Non-linear Blocking Effects on Suppletive Allomorphy*

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ABSTRACT: It has been widely observed that suppletive allomorphy (e.g., *better* blocking **good+er* in English) respects some form of locality; however, it is still debated if the relevant metric of locality needs to be stated in *linear* terms or *structural* terms (Embick, 2010; Bobaljik, 2012; cf. Moskal and Smith, 2015). This study contributes to this debate by investigating the root allomorphy patterns in Laz, an endangered South Caucasian language spoken primarily in Turkey. In each case of root allomorphy in Laz, the root is required to be linearly adjacent to the morpheme that conditions the allomorphy. Moreover, Laz exhibits (what will be called) *non-linear blocking effects* on allomorphy: Some prefixes can prevent a suffix from conditioning allomorphy on the root. Importantly, this case constitutes evidence that *linear adjacency* is not a sufficient condition on suppletive allomorphy and is at odds with the view that the domain of grammar responsible for selecting exponents operates on linearized structures (cf. Embick, 2010).

Keywords: root allomorphy, suppletive allomorphy, non-linear blocking

Değişken Altbiçimlenmeye Çizgilesellik-dışı Engeller

ÖZ: Değişken altbiçimlenmenin (örn: İngilizcede *better* sözcüğünün **good+er* biçimini engellemesi), bir çeşit yerellik ilkesine uyduğu yaygın olarak gözlemlenmiştir. Fakat, bu yerellik ilkesinin çizgisel (İng. *linear*) mi yapısal mı olduğu tartışmaya açıktır (Embick, 2010; Bobaljik, 2012; cf. Moskal and Smith, 2015). Bu çalışma, en çok Türkiye'de konuşulan tehlike altındaki Güney Kafkas dili Lazcada, kökte altbiçimlenme örneklerini inceleyerek bu tartışmaya katkı sunmayı hedeflemektedir. Lazcadaki her kökte altbiçimlenme durumunda, kökün altbiçimlenmesini koşullayan biçimbirimle kök bitişik

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olmak zorundadır. Ayrıca, Lazca değişken altbiçimlenmede *çizgisellik-dışı engelleme* olarak adlandırılacak kısıtlar göstermektedir: Bir önek, bir sonekin kökte altbiçimbirim koşullamasını engelleyebilmektedir. Önemli olarak, bu tip örnekler değişken altbiçimlenmenin uyduğu yerellik ilkesinin salt *çizgisel bitişiklik* olamayacağına dair kanıt sunmaktadır ve dilbilgisi modelinde biçimbirim seçiminden sorumlu birimin çizgiselleştirilmiş yapılar üzerinde işlem yaptığı fikriyle uyumlu değildir (cf. Embick, 2010).

Anahtar Sözcükler: kökte altbiçimlenme, değişken altbiçimlenme, çizgisellik-dışı engelleme

1 Theoretical Background

In this paper, I investigate suppletive allomorphy patterns in verb roots in Laz and discuss their theoretical implications. To guide the discussion that follows, let us briefly go over the notions relevant to suppletive allomorphy and introduce the model in which the discussion is couched. (1) below is a frequently cited example of suppletive root allomorphy in English, where the comparative morpheme is said to *condition* suppletive allomorphy on a root (Bobaljik, 2012:8).

(1)	a.	*good*		[positive degree]
	b.	*bett*-er	cf. *good-er	[comparative degree]

For the purposes of discussion, I adopt one of the syntax-based realizational models of morphology, namely Distributed Morphology (henceforth DM) (Halle and Marantz, 1993).[1] The core premise of DM is that exponents (also called vocabulary items) are *inserted* into terminal nodes in the structure that syntax builds.[2] Under the assumptions of DM, the insertion procedure reads and implements rules that match an exponent with a syntactic node containing a set of (morpho-syntactic) features. The suppletive allomorph of a morpheme/node

[1] I couch the discussion in DM. But I did not make this decision because I believe DM to be superior to its alternatives but because I hope that it will be more familiar to the reader than its close alternatives such as Nanosyntax (Caha, 2009). See also other respectable models of morphology such as A-Morphous Morphology (Anderson, 1992), Paradigm Function Morphology (Stump, 2001), among others, which are theoretically distinct from the present framework. Nevertheless, I hope that the empirical contribution of the paper will be relevant to readers familiar with other models of morphology.

[2] This entails that word-internal complexity is *ceteris paribus* syntactic complexity. Surely, this idealization is at best a desideratum, at the very least compromised in particular by non-concatenative morphology (cf. Bye and Svenonius, 2012).

is said to be *conditioned* by another morpheme/node that hosts such information (Bobaljik, 2000). This conditioning is stated as part of an insertion rule in the form of a contextual condition on insertion.[3] To illustrate, the allomorph /bɛt/ in *better* is listed in the lexicon (i.e., in the sense of exponent list) as only insertable in the context of the syntactic node containing the set of features that make an adjective comparative, in short *comparative morpheme* or COMPR.

(2) a. insert /gʊd/ into √GOOD
b. insert /bɛt/ into √GOOD in the context of COMPR

As this paper is about allomorphy in roots, I need to flesh out my assumptions on the representation of roots. I assume that root nodes, just like functional nodes (e.g., Kornfilt, 2001; Alexiadou, 2010; a.o.), are targets for post-syntactic exponent insertion, as we have seen above. Therefore, a root node inserted in syntax must contain some information visible to the exponent selection procedure. Glossing over what that information is, I have tentatively used √GOOD above. However, it has been argued that this information cannot be phonological or conceptual/semantic (Harley, 2014). For that reason, following Acquaviva (2009) and Harley (2014), I tentatively represent roots as numerical indices like √101.[4] These indices can be thought to be in effect like IP addresses in our cognitive system. They are themselves devoid of phonological and semantic information but when they are 'clicked on' so to speak, they provide phonological and semantic interfaces with *access* to such information. When we observe suppletive root allomorphy, this tells us that at least two distinct exponents match the same numerical index. To put it in simple terms, these indices tell us that *good* and *better* come from the same index (while a semantically similar root like *nice* will be linked to a different index). In line with this idea on roots, let us revise the insertion rules above as in (3) below. The

[3] I adopt these DM-style insertion rules with contextual conditions simply for the purposes of discussion. As a matter of fact, syntax-based realizational models of morphology present a variety of approaches to allomorphy. See Caha et al. (2019) and references therein for the Nanosyntactic view based on the premise that exponent insertion always targets non-terminal nodes. Under this view, allomorphy is essentially portmanteaux (i.e., insertion into a non-trivial constituent). A line of work related to Caha (2009) is the *Spanning* model developed by Svenonius (2012) where contiguous heads are assumed to be subject to portmanteaux insertion. Building on the *Spanning* model, Merchant (2015) proposed the span-adjacency hypothesis, arguing that it better accounts for apparent non-local conditioning. For reasons of space, I do not discuss these alternative models further.

[4] These numerical indices are theoretical constructs. They are chosen arbitrarily and do not mean anything. In that sense, their use is similar to the use of indices in syntax for coreference.

index is chosen arbitrarily but their identity is important. Here the rule in (3b) is more specific and whenever its condition is satisfied, it bleeds/overrides the default/elsewhere rule in (3a) and blocks **good-er*. Note that there is no competition between the rule in (3b) and the rule in (4) because they are instructions that match distinct indices. This is why *better* does not block *nicer*.

(3) a. insert /gʊd/ into √123
b. insert /bɛt/ into √123 in the context of COMPR

(4) insert /najs/ into √321

What is most relevant to this paper is the underlined portion of an insertion rule like (3b), in particular what is behind the vague phrase *in the context of*. The received view is that suppletive allomorphy respects some form of adjacency/contiguity (Embick, 2010; Bobaljik, 2012; Merchant, 2015, a.o.).[5] This means that the *in the context of* part of insertion rules is subject to certain locality principles. If such rules can only make reference to strictly local contexts, there are two conceivable ways to understand strict locality. In particular, the locality conditions on suppletive allomorphy may be expressed in *linear* (e.g., Embick, 2010) or *structural* (e.g., Bobaljik, 2012) terms.

(5) a. √123 and COMPR can be *linearly adjacent* (i.e., there is no exponent that breaks the string-adjacency between √123 and COMPR) (Embick, 2010)

b. √123 and COMPR can be *structurally contiguous* (i.e., there is no node between COMPR and the root node in the structure) (Bobaljik, 2012)

Structural contiguity may usually translate into linear adjacency. But there is a way to tease apart these distinct notions of locality. Suppose that syntax compiles

[5] Locality conditions that govern suppletive allomorphy have been at the heart of recent research on morphology and its interface with syntax (see Siddiqi, 2009; Bonet and Harbour, 2012; Gouskova and Bobaljik, 2019; a.o. for comprehensive reviews and discussion). Notably, there are also reports of allomorphy whose conditioning context appears to be non-local (Moskal and Smith, 2015; Božič, 2017, 2018; Smith et al., 2018). An evaluation of these problematic cases is beyond the scope of this paper. But see Božič (2017) who reports that despite rare exceptions, the adjacency requirement appears to be a defining characteristic of root allomorphy across languages.

the set-theoretic object[6] in (6) by Merge (Chomsky, 2015), where each object that is not a set is a terminal node. Further suppose that this set-theoretic object is in the end linearized into the string in (7).[7] Let us also adopt the insertion rules in (8).

(6) {{{ √000, F1 }, F2 }, F3}

(7) F2+F1+√000+F3

(8) a. insert /nana/ into √000
b. insert /bebe/ into √000 in the context of F3

If the exponent insertion procedure operates over linearized structures and the relevant notion of locality is linear adjacency, the rule in (8b) is local enough (hence applicable) because √000 and F3 are linearly adjacent in (7). Accordingly, in pronouncing (6), the root allomorph /bebe/ will be chosen.

If, on the other hand, the insertion procedure applies to (the terminal nodes in) hierarchical objects as in (6) and the relevant notion of locality is structural contiguity[8], then the rule (8b) is not applicable because F3 is contextually not local enough. F2 is a structural intervener between √000 and F3 (even though it ends up being a non-intervener in linear terms). Accordingly, we expect to see the default/elsewhere allomorph /nana/ in pronouncing (6).

In short, these different notions of locality can be teased apart in certain configurations (even though they make the same predictions in many other configurations[9]). This paper not only provides a detailed empirical description of

[6] An anonymous reviewer points out to the necessity of distinguishing these unordered set-theoretic objects from similarly unordered representations in Lexical-Functional Grammar (Bresnan, 2001) or Interactive Grammar (Kunduracı, 2020), and further asks whether structural contiguity and these unordered representations are compatible. It should be emphasized that the set-theoretic objects built by Merge *do* encode information about hierarchy. What they do not encode is the linearization information between the two members of a set. Therefore, structural contiguity *is* defined for set-theoretic objects.

[7] I remain agnostic on how linearization is implemented but I admit that it has to respect exponent-intrinsic linearization instructions (e.g., 'align me to the left'). See Bye and Svenonius (2012) for relevant discussion.

[8] X and Y are structurally contiguous if and only if (i) Y is a daughter of X's sister, or (ii) X and Y are sisters.

[9] For example, if the linearization were F1-√000-F2-F3 and we had the default /nana/ exponing √000, we could not tell if we observe the blocking of the suppletive allomorphy because √000 and F3 are not linearly adjacent or because √000 and F3 are not structurally contiguous.

the attested conditions of root allomorphy in Laz but also brings in a particularly informative set of data that allow us to do exactly this, namely tease apart these two distinct notions of locality. The main finding of the investigation is that the linear adjacency requirement falls short of explaining blocking effects on allomorphy (contra Embick, 2010). As will be discussed in depth, in Laz root allomorphy *can* be blocked by a linearly uninvolved, structural intervener. This state of affairs is naturally at odds with the view that *linear adjacency* is the relevant metric of locality.

2 Root Allomorphy in Laz

There are four verbal[10] roots in Laz that exhibit suppletive allomorphy conditioned by imperfective, past, and subjunctive.[11] These are *xen*- 'do', *şk'om*- 'eat', *lv*- 'move', and *zit'*- 'say'. Below, I first present the regular pattern (with no allomorphy) and then introduce the set of roots that exhibit allomorphy.

2.1 The Regular Pattern

In the regular pattern, the verbal root is not affected in any way by the affixes attached to it. To illustrate, the root *t'ax*- 'break$_{\text{transitive}}$' remains unchanged under all inflections.

(9) a. **t'ax**-u
break-3SG.PST
'S/he broke it.'

b. **t'ax**-um-s
break-IMPF-3SG.PRES
'S/he is breaking it.'

c. **t'ax**-a-s
break-SUBJ-3SG.PRES
'Let her/him break it.' // 'May s/he break it.'

[10] I do not discuss the auxiliary 'be' which also exhibits suppletion.

[11] See Öztürk and Pöchtrager (2011) and Demirok (2014) for partial paradigms. All data reported here were elicited from İsmail Bucaklişi, who is a Laz-Turkish bilingual proficient in both languages.

d. **t'ax**-eri
break-PTCP
'having broken it'[12]

2.2 The Allomorphy Patterns

As mentioned above, there are four verbal roots that show suppletive allomorphy in Laz. As will be discussed shortly, the allomorphy patterns among these verbs are not uniform: one of the roots has a distinct form only under past and subjunctive, two of the roots have a distinct form only under imperfective, and the remaining one root has distinct forms both under past and subjunctive and under imperfective.

Throughout the examples below, the past, subjunctive, and imperfective forms are provided. In addition, I present the participle form, which does not condition allomorphy anywhere in the language, as the control case illustrating the elsewhere form.

2.2.1 xen- ~ ik-

The verbal root *xen-* 'do' surfaces as *ik-* under imperfective. In other words, we can identify the imperfective context as the condition for the allomorphy.

(10) a. **xen**-u cf. *ik-u
do-3SG.PST
'S/he did it.'

b. **ik**-um-s cf. *xen-um-s
do-IMPF-3SG.PRES
'S/he is doing it.'

c. **xen**-a-s cf. *ik-a-s
do-SUBJ-3SG.PRES
'Let her/him do it.' // 'May s/he do it.'

d. **xen**-eri cf. *ik-eri
do-PTCP
'having done it'

[12] The participle forms built by *-eri* can be used in numerous syntactic contexts. See Öztürk and Pöchtrager (2011) for a preliminary investigation. Due to a lack of an all-encompassing translation into English, I use English perfect participle forms.

Notably, *ik-* is followed by a regular imperfective suffix. That is, it does not appear to be a portmanteau exponent that also expones IMPF.

2.2.2 şk'om- ~ imxor-

The verbal root *şk'om-* 'eat' surfaces as *imxor-* with imperfective.

(11) a. **şk'om**-u — cf. ***imxor**-u
do-3SG.PST
'S/he ate.'

b. **imxor**-s — cf.***şk'om**-um-s, ***imxor**-um-s[13]
eat.IMPF-3SG.PRES
'S/he is eating.'

c. **şk'om**-a-s — cf. ***imxor**-a-s
eat-SUBJ-3SG.PRES
'Let her/him eat.' // 'May s/he eat.'

d. **şk'om**-eri — cf. ***imxor**-eri
eat-PTCP
'having eaten'

Unlike *ik-* (the allomorph of *xen-* 'do' under imperfective), *imxor-* cannot be followed by a regular imperfective suffix. That is, it is possible to take *imxor-* as a portmanteau exponent that also expones IMPF. However, this is not the only plausible analysis for *imxor-*, for some roots in Laz do license zero imperfective forms like many other languages, as illustrated below in (12b). Therefore, it is equally possible that *imxor-* is followed by a zero imperfective suffix.

(12) a. ibgar-u
cry-3SG.PST
'S/he cried.'

cf. t'ax-u
break-3SG.PST
'S/he broke it.'

b. ibgar-s
cry.IMPF-3SG.PRES
'S/he is crying.'

t'ax-**um**-s
break-IMPF-3SG.PRES
'S/he is breaking it.'

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[13] Laz has four different overt allomorphs for IMPF: *–um, -am, -ur/un, -er/en* (Öztürk and Pöchtrager, 2011; Öztürk, 2013). None of them is able to co-occur with *şk'om-* or *imxor-*.

2.2.3 lv- ~ xt'-

The verbal root *lv-*[14] 'move' surfaces as *xt'*- under past and subjunctive. Notably, this root corresponds to a motion verb, which is underspecified for directionality or manner, and it co-occurs with one of the many spatial prefixes.[15]

(13) a. mo-**xt'**-u cf. *mo-**l**-u
DIR-move-3SG.PST
'S/he came.'

b. mo-**l**-un[16] cf. *mo-**xt'**-un
DIR-move-IMPF+3SG.PRES
'S/he is coming.'

c. mo-**xt'**-a-s cf. *mo-**lv**-as
DIR-move-SUBJ-3SG.PRES
'Let her/him come.' // 'May s/he come.'

d. mo-**lv**-eri cf. *mo-**xt'**-eri
DIR-move-PTCP
'having come'

Notice that the root *xt'*- is always followed by regular suffixes that expone past tense or subjunctive. Therefore, *-xt'*- is not obviously a portmanteau exponent.

I have made the claim that past is a conditioner. Notice, however, that the past tense marker in (13a) is a portmanteau that expones tense+person+number (agreement) information together. This raises the question whether it is only 'past' that conditions the allomorphy in an example like (13a). The answer is affirmative. Regardless of the person-number information that the past tense portmanteau expones as shown in (14) below, we observe the allomorph *xt'*, which suggests that it is only past that conditions the allomorphy.

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[14] Laz has a general phonological process that simplifies the cluster Cvu by deleting the [v] (Öztürk and Pöchtrager, 2011). Therefore, we have *mo-**lv**-eri* 'having come' and *mo-**l**-un* "S/he is coming." rather than **mo-**lv**-un*.

[15] Some examples: *ama-xt'-u* 'S/he entered.', *e-xt'-u* 'S/he climbed up.', g*ama-xt'-u* 'S/he exited.', *go-xt'-u* 'S/he wandered.'. See Öztürk and Pöchtrager (2011:107-116) for a detailed discussion of spatial prefixes in Laz.

[16] The imperfective suffix for underived unaccusatives is *–ur*, which has the portmanteau allomorph *–un*. In all cases where we expect [ur]+[s] for IMPF+3SG.PRES, we get *-un* instead of **ur+s*.

(14) a. mo-**xt’**-i *mo-**lv**-i
DIR-move-2SG.PST
‘You (sg) came.’

b. mo-**xt’**-es *mo-**lv**-es
DIR-move-3PL.PST
‘They came.’

2.2.4 zit’- ~ it’ur- ~ t’k’v-

The verbal root *zit’*- ‘say’ surfaces as *it’ur*-[17] under imperfective and *-t’k’v*-[18] under past and subjunctive. Like *imxor*-, *it’ur*- cannot be followed by an overt imperfective suffix.[19] However, *t’k’v*- is followed by regular past tense or subjunctive suffixes. See the data in (15) below.

(15) *a.* **t’k’**-u cf. ***zit’**-u, ***it’ur**-u
say-3SG.PST
‘S/he said it.’

b. **it’ur**-s cf. ***zit’**-Δ-s, ***t’k’**-Δ-s[20]
say.IMPF-3SG.PRES
‘S/he is saying it.’

c. **t’k’**-a-s cf. ***zit’**-a-s, ***t’k’**-a-s
say-SUBJ-3SG.PRES
‘Let her/him say it.’ // ‘May s/he say it.’

[17] The [r] in coda positions are often silent in fast speech. For example, the form *it’urs* in (15b) can also be pronounced as *it’us*.

[18] See footnote 14.

[19] One of the imperfective suffixes is -*ur*, which naturally raises the question if *it’ur*- can be decomposed as *it’*+*ur*. This synchronic decomposition cannot be maintained because –*ur* cannot be followed by the suffix –*s* [3SG.PRES] in Laz. Instead, the expected *ur+s* sequences are without exception exponed by the portmanteau –*un*. Notably, the third person singular imperfective form is *it’ur-s,* not **it’un*. Hence, the imperfective-conditioned root has to be *it’ur*-, not *it’*-. That said, it is surely possible that *it’ur*- was bimorphemic in earlier stages of the language, as an anonymous reviewer points out.

[20] Where Δ is silence or a member of the set of overt allomorphs for IMPF.

d. **zit’**-eri cf. ***t’k’**-eri, ***it’ur**-eri
say-PTCP
‘having said it’

For this particular root, the allomorphic variation is abundant. Therefore, in (16) below, I provide further examples that demonstrate that *zit’*- must be the (unconditioned) elsewhere form.

(16) a. o-**zit’**-ap-u cf. *o**t’k’v**apu, *o[**i**]**t’ur**apu
CAUS-say-CAUS-3SG.PST
‘S/he made him/her say it.’[21]

b. a-**zit’**-en cf. *a**t’k’v**en, *a[**i**]**t’ur**en
ABIL-say-IMPF.3SG.PRES.ABIL
‘S/he can say it.’

c. o-**zit’**-oni cf. *o**t’k’v**oni, *o[i]**t’ur**oni
FUT.PTCP-say-FUT.PTCP
‘(something that) should/can/will be said’

d. u-**zit’**-u cf. *u**t’k’**u, *u[i]**t’ur**u
NEG.PTCP-say-NEG.PTCP
‘(something that) hasn’t been said’

For completeness sake, in (17) I also provide the data showing that it is past that conditions the *t’k’v*- allomorph. Regardless of the person or number information exponed along with it, we see the *t’k’v*- allomorph under past.

(17) a. **t’k’v**-i cf. ***zit’**-i
say-2SG.PST
‘You (sg) said it.’

b. **t’k’v**-es cf. ***zit’**-es
say-3PL.PST
‘They said it.’

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[21] Causativized stems in Laz feature the suffix *-in* and/or the suffix *-ap* whose distribution is subject to a transitivity calculus. Both of these suffixes require the prefix *o-*. However, in certain configurations the prefix *o-* can be overwritten by another prefix. See Öztürk and Pöchtrager (2011:68) for relevant discussion.

2.3 An Interim Summary

We have seen that Laz has four verbal roots that exhibit allomorphy conditioned by imperfective, and past/subjunctive[22] contexts. This is summarized below.

Table 1. Root allomorphy in Laz

	'eat'	'do'	'move'	'say'
past/subjunctive	*şk'om-*	*xen-*	***xt'-***	***t'k'v-***
imperfective	***imxor-***	***ik-***	*lv-*	***it'ur-***
elsewhere	*şk'om-*	*xen*	*lv-*	*zit-*

An important aspect of root allomorphy patterns is that they exemplify a clear case of outward-sensitive allomorphy (Bobaljik, 2000). That is, the conditioning factor is (abstract) morpho-syntactic features rather than particular exponents. This is best illustrated by the possibility of the conditioning feature to be exponed by different exponents. For example, in Laz, when past tense is a conditioner, it remains as a conditioner no matter which exponent spells it out, as was shown in (14) and (17) above.[23]

Therefore, the insertion rules will be along the lines of (18), where the outward-sensitive allomorphy rules make reference to grammatical context(s) (i.e., features) rather than exponents. This follows from the assumption that insertion of exponents (i.e., vocabulary items in DM terms) proceeds bottom-up (i.e., starting from the root and proceeding outwards/upwards). The insertion rule for a root node cannot make reference to a particular exponent above it simply

[22] As an anonymous reviewer points out it remains curious under an approach like DM why past and subjunctive exhibit the same conditioning profile given that one is tense marking while the other is mood/modal-like. They rightly point out that these paradigmatic effects are not at all surprising under approaches like Paradigm Function Morphology (Stump, 2001), for they admit that paradigms are grammatically real (which is a position rejected by DM). A plausible hypothesis regarding the same conditioning profile of past and subjunctive could be that in both cases, it is actually the perfective aspect which conditions the root allomorphy, not past or subjunctive. However, the perfective aspect is never overtly marked in the language, which makes it difficult to verify or falsify this hypothesis. Therefore, I do not pursue it further here.

[23]The first draft of this paper had made the claim that we can make a parsimony-related argument in favor of the idea that it is features not exponents that condition allomorphy. I owe my thanks to an anonymous reviewer for their detailed explanation for why this argument cannot be made without a meaningful complexity measure in mind. See Beekhuizen et al. (2013) for an informative read on the issue.

because there is no exponent there yet, but only grammatical information (Bobaljik, 2000).[24]

(18) a. insert /zit'/ into √912
b. insert /t'k'v/ into √912 in the context of PAST or SUBJUNCTIVE
c. insert /it'ur/ into √912 in the context of IMPERFECTIVE

It should also be pointed out that capturing the fact that root allomorphy refers to grammatical context rather than particular exponents is not a unique feature of DM. Rather, this is expected under realizational theories of morphology regardless of their position on where in the grammar word-internal complexity arises. See, for example, Anderson (1992:Ch6).[25]

In the next section, we will seek an answer to the question of what kind of locality conditions are at work in suppletive root allomorphy in Laz.

3 Locality Conditions on Root Allomorphy in Laz

To probe the issue of locality in root allomorphy, we will investigate three types of configurations: (i) configurations where a conditioning morpheme is linearly separated from the root by a non-conditioning morpheme (ii) configurations where a root is followed by two distinct conditioning morphemes, and (iii) configurations where a root is immediately followed by a conditioning morpheme and at the same time, immediately preceded by a non-conditioning morpheme.

(19) a. root + non-conditioner + conditioner (i)
b. root + $conditioner_1$ + $conditioner_2$ (ii)
c. non-conditioner + root + conditioner (iii)

In the first two types of configurations, it is very difficult, if not impossible, to tease apart the predictions of the linear adjacency view and the structural contiguity view.

In the third type of configuration, predictions diverge: if the relevant metric of locality for suppletive allomorphy is linear, then since no morpheme is linearly between the conditioner and the root in (19c), we predict that the allomorphy will go through (i.e., we will not see the default/elsewhere form). The structural contiguity approach, on the other hand, predicts the elsewhere/default form in

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[24]An anonymous reviewer points out that it is not obvious if this claim can be maintained in case of derivational morphology. This is a legitimate and important question, which I will have to set aside.

[25] I owe my thanks to an anonymous reviewer for raising this point.

(19c) if and only if the non-conditioner morpheme (linearized to the left) is a structural intervener.[26] This section has the modest purpose of demonstrating that the linear notion of locality in the sense of Embick (2010) fails to make the right predictions.

3.1 Case 1: root + non-conditioner + conditioner

Recall that the motion verb *lv*- surfaces as *xt'*- only in the context of past and subjunctive. The imperfective is not a conditioner for *lv*-. This gives us a way to see what happens in [root + non-conditioner + conditioner] situations, that is in the past imperfective forms.

First, notice that the regular past imperfective sequence in Laz is V+IMPF+AUX+PST, as illustrated in (20c) with the verb *ğur*- 'die':

(20) a. ğur-un — imperfective
die-IMPF+3SG.PRES
'S/he is dying.'

b. ğur-u — past
die-3SG.PST
'S/he died.'

c. ğur-ur-t'-u — past imperfective
die-IMPF-AUX-3SG.PST
'S/he was dying.'

The irregular root *lv*-, having the special allomorph *xt'*- under past but not under imperfective, only accepts its default/elsewhere form *lv*- in the past imperfective, as shown below in (21c).

(21) a. mo-l-un
DIR-move-IMPF+3SG.PRES
'S/he is coming.'

b. mo-xt'-u
DIR-move-3SG.PST
'S/he came.'

[26] The non-conditioner morpheme is a structural intervener if it is c-commanded by the conditioner morpheme but not by the root. See footnote 8.

c. mo-**l**-ur-t'-u cf. *mo-**xt'-**ur-t'-u
DIR-move-IMPF-AUX-3SG.PST
'S/he was coming.'

This means that some locality condition bleeds the insertion rule in (22b). Since (22b) cannot apply, (22a) applies. This is why we see the default/elsewhere form *lv*-.

(22) a. insert /lv/ into √122
b. insert /xt'/ into √122 in the context of PAST

We cannot unambiguously determine the locality condition preventing the rule in (21b) from applying. This blocking effect can be attributed to the absence of linear adjacency between the root √122 and PAST or could stem from the absence of structural contiguity between √122 and PAST.

3.2 Case 2: root + non-conditioner + conditioner

Recall that the root *zit'*- 'say' has distinct surface forms both under imperfective and past/subjunctive, as repeated in (23) below. Accordingly, the relevant insertion rules will be as in (24).

(23) a. **t'k'**-u past form
say-3SG.PST
'S/he said it.'

b. **it'ur**-s imperfective form
say.IMPF-3SG.PRES
'S/he is saying it.'

c. **zit'**-eri elsewhere form
say-PTCP
'having said it'

(24) a. insert /zit'/ into √912
b. insert /t'k'v/ into √912 in the context of PAST or SUBJUNCTIVE
c. insert /it'ur/ into √912 in the context of IMPERFECTIVE

Three different exponents compete to expone √912. Hence, the past imperfective sequence where both (IMPF and PAST) conditioners are present is informative. As illustrated in (25) below, only IMPF can condition allomorphy, i.e., the rule in (24c) wins.

(25) **it'ur-**t'-u cf. ***t'k'v**-Δ-t'-u, ***zit'**-Δ[27]-t'-u
say.IMPF-AUX-3SG.PST
'S/he was saying it.'

This means that when two distinct contextual rules are applicable, there is no *tie* which allows for optionality or forces the elsewhere rule. Rather, the rule that makes reference to the more local context wins. Just like in the previous case, *more local* can be understood in structural or linear terms. In other words, we are unable to determine if (24b) loses and (24c) wins due to the absence of linear adjacency between the root √912 and PAST or due to the absence of structural contiguity between the root √912 and PAST.

3.3 Case 3: non-conditioner + root + conditioner

Now we turn to the most informative case, namely the configuration where a non-conditioner morpheme immediately precedes the root and a conditioner morpheme immediately follows the root. In this configuration, the predictions diverge. If we systematically fail to see the elsewhere form (i.e., the conditioner morpheme does what it does and triggers allomorphy in each case), there is no challenge for the view that allomorph selection is done over linearized structures (Embick, 2010). If, on the other hand, the preceding non-conditioner morpheme is able to block the allomorphy, then this view makes incorrect predictions.

The first set of data comes from directional prefixes which never block the root allomorphy.[28] Recall that the root *lv*- 'move' surfaces as *xt'*- under past. This is so regardless of the choice of the directional prefix, as shown in (26).

[27] where Δ is one of the imperfective exponents, including the zero exponent.

[28] An anonymous reviewer suggests the possibility that these directional prefixes are adjoined phrasal objects rather than heads in the clausal spine, which could be argued to be consistent with the fact that they never block allomorphy. I am sympathetic to this idea. Indeed, determining whether directional prefixes are phrasal objects would be important, if this paper were defending the structural contiguity approach. I do not undertake this task in this paper.

(26) a. go-**xt’**-u
DIR-move-3SG.PST
‘S/he wandered.’

b. e-**xt**’-u
DIR-move-3SG.PST
‘S/he climbed up.’

c. ce-**xt**’-u
DIR-move-3SG.PST
‘S/he went down.’

Another case where the preceding non-conditioner morpheme has no effect on the allomorphy involves sentential polarity markers. Recall that *zit*’- ‘say’ surfaces as *t’k’v*- under past. We observe that this is the case when it is preceded by negation or affirmative markers, as shown in (27b-c) below.

(27) a. **t’k’**-u
say-3SG.PST
‘S/he said it.’

b. va-**t’k’**-u — negation
NEG-say-3SG.PST
‘S/he didn’t say it.’

c. do-**t’k’**-u — affirmative[29]
AFF-say-3SG.PST
‘S/he *did* say it.’

d. **zit’**-eri — elsewhere form
say-PTCP
‘having said it’

Our final case involves pre-root vowels *u*-, *i*-, *a*-[30] which have functions such as applicativization, passivization, and root modality, respectively (Öztürk and

[29] The exact licensing conditions of the affirmative prefix have not yet been studied. I label it affirmative, for it cannot co-occur with negation. See Öztürk and Pöchtrager (2011) for relevant discussion.

[30] There is also a causative prefix *o*-. Yet, *o*- co-occurs with a causative suffix (*–in*, *–ap* or both) that immediately follows the root. That is why the linear adjacency between a

Pöchtrager, 2011; Öztürk, 2013). I illustrate their uses in (28) below on a regular root first. These prefixes never trigger allomorphy in the language.

(28) a. t'ax-u default/no prefix form
break-3SG.PST
'S/he broke it.'

b. **u**-t'ax-u applicative form
3SG.APPL-break-3SG.PST
'S/he broke it for/on behalf of her/him.'

c. **i**-t'ax-u impersonal passive form
PASS-break-3SG.PST
'Someone broke it.'

d. **a**-t'ax-u ability form
ABIL-break-3SG.PST
'S/he was able to break (it).'

Recall that *zit'*- has a distinct allomorph, *t'k'v*-, under past, as shown in (29a). However, when a pre-root vowel is attached to it, we always see the default/elsewhere form *zit'*-, never *t'k'v*-, as shown in (29c-e). Crucially, in none of the cases is there anything that breaks the linear adjacency between the root and the past tense morpheme. This is a clear case of non-linear blocking effect on allomorphy where a morpheme blocks allomorphy despite not breaking the linear adjacency between the root and its conditioning context.[31]

(29) a. **t'k'**-u cf. *zit'-u
say-3SG.PST
'S/he said it.'

b. **zit'**-eri elsewhere form
say-PTCP
'having said it'

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root and its conditioner is necessarily broken when *o*- is present. This makes it a less interesting test case. For this reason, I do not discuss it further in this paper.

[31] An anonymous reviewer suggests an alternative account that makes reference to *base complexity* in morphological processes. I briefly discuss this in the final section.

c. **u**-zit'-u cf. *u-t'k'-u
3SG.APPL-say-3SG.PST
'S/he said it for/on behalf of her/him.'

d. **a**-zit'-u cf. *a-t'k'-u
ABIL-say-3SG.PST
'S/he was able to say it.'

e. **i**-zit'-u cf. *i-t'k'-u
PASS-say-3SG.PST
'It was said/people said it.'

The same pattern is also observed with other irregular roots and conditioning contexts. (30c-e) illustrate the allomorph *imxor-* 'eat' being blocked by a pre-root vowel.[32]

(30) a. **imxor**-s imperfective form
eat.IMPF-3SG.PRES
'S/he is eating it.'

b. **şk'om**-eri default form
eat-PTCP
'having eaten it'

c. **a**-şk'om-en cf.*a-**[i]mxor**-en[33]
ABIL-eat-IMPF+3SG.PRES
'S/he is able to eat it.'

d. **u**-şk'om-am-s cf. *a-**[i]mxor**-s
3SG.APPL-eat-IMPF-3SG.PRES
'S/he is eating it on behalf of her/him.'

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[32] One can notice that the imperfective exponent varies in grammatical forms. These are predictable patterns; however, for space reasons, I focus on the root allomorphy and gloss over the allomorphy patterns observed in the imperfective morpheme itself.

[33] One could counter that these forms are blocked/not preferred because they introduce vowel-vowel sequences, which are typically simplified in the language (Öztürk and Pöchtrager, 2013). However, even if we grant that these forms are phonologically blocked, the previous case (i.e., *t'k'v-* being blocked by a pre-root-vowel) cannot be explained by phonological considerations of this sort.

e. **i**-şk'om-en cf. *a-**[i]mxor**-s
PASS-eat-IMPF+3SG.PRES
'It is eaten/People eat it.'

This set of data, again, suggests that allomorph selection cannot solely be about linear adjacency, contra Embick (2010). If this were the case, we would predict to find a uniform behavior in the various [non-conditioner + root + conditioner] configurations we have considered in this subsection. In particular, the non-linear blocking of the suppletive allomorphy in (29c-e) and (30c-e) is suggestive of an exponent selection procedure that cares about something other than the linear adjacency between a root and its conditioner. In the next section, I discuss the structural contiguity view and point to some independent challenges against it.

4 Is it structural contiguity?

What might non-linear blocking of allomorphy be all about? As we have discussed, an alternative metric of locality, namely the structural contiguity requirement on allomorphy (Bobaljik, 2012), is equipped to accommodate the non-linear blocking effects. However, under this kind of approach, it is crucial that the non-conditioner that blocks the allomorphy is indeed a structural intervener.

Suppose that syntax generates the set-theoretic object in (31). The structural contiguity view of locality (Bobaljik, 2012) predicts that the insertion rule in (32b) cannot apply because PAST is not local enough to condition allomorphy on √912, for it c-commands a node that √912 does not. In other words, there is a structural intervener, namely APPL.

(31) { PAST, { APPL, { *v*, √912 } } }

(32) a. insert /zit'/ into √912
b. insert /t'k'v/ into √912 <u>in the context of PAST or SUBJ</u>

This explanation could in principle be invoked in the blocking of the allomorph *t'k'v-* in in (33b).

(33) a. **t'k'**-u past
say-3SG.PST
'S/he said it.'

b. **u**-zit'-u elsewhere
3SG.APPL-say-3SG.PST
'S/he said it for/on behalf of her/him.'

However, unlike the linear adjacency condition, the structural contiguity condition requires independent justification of the assumed abstract structures. Arguably, the case at hand does not require a controversial assumption regarding the relative merge order of APPL and PAST. There is semantic evidence that APPL is merged before PAST in syntax. Given that APPL is a head which needs to semantically modify an event predicate (Pylkkänen, 2002), it is a VP-level head (it belongs to the thematic domain). PAST, on the other hand, is necessarily above the event domain in that it makes its semantic contribution by situating (the time interval of) an event with respect to the utterance time (von Stechow and Beck, 2015).[34] Needless to say, facts about permissible exponent orders across languages should ideally support the assumed structures.[35]

If we assume that it is the violation of structural contiguity that explains the blocking effect of the pre-root-vowels, we additionally have the burden of proof about other prefixes not blocking the allomorphy. Recall that spatial markers and polarity markers do not block root allomorphy. Now suppose that X is a conditioner for the root in (34) and nothing else is. Under the structural contiguity view, F2 is a structural intervener and hence is predicted to block allomorphy.

(34) { F3, { X, { F2, { F1, √ } } } }

Hence, if the relevant metric of locality is structural contiguity as we have defined it, it must be the case that spatial markers and polarity markers that precede the verbal root are not structural interveners like F2 is in (34). In less abstract terms, the string in (35) would be allowed to have the structure in (36a), but, for example, not (36b). The real question is: *Can* it have the structure in (36a)?[36]

(35) va-mo-xt'-u
NEG-DIR-move-3SG.PST
'S/he did not come.'

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[34] The same argument is also true for the impersonal passive marker *i*-, which exhibits identical behavior of allomorphy blocking. Arguably, the prefix *a*- also belongs to the VP-domain as it signals root modality anchored to circumstances or participants of an event rather than propositions (Hacquard, 2006).

[35] I do not know if there are languages that exhibit morpheme orders that go against these structures.

[36] Negation is notoriously unstable in where it seems to be able to occur in the structure, and its exponence position does not necessarily reflect where it should be interpreted (Zeijlstra, 2007).

(36) a. { NEG, { PAST, { DIR, √122 } } }
b. { PAST, { NEG, { DIR, √122 } } }

As both reviewers rightly point out, these set-theoretic objects are sweeping quite a bit under the rug. For example, how can there be just a PAST node despite the fact that the past tense markers are portmanteau suffixes exponing person-number agreement information, too? Another directly relevant question is: How do we know there is no additional unpronounced structural intervener? It has been argued that nodes which are structural interveners may not count as interveners when they are not targets of any exponent insertion (Embick, 2010). This is arguably a concern in root allomorphy patterns in Laz, too. For example, the PAST-conditioned root allomorphy in (36) would be licensed if and only if PAST and √122 are structurally contiguous, i.e., if there is no other node in syntax which PAST c-commands but √122 does not. Is this *reduced* structure really what syntax generates? It is widely assumed that there are additional nodes between a root node and a tense node such as the categorizer *v* head, thematic/event structure-related projections like the 'cause' and/or voice heads, the aspect head, and so forth. If at least one of these additional heads are necessarily in the structure, the tense node and the root node will not be structurally contiguous and the allomorphy will be blocked. For illustration purposes, a reasonable but slightly more complex set-theoretic object is given in (37). And here we *incorrectly* predict the elsewhere exponent for √122, for an intervening PERF head is part of the structure.[37]

(37) { NEG, { PAST, { **PERF**, { DIR, √122 } } } }

But if we do not know exactly what the structures are, how can even we make claims about structural contiguity? This is exactly why I am *not* making the claim that structural contiguity is the end of the story. I will not be able to answer these questions in the current context. And they are orthogonal for the main point of this paper which is to present an empirical challenge against the merely linear notion of locality in the sense of Embick (2010). However, I should admit that they are difficult and equally important questions. Does additional complexity need to increase the size of the set-theoretic object syntax generates? Or can it be that some of the additional complexity hides inside terminal nodes?

[37]An anonymous reviewer raises the question whether there is any proof that a null structural intervener is there. Since this paper is not defending the structural contiguity view *per se*, I only discuss the potential presence of unpronounced structural interveners to demonstrate the problem. But here is a more concrete example: We have transitive irregular roots like *zit*'- 'say' and *şk'om*- 'eat'. The standard DM treatment would take a contextually unpronounced *voice* projection to be present on top of these roots. Given that Laz exhibits morphologically-marked transitivity alternations in both directions (Öztürk and Pöchtrager, 2011), this is taken to constitute evidence that *voice* is there and can be pronounced or null depending on the root below.

The mainstream view in DM is that terminal nodes (i.e., heads) host bundles of features. This is the standard way in DM to have syntax generate relatively more compact structures.[38] However, this alone is not sufficient. To illustrate, in Laz an imperfective exponent can expone agreement information as in (38a). However, we cannot claim that the aspect node necessarily always contains both aspect features and features relevant to agreement because, as shown in (38b), the imperfective marker is not always a portmanteau for these features. DM has standardly assumed Fusion as a post-syntactic operation that can merge heads into a single head to handle portmanteau. But this operation is far from being uncontroversial (Siddiqi, 2009).

(38) a. ğur-**un** imperfective
die-IMPF+3SG.PRES
'S/he is dying.'

b. ğur-**ur**-t'-u past imperfective
die-IMPF-AUX-3SG.PST
'S/he was dying.'

In short, for us to maintain the DM-understanding of syntactic contiguity, it seems that exponent insertion must operate over highly compact set-theoretic objects to PF. However, it is not clear how to achieve this exactly.[39]

[38] Embick (2010) goes a bit further and proposes to simplify representations post-syntactically. The way Embick's system ensures that null heads do not block allomorphy is an operation of *Pruning,* which removes null nodes. However, as pointed out in Moskal and Smith (2015), *Pruning* faces a look-ahead problem: for root allomorphy to be licensed, all the null nodes between the root and the conditioning node need to be pruned *before* any attempt is made to insert an exponent in the root node. Assuming that exponent insertion process is bottom-up and the lowest node is the root node, *Pruning* requires access to the information that these intervening nodes are null before the exponent insertion process starts. Since *Pruning* cannot be a blind operation and needs this information, it needs to *look ahead* to see which nodes are null and can be pruned.

[39] A promising but radically different alternative to DM is Nanosyntax which relies on an algorithm where structure building by Merge and insertion of exponents into structure are cyclically interspersed (Caha, 2009; Caha et al., 2019). A crucial assumption of Nanosyntax is *phrasal spell-out*, where exponents are tree structures and typically portmanteau morphemes. Under this view, every feature is a head and the tree structures are far from being compact, which is (ironically) what allows allomorphy to be uniformly analyzed as portmanteau. For reasons of space, I leave it a future occasion to explore the way root allomorphy in Laz can be accounted for under the assumptions of Nanosyntax.

5 Concluding Remarks

In this study, we have investigated suppletive root allomorphy patterns in Laz. We have found that the root is always required to be linearly adjacent to the morpheme that conditions the allomorphy in Laz. This is in accordance with Božič's (2017) observation that the adjacency requirement appears to be a defining characteristic of root allomorphy across languages. But more importantly, we have identified some prefixes in Laz that prevent a suffix from conditioning allomorphy on the root, constituting what I have labelled *non-linear blocking effects.* These effects *prima facie* challenge the view that *linear adjacency* is a sufficient condition on suppletive allomorphy and are at odds with the view that the domain of grammar responsible for selecting exponents operates on linearized structures (contra Embick, 2010). As a promising alternative to explain *non-linear blocking effects*, we have discussed syntactic contiguity (Bobaljik, 2012) and have pointed out certain independent challenges against this view that would need to be overcome. Below, I briefly discuss two more alternatives.

Non-linear blocking effects could in principle be attributed to a domain-related locality constraint, which bars allomorphy across domains. Although implementations vary, there seems to be a consensus[40] that a global locality constraint of this sort is needed (Embick, 2010; Moskal and Smith, 2015; Smith et al., 2018).[41] To implement domain-related blocking, Embick (2010) resorts to what he calls cyclic heads (which include the categorizer heads such as *v*, *n* etc.). He argues that while allomorphy across one cyclic head is possible when linear adjacency is also satisfied, allomorphy across two or more cyclic heads is globally blocked. That is, linear adjacency becomes relevant only if this global condition is satisfied. To illustrate, if APPL is designated as a cyclic head in Laz, it will not matter if the root node is linearly adjacent to PAST because there will be two cyclic heads (i.e., *v* and APPL) between them, barring PAST from conditioning allomorphy on the root. The problem with invoking a global constraint for the discussed non-linear blocking effects is that there is simply no

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[40] Though see Weisser (2019).

[41] While Embick's proposal invokes a domain-related locality constraint in addition to linear adjacency, Moskal and Smith (2015) and Smith et al. (2018) argue that domain-related locality is sufficient and adjacency may not be needed. The theory presented in Moskal and Smith (2015) slightly relaxes the notion of structural contiguity by defining *accessibility domains* for roots and functional heads. Under this system, the most distant node that can condition allomorphy on a root is the node right above the highest category defining node. In our cases, this would be the categorizer *v* head, since we are dealing with verbal roots. Therefore, its predictions for the cases we have discussed are virtually indistinguishable from a simple structural contiguity approach. See Moskal and Smith (2015) for the details for their proposal.

independent evidence for designating all prefixal blockers in Laz as cyclic heads.[42] The intuition behind a global locality constraint is to capture the absence of allomorphy across categories[43] and perhaps to block allomorphy under accidental linear adjacency. Importantly, non-linear blockers in Laz do not fall under either of these.

As an anonymous reviewer points out there is an alternative explanation of what I have labelled *non-linear blocking effects,* which is the possibility that root allomorphy in Laz is sensitive to *base complexity*. Under this account, the conditioning morpheme would be able to trigger allomorphy if and only if it is attached to a simplex base (i.e., the root). For a concrete implementation, see Kunduracı (2019) on how base complexity can be relevant in stating conditions on certain morphological processes involving compounding and derivation in Turkish. Notice that this attractive alternative is in effect a relaxed implementation of a potential account invoking structural contiguity. Both have to assume that prefixation that blocks allomorphy applies before the suffixation of the conditioning morpheme. However, the base complexity account will not encounter the problem of *unpronounced structural complexity* that a strict understanding of structural contiguity will likely do. Notably, stating a rule that refers to base complexity needs an architecture in which morphology is autonomous. Hence, it is not expressible under DM where the notion of base complexity can only be derivative and hence cannot be referenced by exponent insertion rules.[44]

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[42]As an anonymous reviewer points out, these prefixes are also functionally distinct, making it a suspect declaring all of them cyclic heads.

[43] To illustrate, while there are languages that exhibit plural-induced allomorphy in their noun roots (e.g., person ~ people), we do not expect there to be languages that exhibit plural-induced allomorphy in their nouns derived from verb roots (e.g., nominalizations).

[44] Setting aside the problem of unpronounced structural interveners, there is one configuration where the two approaches will make different predictions. Suppose our structure is { X, { Y, √ } } where X is a conditioner for the root √. The structural contiguity condition will let X trigger allomorphy on the root. However, if the particular allomorphy rule concerning X fails in case of stem complexity, it will not be able to trigger allomorphy here. I leave this intriguing comparison to future work.

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