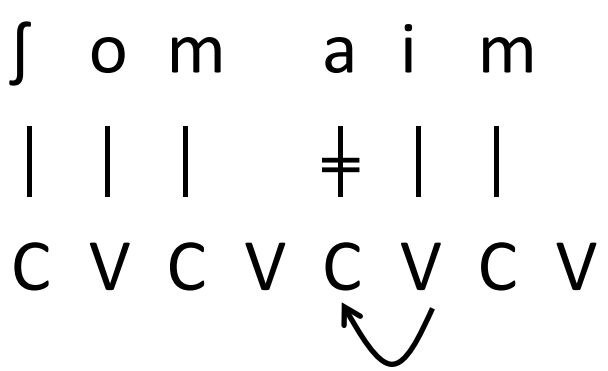
Given [ʃuabdu]

a)



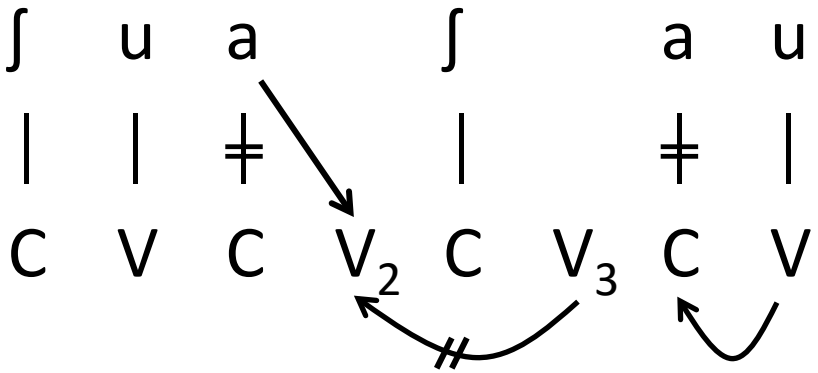
and [ʃomʔim]

b)



Why not *[ʃuaʃʔu]?

c)

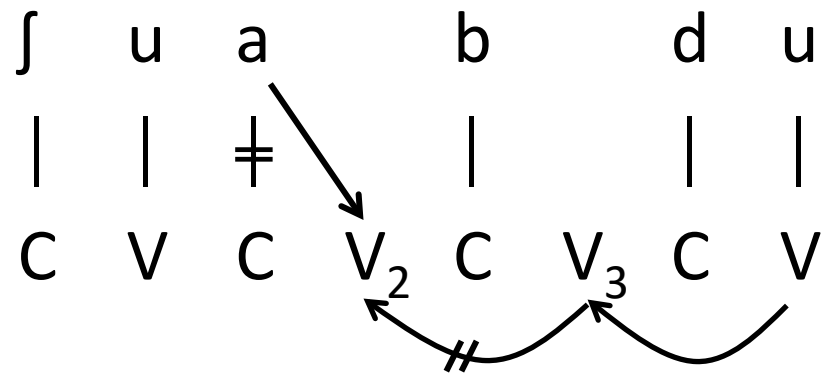


Why does V_3 have to be realized here?

and the second /a/ in (c), but not in (a).

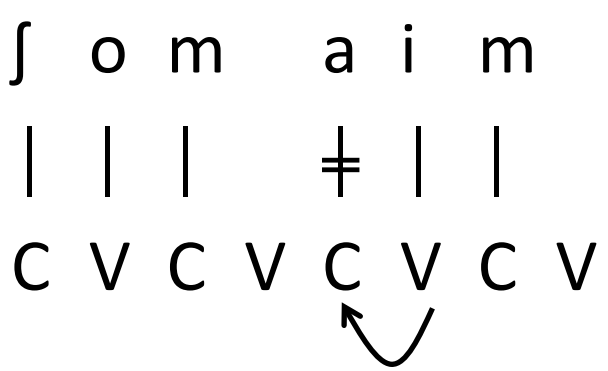
Given [ʃuabdu]

a)



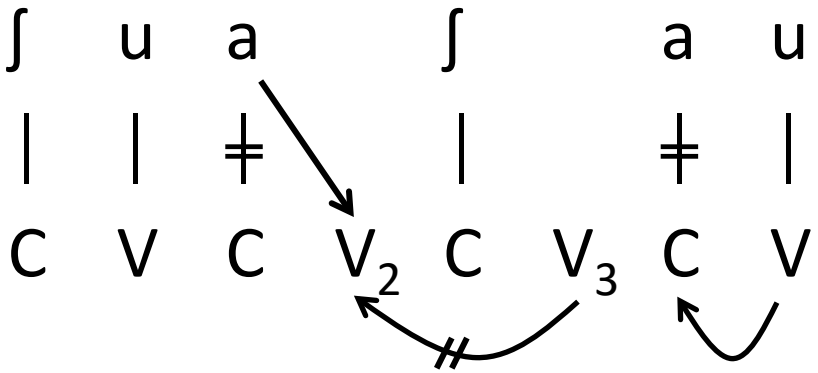
and [ʃomʔim]

b)



Why not *[ʃuaʃʔu]?

c)

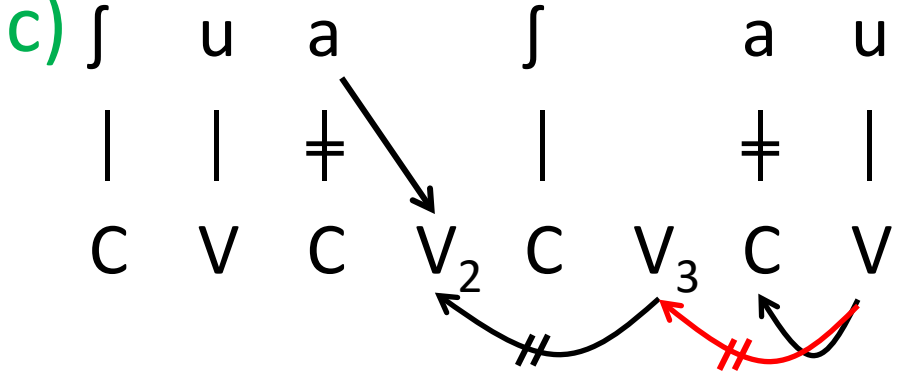


Why does V_3 have to be realized here?

Solution

Clearly, the power of the /-u/ in (c) is "spent" on the radical /a/, and therefore cannot silence V_3.

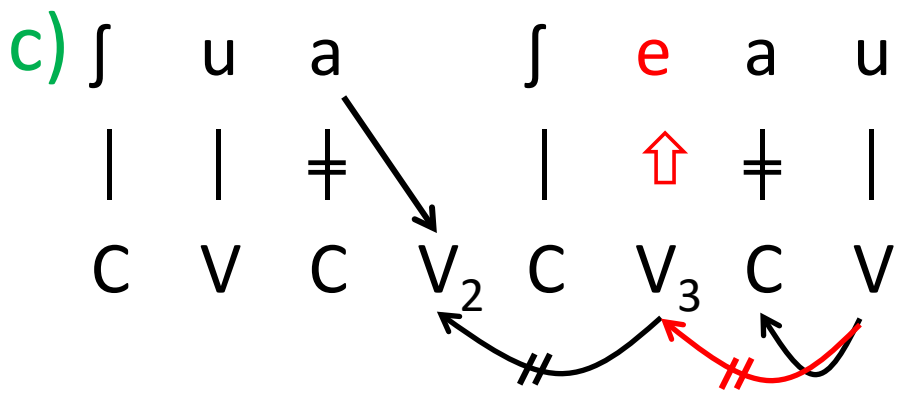
Why not *[ʃuaʃʔu]?



Solution

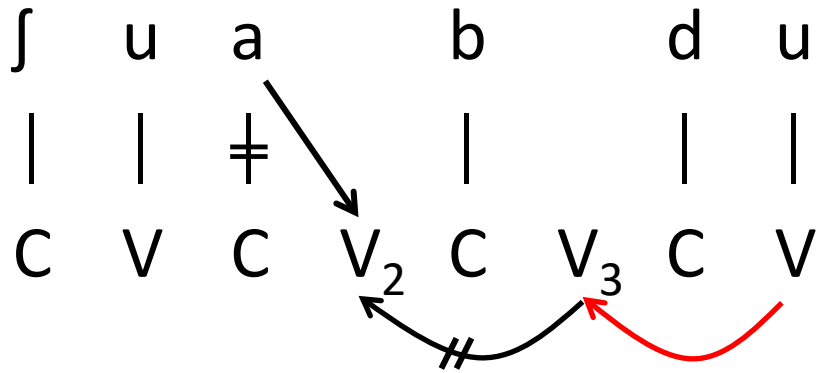
Clearly, the power of the /-u/ in (c) is "spent" on the radical /a/, and therefore cannot silence V_3.

/ʃuᵃʃᵃu/ => [ʃuaʃeʔu]



Solution

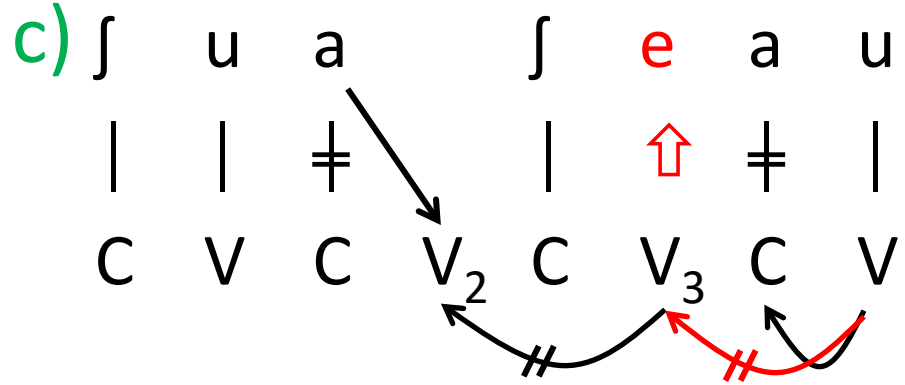
a)



This works nicely for [ʃuabdu], becauase here the power of the /-u/ is not spent on a "guttural" ghost.

/ʃuᵃʃᵃu/ => [ʃuaʃeʔu]

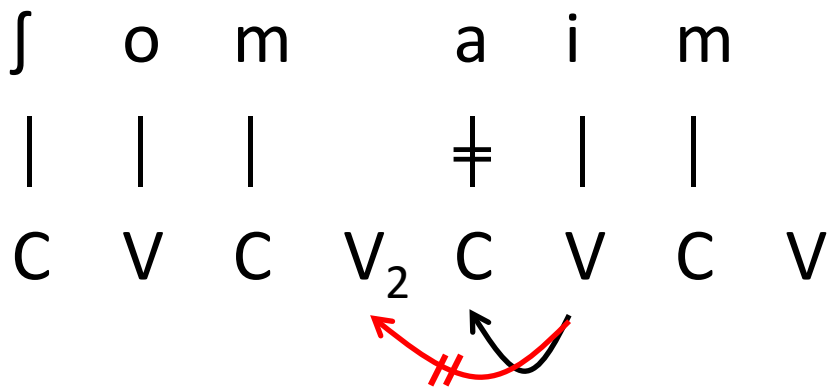
c)



Solution

[ʃomʾim], *[ʃomeʾim]

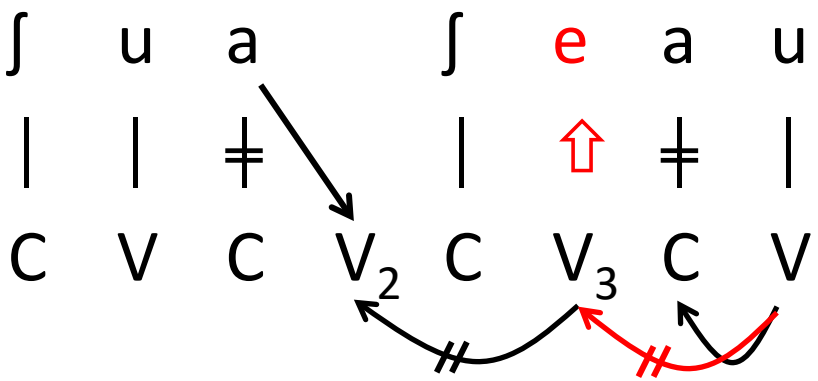
b)



But again it raises the question of why V_2 in (b) can be silenced…

/ʃuᵃʃᵃu/ => [ʃuaʃeʾu]

c)

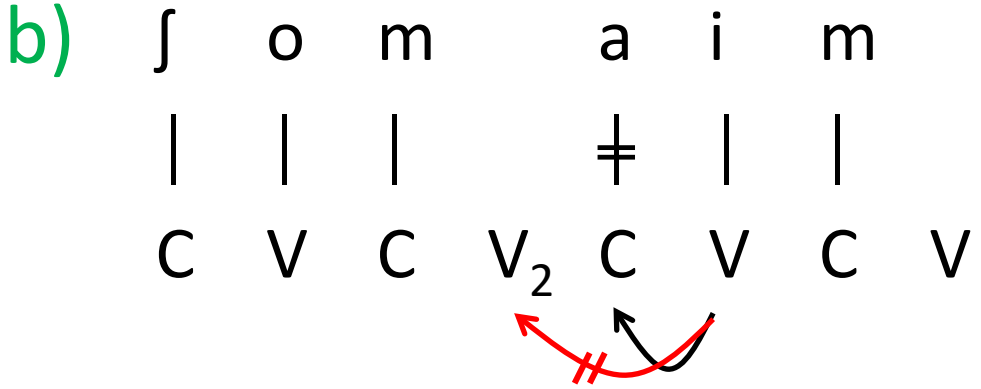


Solution

It must be that in (b), V_2 does not require inhibition in order to remain silent.

[ʃomʔim], *[ʃomeʔim]

b)



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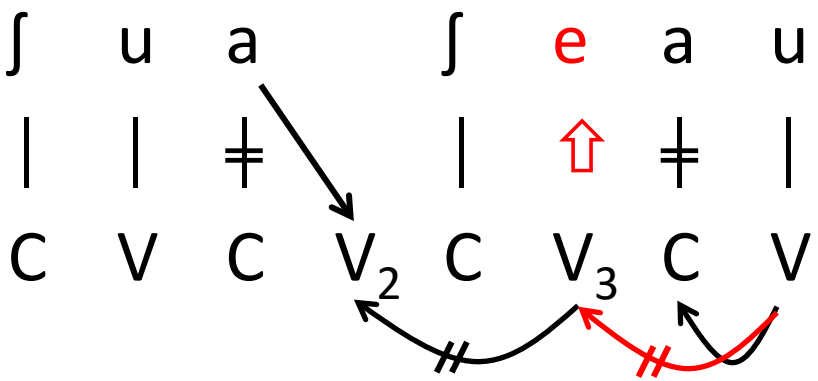
c)



Solution

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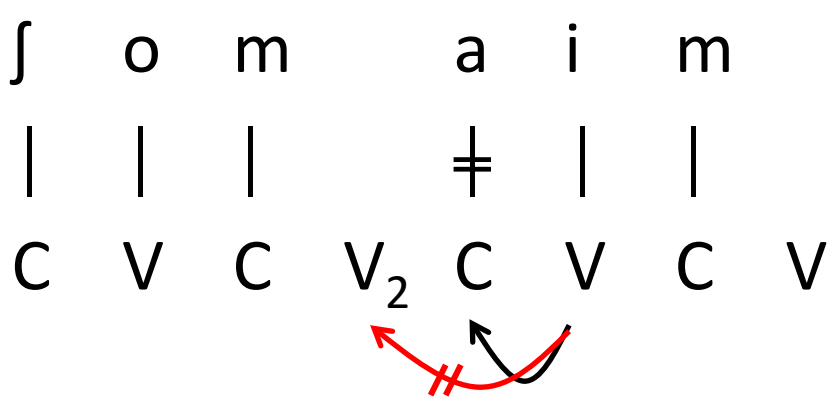
But why?

[ʃomʔim], *[ʃomeʔim]

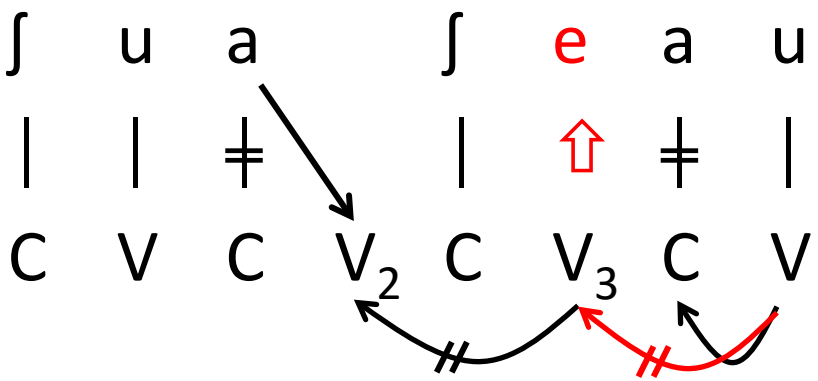
b)



But again it raises the question of why V_2 in (b) can be silenced…

/ʃuᵃʃᵃu/ => [ʃuaʃeʔu]

c)



Solution

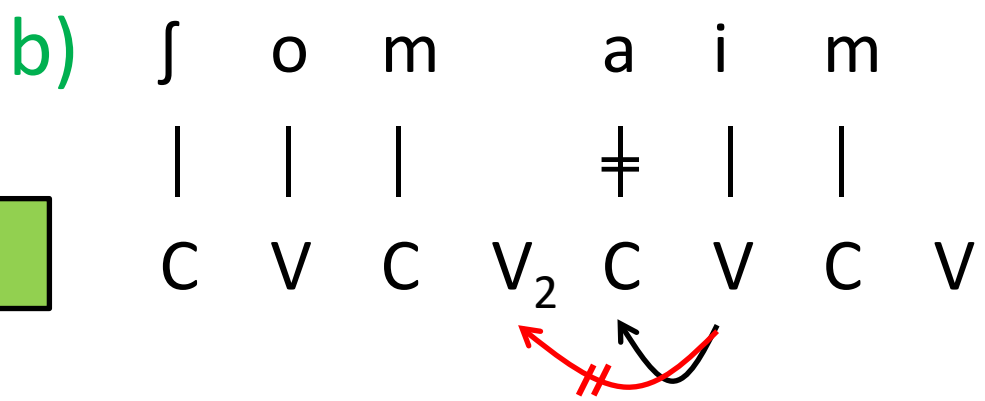
It must be that in (b), V_2 does not require inhibition in order to remain silent.

But why?

The answer has to do with the preceding /ua/ sequence.

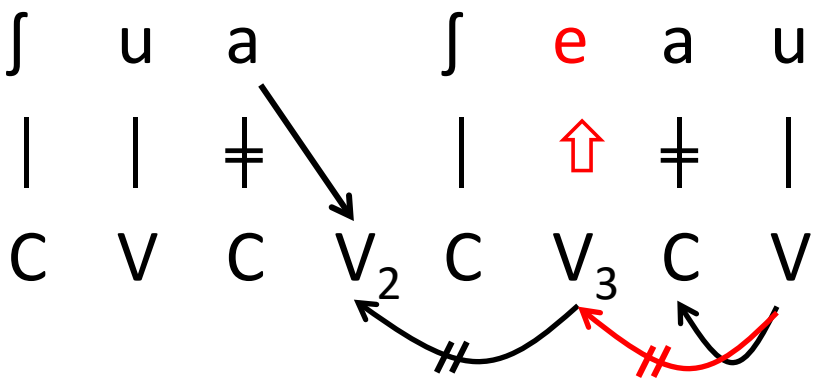
[ʃomʔim], *[ʃomeʔim]

b)



/ʃuᵃʃᵃu/ => [ʃuaʃeʔu]

c)



Solution

- Disclaimer: the solution that will be proposed now is not entirely in line with the general theory of CVCV phonology.

- Specifically, it depends on an additional layer of syllabic structure, that involves **codas**, whereas in CVCV all consonants are onsets.

Solution

- Recall our second question:

is [oa] in *moalim* a bisyllabic hiatus [o.a] or a monosyllabic diphthong [oa]?

- One thing we know about dipthongs is that, like long vowels, they do not like to be in closed syllables.

Solution

- Recall our second question:

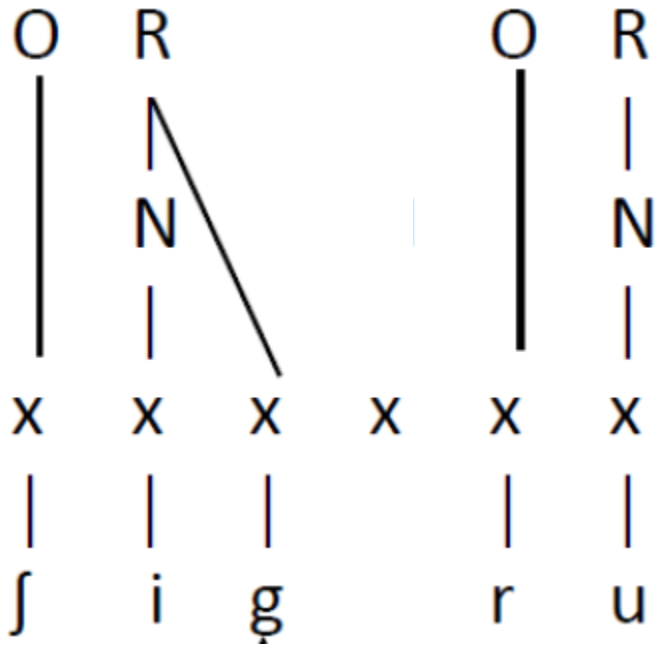
is [oa] in *moalim* a bisyllabic hiatus [o.a] or a monosyllabic diphthong [oa]?

- One thing we know about dipthongs is that, like long vowels, they do not like to be in closed syllables

We will now see that it is the diphthong parse that will give us the correct result.

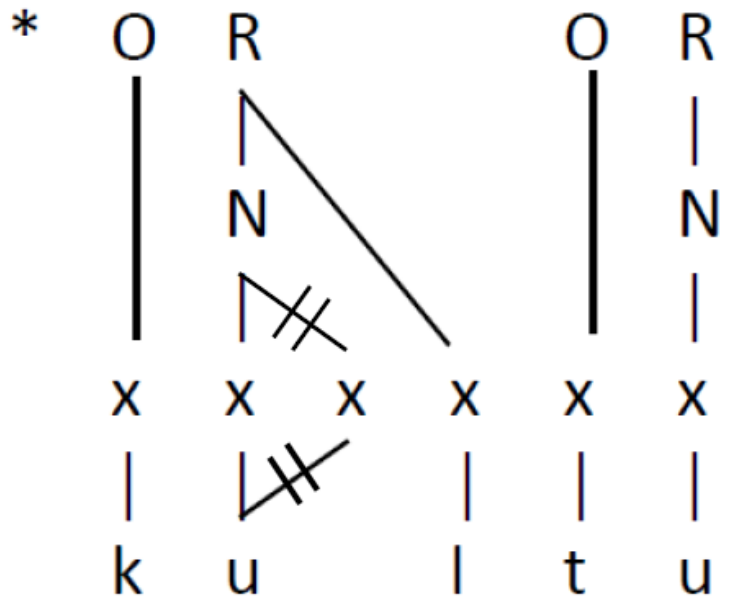
Solution

- Codas



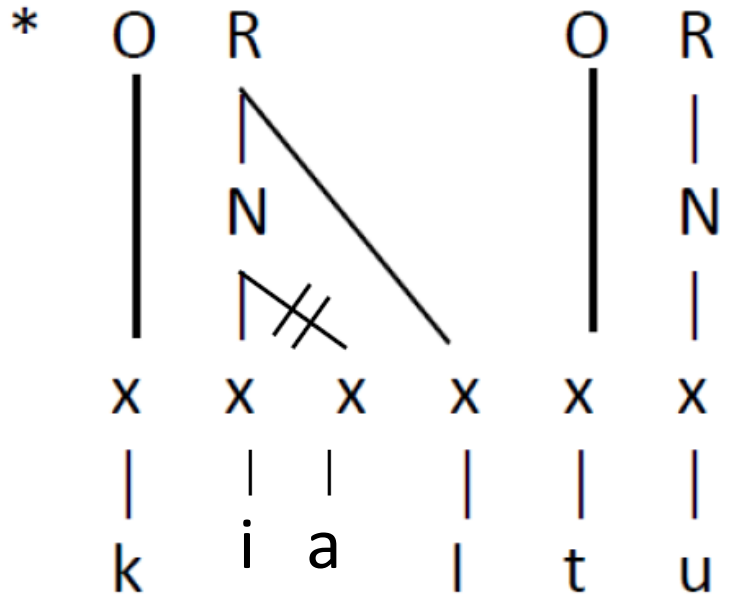
Solution

- A ban on two level branching, responsible for closed syllable shortening

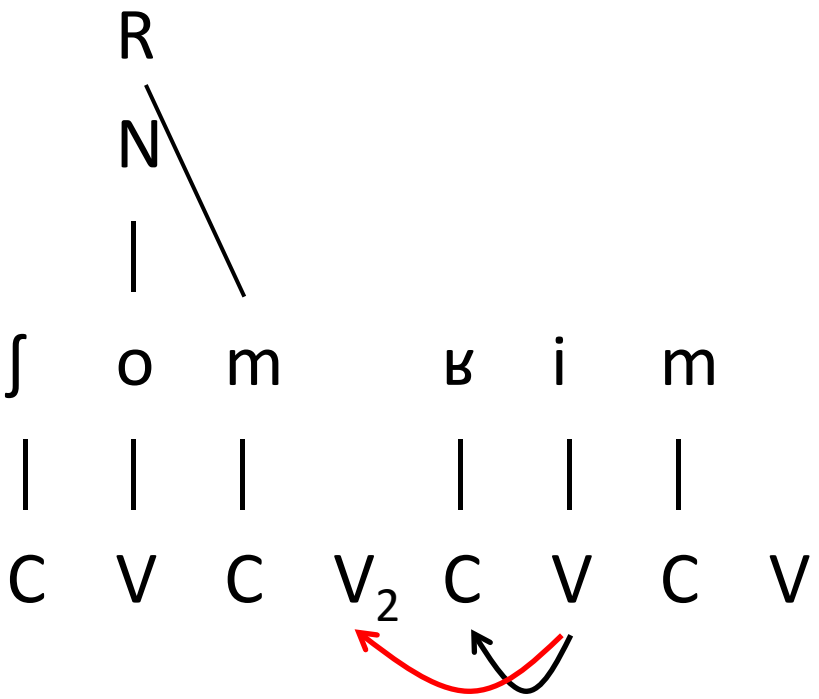


Solution

- A ban on two level branching, responsible for the ungrammaticality of diphthongs before codas

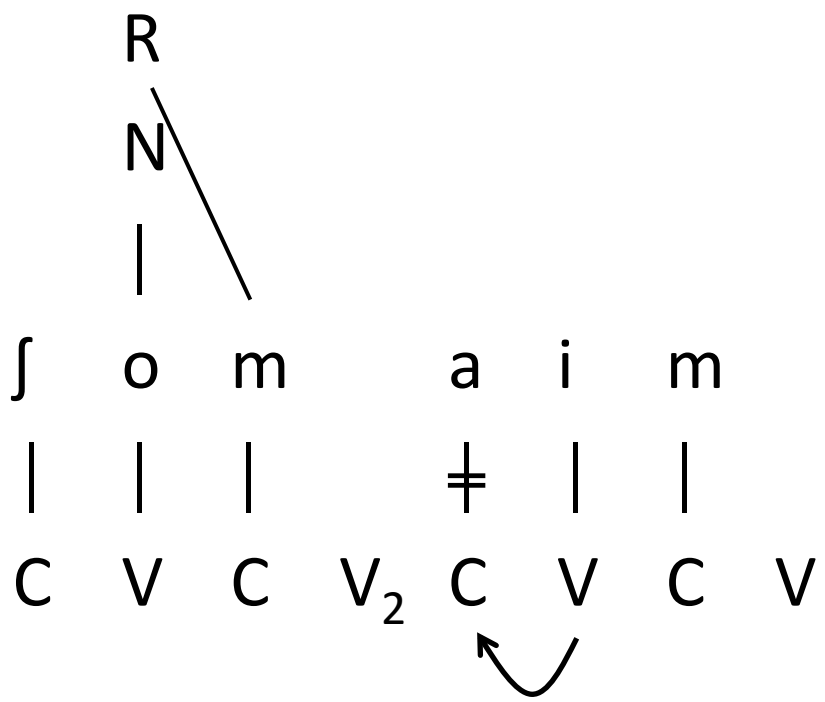


Solution



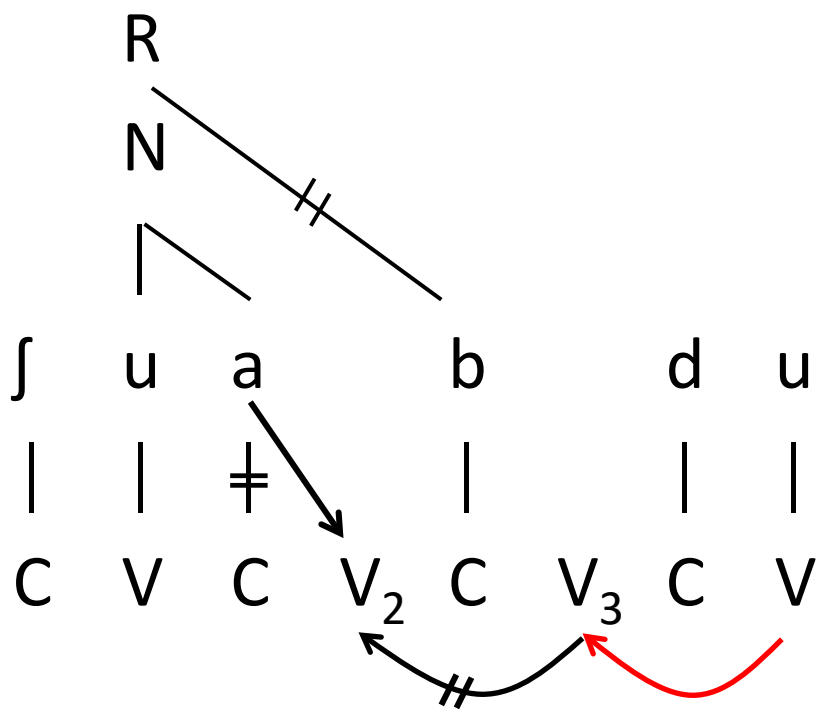
Let us assume that in order for a C to have a derived coda status, either the following consonantal position is licensed by a vowel, or the intervening V is governed.

Solution



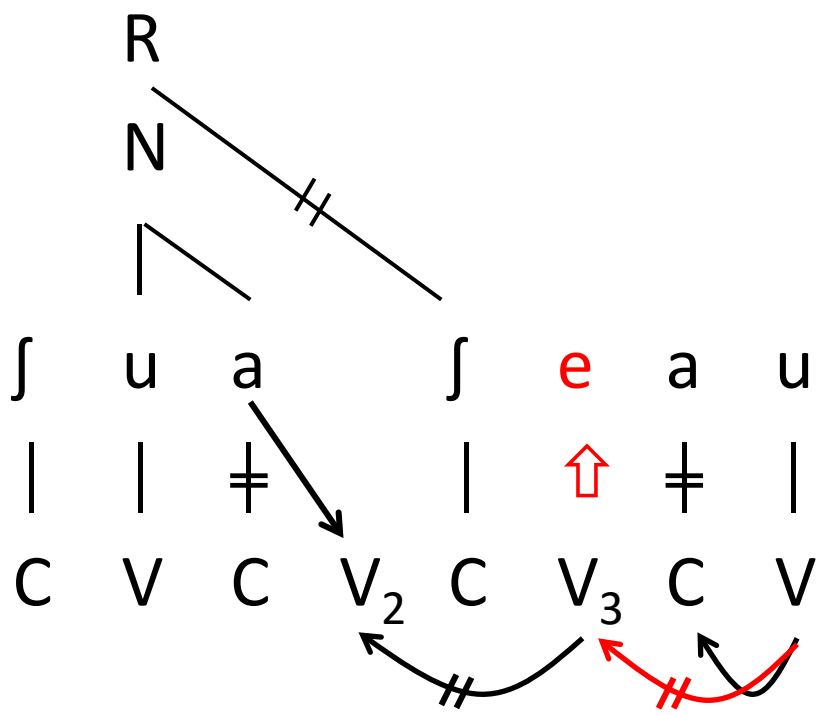
in [ʃomʔim], the V_2 is not governed, because the vowel's power is spent on the guttural ghost. But **the following C is licensed**, and so a derived coda may be formed.

Solution



In [ʃiabdu], however, a coda cannot be formed at all, because of the diphthong [ua]. V_3 still does not have to be realized, because it is governed.

Solution



In [ʃiaʃeu], too, a coda cannot be formed because of the diphthong [ua]. But in contrast to [ʃiabdu], V_3 cannot be inhibited by /-u/, and **therefore it must be realized.**

Puzzle solved

Solution

- This solution relies crucially on the diphthong parse of the sequences created by unloaded guttural ghost /ᵃ/.

- This is a welcome result. Several scholars have argued for disyllabic word minimality of uninflected stems in IH, understood here as two realized nuclei. A hiatus parse of [ʃi.aʃe.a] violates this condition, a diphthong parse doesn't.

However,

One must stress the price that has to be paid.

- Work in CVCV has claimed that all hierarchical syllable structure can be eliminated…

- Although the codas here are “derived” (not primitive) the coda-onset clusters argued for are not accepted by the general principles of the theory.

That said,

- I have not found a better explanation.

- The analysis sheds light on other issues in MH, a fact which lends it support.

(to be explored if there's time, in separate PDF)

Class summary

- Today we've distanced ourselves from the root and template polemics and delved into another aspcet that Semitic is famous for, gutturals.

- IH, like many other Afro-asiatic languages, no longer has gutturals. But like those other languages, it does retain many guttural *effects*. We asked how come.

Class summary

- We've explored the hypothesis that gutturals have been reihabilitated as a /a/ radical, which as such is initially mapped to a C-slot.

- In light of this, we looked at a specific puzzle of rediplicated biradical with a second guttural.

Class summary

- Roots are usually refered to as being "consonantal". Today's discussion qualifies this term: radicals are not necessarily consonants, but as radicals they are mapped to consonantal positions in tempaltes.

- Even though we've not discussed the non-concatenative polemic today, it is really hard to imagine what a non-templatic, word-based analysis would be of the issue we've looked at today.

Class summary

- This is a real challenge for such an approach – these verbs are not negligeable at all in the language, and the processes are both productive and exceptionless.

- All that said, we've only looked at a couple of guttural effects. To close with a challenge, let us consider the following guttural-related data

the challenges of *ħ

hifʁiχ	‘refute’	hifʁíaχ	‘blow’
hetiχ	‘weld’	hetíaχ	‘hurl’
tiveχ	‘mediate’	tivéaχ	‘give range’
sibeχ	‘complexify’	ʃibéaχ	‘praise’

the challenges of *ħ

hifʁiχ	hifʁíχu	hifʁíaχ	hifʁíχu
hetiχ	hetíχu	hetíaχ	hetíχu
tiveχ	tivχu e’	tivéaχ	tivχu nge’
sibeχ	sibχu xify’	ʃibéaχ	ʃibχu

the challenges of *ħ

hifʁiχ	‘refute’	hifʁíaχ	‘blow’
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s i b e χ
| | | | |
C V C V C V

the challenges of *ħ

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s i b e a

| | | | | | |

C V C V C V

the challenges of *ħ

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hetiχ	‘weld’	hetíaχ	‘hurl’
tiveχ	‘mediate’	tivéaχ	‘give range’
sibeχ	‘complexify’	ʃibéaχ	‘praise’

s i b e a χ ????

| | | | | | |

C V C V C V

the challenges of *ħ

jaazoʁ	‘help’	jaχzoʁ	‘return’
maaviʁ	‘pass’	maχviʁ	‘grow pale’

Course Summary

- Semitic languages exhibit real non-concatenativity: morphemes that are not suffixed, infixed or prefixed to their bases.

- This phenomenon is, as far as I know, unique to these languages.

- Like these morphemes, the bases are also discontinuos, and are a special type of “stem”…

Course Summary

- Several scholars, famously but certainly not exclusively Outi Bat El, have argued that Semitic langauges are not so different in fact.

- In these languages, too, the basic storage unit is the word. They argued for this mainly because

  - Roots are too underspecified in meaning

  - in derivation, the target is sensitive to more than just a set of extracted consonants.

Course Summary

- Subsequently, some aspects of the template morpheme were also under “attack”: the syllable structure, it was argued, can be derived phonologically. The template is in fact only its vowels.

- We’ve gone over many arguments against these claims. While in many cases the proponents of the rootless approach can still appeal to the stem, there are crucial cases where they cannot, often related to weak verbs

Course Summary

- We devoted an entire class to the question of biradical roots, reduplication and template satisfaction. While there are ways to derive the phenomena in a rootless approach, it was shown that they come with a cost.

- In addition, we saw that external evidence – psycholinguistic etc. - also argue for the existence of the root as a meaningful cognitive unit.

Course Summary

- Indeed, in many theories underpecified roots are a universal component of morphology, and what sets Semitic ones apart is mostly their internal structure.

- Finally, we examined from up close the case of the lost gutturals of IH, implementing all the machinery that we have acquired in the course. This phenomenon, too, relies on a modern interpretation of roots and templates as real cognitive objects.