Domains on the Border: Between Morphology and Phonology

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In this dissertation, I show that a difference in structure between functional and lexical items has a restricting effect on both the morphology and the phonology. Morphologically, we observe two asymmetries: (i) in lexical nouns, number-driven root-suppletion is common whilst case-driven root-suppletion is virtually unattested; (ii) in contrast, pronouns commonly supplete for both number and case. By and large, we see the same pattern in verbs, observing a contrast between lexical verbs and auxiliaries with regard to suppletion for aspect and tense. In order to account for these asymmetries, I appeal to structural differences between lexical and functional material, combined with locality effects as proposed in Distributed Morphology (Halle & Marantz 1993). Crucially, lexical material contains a category-defining node which has a delimiting effect that causes case/tense to be insufficiently local to the root to condition its suppletion. In contrast, functional material lacks category-defining nodes and thus no delimiting effect is observed and case/tense are free to condition suppletion of the functional base. Phonologically, we see a correlation between the presence of a category-defining node and the absence of dominant prefixes in vowel harmony and lexical accent, whilst in the absence of a category-defining node dominant prefixes are attested. Thus, I argue for universal limitations on suppletion patterns and dominant prefixes, which crucially derive from a difference in morpho-syntactic structure between lexical and functional material.

Domains on the Border: Between Morphology and Phonology

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Over the years, so many versions of the acknowledgments have flitted through my mind. Some, if I would have actually written them down, would have taken up ten pages. Or more. Some are shorter: "The less said the better." Turns out I settled on a slightly extended version of the latter.

The only reason you are reading this dissertation is Pete, my husband. Just like the summer was not done by you for you but by us for us, this dissertation was not done by me for me but for us by us. I love you.

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[1]Apologies if the Russian transliteration is wrong - I could not decide between *bolshoe* and *bolšoe*. I have the suspicion it is the latter. The rest of the dissertation should be fine, though.

Thanks also to my siblings. Ju, thanks for always being there for me (and making sure Mum and Dad got to the wedding alright). Tamara and Edwin (and Stimpie, Chuli and Lindi): your tropical island was the best possible place to figure out what we want out of our future.

Finally, this dissertation is dedicated to my parents: zonder jullie was ik nooit de persoon die ik nu ben, met mijn eigen(aardige) karakter en al; daar ben ik eeuwig dankbaar voor. Dziękuję.

I love deadlines. I like the whooshing sound they make as they fly by.

- Douglas Adams

Contents

Chapter 1

Introduction

This dissertation constitutes an exploration into a range of morphological and morpho-phonological asymmetries between lexical and functional items. This leads to a proposal that at the heart of the asymmetries identified here is that there is more structure in lexical items than in functional items, which has a delimiting effect on the former but not the latter.

Morphologically, I identify universal restrictions on patterns of suppletion (the phenomenon where a single lexical item is associated with two phonologically unrelated forms) in nominals and verbs. Specifically, we observe the following asymmetries in nominals:

(1) In lexical nouns number-driven root-suppletion is common while case-driven root-suppletion seems unattested, bar a few counterexamples discussed later.

(2) In contrast to lexical nouns, pronouns commonly supplete for both number and case.

This is exemplified by the following contrasts in lexical nouns where we see suppletion in the context of the plural in Ket (3), and pronouns where we see suppletion in the context of number and case in German first person pronouns (4):

(3)

SINGULAR	PLURAL	gloss
oˑksʼ	aˀq	'tree'
dɨˑlʼ	kʌˀt	'child'
kɛˀt	dɛˀ-ŋ	'man'

(4)

	SINGULAR	PLURAL
NOM	ich	wir
DAT	mir	uns
ACC	mich	uns

In the verbal domain, we, by and large, observe a similar pattern:

(5) In lexical verbs aspect-driven root-suppletion is attested while tense-driven root-suppletion seems unattested, bar a handful of counterexamples discussed later.

(6) In contrast to lexical verbs, auxiliaries commonly supplete for tense.

This is exemplified by the following pairs, where (7) is a lexical verb and (8) is a functional verb in Lezgian:

(7) tʼü-na   eat-AOR

ne-z   eat-IPFV

(8) ja   be.PRESENT

tir   be.PAST

We see that the lexical verb *eat* suppletes for aspect, the aorist-imperfective contrast, whilst the functional verb *be* suppletes for tense, present vs. past.

Crucially, what we see based on the suppletion patterns in nominal and verbal material is that lexical items are more restrictive than functional items. In the following, I will argue that this discrepancy is categorical in nature and is not explained by exclusively appealing to frequency effects.

In a similar vein, we observe an asymmetry in the morpho-phonological process of vowel harmony: in lexical material a root cannot be influenced by a prefix, but in functional material the prefix is free to interact. In (9), we see that in Tunen the lexical item *and* 'roof' is unaffected by the [+ATR] class 3 prefix *mu-* and surfaces as disharmonic [-ATR] *and*; in contrast, in (10), the functional item *tana* 'this' is realised as [+ATR] *tənə* in the context of the same [+ATR] class 3 prefix *mu-*, even though otherwise it surfaces as [-ATR], as in *ba-tana* 'cl.2-this!'.

(9)
$$\xrightarrow{\quad} \mathsf{X}$$
mu-   and   → [muand]

(10)
$$\xrightarrow{\qquad}$$
mu-   TANA   → [mutənə]

Thus, we again see that functional material is more permissive, whilst lexical material is less so.

In this dissertation, I argue that the asymmetry between lexical and functional items can be derived from (i) a structural difference between the two, and (ii) locality restrictions.

Working in Distributed Morphology, I assume that lexical material contains a root and category-defining node *x*, whereas functional material consists only of a pronomi-

nal/auxiliary base, crucially lacking a category-neutral root. Specifically, this gives the following abstract structures for lexical items (11) and functional items (12):

(11)

                                  B

                       A

    lexical root   *x*

(12)

                       B

    functional root   A
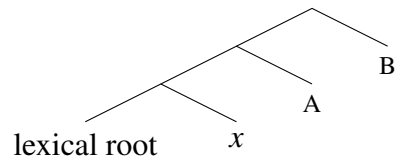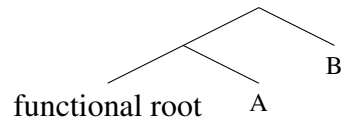
Furthermore, I propose that category-defining *x* has a delimiting effect that causes morphological case/tense to be insufficiently local to the nominal/verbal root to be able to condition root-suppletion. Thus, this leads to a reduced accessibility of nodes in lexical material (13), but not in functional material (14), where *x* is *n/v*, A is number/aspect, and B is case/tense for nominal/verbal material, respectively.

(13)

                                  B

                       A

    lexical root   *x*

(14)

                       B

    functional root   A
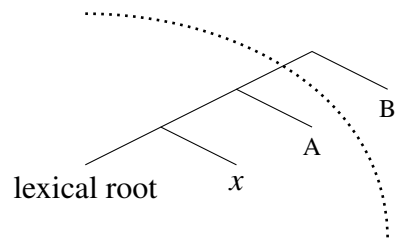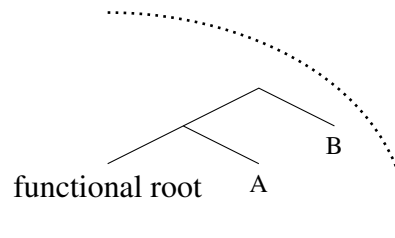
Furthermore, I argue that the discrepancy between functional and lexical items in morpho-phonological process of vowel harmony also derives from the presence/absence

of category-defining nodes. That is, category-defining nodes are crucially only present in lexical material, and I argue that they induce the insertion of a prosodic boundary at the left edge of their complement (most often the root), thus effectively making material within the prosodic word inaccessible to material to its left and ruling out dominant prefixes in lexical material:

(15) **prefix** **($_\omega$ lexical root**

In contrast, given the lack of a category-defining node in functional material, the prosodic word boundary is not inserted at the left edge of the root and the prefix and functional root are free to interact, allowing for the possibility of dominant prefixes in functional material:

(16) **prefix** **functional root**

In sum, in this dissertation I show that there exists a clear difference between lexical and functional material, which I argue stems from (i) a structural difference between the two, and (ii) locality restrictions. In the next section, I will spell out the specific theory of locality that I assume in this dissertation.

1.1 Locality

Distributed Morphology (DM; Halle & Marantz 1993) crucially incorporates hierarchical structure into the morphology; essentially, it assumes the input to morphology to be syntactic structure. Features (or feature bundles) are distributed over nodes, which in turn are subject to Vocabulary Insertion (VI). Furthermore, VI proceeds cyclically from the lowest

element in the structure outwards (Bobaljik 2000). Contextual allomorphy, which includes suppletion, amounts to VI conditioned by morpho-syntactically defined nodes. That is, although a particular feature bundle has a corresponding exponent as a context-free default, an exponent specified for a more specific context takes precedence (per the Elsewhere principle; Kiparsky 1973). Consider the *good-better-best* paradigm as a familiar example; its regular (context-free) exponent is *good* but in the context of the comparative (and superlative) it corresponds to *be(tt)*:

(17)   good $\Leftrightarrow$ bett / __] COMP]

Furthermore, a central research topic within DM is the identification of locality restrictions as to what is accessible as a potential context for a vocabulary insertion rule such as (17) above. Locality as assumed in DM (Embick 2010, Bobaljik 2000) crucially assumes that VI proceeds bottom-up and is domain based. The latter entails that accessibility to structure is domain-dependent. That is to say, certain nodes in the structure function as domain delimiters and morphological processes are confined to operate within a domain. An implementation of domains (and their delimiters) in syntax would be phases (and phaseheads) (Chomsky 2000, 2001). On one line of analysis, a phasal head induces the spellout of its sister, and, as such, immobilises it for further interaction. Consider the following structure:

(18)
　　　A　α　B

If α is a phasal head, then α forces the spellout of its sister: A. Applying this to morphology, morphological 'spellout' includes the operation of Vocabulary Insertion. Then, on the assumption that spellout freezes a string, B and A cannot interact across α (Em-

bick 2010, Bobaljik 2000, 2012; see Scheer 2010 for an overview). However, it has been argued that the situation is actually slightly more complex.

Consider the structure of a lexical item, such as (19) below. As is standard in DM (Marantz 1997), lexical items contain, at a minimum, a root which is unspecified for features that are traditionally associated with, for instance, nouns (e.g., person, number, case, etc.) or verbs (e.g., tense, aspect, etc.), and a category-defining node α (e.g., *n* for nouns and *v* for verbs). Following Embick (2010), category-defining nodes (in italics) are cyclic heads that force spellout.

(19)
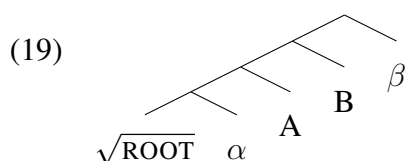
It is important to realize that, while the input to morphology is syntax, a basic tenet of DM, these structures are morphological in nature. As such, the structure in (19) is a head (X^0) (see Bobaljik 2012 on the proposal that accessibility to material is restricted to be within a complex head). Furthermore, while I draw on parallels to syntax, this dissertation is concerned with morphological operations; that is, syntactic spellout and morphological spellout need not be the same (see Bobaljik 2014, D'Alessandro & Scheer to appear; see also section 4.4.2).[1] For now, I refer to the domain in which elements undergo VI as the Spell-Out Domain (SOD) (but see below for discussion on whether a SOD is needed). Nodes that induce VI of their complement are referred to as cyclic nodes (corresponding

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[1]Newell (2008) argues that morphology is identical to syntax, and thus morphological phases and syntactic phases must be the same thing. Curiously, though, she makes a distinction between phaseheads that carry uninterpretable features and those that do not; phaseheads that carry uninterpretable features trigger spellout of their complement (the heads of *v*P, DP and CP), phaseheads that do not carry uninterpretable features (xP heads) trigger spellout which includes the head. Thus, we still see a distinction between 'syntactic' and 'morphological' phaseheads/domains.

to phasal nodes). In sum, a cyclic node (category-defining node) induces VI at terminal nodes in a SOD, which is defined as the sister of the cyclic node.[2,3]

Returning to (19), under all domain-based proposals, cyclic node β is too far away to trigger root allomorphy (root-suppletion). Nevertheless, there is evidence that at least some material above the first category cyclic node α can interact with the root. However, there are competing proposals with regard to which material in-between α and β can function as a context for root allomorphy.

Embick (2010) proposes that a cyclic node β induces VI not of its own complement but VI of the complement of cyclic node α located lower in the structure than β; crucially, this means that there is no VI induced by α (the first category-defining node). However, material that is accessible for purposes of VI of the root includes everything up to the actual VI trigger node (β); i.e. α, A and B. In contrast, Bobaljik (2012) does not assume Embick's mechanism and proposes that a cyclic node α results in VI of its complement, but that the trigger of VI itself (α) is accessible for purposes of VI; in other words, the features at node α may condition allomorphy of nodes undergoing VI. In Moskal (2015), I agree with Bobaljik that the trigger is accessible (α), but in addition I assume a dynamic approach to cyclic nodes for which you also need to access the node above cyclic node α, i.e., A, to determine whether it is the highest cyclic node (see below for details). We can schematize the (first) VI domain of the various approaches as below:

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[2]For a discussion on whether VI at non-terminal nodes is also a possibility, see sections 2.4 and 3.4 on portmanteaux.

[3]For a proposal which assumes that both the complement and trigger are included in a Spell-Out Domain (i.e., root plus category-defining node), see Newell (2008).

(20) Table 1: Overview of locality approaches

	node causing conversion (of $\sqrt{\text{ROOT}}$)	Spell-Out Domain	Accessible as context for allomorphy (of $\sqrt{\text{ROOT}}$)
Embick	β	$\sqrt{\text{ROOT}}$, α, A, B	α, A, B
Bobaljik	α	$\sqrt{\text{ROOT}}$	α
Moskal	α	$\sqrt{\text{ROOT}}$	α, A

To repeat, all authors agree that (at least) the root falls within the SOD and subject to Vocabulary Insertion, is potentially sensitive to α, and that β is too far away to condition root allomorphy; however, the variation lies in whether the nodes (and the features that are located on these nodes) in-between, A and B, can serve as a potential context for root allomorphy.

I will refer to the domain that contains material that is accessible as a potential context for VI (the third column in Table 1) as the *Accessibility Domain* (AD). It is important to note that accessibility is not directly restricting the operation of VI. That is, Vocabulary Insertion is merely the operation of converting morpho-syntactic material into phonological material; however, this operation is subject to morphological conditions, and it is these conditions that are phrased in terms of accessibility. As such, though material outside a domain can be referenced in a VI-rule such a rule is an illegitimate grammatical item given domain restrictions.

As briefly mentioned above, the complement of cyclic nodes form a Spell-Out Domain (the second column in Table 1). In addition, I propose that at this point prosodic words begin to be built left-to-right (cf. edge alignment theory, Selkirk 1986, Downing 2010, Cheng & Downing 2012; see also Kim 2014). As a consequence of prosody building, I

assume that a prosodic boundary is inserted at the left edge of what would correspond to the SOD. Finally, it is this boundary that has the effect of making certain properties of material unalterable within the prosodic domain it initiates. Note that this is counter to the assumption that the SOD as a whole is frozen, as is generally assumed to be the case in syntax (Chomsky 2000, 2001).[4] Indeed, the proposal here advocates for the insertion of a boundary at the left edge of a constituent which is defined as the complement of the first category-defining node. This constituent happens to correspond to the traditional notion of Spell-Out Domain, and hence I will continue to refer to this constituent as the SOD. Note, though, that for the current proposal it is not strictly necessary to refer to a (double-edged) domain, since the boundary is only inserted at the left edge of the complement of the first category-defining node; for more discussion see section 4.4.3.

In sum, I assume the following theory of locality: category-defining nodes are responsible for (i) creating a SOD containing their complement, most often the root; and (ii) creating an AD which contains the category-defining node itself and one node up.

At this stage it should be noted that if we assume a SOD there might seem to be a certain redundancy in the proposal above.[5] Given that I follow Bobaljik (2000) and assume that VI occurs cyclically from the most deeply embedded element outwards, it might seem redundant to create Spell-Out Domains in which the process of VI is initiated by a category-defining node. That is, it is not immediately clear why we would need a separate mechanism to *initiate* Vocabulary Insertion. However, if we would purely rely on VI occurring from the root outwards, as Bobaljik (2000) proposes, then at the point that

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[4]Note that D'Alessandro & Scheer (2013, to appear) who separate the PIC from phases also allow for discrepancies between phases in different modules.

[5]Thanks to Andrea Calabrese for bringing this to my attention.

the root undergoes VI no AD (or SOD) would be in place, given that the AD (and SOD) are created by the category-defining node. Thus, throughout this dissertation, I include the separate mechanism of VI initiation.

1.2 Overview

In the following, I offer an overview of how the dissertation is organised. In chapter two, I first draw on previous work (Moskal 2015) and demonstrate on the basis of suppletion patterns in lexical nouns and pronouns that the relevant accessibility domain is to be defined as the category-defining node and one node above it. This correctly derives a ban on case-driven root-suppletion, whilst allowing for case-driven suppletion in pronouns. In addition, I argue on the basis of conceptual as well as empirical grounds that (linear or structural) adjacency is *not* an additional restrictor on allomorphy. Rather, in order to account for apparent adjacency blocking effects, I propose hyper-contextual VI-rules which make reference to not a single node but a combination of nodes; as follows directly from the approach to locality here, these are by definition restricted by the AD.

In chapter three, I demonstrate on the basis of suppletion patterns in verbs that the dichotomy between lexical and functional material seems, by and large, to parallel that of nominals. Again, on a definition of the AD as comprising the category-defining node and one node above it, we predict a ban on tense-driven root-suppletion, whilst allowing for tense-driven suppletion in auxiliaries. However, it turns out that this definition might be too restrictive, and I consider including the operation of pre-syntactic bundling of aspect and tense in order to bring tense closer to the root.

In addition, I discuss the effect of morphological (post-syntactic) portmanteauhood on accessibility relations in the nominal and verbal domain, arguing that the AD is determined prior to the formation of VI-driven portmanteaux, thus arguing against views in which (morphological) portmanteaux extend locality relations.

In chapter four, I discuss morpho-phonological asymmetries in lexical and functional material. Specifically, first focusing on vowel harmony, I show that though it has been claimed in the literature that dominant prefixes are unattested, they are only unattested in lexical material but are observed in functional constructions. I argue that the lack of dominant prefixes in lexical material derives from a category-defining node induced SOD, which usually comprises only the root. As mentioned above, I propose that a prosodic boundary is inserted at the left edge of a SOD, thus making certain properties of the prosodic word unalterable to material to the left of boundary. This, in effect, results in dominant prefixes not being able to alter certain properties of material within the prosodic word, thus leading to an apparent ban on dominant prefixes.

Then, I turn to lexical accent assignment, where I show that in deletive accent resolution systems we again do not observe dominant prefixes, which I assume derive from the same restrictions as we saw operative in vowel harmony. Further support for dominant prefixes being ruled out by virtue of the prosodic boundary rather than never being generated emerges from additive accent resolution systems in which we do observe dominant prefixes in lexical material; this is not in contradiction with the above, since in additive accent resolution systems dominant prefixes crucially are allowed because they do not alter (but add to) properties of the prosodic word. Finally, also in the area of lexical accent we see a difference between functional and lexical material; in Russian, which is a dele-

tive accent resolution language, we see that in lexical items dominant prefixes outside of the prosodic word cannot alter material within the prosodic word, but we do observe an instance of a dominant prefix in functional material.

Finally, I conclude in chapter five, where I summarise the empirical and theoretical contributions of the dissertation, and offer some directions for future research.

Chapter 2

Limits in the nominal domain

As mentioned above, in the framework of DM suppletion is analyzed as contextual allomorphy. When we look at the phenomenon of suppletion of lexical items, we see that the phenomenon, though rare in absolute terms, is frequently observed across languages (Hippisley et al. 2004). That is to say, whereas it is usually a (very) small number of lexical items within a language that display suppletion, most languages do have such a small set. To illustrate the phenomenon, compare a (non-suppletive) adjective-comparative-superlative paradigm (21) with a familiar suppletive example (22):

(21) smart - smarter - smartest

(22) good - better - best

In particular, in the case of *smart-smarter-smartest* (21) we observe that the root remains the same throughout the paradigm, viz. *smart*. In contrast, in the case of *good-better-best* (22) we see that the root in the adjective surfaces as *good*, whereas in the comparative and superlative we observe *be(tt)*. Specifically, suppletion refers to a phono-

logically distinct realisation of a particular item in a particular context (see Corbett 2007 on specific criteria for canonical suppletion). That is to say, a single lexical item is associated with two phonologically unrelated forms, depending on the morphosyntactic context.

An important question concerns what does and what does not count as a suppletive root. As mentioned above, suppletion involves (i) two phonologically unrelated forms corresponding to (ii) the same lexical item. However, both aspects of this description are not unproblematic. In the current literature, it is not immediately clear what the boundary is between, on the one hand, two forms that are the result of two distinct roots (suppletion), and, on the other hand, two forms that stem from the same root but are phonologically not identical due to readjustment rules. Indeed, Calabrese (p.c.) takes the stance that there is no principled divide between these and suggests that suppletion does not exist, and any forms that display a phonological mismatch are the result of readjustment rules. In contrast, Bye (2007) considers the term suppletive allomorphy to encompass any non-identical morphological form, irrespective of the phonological distance between two forms (see also Siddiqi 2006, i.a.). Similarly, the second part of the description of suppletion is not straightforward either: it is unclear whether two words belong to the same lexical item; consider e.g. cow and bull, which could be considered to be allomorphs in the context of (lexical) gender (see also Corbett 2007).

While certainly valid concerns, these matters cannot be resolved here. Rather, I take a conservative stance in that I only consider 'extreme' cases. Specifically, the criterion for noun suppletion here are singular plural pairs identified as suppletive in prior literature, where these are strongly suppletive, i.e., not plausibly related by (possibly idiosyncratic) phonological (readjustment) rules.

In this case, the root of the lexical item $\sqrt{\text{GOOD}}$ is realised as *good* when it is the adjectival form but surfaces as *be(tt)* in the context of the comparative (and superlative).

When we look at nouns, we observe that languages can display suppletion for number (#). Consider Ket (spoken in the Krasnoyarsk region); let us first look at regular nouns, which display a nasal suffix in the plural (data from the Surrey Suppletion Database):

(23)

SINGULAR	PLURAL	gloss
am	ama-ŋ	'mother'
doʔn	doʔna-ŋ	'knife'
kyl	kyle-n	'crow'

Now, consider the nouns in (24) below, which display root suppletion in the context of number (Werner 1997); for instance, the root for 'tree' in the singular corresponds to *oˑks'* while in the plural it surfaces as *aˀq*.[1]

(24)

SINGULAR	PLURAL	gloss
oˑks'	aˀq	'tree'
dɨˑl'	kʌˀt	'child'
kɛˀt	dɛˀ-ŋ	'man'

Indeed, when we look at various languages, it is not rare to find a (small) group of nouns that displays suppletion in the context of number. In a survey of 79 languages investigating the presence of suppletion in lexical nouns, 18 genetically diverse languages

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[1] Note that the form 'man' actually displays both a suppletive root as well as an exponent of the regular plural suffix. Here I put aside the question of when the plural morpheme is realized as a regular plural exponent or a zero, an issue that arises in English past tense (*run - ran* vs. *tell - tol-d*) and comparatives (*worse* vs. *bett-er*) as well.

were found to display root-suppletion for number (Moskal 2015). Some more examples are given below:[2]

(25)

SG	PL	gloss	Language (source)
!ōo	ǂnûn	'knife'	!Xóõ (SMG; Traill 1994)
bič'ní	boždó	'corner of a sack'	Archi (SMG)
ká:k^h	hí"baya	'man'	Eastern Pomo (McLendon 1975, 122)
gnu/frosa	naga'	'person'	Hua (Haiman 1998, 544)
mort	jöz	'person'	Komi (SMG)
dákô	món	'woman, wife'	Lango (Noonan 1992, 85)
pale	olɣannar	'child'	Khakas (SMG)
iso	amehlo	'eye'	Zulu (Poulos & Msimang 1998, 49)

Curiously, although root-suppletion in nouns in the context of number is clearly observed, root-suppletion in the context of case (K) seems to be largely unattested (cf. Bybee 1985) (counter-examples are discussed in section 2.1.1).

Indeed, contrast this to the situation with pronouns, which regularly display suppletion for number as well as case. Consider the paradigm for German, which displays suppletion of pronouns for number as well as case (only first person is given):[3]

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[2]SMG refers to the Surrey Morphology Group project reports in the Surrey Suppletion Database, which can be found online at http://www.smg.surrey.ac.uk/Suppletion/explore.aspx.

[3]Note that I do not make any claims about any internal regularities within the pronoun paradigm, just that there is suppletion for case in at least some of the cells in (26).

(26)

|	SG	PL
NOM	ich	wir
DAT	mir	uns
ACC	mich	uns

The central goal of this chapter is to account for the discrepancy between, on the one hand, often observed case-driven suppletion in pronouns, and, on the other hand, the lack of case-driven root-suppletion in lexical nouns (see also a condensed version of this in Moskal 2015). In particular, to explain the (lack of) case-driven root-suppletion, I draw on the structural difference between nouns and pronouns, and combine that with locality claims in the framework of DM, as introduced in the previous section.

Specifically, I propose that the structure of nouns is as in (27) (to be discussed in more detail below). A key assumption here, repeated from above, is that the representation of nouns contains, at a minimum, a root and a category-defining node *n*. In a manner to be made more precise below, this *n* node will have the effect that the root and K are not sufficiently local in (27); more specifically, under a cyclic (bottom up) application of vocabulary insertion (Bobaljik 2000) constrained by locality domains (Embick 2010) at the point where the *root* is subject to VI within a Spell-Out Domain, the node K is not in the corresponding Accessibility Domain and thus not yet visible in the derivation, and cannot serve as a context for root allomorphy (i.e., suppletion).

(27)

$$\sqrt{\text{ROOT}} \quad n \quad \# \quad K$$
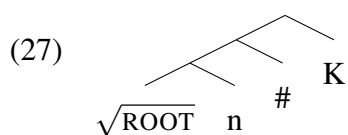
In contrast, it is widely assumed that pronouns have less structure than lexical nouns; concretely, I assume (28) as the representation of pronouns (Postal 1969, Longobardi 1994,

Déchaine & Wiltschko 2002). The key difference between nouns and pronouns is that pronouns are, at their core, functional (D) - they crucially lack a root and a (lexical-)category-defining node (*n*). By hypothesis, the absence of this *n* node will mean that even the deepest node in the pronoun (D) will be in the same domain as K, and thus subject to allomorphy (i.e., suppletion) conditioned by K.[4]

(28)

D   #   K
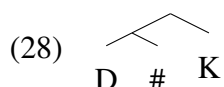
Thus, we observe the following two asymmetries here:

(29)   In lexical nouns, number-driven root suppletion is common while case-driven root suppletion is virtually unattested.

(30)   In contrast to lexical nouns, pronouns commonly supplete for both number and case.

The latter asymmetry (30) mainly relies on the structural difference between lexical and functional material, specifically the presence and absence of a category-defining node, respectively. The asymmetry in (29), however, relies on a particular implementation of locality, briefly introduced in the previous section. Recall from Table 1 in (20) that I assume that the Accessibility Domain is comprised of both the VI-node as well as one node above it. There are at least two ways this locality domain might be derived. On the one hand, it may simply be stipulated as for instance a kind of morphological subjacency (see Moskal to appear), along the lines of Embick's (2010) C1LIN proposal.[5] On the other hand, it may be derived from a dynamic approach to domains. Specifically, Bobaljik

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[4]Whether or not the pronominal base D and K are in the same SOD, I leave open at this stage; K is at any rate in the Accessibility Domain.

[5]See section 2.3 for a discussion on how the current proposal differs from Embick's.

& Wurmbrand (2013) argue that nodes are designated inherently only as potential phase initiators; whether they are actual phase initiators or not is dependent on whether they are the highest node of an extended projection (Grimshaw 2005); see also Bobaljik & Wurmbrand (2005), den Dikken (2007), Bošković (2014), Wurmbrand (2014a). That is, not until the next node is accessed is it known whether the potential phase initiator is the top projection, and, as such, an actual phase initiator. Since access to one node above the category-defining node is required to determine its status, that node itself is a potential context for root allomorphy; as such, the Accessibility Domain is comprised of the cyclic node and one node above.[6]

2.1   Suppletion in lexical nouns

As mentioned above, case-driven suppletion is not observed in lexical nouns, while number-driven suppletion has been attested in a variety of languages. In the following, I will use a projection labelled 'case' (K) as an umbrella term for what is realised as the case morpheme.[7] Similarly, I collapse the ϕ-features into a single projection, and will equate ϕ with its internal constituents, in particular the number node (#).[8] Furthermore, in accordance with Greenberg's (1963) universal, case is assumed to be located higher than number (and

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[6]Note that the current proposal potentially predicts that suppletion in deverbal nouns and other category-changing words would be freely available. If domain extension is insensitive to the type of a category-defining node then we predict that such suppletion patterns would be possible; however, it is empirically difficult to identify such patterns as suppletion rather than separate lexical items. In contrast, if domain extension is sensitive to the type of a category-defining node then only a node that is part of the extended projection of the root can extend a domain.

[7]For more articulated representations see e.g. Caha (2009), Pesetsky (2012); see also the discussion in Smith et al. (2015) summarised in section 2.2.1.

[8]However, clearly, the current proposal makes predictions about more fine-grained morphological sub-analysis; at this point, I leave this to future research.

all other ϕ-features).

(31)   **Universal 39** (Greenberg 1963, 95): Where morphemes of both number and case
       are present and both follow or both precede the noun base, the expression of num-
       ber always comes between the noun base and the expression of case.

In (32), I repeat the abstract representation for a lexical noun from above:

(32)
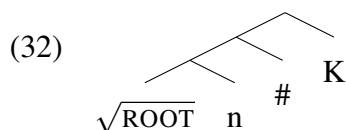
$$\sqrt{\text{ROOT}} \quad n \quad \# \quad K$$

To repeat, Vocabulary Insertion proceeds cyclically from the root outwards.[9] As such,
we start at the $\sqrt{\text{ROOT}}$. Next we reach category-defining *n* which is a VI-node, which, as
such, creates a Spell-Out Domain solely occupied by the root, [$\sqrt{\text{ROOT}}$]. Crucially, how-
ever, the Accessibility Domain, which delimits possible allomorphy triggers, is comprised
of the cyclic node and 'one node up', viz. number.

As for practical application, the VI-rules for languages that display a suppletive form
in the plural will take the following form:[10]

---

[9]I assume both roots and functional vocabulary are inserted late (see Corbett 2007, Harbour & Bonet
2010 and Harley 2014 for discussion). However, as briefly noted above, Embick (2010, 193, n.1) assumes
that roots are actually not subject to VI. Rather, roots come with a phonological underlying form. Although
he assumes, following Marantz (1995), that suppletion is restricted to the functional vocabulary, he adds that
this might be empirically not correct. In order to main the division between roots and functional items he
draws on *defective paradigms* which would account for 'surface' suppletion of roots. Nevertheless, even if
we would allow for defective paradigms to play a role the question of their representation would remain; in
other words, how would we model two 'allo-roots' with the same semantics to correspond to a single root
'position', and crucially maintain a difference between that and a situation in which there are two vocabulary
items that correspond to a single morpheme (i.e. suppletive allomorphy). See also section 3.2.1.

[10]Note that one could equally say that the suppletive root is realised in view of the singular and the
elsewhere root surfaces in the plural. Which feature is the trigger could reasonably be related by markedness
of features; see section 5.3 for a brief discussion of the role of markedness and suppletion triggers.

(33) $\sqrt{\text{ROOT}} \Leftrightarrow \beta \,/ \,\underline{\quad}\,] \,\#_{[\text{PL}]} \,]$

        $\sqrt{\text{ROOT}} \Leftrightarrow \alpha$

Ket   As an actual example, consider again the suppletive forms in Ket (Werner 1997), repeated here from (24) above:

(34)

SG	PL	gloss
oˑks'	aˀq	'tree'
dɨˑl'	kʌˀt	'child'
kɛˀt	dɛˀ-ŋ	'man'

The VI entries for the Ket forms in (34) would correspond to the following:[11]

(35) $\sqrt{\text{TREE}} \Leftrightarrow \text{aˀq} \,/ \,\underline{\quad}\,] \,\#_{[\text{PL}]} \,]$

        $\sqrt{\text{CHILD}} \Leftrightarrow \text{kʌˀt} \,/ \,\underline{\quad}\,] \,\#_{[\text{PL}]} \,]$

        $\sqrt{\text{MAN}} \Leftrightarrow \text{dɛˀ} \,/ \,\underline{\quad}\,] \,\#_{[\text{PL}]} \,]$

        $\sqrt{\text{TREE}} \Leftrightarrow \text{oˑks'}$

        $\sqrt{\text{CHILD}} \Leftrightarrow \text{dɨˑl'}$

---

[11]Whilst we see that the form for 'man' has a clear (regular) plural exponent *-ŋ*, thus showing that we are indeed dealing with suppletion of the root, the forms for 'tree' and 'child' are analysed as containing null plural affixes; an alternative analysis would list 'tree' and 'child' as portmanteaux consisting of the root, category-defining node and number.

    i. $[\sqrt{\text{TREE}}, \text{n}, \text{PL}] \Leftrightarrow \text{aˀq}$
       $[\sqrt{\text{CHILD}}, \text{n}, \text{PL}] \Leftrightarrow \text{kʌˀt}$
       $\sqrt{\text{MAN}} \Leftrightarrow \text{dɛˀ} \,/ \,\underline{\quad}\, \text{PL}$
       $\sqrt{\text{TREE}} \Leftrightarrow \text{oˑks'}$
       $\sqrt{\text{CHILD}} \Leftrightarrow \text{dɨˑl'}$
       $\sqrt{\text{MAN}} \Leftrightarrow \text{kɛˀt}$
       $\text{PL} \Leftrightarrow \text{-N}$

    At this stage, I do not yet discuss the effects of portmanteauhood; suffice it to say that none of the VI entries make reference to case. For a discussion on the consequences of portmanteauhood on accessibility domains, see section 3.4.

$\sqrt{\text{MAN}} \Leftrightarrow k\varepsilon^{\text{ʔ}}t$

PL $\Leftrightarrow \emptyset$ / N] __] (where N = TREE, CHILD)

PL $\Leftrightarrow$ -N

To repeat, by virtue of the elsewhere principle the more specific VI rules (such as $\sqrt{\text{TREE}} \Leftrightarrow a^{\text{ʔ}}q$ /__] #$_{[PL]}$] and $\sqrt{\text{MAN}} \Leftrightarrow d\varepsilon^{\text{ʔ}}$ /__] #$_{[PL]}$]) are chosen if the context for them is met. Furthermore, the context of the plural is available since at the point that the root undergoes VI the number node, which carries [PLURAL], is sufficiently local by virtue of being within the Accessibility Domain. That is, when *n*, a potential domain delimiter, is reached, due to the dynamic approach to domain formation, it still needs to be confirmed whether a potential cyclic node is an actual domain delimiter. Thus, at the point that the number node, which is specified for [PLURAL] is accessed, *n* is confirmed as an actual domain delimiter, resulting in the formation of a SOD comprised of the root, and a corresponding AD which contains *n* as well as number ([PLURAL]).

However, as per the formalisation of locality above, the case node does not fall within the Accessibility Domain of the root. In other words, the root has already undergone VI at the point that case is relevant for contextual allomorphy. It is important to note that it is locality restrictions that prevent the root from accessing case information. That is, nothing prevents the formulation of a hypothetical VI entry that makes reference to K, as in the rule in (36).

(36) $\sqrt{\text{CHILD}} \Leftrightarrow gu:$ / __] K]

However, a VI-rule such as (36) is an illegitimate grammatical item, since K is inaccessible due to locality, and thus an uninterpretable entity.

Thus we derive the lack of case-driven root-suppletion in lexical nouns.[12]

(37)
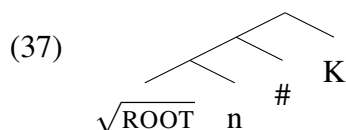
In sum, whilst number-driven root-suppletion is possible, case-driven root-suppletion is prohibited by virtue of locality. Indeed, in total, 18 languages from the survey were found to display some item(s) that supplete in the presence of the plural. In contrast, only a handful of items display root-suppletion that is conditioned by case (which will be discussed immediately below). The formulation in terms of the Accessibility Domain consisting of the cyclic node and one node up blocks case-driven root-suppletion in a structure such as (32); however, it predicts a certain class of exceptions to this ban: K may be close enough to the root just in case number is missing. Indeed, in the next section I argue that four apparent counter-examples should be analysed in exactly this way.

2.1.1 Case-driven root-suppletion

An interesting prediction from the proposal here is that removing or adding structure will influence accessibility of nodes to influence suppletion. For instance, in lexical nouns which lack a number node we predict case-driven root-suppletion to become possible, since in that configuration K is 'one node up' from category-defining *n*, and thus falls within the AD of the root. Thus, we see that the lack of number in the structure opens the door the possibility of case-driven root-suppletion.

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[12]I leave the question of whether case triggers a Spell-Out Domain of its own to future research; either way, it will be (part of) a SOD that is different from that in which the root receives its phonological form.

(38)

$$\sqrt{\text{ROOT}} \quad \text{n} \qquad \text{K}$$
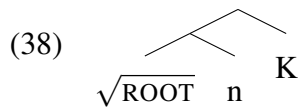
Indeed, there are a handful of items where we see case-driven root-suppletion, each of which I will discuss in turn below.

The five cases of root-suppletion in the context of case all come from North-East Caucasian languages.[13] In the following, I will argue that four of these can be analysed by arguing that they lack a number node in certain contexts, which thus corroborates the hypothesis here that the absence of number opens up the possibility of case-driven root-suppletion. I will return to the fifth case (from Lak) last, and will argue that in this case the locality domain is extended beyond number due to multiple instances of *n* being in the structure.

Archi The first two counter-examples come from Archi (spoken in Southern Daghestan); first consider 'regular' root-suppletion in the presence of number (Archi Dictionary[14]):[15]

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[13]The fact that lack of number in certain contexts only seems to be observed in two closely related North-East Caucasian languages suggests that this configuration is highly marked.

[14]Available at: http://www.smg.surrey.ac.uk/archi/linguists/.

[15]Note that the singular - plural alternations for *bič'nt́ - b18ždó* 'corner of a sack' and *biqʕnt́ - boʁdó* 'pier of a bridge' could involve a readjustment rule that targets the second consonant in the forms. Given the other suppletive forms in the table, I still include them here as suppletive pairs.

(39)

	SG	PL	gloss
ABS	bošór	kɬelé	'man'
ERG	bošór-mu	kɬelé-maj	
ABS	úɬdu	ɬ:ʷat	'shephard'
ERG	úɬ-li	ɬ:ʷá-čaj	
ABS	bič'ní	boždó	'corner of a sack'
ERG	bič'ní-li	boždó-rčaj	
ABS	ɬ:onnól	χom	'woman'
ERG	ɬ:anná	χam-aj	
ABS	χˁon	buc:'i	'cow'
ERG	χˁiní	búc:'i-li	
ABS	biq'ˁní	boʁdó[16]	'pier of a bridge'
ERG	biq'ˁní-li	boʁˁdó-rčaj	

The data above are clear cases of root-suppletion caused by number. However, according to Hippisley et al. (2004), the forms for 'father' and 'child' in Archi display suppletion for case. Leaving the case of Archi's 'child' aside for the moment, consider Archi's 'father' (Archi Dictionary).

(40)

	SG	gloss
ABS	ábt:u	'father'
ERG	úmmu	

Intriguingly, though, this form is listed as a *singulare tantum* and as such the form

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[16]According to the Archi Dictionary there is also a non-suppletive absolute plural variant *biq'ˁní-t:u*; presumably, this variant has a concomitant non-suppletive ergative plural variant, though this is not mentioned.

does not have a corresponding plural.[17] I argue that Archi's 'father' is defective in that it lacks a number node.[18] Indeed, the absence of number opens up the door for case-driven root-suppletion; in the specific item Archi's 'father' we see that the (ergative) case node is sufficiently local to the root to affect the choice of root exponent, since it is one node up from *n* and thus within the AD:

(41)
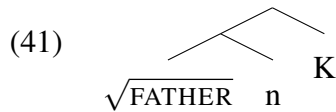
$$\sqrt{\text{FATHER}} \quad n \qquad K$$

The corresponding VI-rules are given below:[19]

(42) $\sqrt{\text{FATHER}} \Leftrightarrow$ úm- / __] $K_{[\text{ERG}]}$]

  $\sqrt{\text{FATHER}} \Leftrightarrow$ ábt:u

Thus, given the lack of number, both rules in (42) are interpretable to the grammar; crucially, the VI-rule making reference to $K_{[\text{ERG}]}$ is a legitimate grammatical item since K falls within the AD as it is the next node up from category-defining *n* (41).

Lezgian The next two items comes from Lezgian; consider the forms for 'water' and 'son', which display suppletion in the context of non-absolute (oblique) case in the singular (Haspelmath 1993, 80, p.c.):

---

[17]The absolute form *ábt:u* seems to include the (productive) plural suffix *-t:u*; given its listing as a *singulare tantum*, though, I assume that the form is reanalysed into a monomorphemic root.

[18]As to singular nature of the *singulare tantum*, I suggest its inherent singular value is located on *n* (see Kramer 2012, Smith to appear, 2015 for proposals that inherent gender or number features may be on *n*).

[19]Note that the ergative form contains the ergative suffix *-mu*; indeed, in Archi, other cases are built on top of the ergative, and these cases take the ergative stem *úm-mu*, as in e.g. *úm-mu-t* 'father-ERG-LOC'.

(43)

	SG	PL	gloss
ABS	jad	jat-ar	'water'
OBL	c-i	jat-ar-i	
ABS	xwa	ruxwajar	'son'
OBL	xc-i	ruxwa-jr-i	

Indeed, I will argue that in these cases what we see is what we get: in the forms for 'water' and 'son' the singular is absent and, as such, as we saw above in the case of Archi, the door is opened for case to govern root-suppletion. That is to say, rather than the structure in (32), in the suppletive forms in (43) the number node is missing from the structure and, as such, (oblique) case is sufficiently local to govern root-suppletion.

(44)

$$\sqrt{\text{WATER, SON}} \quad n \qquad K$$
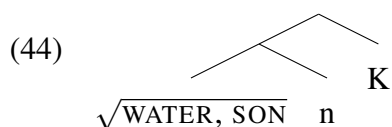
In order to show this, we need to take a closer look at the structure of oblique stems. As can be seen even from the data above, the absolutive singular does not have a suffix. Crucially, the oblique suffix in the suppletive (singular) forms in (43) consists of *-i*. I will argue that this exponent is the exponent of (the oblique) case exclusively (and does not include number information).

First, consider the formation of oblique plurals in Lezgian (Haspelmath 1993, 75); these are formed by adding *-i* to their non-oblique (absolutive) stem.[20] In particular, the absolutive plural exponent corresponds to *-(C)ar*.[21] The plural of the oblique, then, is formed by observing the plural *-(C)ar* (with syncope) followed by *-i*.

---

[20]The only exception are items that take *-bur* as a plural, in which case we observe *-u* instead of *-i* (e.g. *jarú-bur-u* 'red one-PL-OBL'); I take this to be a case of underlying *-i* undergoing vowel harmony (which is independently observed in Lezgian).

[21]I abstract away from some additional allomorphy since it does not bear directly on the argument here.

(45)

ABS PL	OBL PL	gloss
balk'an-ar	balk'án-r-i	'horse'
buba-jar	bubá-jr-i	'father'
dağ-lar	dağ-lár-i	'mountain'

This suggests the following structure for e.g. 'father-PL-OBL':

(46) buba   -jr   -i

      father   -PL   -OBL

Turning to the singular forms, Haspelmath (1993, 74ff) lists the the following eight realisations of the 'oblique stem affixes':[22]

(47)   *-di*   *-a*   *-Adi*   *-rA*

       -Uni   *-A*   *-U*   *-ci/-c'i/-či/-č'i/-ži*

The default oblique stem suffix *-di* I argue is actually decomposable into *-d-i* corresponding to '-SG-OBL'. This leads to the following (subset of) Vocabulary Insertion rules for Lezgian, which are given in (48) below; note that the exponent of the singular in (48) is the default realisation which I assume to apply when all other more specific (and lexically restricted) VI-rules for the singular (such as, in (49), [SG] ⇔ *-ed* / {nek', ...}] __], and, in (50), [SG] ⇔ *-un* / {kam, ...}] __]), have applied. Also, note that *-d* only surfaces in oblique contexts and not in absolutive contexts.

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[22]Haspelmath (1993) actually lists ten realisations, but two of these I have already addressed: *-i* and *-u* (see note 20 above).

(48)   [SG] ⇔ -d / __] K[OBL]]

[SG] ⇔ -∅

[PL] ⇔ -(C)ar

[OBL] ⇔ -i

Furthermore, I assume that Haspelmath's 'oblique stem affixes' *-Ad-i* (49), *-Un-i* (50) and *-c-i/-c'-i/-č-i/-č'-i/-ž̌-i* (51) are examples of allomorphy of the singular in the context of the root followed by the ergative suffix.[23,24]

(49)   nek'   -éd   -i

       milk   -SG   -OBL

(50)   kam   -ún   -i

       trap   -SG   -OBL

(51)   par   -c   -i

       load   -SG   -OBL

This leaves us with the following 'oblique stem affixes': *-a*, *-rA*, *-A* and *-U*. Strikingly, all these suffixes end in a vowel other than /i/; as such, I suggest that most of the above-listed exponents are allomorphic realisations of the singular node but that the resulting configuration of *V-i* is phonologically dispreferred. Indeed, Lezgian only has two long vowels (/æ:/ and /a:/), which have a marginal status: they result from compensatory lengthening after the loss of ʁ in (combinations of different preverbs with the verb) *jaǧun* 'hit' (Haspelmath 1993, 32).[25]

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[23]Clearly, one could decompose *-Adi* into *-A-d-i*; I leave that open.

[24]The different variants *-c-i/-c'-i/-č-i/-č'-i/-ž̌-i* are the result of Affricate Assimilation, see (Haspelmath 1993, p.63, section 5.13).

[25]Furthermore, "*-aj* and *-äj* in suffixes are often pronounced as /a:/ and /æ:/ respectively" (Haspelmath 1993, 32).

As such, I suggest that in the situation where the singular allomorph and the oblique result in vowel hiatus this is resolved by virtue of deleting the high vowel /i/, resulting in a surface situation in which the 'oblique stem affix' does not include (morphological) *-i*: *-a* (52), *-rA* (53), *-A* (54) and *-U* (55).

(52) apaj   -a   -i   → apaja

      father-in-law   -SG   -OBL

(53) lam   -ra   -i   → lamra

      donkey   -SG   -OBL

(54) luw   -á   -i   → luwá

      wing   -SG   -OBL

(55) čarx   -ú   -i   → čarxú

      rock   -SG   -OBL

Finally, the remaining realisation of the 'oblique stem affix' is a 'bare' *-i*.[26] Interestingly, the class of nouns that take a 'bare' oblique marker *-i* are suggested by Haspelmath (1993, 75) to be "former *pluralia tantum* which have been reanalyzed as singulars."[27] Indeed, *pluralia tantum* have been argued to have a lexical number specification on *n* (Smith to appear, 2015; see also Kramer 2012 for lexical gender information being situated on *n*), which would exempt them from projecting a number node.

At long last, we can return to the suppletive nouns in the table in (43) above, repeated below in (56) from (43) above.

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[26]Another realisation of the 'oblique stem affix' is a stressed *-í*; I assume that this again involves a singular exponent (stressed) *-í* followed by ergative *-i*, which is resolved as *-í*.

[27]The other class of nouns that take a 'bare' oblique marker *-i* are deverbal nouns; at this point I leave open why deverbal nouns take a (surface) bare oblique marker.

(56)

	SG	PL	gloss
ABS	jad	jat-ar	'water'
OBL	c-i	jat-ar-i	
ABS	xwa	ruxwajar	'son'
OBL	xc-i	ruxwa-jr-i	

Note that they are among the class of nouns that take a 'bare' oblique marker *-i*; thus, I suggest that in the case of 'water' and 'son', the singular is pruned (i.e. deleted) by a specific rule targeting these two items, also noting their potential history as former *pluralia tantum*. Though I allow for the operation of pruning, I assume that there is a preference to keep nodes intact. Indeed, work on (adjectival) suppletion, Bobaljik (2012) shows that the lack of an exponent does not seem to change structural relations. Specifically, Bobaljik argues for an (obligatory) containment relation in adjectives; the superlative contains the comparative, which in turn contains the (positive) adjective:

(57)

```
                 S
               /   \
              c     SPRL
            /   \
           a    CMPR
           |
          ADJ
```
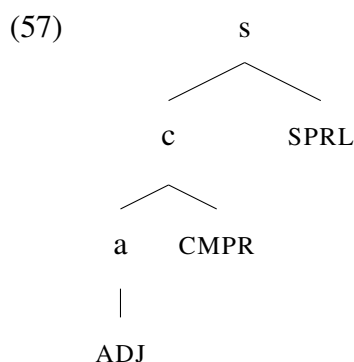
Now, if pruning of (null) CMPR were freely available, then SPRL would be expected to trigger root-suppletion, which is unattested.

Thus, pruning seems to be a highly marked configuration; presumably, missing features are derivationally costly, but I leave an investigation into the nature of pruning to

future research.[28]

In the absence of singular number, the oblique case node becomes structurally local enough (it falls within the AD) to allow it to condition root-suppletion, as seen in the structural representation below, repeated from (44) above.

(58)

$$\sqrt{\text{WATER, SON}} \quad n \qquad K$$
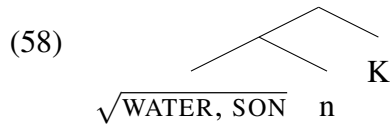
The particular VI-rules for Lezgian 'water' and 'son' are given below, in (59) and (60), respectively.

(59) $\sqrt{\text{WATER}} \Leftrightarrow c \: / \: \rule{0.5cm}{0.15mm} \:] \: K_{[\text{OBL}]} \:]$

$\sqrt{\text{WATER}} \Leftrightarrow \text{jaT}$

(60) $\sqrt{\text{SON}} \Leftrightarrow \text{xc} \: / \: \rule{0.5cm}{0.15mm} \:] \: K_{[\text{OBL}]} \:]$

$\sqrt{\text{SON}} \Leftrightarrow \text{(ru)xwa}$

Again, given that K falls within the AD, the VI-rules in (59-60) that make reference to case are interpretable grammatical items.

Archi   For the fourth instance of case-driven suppletion, we return to Archi, where we observe that in the case of the ergative singular Archi's 'child' displays (case-driven) suppletion:

(61)

	SG	PL	gloss
ABS	lo	ló-bur	'child'
ERG	lahá	ló-bur-čaj	

---

[28]See also section 3.2.5 for a brief discussion on pruning and fusion.

In essence, the analysis of this items follows that of the Lezgian cases. We observe the following: (i) as in Lezgian, the plural (*-bur*) blocks the suppletive root from surfacing (*ló-bur-čaj* rather than **lahá-bur-čaj*), and (ii) there is no overt suffix on the ergative singular form which would correspond to a singular exponent. It seems that in Lezgian stress falls on a root-syllable and not on suffixes; as such, I assume that the ergative singular lacks an overt suffix altogether and the form *láha* is monomorphemic. The fact that the regular root surfaces in the ergative plural supports the analysis proposed here, since the presence of the plural morpheme intervenes between the root and the ergative, thus preventing root suppletion:

(62)

$$\begin{array}{c} \sqrt{\text{CHILD}} \quad n \quad \#_{[\text{PL}]} \quad K_{[\text{ERG}]} \end{array}$$
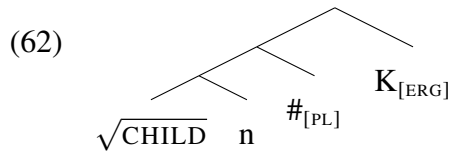
Importantly, the blocking effect of the plural holds due to accessibility relations; as depicted in (62), the plural number node falls within the AD, whilst the ergative case node does not.[29]

Secondly, the ergative singular form is lacking any suffix. Indeed, the lack of any suffix allows for an analysis of the item 'child' where the singular is pruned (deleted) in the context of the ergative. As such, this opens up the door for (ergative) case to be sufficiently local to the root to govern suppletion, since the case node falls within the AD.

(63)

$$\begin{array}{c} \sqrt{\text{CHILD}} \quad n \quad K_{[\text{ERG}]} \end{array}$$

---
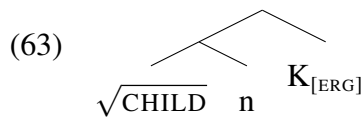
[29]In section 2.5, I turn to the role of (linear and structural) adjacency in blocking effects.

The VI rules for Archi's 'child' are given below. Note, that I need to postulate a null (ergative) case suffix in the singular (*lahá-∅* 'child-ERG') to condition the suppletion in the context of the ergative (64).[30]

(64) $\sqrt{\text{CHILD}} \Leftrightarrow$ lahá / __] K$_{[\text{ERG}]}$]

   $\sqrt{\text{CHILD}} \Leftrightarrow$ ló

Lak The final instance of case-driven root-suppletion in a North-East Caucasian language is from Lak (Radkevich 2014). Specifically, the root for the item 'moon/month' suppletes in the context of (ergative) case:

(65)

	SG	PL	gloss
ABS	barz	barz-ru	'moon/month'
ERG	zur-ul	zur-dald-il	

In the preceding sections, we saw that case-driven root-suppletion became possible due to number being absent, and thus bringing case closer to the root. However, in (65) we see that the suppletive root *zur-* surfaces even though there is an overt plural marker-*dald* (note that the plural marker displays a lot of allomorphy, with over 40 different realizations). Thus, it is clearly not a case of the nominal containing less structure.

Interestingly, Radkevich (2014) argues that the nominal structure of Lak is more extensive, and proposes the following structure:

(66)

---
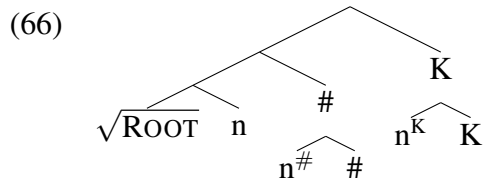
[30]See again section 3.2.5 for a brief discussion on pruning and fusion.

In (66), we see that Radkevich posits multiple occurrences of *n*, crucially including *n* as a sister of number and also of case, thus resulting in multiple instances of *n* in the structure.

Thus, she analyses a form such as *lut:irdal* 'books' as follows:

(67) lu-   t:i- rd- a-   l
      book- $n^{\#}$- PL- n^{K}- ERG

If we now take the hypothesis of dynamic domain triggers seriously, we see that on the structure in (66) K becomes available as a possible context for root-suppletion as follows. If we go over the derivation, we see that at the first category-defining node *n* we encounter a potential cyclic node. Thus, per the dynamic approach, we look at the next node in order to see whether *n* is the highest cyclic node in the extended domain of the nominal. On the assumption that what is visible for purposes of evaluating whether this is the highest potentially cyclic node is a domain comprised of 'one node up' from *n*, i.e. #, and everything that is contained within this node, then both $n^{\#}$ and # are visible.[31] Given that $n^{\#}$ constitutes another cyclic node (within the extended projection of the root) that is visible upon evaluating the highest cyclic node, we move on to the next node, K.[32] Thus, we see that in this way case information falls within the AD (if not the SOD) of the root.

Though this analysis seems on the right track, clearly a more detailed investigation into the structure of Lak nominals is required.[33]

---

[31]Though Halle & Marantz (1993) assume a c-command condition on triggers as well, I do not adopt this view. We will see that weakening the condition on triggers in this way allows us to capture more data than just the problematic Lak datum; see section 2.5.2 on Basque and 3.2.6 for a brief discussion on agreement-driven root-suppletion.

[32]Though not relevant for the analysis of the suppletion datum here, I assume again that at this stage both n^{K} and K are visible to evaluate whether the highest cyclic node has been reached.

[33]Alternatively, we could assume the following structure, which maintains most of Radkevich's insights:

In sum, in this section we have seen that in Archi and Lezgian case-driven suppletion became available in the absence of the number node. However, this account crucially relied on pruning of the relevant number nodes. Though I noted a possible connection to *pluralia tantum* in Lezgian, it remains that pruning seems a highly marked configuration only observed in two closely related languages, Archi and Lezgian. A different angle to approach the cases of case-driven root-suppletion in Archi and Lezgian would be to extend Radkevich's (2014) analysis of the structure of nominals in Lak to other Nakh-Dagestanian languages, in which case the case-driven root-suppletion cases discussed above would fall out naturally; I leave this for future research.

Also relevant here is that I do not assume number to be universally present. In languages that lack NumP altogether, I predict that case-driven root-suppletion becomes a possibility (though not a necessity). Languages that have been argued to lack NumP include Haitian Creole (Déprez 2005) and Persian (Ghomeshi 2003); however, neither of these languages marks case on their lexical nouns, and it remains to be seen whether there are languages that lack number but do mark case morphologically.

i.
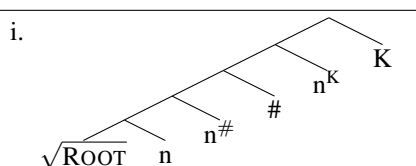
Indeed, if Radkevich is correct about the extended structure for Lak nominals and we assume the one in (i), then we can assume that it is the highest instance of *n* that counts as a definitive VI-node that creates a Spell-Out Domain. In (i), that would be n^K, thus allowing for the possibility of case-driven root-suppletion, since in that situation the first SOD would be comprised of the string [$\sqrt{\text{ROOT}}$-n-$n^\#$-#], and the corresponding AD would include all the nodes in (i), crucially including case information. However, if we want to maintain no look-ahead, this approach requires some 'deficiency' of *n* until the highest instance is encountered.

2.1.2 Interlude: Non-suppletion

Here, I discuss a few cases which could be regarded as involving suppletion, but below I argue that they can be reanalysed as resulting from readjustment.

Scottish Gaelic In Scottish Gaelic, there is a form that could be considered as case-driven root-suppletion (David Adger, p.c.). Consider the paradigm for 'wife':

(68)

	SG	PL	
NOM	bean	mnatha	'wife'
GEN	mnà	ban	
DAT	mnaoi	mnathan	

I analyse these forms as involving (idiosyncratic) readjustment rules; specifically, the analysis runs as follows: syncope of the first syllable if the form is polysyllabic, and a rule /b/ to /m/ before nasals (N). Thus, we see the following derivation for e.g. the genitive singular form *mná*:

(69) /ban-à/

  bnà   syncope

  mnà   b → m / __ N

  [mnà]

In (69), given that the suffix *-à* creates a bisyllabic unit, syncope applies, which in turn results in the voiced labial stop being immediately adjacent to a following nasal, triggering the rule which changes /b/ to /m/; thus, syncope feeds b → m.

Compare this to the derivation for e.g. the genitive plural form *ban*, given below:

(70)   /ban/

    ban   syncope (n/a)

    ban   b → m / __ N (n/a)

    [ban]

In (70), syncope fails to apply since it is monosyllabic and syncope would leave the form with no nucleus. Given that syncope does not apply the configuration for b → m is not met, since /b/ is not immediately adjacent to a nasal.

Crucially, being readjustment rules, these rules are idiosyncratic, and only apply in the relevant environment, taken here to be the particular item for 'wife' in Gaelic. Indeed, the rule that changes /b/ to /m/ before is reminiscent of *eclipsis* observed in both Scottish Gaelic and the closely related Modern Irish. Eclipsis is a morphologically conditioned rule that applies only in certain environments, such as after the interrogative particle *an*, the possessive pronoun 'their', the preposition 'in', etc. Specifically, it is a morpho-phonological phenomenon where certain function words cause nasalisation. In Modern Irish, certain words trigger the insertion of prefixal *n-* on vowel-initial words (71a), and nasalization of consonant-initial words (in some dialects) (71b) (Ó Maolalaigh 1995-1996).

(71)   a. ar **n-**athair 'our father'

       b. <ar bean> [ar mʲan]

In Scottish Gaelic the corresponding process is somewhat different; there is considerable dialectal variation but one of the main types of nasalization involves the (partial) nasalization of stops, resulting in the following alternations (Ó Maolalaigh 1995-1996, 159):

(72) /k t p/ → [ŋʰ Nʰ mʰ]

  /g d b/ → [ŋ N m]

Clearly, eclipsis and the b → m rule differ in their directionality, with the former post-nasalising an element, and the latter causing a preceding element to become nasal.[34] However, the configuration where voiced stops become homorganic nasals resulting in $b \sim m$ alternations clearly is attested in the language, which adds support to an analysis which includes a rule such as b → m / __ N to account for the data in (68). Thus, what we see in Scottish Gaelic is readjustment rules masquerading as suppletion, which crucially does not constitute a counter-example to the claims made here.

Icelandic Next, consider Old Icelandic forms such as *kýr* 'cow' (73) and *ær* 'sheep' (74), given below:

(73)

	SG	gloss
NOM	kýr	'cow'
ACC	kú	
DAT	kú	
GEN	kýr	

---

[34]A second difference between the rule above and eclipsis is that the rule above occurs word-internally, whilst eclipsis is a process that occurs across word boundaries. However, Jaskuła (2006), in her dissertation on (Old) Irish, observes that although "it is not uncommon to encounter views that eclipsis is confined to word boundaries, in prehistory its activity was also observed in the interior of words" (Jaskuła 2006, 85ff).

(74)

	SG	gloss
NOM	ær	'sheep'
ACC	á	
DAT	á	
GEN	ær	

Even though the accusative and dative forms seem to have different roots, these actually result from a readjustment rule, which causes the vowel before *r* to front (I-umlaut). As such, they do not qualify as instances of root-suppletion as assumed here.

Latin Finally, consider Latin *Jupiter* 'Jupiter-NOM' which seems to change its root in the presence of case:

(75)

	SG	gloss
NOM	Jup-piter	'Jupiter'
GEN	Iov-is	
DAT	Iov-ī	

Furthermore, the nominative plural also takes *Iov-* as its root: *Iov-ēs* 'Jupiter-NOM.PL'. However, I assume that the alternation between *Jup-* and *Iov-* involves a readjustment rule with a vowel change and lenition of /p/ to /v/.[35]

2.1.3   Diminutive blocking

A second prediction that follows from the locality restrictions identified here is that when a node X intervenes between *n* and number, we predict that number-driven root-suppletion

---

[35]Also, in Greek the form for 'lamb' seems to involve a root-alternation: *amnos* 'lamb-NOM' and *arnos* 'lamb-GEN'; however, I treat this as a readjustment rule as well.

should be blocked, since only *n* and X would fall in the AD and be accessible to potentially govern root-suppletion. That is, an (overt) element between the category node *n* and number should block number-driven root-suppletion, since in that configuration number is no longer one node up from category-defining *n*.

(76)

$$\sqrt{\text{ROOT}} \quad n \quad X \quad \#$$
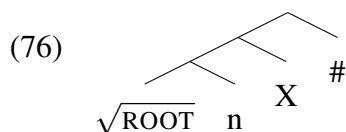
In Slavic languages, the diminutive is located closer to the root than number;[36] the corresponding structure is given below (at the surface, the 'number' exponent also incorporates case information, *per* portmanteau):

(77)

$$\sqrt{\text{ROOT}} \quad n \quad \text{Dim} \quad \#$$
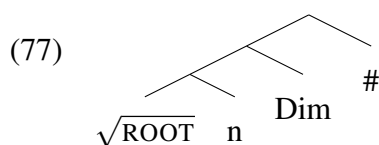
As such, the diminutive is predicted to block number-driven root-suppletion, rendering the form with the suppletive root incorrect in the context of the diminutive.

By and large this prediction seems to be borne out. Based on informants from three Slavic languages, Serbo-Croatian, Polish and Russian, the generalisation that the diminutive blocks number-driven root-suppletion is mostly supported.

Serbo-Croatian First consider Serbo-Croatian, where *čovek* 'man' displays regular number-driven root-suppletion:

(78)

	SG	PL	gloss
NOM	čovek	ljud-i	'man'

---

[36]This is not universally the case; Bachrach & Wagner (2007) show the diminutive can lie outside of number in Brazilian Portuguese.

On the hypothesis that the diminutive intervenes between number we predict that the diminutive plural form *ljud-ić-i* 'man-DIM-PL' should be incorrect. Indeed, the Serbo-Croatian speakers indicated that the analytic diminutive form is unavailable here; instead, they opt for a periphrastic construction: *mal-i ljud-i* 'small-PL person-PL'. Indeed, according to one speaker the analytic diminutive plural form "sounds ridiculous to me, [but] as silly as *čoveč-ić-i* sounds, *ljud-ić-i* sounds even sillier." The pattern for Serbo-Croatian is given below:

(79)

SG	PL	gloss	comments
čovek	ljud-i	'man'	
čovečić	mali ljudi	'man-DIM'	(*čovečić-i* marginally accepted)
	*ljud-ić-i		

Polish   With regard to Polish, we observe that, as in Serbo-Croatian, the form for 'man', *człowiek*, suppletes in the presence of the plural to *ludz-ie* 'man-PL'. In contrast to Serbo-Croatian, however, Polish seems to pose a problem since it does allow for *ludz-ik-i* 'man-DIM-PL'. However, this reading does not refer to human beings but rather to figurines (as such, *ludz-ik-i* should be glossed as 'figurine-DIM-PL'), and it has a corresponding singular *ludz-ik* 'figurine-DIM'. Crucially, although at first blush *ludziki* seems to consist of a suppletive root of $\sqrt{\text{MAN}}$, it is actually a different vocabulary item with its own distinct meaning: $\sqrt{\text{FIGURINE}}$. In a similar vein, *lud-k-i* is accepted but it refers exclusively to non-humans; e.g. *ufoludki* 'aliens', with its corresponding singular *ufoludek*. As in Serbo-Croatian, we observe that though not common, if anything is accepted it is the non-suppletive form *człowiecz-k-i*. The Polish judgments are given below:

(80)

	SG	PL	gloss
	człowiek	ludz-ie	'man'
	człowiecz-ek	człowiecz-k-i	'man-DIM'
		*ludz-ik-i	

Russian   Finally, the pattern for two Russian items is slightly more complicated. Firstly, *čelovek* 'man' again is suppletive, being realised in the plural as *lyudi*. With regard to the diminutive plural of this form, some speakers use a periphrastic construction (as in Serbo-Croatian), and others opt for the regular non-suppletive root in the diminutive plural context (as in Polish). Some speakers accept a suppletive root in the diminutive plural, which divides into some speakers assigning an idiosyncratic meaning to it (cf. Polish *ludz-ik-i* 'figurine-DIM-PL'), and some apparently using the suppletive root without any special meaning. The (complicated) situation of the plural diminutive of Russian *čelovek* 'man' (singular diminutive: *čeloveček*) is given in the table below:

(81)   a.   malenjkie lyudi   *periphrastic construction*

b.   čelovečki   *non-suppletive root*

c.   lyudiški   *suppletive root but idiosyncratic meaning*

d.   lyudiški   *suppletive root and transparent meaning*

It should be noted that it seems that for many speakers *lyudiški* has a derogatory meaning (81c): it refers to "unimportant shallow people of whom the speaker doesn't have a very high opinion", as one speaker puts it. Nonetheless, it seems that at least one speaker is happy to use the suppletive root with the transparent meaning of the plural diminutive of *čelovek* (81d).

In the Russian National Corpus the form *lyudiški* is not attested, as compared to *čelovečki* which is attested (Bobaljik, p.c.). Thus, at this stage I tentatively leave aside the one speaker who uses the suppletive root in the plural diminutive form, but clearly a larger scale study of Russian is required.

In addition to *čelovek* 'man', there is a second item in Russian which displays plural-driven root-suppletion: *rebenok* 'child' takes the suppletive variant *deti* in the plural. The singular diminutive form is *rebenoček*, but in the plural diminutive we regularly find the suppletive variant *detiški*, counter to what we would predict. This finding is further corroborated by the Russian National Corpus, which lists the suppletive variant as the plural form of *rebenoček* (Bobaljik, p.c.).

The situation for *rebenok* 'child' might however be complicated by the fact that there do exist two forms that take the same root as *detiški* in the singular: *ditja* and *ditjo*. Neither of these forms are 'standard' Russian, though; curiously, according to my consultant, *ditja* "is only used in poetic or 'high' speech contexts", whilst *ditjo* is used in " 'low' colloquial speech, [...] in dialects" and general low register speech. This does not fully explain the fact that the plural diminutive form takes the suppletive root, but may well be a confounding factor; again, a more detailed study into Russian is required to see the extent to which the predictions here are violated.

Finally, it is worth noting that Arregi & Nevins (2014) account for the lack of suppletion in one form of certain disuppletive pairs by drawing on a parallel notion of blocking where an additional functional head intervenes in the structure. They argue that there is a single root in disuppletive pairs such as *persons/people*, and *worse/badder*, and that the difference between the regular and suppletive forms in the pairs stems from the presence and

absence of an intervening element, respectively. That is, consider the pair *worse/badder*; Arregi & Nevins (2014) argue that in the form *badder* comparative-driven root-suppletion is blocked due to the presence of an evaluative element EVAL (adapted from Arregi & Nevins 2014, 323):

(82)

$$
\begin{array}{c}
\text{CMPR} \\
\text{EVAL} \\
\sqrt{\text{BAD}} \quad \text{a}
\end{array}
$$
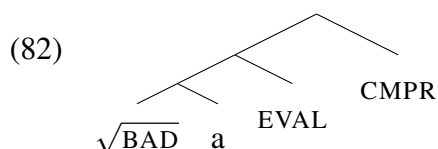
Compare this to the construction that does not contain EVAL, where the root is free to supplete in the context of the comparative surfacing as *worse* (adapted from Arregi & Nevins 2014, 322):

(83)

$$
\begin{array}{c}
\text{CMPR} \\
\sqrt{\text{BAD}} \quad \text{a}
\end{array}
$$
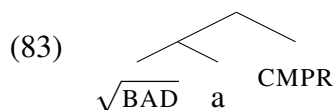
Thus, we see that EVAL in (82) blocks comparative-driven suppletion which is available in its absence, as in (83), thus adding further support to locality as defined here.

In a similar vein, they argue that in the pair *person/people*, the former contains a projection SEP which extracts the individual parts from a plurality (84), whilst the latter, analysed as a *plurale tantum*, does not (85) (adapted and simplified from Arregi & Nevins 2014, 321).

(84)

$$
\begin{array}{c}
\text{PL} \\
\text{SEP} \\
\sqrt{\text{PERSON}} \quad \text{n}
\end{array}
$$

(85)

$$
\begin{array}{c}
\text{PL} \\
\sqrt{\text{PERSON}} \quad \text{n}
\end{array}
$$
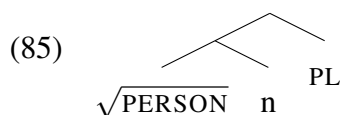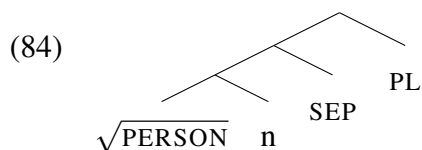
Again, we see that an intervening element, SEP, blocks plural-driven root-suppletion, in line with the assumptions about locality proposed here. This point will be explored in more detail below, but it is important to bear in mind that the 'blocking' is not taken here to be a (linear or structural) adjacency effect (see section 2.5); the suppletive form is blocked simply because the trigger of suppletion is inaccessible to the target, since it is no longer in the AD of the target.

In sum, we observe that in lexical nouns case-driven root-suppletion is blocked due to locality restrictions arising from the presence of a category-defining cyclic node which induces a SOD. In contrast, number-driven root-suppletion is allowed given that it is sufficiently local to potentially govern suppletion by being within the AD. However, in case an element intervenes between the category-defining node and one node up, as can be seen in Slavic diminutives and the disuppletive pairs discussed by Arregi & Nevins (2014), number-driven (and comparative-driven) root-suppletion is blocked.

2.2   Suppletion in pronouns

In contrast to lexical nouns, pronouns have been argued to be purely functional projections (Postal 1969, Longobardi 1994, see also Déchaine & Wiltschko 2002), crucially lacking a root and category-defining node. Indeed, a 'purely' featural view on pronouns amounts to the following structure for pronouns:[37]

(86)

      D # K

---
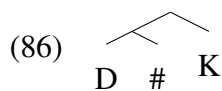
[37]As in the case of the nouns, I represent the ϕ node as # for expository reasons.

Now, as set out in the beginning, pronouns are regularly suppletive for number as well as case; indeed, this is exactly what we expect if the structure in (86) is correct. Given that they lack a category-defining cyclic node, there is no Spell-Out Domain created low in the structure, thus the Accessibility Domain will include the case node. Indeed, consider personal pronouns in Latvian (Mathaissen 1997). Second person (87) pronouns show the by now familiar pattern of suppleting in the presence of number:

(87)

	SG	PL
NOM	tu	jūs
DAT	tev	jums
ACC	tevi	jūs
LOC	tevī	jūsos

However, first person pronouns, given in (88), not only show suppletion for number, but also for case: the form for the nominative singular, *es*, is different from the singular form in the other cases, *man(-)*.[38]

---

[38]For nominative case being different from the other cases, see McFadden (2014); also, see discussion below in section 2.2.1 based on Smith et al. (2015).

It should be noted that one could take the initial *m-* of all non-nominative non-singular instances as non-spurious and argue that the first person pronoun suppletes for nominative singular rather than for all other cases. However, given the generalisation identified in Smith et al. (2015), I tentatively assume that the common *m-* is accidental.

(88)

	SG	PL
NOM	es	mēs
GEN	manis	mūsu
DAT	man	mums
ACC	mani	mūs
LOC	manī	mūsos

Similarly, in second person pronouns in Armenian (Kozintseva 1995) we observe suppletion in the context of (dative) case:

(89)

	SG	PL
NOM	du	duk'
DAT	k'ez	jez
ABL	k'ez(a)nic	jez(a)nic

Indeed, in contrast to lexical nouns, we expect pronouns to display suppletion for case, since there is no Spell-Out Domain induced by a cyclic node and, as such, number and case are sufficiently local for case to govern suppletion patterns (see (86) above). Crucially, VI entries for pronouns that make reference to case are legitimate items since case is accessible. Thus, VI-rules such as in the ones in (90) below for Armenian second person pronouns can be interpreted, where [K1] is taken to be nominative case, [K1,K2] is taken to be dative case and [K1,K2,K3] is taken to be ablative case (see also section immediately below):

(90) $[2] \Leftrightarrow j \, / \underline{\quad} \,] \, \#_{[PL]} \,] \, K_{[K1,K2]} \,]$

     $[2] \Leftrightarrow k' \, / \underline{\quad} \,] \, K_{[K1,K2]}$

     $[2] \Leftrightarrow du$

     $[K1,K2,K3] \Leftrightarrow \text{-(a)nic}$

     $[K1,K2] \Leftrightarrow \text{-ez} \, / \underline{\quad} \,] \, K_{[K1,K2]} \,]$

     $PL \Leftrightarrow k' \, / \underline{\quad} \,] \, K_{[K1]} \,]$

In sum, given the lack of a category-defining node in pronouns, no Accessibility Domain is created low in the structure, and suppletion in the context of number as well as case is possible.

It should be noted here that there is an alternative account for the divergent behaviour of pronouns displaying case-driven suppletion whilst lexical do not. Specifically, we could take the view that the Accessibility Domain is determined by structural adjacency; that is, (only) the immediately (structurally) adjacent morpheme can be a possible context for suppletion.[39] Then, the contrast between functional and lexical material may lie in that functional heads tend to fuse with structurally adjacent morphemes, which has phonological underpinnings, since functional heads are often prosodically weak and thus tend to be fused with surrounding material. Crucially, this explanation relies on structural adjacency as the sole restrictor on contextual allomorphy. However, in section 2.5 I reject that adjacency of any kind, linear or structural, is a restrictor on allomorphy (see also Moskal & Smith 2015); most notably, in section 2.5.2 I discuss the suppletion pattern of Tamil pronouns, which shows case-driven suppletion across a structurally and linearly adjacent number morpheme.

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[39]Thanks to Andrea Calabrese for drawing this to my attention.

2.2.1 Decomposing case

So far, I have used a single feature 'case' and specific case features such as [ERGATIVE] and [ABLATIVE] interchangeably, as seen in the previous section directly above. However, in ongoing joint work with Peter W. Smith, Jungmin Kang, Ting Xu and Jonathan Bobaljik we have investigated the internal complexity of (morphological) case.[40] This discussion is included here since it will become important later on.

Indeed, it has been proposed that morphological case does not consist of primitive features like [ACCUSATIVE], [DATIVE], [ERGATIVE] *etc.*, but these cases show evidence for being internally complex. For instance, Caha (2009) claims that cases are universally built up in an iterative fashion. The nominative is contained within the accusative, and both are contained within the dative case and so on.[41]

---

[40]Note that in this study we do not include genitive case, in part since sources do not consistently distinguish a genitive case (relevant to the case hierarchy) from possessive pronouns (which are not part of the hierarchy).

[41]Caha (2009) uses nanosyntax to derive the containment, which he says is structural.

(91)   ComitativeP
            ╱   ╲
        Com⁰   InstrumentalP
                  ╱   ╲
              Instr⁰   DativeP
                        ╱   ╲
                    Dat⁰   GenitiveP
                              ╱   ╲
                          Gen⁰   AccusativeP
                                   ╱   ╲
                               Acc⁰   NominativeP
                                         ╱   ╲
                                     Nom⁰   NP
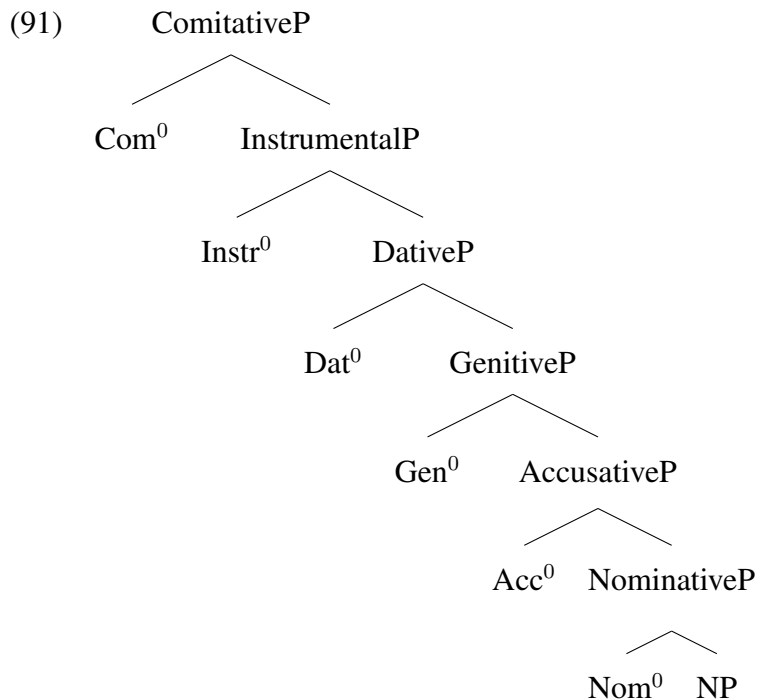
These containments relations of cases are supported by the following observations. Firstly, Caha (2009) shows that in certain languages you can transparently see one case contained within another, such as in the following, from Colloquial Czech, where we can see the nominative marker contained in the instrumental marker:

(92)

NOM	ACC	INST	gloss
muž-i	muž-E	muž-E-ma	'man'
kuřat-a	kuřat-A	kuřat-A-ma	'chicken'
oč-i	oč-I	oč-I-ma	'eye'

Secondly, Caha (2009) argues that case syncretisms always target contiguous regions on the case hierarchy of Blake (1994) (but see Hardarson (2015a) for West Nordic being a counterexample to this claim):

(93)   NOM − ACC − GEN − DAT − INS − COM

Possible syncretisms for case are then ACC=GEN=DAT, INS=COM, or NOM=ACC, but not for instance NOM=INS. Caha (2009) shows that such facts are easy to capture on the assumption that cases are all contained within each other as in (91), but not so easily handled when no complexity relations are assumed.

On the hypothesis that case shows containment relations, we expect similar behaviour of case with regard to suppletion that has been found in adjectival suppletion patterns (Bobaljik 2012). Specifically, Bobaljik (2012) shows that suppletion in ADJECTIVE– COMPARATIVE–SUPERLATIVE triples shows only AAA, ABB and ABC patterns, but ABA is unattested.[42] Ruling out the unattested ABA pattern, and allowing for the attested ones is done by virtue of the comparative always being contained within the superlative. Once the comparative is necessarily a part of the superlative, any VI-rule that makes reference to the superlative will thus always make reference to the comparative. Thus, if the comparative is suppletive, the superlative must be as well:

(94)   a. $\sqrt{\text{GOOD}} \rightarrow$ be(tt) / __] COMP]

   b. $\sqrt{\text{GOOD}} \rightarrow$ good

   c.   SPRL $\rightarrow$ -est

   d.   COMP $\rightarrow$ -er

Returning to case suppletion, we can formulate parallel predictions. That is, if cases are contained in the same way we expect to find AAA, ABB and ABC patterns in case,

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[42]The unattested AAB pattern is ignored for now, but I return to it in the discussion below.

but not ABA patterns. Indeed, this is exactly what we find: ABA patterns are not found in case suppletion.

Thus, the survey in case suppletion patterns supports the hypothesis that cases are in a containment relation. The clearest evidence is the lack of ABA patterns: once a form is suppletive, it stays suppletive. For convenience, I follow Smith et al. (2015) and assume here that this is reflected in terms of features on a single node, rather than structurally.[43] To repeat, crucially, items cannot supplete for dependent case without also suppleting for the oblique cases in a language. As a concrete example, consider West Greenlandic (Sadock 2003) which displays an AAA pattern:[44]

(95)

	ABS	INSTR	ALLATIVE	LOC	ABL
1.SG	uanga	uannik	uannut	uanni	uannit
1.PL	uagut	uatsinnik	uatsinnut	uatsinni	uatsinnit

Here, we see that the base does not change according to any kind of case information, staying consistently *ua-*.

For an example of an ABB pattern, consider Armenian again (also discussed above). We see that the base shows suppletion with the suppletion occurring from nominative to accusative, but the base then remains in the suppletive form in the remaining cases: dative, ablative, locative and instrumental.

---

[43]In Smith et al. (2015) we showed that on adopting a structural (not linear) adjacency condition on VI-rules (see also below), data from Wardaman disambiguates case containment in favour of feature bundles rather than structural case. However, in the current approach I reject the adjacency hypothesis (see section 2.5), and consequently the only relevant domain is the AD; for pronouns this means that all case material is accessible, irrespective of linearly intervening nodes. Thus, in the current approach there is no need to necessarily resort to a featural representation of containment over a structural representation.

[44]In addition, in the first person plural forms, the non-absolutive forms also have a suppletive variant with *sugu-* as the base: e.g. *sugutsinnik* in the instrumental case.

(96)

	NOM	DAT	ABL	LOC	INSTR
1.SG	es	inj	inj(a)nic	inj(a)num	inj(a)nov
2.SG	du	k'ez	k'ez(a)nic	k'ez(a)num	kez(a)nov
2.PL	duk'	jez	jez(a)nic	jez(a)num	jez(a)nov

Finally, the best instance of an ABC pattern comes from the first person singular pronoun in Khinalug:

(97)

	ABS	ERG	DAT
1.SG	zɨ	jä	as(ɨr)

In Smith et al. (2015), we argue that these patterns are best explained in terms of case containment, whereby unmarked cases are basic, dependent cases contain unmarked cases, and oblique cases contain both (and other obliques). Thus, in a language with a nominative/accusative alignment, we can represent the cases as follows (to be revised):

(98)

```
      /\
     /  \
  D  #   NOM
```

(99)

```
        /\
       /  \
      /\   ACC
     /  \
  D  #   NOM
```

(100)

```
          /\
         /  \
        /\   DAT
       /  \
      /\   ACC
     /  \
  D  #   NOM
```
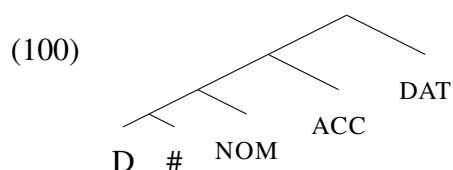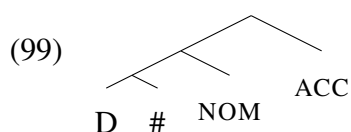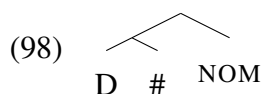
If cases are contained in this way, then any VI-rule that makes reference to the accusative will also be targeted when the form is in the dative, due to the elsewhere principle, which requires that a more specific VI-rule is always preferred over a less specified

VI-rule. Since the dative includes the accusative, any rule that makes reference to the accusative will have to be inserted in the dative as well. This is the same logic as shown in Bobaljik (2012), where the fact that the comparative is contained within the superlative ensures that if the superlative suppletes, then the comparative must supplete as well (either with respect to the positive, giving an ABB pattern, or with respect to the comparative, giving an ABC pattern).

Concretely, the VI-rules for Armenian first person singular are given below:

(101)　D　⇔　inj / __] $K_{[ACC]}$]

　　　D　⇔　es

Thus, ABA forms are ruled out in the same way here as in Bobaljik (2012): by containment. For comparative suppletion, ABA cannot arise because suppletion for the comparative necessitates that the superlative is suppletive as well. In case, suppletion for the accusative necessitates that suppletion is also observed in the dative (and any further cases).

Finally, we turn to AAB patterns. Bobaljik (2012) shows that AAB is unattested in adjectival suppletion; thus, we do not observe suppletion in the superlative without also seeing a suppletive form in the comparative. However, in Smith et al. (2015) we show that this is not the case with case; rather, we observe AAB patterns such as in German (102) and Krongo (103):

(102)

	NOM	ACC	DAT
3.SG.M	er	ihn	ihm
3.SG.F	sie	sie	ihr
3.PL	sie	sie	ihnen

(103)

	Subject	Object	DAT	ABL	LOC
1.SG	àʔàŋ	àʔàŋ	àʔàŋ	nkàtí	kàtí
2.SG	ùʔùŋ	ùʔùŋ	ùʔùŋ	nkòtú	kòtú
1.EXCL	óow	óow	óow	nkòtíg	kòtíg

German (102) and Krongo (103) represent the standard instances of AAB patterns found in pronominal case suppletion; we see that in these languages AAB results from complete syncretism between the first two cases. Thus, for instance in German (102) it may superficially seem that the dative suppletes whilst the accusative does not, it is in reality an AB(B) pattern where nominative and accusative are syncretic.

However, true cases of AAB patterns (with no syncretism) are well represented in Nakh-Dagestanian languages (see Smith et al. 2015). As an example, consider (not Nakh-Dagestanian) Wardaman third person pronouns:

(104)

	ABS	ERG	DAT/OBL
3.SG	narnaj	narnaj-(j)i	gunga
3.PL	narnaj-bulu	narnaj-bulu-yi	wurrugu

In (104), we observe that the base for the ergative and the absolutive is the same, *narnaj*, but the form in the dative/oblique is suppletive: *gunga* and *wurrugu* for third person singular and plural, respectively. A syncretism analysis is not available here due to the presence of an overt case marker in the ergative form, which crucially distinguishes it from the absolutive. Given that Wardaman constitutes a true AAB pattern we show in Smith et al. (2015) that on the assumption that (structural or linear) adjacency is a restrictor on allomorphy the containment patterns shown in case must be situated on a single node rather than structurally. Thus, nominative case would be represented as in (105), accusative

case would be represented as in (106), dative case would be represented as in (107), etc. (irrelevant information, such as number, is left out for expository reasons)

(105)   D   [NOM]

(106)   D $\begin{bmatrix} \text{NOM} \\ \text{ACC} \end{bmatrix}$

(107)   D $\begin{bmatrix} \text{NOM} \\ \text{ACC} \\ \text{DAT} \end{bmatrix}$
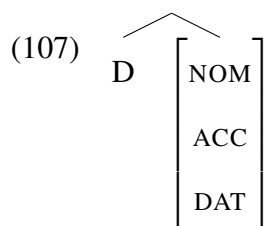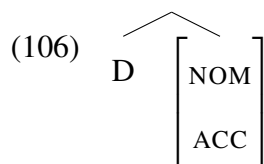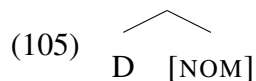
However, as mentioned above in footnote 43, this crucially hinges on incorporating adjacency as an additional restrictor. Given that I will argue against adjacency (see section 2.5), on these grounds I do not necessarily commit to either containment represented featurally or structurally.

However, though the discussion here centres around pronouns, the representation of case of course also holds for lexical material. Now, in the handful of cases that showed case-driven root-suppletion in Archi, Lezgian and Lak (section 2.1.1) we saw that the roots suppleted in the context of the ergative (Archi, Lak) or the oblique (Lezgian). Thus, if we would want to maintain a structural view of cases on separate nodes, we have to say that the absolutive is the literal absence of case so that the ergative/oblique case node is the first node above the category-defining node. Though this may be the case, the approach here is a more natural fit with assuming that containment is represented featurally, so that

all cases are equidistant and thus can govern suppletion. Thus, for the remainder of this chapter I continue to represent case containment as featural containment.

The featural containment hypothesis states that cases become more complex through the iterative addition of features. The nominative has the fewest features, then the accusative, then the dative etc. Thus, whilst Caha (2009) argued that the case hierarchy is best represented in terms of structural containment (108), in Smith et al. (2015) we represent the internal structure of case by the formalisation in (109), with concomitant tree representations in (110-112).
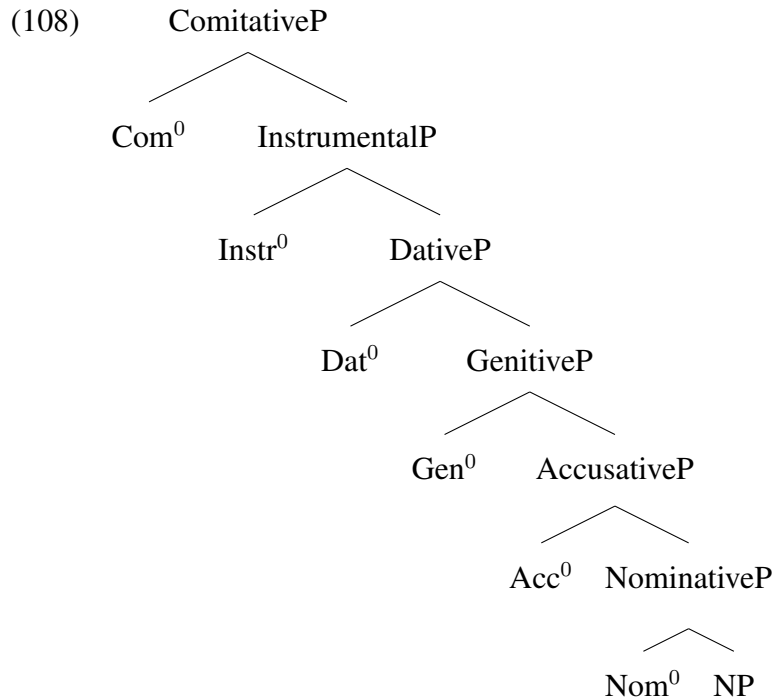
(108)

```
                ComitativeP
               /          \
          Com^0         InstrumentalP
                       /            \
                  Instr^0          DativeP
                                  /       \
                              Dat^0      GenitiveP
                                        /         \
                                    Gen^0       AccusativeP
                                               /           \
                                           Acc^0        NominativeP
                                                        /          \
                                                    Nom^0          NP
```

(109)   nominative   = [к1]

           accusative   = [к1,к2]

           dative   = [к1,к2,к3]

           instrumental = [к1,к2,к3,к4]

           comitative   = [к1,к2,к3,к4,к5]

(110) D [к1]

(111) D [к1 / к2]

(112) D [к1 / к2 / к3]
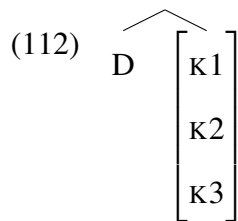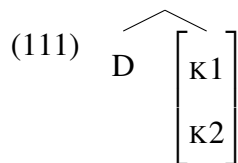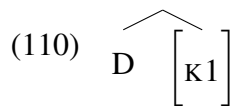
The featural containment hypothesis circumvents the adjacency condition of Bobaljik (2012), but crucially still ensures that as soon as case suppletion is observed, all other more complex cases will be suppletive as well.

Thus, we can summarise the observations of Smith et al. (2015) as follows:

(113)

Pattern	Prediction	Attested?	Representative Languages
AAA	✔	✔	Lezgian, W. Greenlandic, etc.
AAB	✔	✔	Krongo, Hunzib, Wardaman
ABB	✔	✔	Indo-European, Evenki, Chuvash, Itelmen
ABC	✔	✔	Khinalug
ABA	✘	✘	n/a

Based on the generalisations in (113), we argue in Smith et al. (2015) that cases show containment relations which can be captured by featural containment.

2.3 Locality

Here I turn to a comparison with the proposal of Embick (2010). In this section I compare the current proposal to Embick's theory of locality, showing that in particular case-driven root-suppletion and blocking effects are a problem in his framework, as well as discussing certain different predictions that the two approaches make.[45]

To repeat from section 1.1, Embick proposes that in a structure such as (114) below, repeated from (19) above, a cyclic node β induces VI not of its own complement but VI of the complement of cyclic node α located lower in the structure than β; crucially, this means that there is no VI induced by α (the first category-defining node). However, material that is accessible for purposes of VI of the root includes everything up to the actual VI trigger node (β); i.e. α, A and B.

(114)
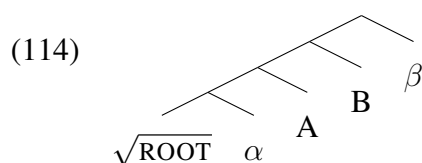
Focusing on lexical nouns (115), we see a variety of candidates to function as β, most notably K.
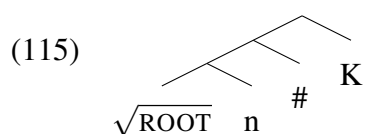
(115)

Indeed, let us assume, in addition to category-defining nodes, that the highest node of an extended projection (Grimshaw 2005) also functions as a cyclic node (see also den Dikken 2007, Wurmbrand 2012, Bošković 2014). Applying this to the structure of lexical nouns results in *n* and K being cyclic nodes: *n* by virtue of its category-defining status, and K by virtue of being the highest functional projection dominating the lexical node.

As such, at the point that K is targeted, this will result in a Spell-Out Domain consisting of the root, and an Accessibility Domain consisting of *n* and number, which, as such, allows number to be a context for root-suppletion. However, case is not accessible as a potential context for root-suppletion.

With regard to pronouns, there is no category-defining cyclic node present in the structure (repeated below), and, as such, D, number and case are all within the same Spell-Out and Accessibility Domain. Consequently, case-driven suppletion is predicted to be possible in pronouns on cyclic locality.

(116)

  D # K
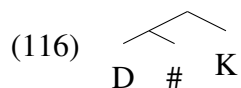
So far, Embick's predictions regarding suppletive patterns correspond to the generalisations discussed here: the lack of case-driven root-suppletion in lexical nouns, and the possibility of case-driven suppletion in pronouns. However, it is some of the cases discussed in section 2.1.1 that are crucial. Specifically, items that I argue lack a number node and consequently do display sensitivity of their root regarding case are problematic for Embick's account. Indeed, since number is not a cyclic node, the lack of a number node would not affect accessibility of nodes to influence root-suppletion, incorrectly predicting that case-driven root-suppletion is never an option. In contrast, the view assumed here, which makes crucial reference to the accessibility of 'one node up' allows for exactly the

right cut: in a structure that lacks a number node it is possible to display case-driven root-suppletion by virtue of case then being sufficiently local to the root to serve as a context for root allomorphy.[46]

Finally, the blocking effects are also less straightforward in Embick's account. With regard to the diminutive blocking effect, I have shown above that when the diminutive is in the structure, it blocks suppletion for number. For instance, whereas in Polish *człowiek* suppletes to *ludzie* in the presence of plural, placing the diminutive in the structure gives us *człoweiczki*, with the non-suppletive root. The blocking effect of the diminutive was

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[46]A further complication for assuming this interpretation of Embick potentially involves internally complex cases (Caha 2009, Radkevich 2010, Smith et al. 2015). For instance, as we saw before in (96), in Armenian the dative form functions as the stem on which all other marked (non-absolutive) cases (K2) are built:

i.

	NOM	DAT	ABL	LOC	INSTR
1.SG	es	inj	inj(a)nic	inj(a)num	inj(a)nov
2.SG	du	k'ez	k'ez(a)nic	k'ez(a)num	kez(a)nov
2.PL	duk'	jez	jez(a)nic	jez(a)num	jez(a)nov

On the arguable hypothesis that case is structurally represented, this would result in a structure such as (ii) below; see also section 2.2.1 above on data compatible with case being represented either structurally or featurally.

ii.

```
                          K2
                    DAT
                #
        √ROOT   n
```
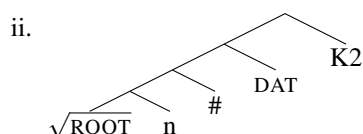
Now, under a view in which only the topmost projection constitutes an actual cyclic node, this allows for the possibility of unattested suppletion patterns of dative-driven root-suppletion exclusively in the presence of (any) K2. That is, in a structure such as (ii) K2 would result in spellout of its complement, thus creating a SOD which contains DAT; in contrast, if only the dative is present in the structure, as in (iii), DAT is the highest projection and as such functions as the cyclic node causing spellout of its complement, thus crucially excluding DAT itself from being in the SOD.

iii.

```
                    DAT
                #
        √ROOT   n
```
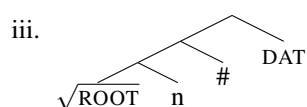
Consequently, we would predict dative-driven root-suppletion only in the presence of K2.

derived by virtue of Dim being one node above category-defining *n*, and therefore falling within the Accessibility Domain. That is, since Dim is located lower than #, this ensures that # is too far away to condition root-suppletion. Similarly, the blocking effects discussed in Arregi & Nevins (2014) fall out naturally as intervening between the trigger of suppletion and the root.

For Embick (2010), the only way to derive the blocking effects by cyclic locality would be to assume that the offending nodes are cyclic in nature, i.e. β in (19) above.[47] Taking the diminutive blocking effect as an example, this would then result in # being inaccessible to the root in the presence of the diminutive as follows: category-defining *n* is cyclic as well, and cyclic Dim causes its complement to be spelled out. Thus, at the point that the root undergoes VI, # is not accessible. Whilst this captures the blocking effect of the diminutive, Dim seems an unlikely candidate for cyclic status. Notably, Bachrach & Wagner (2007) and Newell (2008) propose that, at least in certain languages, diminutive heads are adjuncts, which do not seem like likely candidates for being cyclic nodes, especially given the parallels to syntactic phases that Embick (2010) assumes. Specifically, Bachrach & Wagner propose that diminutive heads in Brazilian Portuguese are adjuncts for the following reasons: (i) diminutives show agreement with the stem instead, (ii) in contrast to derivational suffixes, diminutives do not determine the categorial status of the form, (iii) diminutives can never appear inside truly derivational affixes (Bachrach & Wagner assume that they are adjuncts above category defining nodes or number in Brazilian Portuguese).

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[47]It should be noted here again that Embick (2010) assumes a linearity condition on suppletion, such that only linearly adjacent nodes can form allomorphic relations. When Dim intervenes between the root and #, number cannot condition suppletion. However, as I will discuss at length in section 2.5 below, a linearity condition on suppletion makes incorrect predictions in many cases, and is an unnecessary addition to the theory. Therefore, I will assume at this point that the diminutive blocking effect is not derived through Dim intervening linearly.

Indeed, Slavic languages seem to behave similarly. For instance, with regard to (i), in Russian (as well as Serbo-Croatian), diminutives are formed differently for each gender and declension class, and never change the gender of a noun (and a limited influence on declension class) (Gouskova et al. 2015). In fact, Steriopolo (2008) analyses diminutives in Russian as morpho-syntactic adjuncts to categorised roots, thus locating them, as adjuncts, immediately above *n*. As to (ii), in Serbo-Croatian adding a diminutive never changes the category; thus, adding a diminutive to the adjective *malo* 'small' results in *malecko* 'really small' but crucially the category remains the same. Finally, as in Brazilian Portuguese, it seems that no derivational material can be added to a diminutive in Serbo-Croatian.

In sum, we saw that whilst the approach exemplified by adapting Embick to include *n* and K as cyclic nodes and the approach taken here do not make different predictions regarding regular number-driven root-suppletion and pronominal suppletion patterns, numberless nouns and blocking patterns provide the crucial argument against an approach to locality framed in Embick's terms.[48]

It should be mentioned here that there is no way to derive the correct results by assuming Embick's locality, irrespective of which nodes are assumed to be cyclic. As explained above, assuming that *n* and K are cyclic results in the correct general pattern, but cannot

---

[48]A more fine-grained morphological sub-analysis will reveal further differences between Embick and the current approach. Specifically, according to Embick, e.g. gender should not intervene for purposes of locality since it would again result in the structure in (114) above, where α = n, W = gender, Z = #; crucially, this would allow for number-driven root-suppletion across gender. In contrast, the approach to locality advocated here predicts that the AD includes category-defining *n* and gender but not number; only (*n* and) gender would be then be accessible, thus prohibiting number-driven root-suppletion in the presence of a gender node.

However, identifying gender morphology is not a straightforward exercise, given that it is sometimes hard to distinguish between two lexical items or a single one with (null/unclear) gender morphology on it. Consider for instance the pair *cow* and *bull*; it is unclear whether this is an instance of two separate lexical entries, or there is one basic form from which the other is derived by suppletion in the context of gender.

capture case-driven root-suppletion and blocking. Assuming that n and number (and K) are cyclic excludes number-driven root-suppletion, since number results in spellout of its complement which only contains the root and category-defining node, excluding number. If we assume that category-defining nodes are not cyclic but instead number and K are we get the right pattern for lexical nouns: K triggers spellout of its complement: the root, category-defining node and number, but crucially excluding case; however, case-driven suppletion in pronouns is now excluded as well, since K would still trigger spellout of its complement: the pronominal base (D) and number, but crucially excluding case.

In contrast to Embick, the approach here naturally accommodates the possibility of numberless nouns suppleting for case, and relies on fewer stipulations about which nodes are domain delimiters, (currently) only committing to category-defining nodes as cyclic nodes.

2.4 Portmanteaux part one

In this section I discuss a subset of portmanteaux; specifically, here I focus on portmanteaux that crucially do not contain the most deeply embedded element. A discussion on portmanteaux that involve the root/base is postponed until section 3.4.

Serbo-Croatian   Consider languages in which number and case are collapsed into a single morpheme, such as Serbo-Croatian:

(117)

	SG	PL	gloss
NOM	ruk-a	ruk-e	'arm'
ACC	ruk-u	ruk-e	

In (117), both number and case information are pronounced in a single vowel, e.g. the nominative singular has a single exponent *-a*.

Applied to the case at hand, when case and number form a portmanteau, this would seem to provide an opportunity for case-driven root-suppletion, since in that configuration K would be sister to the category-defining cyclic node, and, as such, it would be able to condition root-suppletion.[49]

(118)

$$\sqrt{\text{ROOT}} \quad \text{n} \qquad \text{\#+K}$$
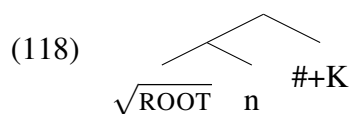
Thus we might predict that in languages which fuse number and case into a single morpheme case-driven root-suppletion becomes a possibility. However, this does not seem to be the case; in Slavic languages that display root-suppletion in the context of a fused number and case morpheme, the suppletion is governed by the number specification and not by case:

(119)

	SG	PL	
NOM	čovek	ljud-i	'man'
ACC	čovek-a	ljud-e	
DAT	čovek-u	ljud-ima	
INSTR	čovek-om	ljud-ima	
LOC	čovek-u	ljud-ima	

[49]Indeed, Radkevich (2010), Bobaljik (2012), Bobaljik & Wurmbrand (2013) have argued that portmanteaux extend locality domains. In effect, they serve to make the node that dominates the elements within a portmanteau the focal point; that is to say, whether by pre-VI fusion of morphosyntactic nodes or VI-insertion at non-terminal nodes, the relevant node at which VI (and as such sensitivity to suppletive contexts) applies is higher than the VI-targeted nodes prior to the portmanteau. Crucially, though, Radkevich (2010), Bobaljik (2012), Bobaljik & Wurmbrand (2013) discuss portmanteaux which involve the most deeply embedded element. In contrast, I focus here on portmanteaux that involve affixes. For portmanteaux that involve the root/base, see section 3.4.

However, if we assume that portmanteaux are formed at the point that they are subject to conversion, we see that a [#-K] portmanteau would be formed at the point that (at least) number is undergoing Vocabulary Insertion. Thus, VI occurs bottom-up and we start at the root, but since the root is not involved in the [#-K] portmanteau case and number have not fused at this stage. In this way, portmanteau creation counter-feeds case-driven root-suppletion since the former applies too late. Crucially, such a 'late' view on portmanteaux keeps the morpho-syntactic structure intact up to the point of Vocabulary Insertion of the relevant node.

Concretely, consider the derivation for *ljudi* 'man-PL.NOM', which has the structure below:

(120)

$$\sqrt{\text{MAN}} \quad \text{n} \quad \#_{[\text{PL}]} \quad \text{K}_{[\text{NOM}]}$$
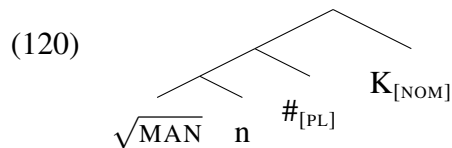
Next, per cyclic VI we insert the exponent for $\sqrt{\text{MAN}}$, which, in the context of the plural is *ljud*; crucially, at this point the portmanteau has not yet formed since the element undergoing VI, the root, is not involved in the portmanteau.

(121)

$$\text{ljud} \quad \text{n} \quad \#_{[\text{PL}]} \quad \text{K}_{[\text{NOM}]}$$
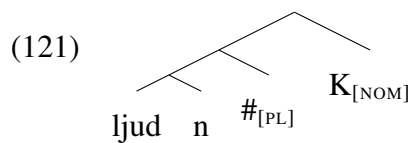
Thus, a hypothetical VI-rule making reference to case-driven root-suppletion remains an illegitimate item.

It is only when number undergoes VI that the [#-K] portmanteau is formed:[50]

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[50]Here, I remain neutral about whether portmanteaux are formed by a structure changing operation (e.g., fusion, rebracketing; see Radkevich 2010) or by 'spanning' (i.e., VI at multiple nodes simultaneously; see Svenonius 2012, Merchant 2015).

(122)

$$\text{ljud} \quad \#_{[\text{PL}]}+K_{[\text{NOM}]}$$

To conclude, we see that *-ta* is inserted as the exponent of the [#-K] portmanteau:

(123)

$$\text{ljud} \quad \text{i}$$

In sum, we see that in cases where the portmanteau does not include the most deeply embedded element, case-driven root-suppletion is still excluded. To repeat, when the element undergoing VI is the root, it is at that point irrelevant whether the node that can condition contextual allomorphy, number, itself is part of a portmanteau or not; either way, the locality restrictions hold and case-governed root-suppletion is still banned.

Slovenian   As an apparent counter-example to this view on portmanteaux, consider Slovenian (Priestly 1993, Corbett 2007) which shows suppletion for the item 'man, person'. The pattern is given in the table below:

(124)

	SG	DU	PL
NOM	človek	človeka	ljudje
ACC	človeka	človeka	ljudi
GEN	človeka	ljudi	ljudi
DAT	človeku	človekoma	ljudem
INSTR	človekom	človekoma	ljudmi
LOC	človeku	ljudeh	ljudeh

In (124), we see the unexpected situation that suppletion seems to occur in the context of the plural in the nominative, accusative, dative and instrumental; however, in the genitive and locative it seems to occur in the context of the dual and plural. Thus, it seems

that you need to know both number and case information at the point that the root sup-pletes, counter to what I have argued above. However, as Corbett (2007, 30) points out, in Slovenian the dual and the plural are syncretic in the genitive and the locative as a general property of the language; thus, the genitive and locative dual are to all intents and purposes plural. Specifically, Smith et al. (2015) show that, just like case, number is internally com-plex and composed of smaller atoms (cf. section 2.2.1 on case being internally complex). Thus, the representations of singular, dual and number are as follows:

(125)   SINGULAR: [+singular, -augmented]

         PLURAL: [-singular, +augmented]

          DUAL: [-singular, -augmented]

Now we can posit the following rule in Slovenian:[51]

(126)   [-augmented] $\rightarrow$ [+augmented] / __] K$_{[\text{GEN}], [\text{LOC}]}$]

This rule ensures that, in Slovenian, the dual turns into the plural in the context of genitive and locative case, which results in dual items in the genitive and locative to have the same structure as corresponding items in the plural, thus resulting in 'dual' genitive and locative items receiving a VI-entry that is the same VI-entry as used in their corresponding plural forms.

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[51]Note that technically these would be two rules, one targeting the genitive, and one targeting the locative. Firstly, given that I follow the assumptions in Smith et al. (2015), where case is internally complex, locative must be the most complex case, compared to the nominative, accusative, dative and instrumental to ensure that only the locative is affected by the rule in (125). Then, the genitive must either be more complex than the nominative, accusative, dative and instrumental or it is not part of the case complex. Given that there does not seem to be any reason to suspect the former, for now I tentatively assume that the genitive is separate from the case complex (either by virtue of not being 'true' case, or genitive case being separate from the case complex identified in section 2.2.1).

Thus, at the point of VI of the root, it is not a combination of case and number that gives the suppletive form, but rather only number information, i.e. 'plural'.

2.5 Adjacency

Throughout this chapter I have formulated a version of locality that makes the correct predictions of what is (not) accessible to cause suppletion.[52]

(127)   Accessibility Domain Hypothesis (ADH): Suppletion is possible only if the target and trigger are in the same Accessibility Domain.

The Accessibility Domain Hypothesis makes clear predictions about where suppletion should be possible, and, crucially, where it should not be possible. Furthermore, I have considered the notion of cyclic locality in relation to that given in Embick (2010), and shown that the current approach more naturally accounts for what is accessible, and what is not, to condition suppletion patterns.

Embick's and my approach are similar in that they both advocate for cyclic locality constraining Vocabulary Insertion. However, as alluded to at various points above, in addition to locality domains, Embick (2010) suggests that linear adjacency is an additional restrictor of allomorphy: that is, allomorphic relations can only be formed when the nodes are linearly adjacent to each other.

Adjacency has been assumed to exist more or less in the same guise in various other works too. Bobaljik (2012) adopts structural adjacency as a part of his view on locality. In

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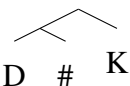
[52]This section on the role of adjacency on contextual allomorphy is based on joint work with Peter W. Smith.

a separate view, Adger et al. (2003) claim that linear adjacency holds only when roots are involved, but not affixes (cf. Bobaljik 2000).

Before we proceed, we should take a closer look at the linear adjacency condition that Embick (2010, 16) proposes:

(128) Contextual allomorphy is possible only with elements that are concatenated.

Taken by itself this statement does not make any reference to directionality of allomorphy; that is, it holds for inward as well as outward allomorphy. However, if we combine it with cyclic VI (Bobaljik 2000) we run into a problem with outward allomorphy when there are null allomorphs of a given node, which would potentially bring two nodes close enough to enter into an allomorphic relation. In outward allomorphy, the morpheme that is potentially subject to contextual allomorphy can only see the morpho-syntactic features of its adjacent morphemes since these adjacent morphemes have not yet undergone VI themselves. Consider the hypothetical example of case-driven base-allomorphy across a null number morpheme. First, consider the morpho-syntactic structure:

(129)
```
       ⌒
   D   #   K
```

On the assumption that VI proceeds cyclically from the most deeply embedded element outward, for purposes of allomorphy, D can only see the morpho-syntactic features of number (and case).[53] Thus, at this stage the phonological form of number is not known and linear adjacency with case cannot be established. Crucially, it is only after D has

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[53]Note that even approaches that assume that linear relations are established early (Arregi & Nevins 2012, Smith 2014) do not help since they are still crucially established before VI takes place, thus the exponent is still unavailable at the point that morphemes are linearised.

undergone VI (here: /base/) that the exponent of number, which is null in this example, becomes known and linear adjacency with case can potentially be established.[54]

(130)

/base/ # K
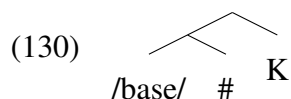
In order to circumvent this problem, Embick makes a distinction between zero morphemes and pruning. Crucially, linear adjacency relies on the operation of pruning (Embick 2003, 2010), which eliminates nodes with null exponents. Note that pruning is not obligatory for all nodes with null exponents; rather, Embick "posit[s] pruning rules where required" (Embick 2010, 59). Though in most cases Embick assumes that pruning takes place after VI, in the cases discussed here, pruning necessarily must take place prior to VI to avoid the look-ahead problem mentioned above.

In order to account for data from Latin that require such 'early' pruning, Embick (2010, 86) draws on "a general "radical" Pruning rule that applies early in PF derivations [...], eliminating node[s] from the representation" prior to VI (cf. Embick & Halle in prep). Such a rule is a powerful addition to the toolkit of DM, and it is clear that a theory that does not have to rely on this type of "radical" pruning is to be preferred, all else being equal (see also Moskal & Smith 2015).

As an alternative to radical pruning, we could assume that linear adjacency holds after cyclic VI has occurred; this would be reminiscent of an output constraint (cf. morphotactic constraints in DM). In addition, to demarcate (activate) the linearity condition it could still be restricted to, for instance, Embick's spellout domain (i.e., the complement of β). With

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[54]Note that inward allomorphy does not run into this problem; that is, base-driven allomorphy of K does not run into this look-ahead problem given that at the time that case undergoes VI that is potentially sensitive to base information the base has already undergone VI and thus phonological information about the base is available.

respect to outward allomorphy, we could then maintain a linear adjacency approach to allomorphy if we assume that VI is derivational (in the sense that it proceeds iteratively from the root outwards) but crucially that it is also evaluated representationally by way of, e.g., filters.

However, we see that in order to maintain linear adjacency as a restrictor we need to either adopt radical pruning or the view that linear adjacency is evaluated after cyclic VI has occurred within a domain, such as Embick's spellout domain.

It should be clear that in the approach advocated here there is no clear analogue to Embick's spellout domain; the Accessibility Domain is clearly identified as not undergoing VI and thus being purely morpho-syntactic in nature and the Spell-Out Domain seems too small given that in lexical material it only contains the root. Note that all the ADH does is say which morpho-syntactic nodes are accessible to govern suppletion; since per cyclic VI this is determined before the relevant nodes undergo VI, the phonological form of the nodes within the AD is unknown and should be irrelevant.

Thus, in the current approach there seems no natural place for linear adjacency to be evaluated after cyclic VI has occurred within an independently motivated domain, such as Embick's spellout domain.[55] Whilst we can always resort to an operation such as radical pruning, this is not desirable given its stipulative character and unpredictability - whether or not a node that will be null is pruned or not is unpredictable.

Given the theoretical problems that it brings with it, the question arises whether linear adjacency is a valid additional restrictor on allomorphy; in addition, I also discuss struc-

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[55]One could also always have linear adjacency be evaluated after cyclic VI without being restricted by a domain, but then allomorphy would not at all be cyclic in any sense since the choice of allomorph would be determined at a much later point in the derivation; note that this is a view compatible with (phonological) optimization-based approaches to allomorph distribution (e.g. Bye 2007).

tural adjacency as a possible alternative to linear adjacency. In the following, I first review the evidence in favour of adjacency delimiting suppletion patterns (section 2.5.1), then I turn to cases that are problematic for this view (section 2.5.2), which leads me to conclude that adjacency is not a universal restrictor on suppletion. Finally, in section 2.5.3 I then return to the evidence that led to the adjacency hypothesis in the first place, reanalysing it without resorting to adjacency.

2.5.1 Adjacency blocking effects

The strongest indication in favour of linear and/or structural adjacency being relevant for suppletion/allomorphy comes from blocking effects that are apparently conditioned by adjacency. These effects can be divided into blocking effects in lexical material, and blocking effects in functional material.

Kiowa Focusing first on lexical material, consider the following data from Kiowa distributives (Adger et al. 2003):

(131) a. á-   k'úú
           3.PL.AN -sit
           'They sit.'

       b. hɔ́n á-   kóp -gɔ̂ɔ
           NEG 3.PL.AN -sit -NEG
           'They don't sit.'

In (131), we can see that the verb root *k'úú* 'sit' undergoes suppletion conditioned by NEG: *k'úú* is realised as *kóp* when NEG is present in the structure. However, when the

distributive marker *yɔ́* is added to the structure, which, following Adger et al. (2003), is located in (132) between the verb and NEG, the allomorphy is blocked:[56]

(132)   [*v* ROOT] DISTR NEG

   a.   á- k'úú   'They sit.'

   b.   á- kóp   gɔ̂ɔ 'They don't sit.'

   c.   á- k'úú yɔ́   'They sit about.'

   d.   á- k'úú yɔ́ 'gɔ̂ɔ 'They don't sit about.'

   e. * á- kóp yɔ́ 'gɔ̂ɔ 'They don't sit about.'

In (132d), we see that NEG-driven root-suppletion is blocked and instead the elsewhere form of the root surfaces. Adger et al. (2003) argue that this is because the distributive morpheme intervenes between the verbal root and NEG. They argue that root allomorphy is necessarily conditioned by adjacency, and thus the root cannot supplete for NEG due to the intervention of the distributive marker *yɔ́*.

Note however, that this type of blocking is exactly what we predict by virtue of the ADH, without having to invoke adjacency. The fact that we observe suppletion in the context of NEG in (132b) is predicted, since NEG lies one node above category-defining *v*, and thus falls within the Accessibility Domain:

(133)

     v √SIT NEG

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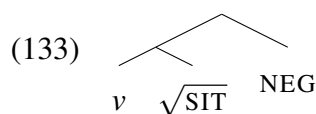
[56]Note that this does not seem to be a general rule of *uu* → *op* / ___ *g* given that the sequence *k'úú-gɏɏ* 'lay-DISTR' in the following sentence remains unaffected (from Adger et al. 2003):

  i. k'ópsɔ́phót-   tɔ k'ɔ̰̂ɔ̰ -dɔ bét-   k'úú -gɏɏ yii   zólkuu
     mountain ghost- INV tomato -INV 3SG:INV:INV- lay   -DISTR HSY.IMPF vomit heaps
     'He put the tomatoes into the mountain ghosts' vomit heaps.'

However, in (132d), NEG is no longer visible since the final node within the AD is DISTR, given that this is the node that is immediately above category-defining *v*:

(134)
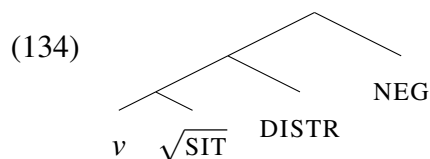
Thus, in accordance with the ADH, suppletion for NEG no longer is a possibility in the presence of the distributive. Crucially, we see that we do not need to resort to adjacency in order to explain the blocking effects here; rather, the limits on allomorphic choices fall out from the ADH: it is not a matter of adjacency, but rather the fact that there can be only one node above the category-defining node which is accessible.

Note that this logic holds for any lexical item. Adger et al. (2003) posit that only roots are subject to adjacency, and they relate this to roots lacking (syntactic) agreement features. However, here the claim is that roots only *seem* to be subject to adjacency, but what is actually going on is that root-suppletion is constrained by what nodes are accessible to govern allomorphy: the ADH.[57]

Turning to adjacency with regard to suppletion patterns in pronouns, we make specific predictions. Specifically, in the absence of a cyclic node in pronouns, the most deeply embedded element does not form a SOD on its own, thus allowing for a wider range of elements to condition suppletion. That is, whilst in lexical nouns overtness of realisation of number morphology is uninformative since under the ADH case is not accessible due

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[57]Note that according to the ADH it is irrelevant whether the distributive morpheme is null or not. Unfortunately, I am not aware of a case where there is clear evidence that DISTR is present in the structure but it is spelled out as a null allomorph. However, it is predicted here that this morpheme should still block NEG-driven root-suppletion. This is less straightforward in linearity approaches, in which null allomorphs are subject to optional pruning Embick (2003, 2010).

to being outside of the AD, pronouns provide a testing ground as to the question whether adjacency plays a role.

Concretely, focusing on only linear adjacency here, if linear adjacency delimits allomorphy then we would expect overt number morphology to block case-driven suppletion if both # and K are suffixal (136) or prefixal (137), since in those configurations, both of which derive from (135), D and K will not be linearly adjacent.

(135)

D   #   K
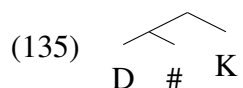
(136)   D-#-K

(137)   K-#-D

In the configurations in (136-137) the number node intervenes linearly between D and K. Thus, we expect case-driven suppletion to be banned if linear adjacency plays a role. Note, though, that this holds only for linear and not structural adjacency.

Khakas   Consider the paradigm for (literary) Khakas (SMG) third person pronouns, which seems to support the stance that linear adjacency constrains suppletion patterns:[58]

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[58]LAT = latitive.

(138)

	SG	PL
NOM	ol	olar
ACC	anɨ	olarnɨ
DAT	aɣaa	olarɣa
LOC	ande	olarda
LAT	anɨŋzar	olarzar
ABL	anəŋ	olardaŋ / olarnaŋ

In (138), we see that third person pronouns in Khakas have an overt plural exponent *-lar*, and we see that suppletion seems blocked in its presence, with the root reverting to the elsewhere realisation *ol*.

Thus, we can formulate the following VI-rules for Khakas, in which, by hypothesis, all contextual rules are subject to the linear adjacency as a property of the grammar:[59]

(139)   [3] $\Leftrightarrow$ an / $\_\_$ $K_{[K1,K2]}$

         [3] $\Leftrightarrow$ ol

The more specific VI-rule, [3] $\Leftrightarrow$ an / $\_\_$ $K_{[K1,K2]}$, will then apply whenever case (excluding the nominative) is adjacent to D, otherwise, the elsewhere form arises. Thus, when number intervenes between the base and case, then [3] $\Leftrightarrow$ an / $\_\_$ $K_{[K1,K2]}$ is inapplicable, since, as mentioned above, every contextual rule is subject to linear adjacency, and default *ol* surfaces.

The data from Khakas seem like a compelling argument in favour of the linear adjacency hypothesis (though see below), since these effects do not follow automatically

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[59]Recall from the discussion above that cases are internally complex, and the accusative is contained within all more complex cases (i.e., non-nominative).

from the ADH without linear adjacency.[60] Note that under the ADH, K is still within the accessibility domain of the base, and so the blocking effect of number is unexpected if we formulate VI-rules only according to hierarchical relations, and do not invoke linear adjacency as a requirement.

(140)   [3] $\Leftrightarrow$ an / __] $K_{[K1,K2]}$]

   [3] $\Leftrightarrow$ ol

Since the case node is accessible by being with the Accessibility Domain, then the more specific rule, [3] $\Leftrightarrow$ an / __] $K_{[K1,K2]}$], should still apply, irrespective of the presence of the number node, if we do not adopt linear adjacency as a restrictor on allomorphy.

Kayardild   In Kayardild (Evans 1995), we see a similar pattern: in the oblique singular form of first person pronouns, the base *nga* undergoes suppletion to *ngiju*. However, as seen in the other oblique forms for the dual and plural, this suppletive form does not arise, presumably due to being blocked by the presence of the dual and plural morphemes (Evans 1995, 202).

(141)

	SG	DU	PL
NOM	nga-da	nga-rr-a	nga-l-da
OBL	ngiju-wa	nga-rr(a)-wa	nga-la-wa

Again, under a linearity account, we can formulate the VI-rules in (142), where we see that the absence of a morpheme for singular allows case to become adjacent to the base and condition suppletion.

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[60]This blocking effect can be derived under structural adjacency only if we assume that singular is the absence of number.

(142)   [1] $\Leftrightarrow$ ngiju / ___ K$_{[\kappa 1, \kappa 2]}$

         [1] $\Leftrightarrow$ nga

In contrast, under the strict version of the ADH (i.e. without linearity), the specific VI-rule above in (142) is ungrammatical. Rather, we expect rules such as (143), and incorrectly predict that it should apply irrespective of the presence or absence of the dual and plural suffixes. Thus, again we see that linearity seems to matter.

(143)   [1] $\Leftrightarrow$ ngiju / ___] K$_{[\kappa 1, \kappa 2]}$]

         [1] $\Leftrightarrow$ nga

As mentioned above, the linearity hypothesis predicts that although case suppletion should not be possible across an intervening number node, this only holds if case and number are both suffixal or both prefixal, as in (136-137). If they differ in this regard and one is a prefix and the other a suffix, then both are linearly adjacent to the base and suppletion for either number or case should then become possible. Note that under structural adjacency case-driven suppletion is still ruled out, since it is irrelevant whether a node is realised as a prefix or suffix.

Qafar   On one analysis of data from Qafar (Hayward 1998), this is the exact configuration we find. That is, on one analysis of Qafar pronouns we only see case-driven suppletion when number is prefixal and case suffixal, bringing K closer to the root (#-D-K), but crucially not when both number and case are suffixal, with # thus intervening between D and K (D-#-K). Note that under a structural account, case-driven suppletion is ruled out either way, since the linear relation of number with the root should not matter; thus, on one analysis of the data, Qafar supports linear rather than structural adjacency.

Now, let us first consider the following pronominal paradigms; (144) constitutes the first person pronouns paradigm, (145) the second person pronouns paradigm, and (146) the third person pronouns paradigm (Hayward 1998, 630).

(144)

	SG	PL
NOM	anu	nanu
ABS	yoo	nee
GEN	yi	ni

(145)

	SG	PL
NOM	atu	i̊sin
ABS	koo	si(i)n
GEN	ku	sin

(146)

	SG.M	SG.F	PL
NOM	ůsuk	is	o̊son
ABS	kåå	te(e)t	ke(e)n
GEN	kay	tet	ken

Note that we seem to recognise a plural morpheme *n* in first (144) and third person (146) pronouns, though it is prefixal in (144) and suffixal in (146). Furthermore, we see that this *n* recurs as a prefix in (some) first person contexts, and as a suffix in other contexts. Qafar verbs divide into four classes: Class IV is stative and the remaining three classes are all eventive verbs; the three eventive classes distinguish themselves by Class I sometimes taking prefixal morphology, Class II always taking suffixal morphology, and Class III

using compound conjugation (Hayward 1998). For instance, in Class I verbs, perfective plural agreement for first person is realised as a prefixal *n-* (Hayward 1998, 633):

(147) n-   eeḑeg -eh
       1.PL- know -PERF
       'we knew'

Also, in Class I verbs, represented below by *-erd-* 'run', the requestive (limited to first person) is formed by prefixing *n-* (148a), and in the jussive the first person plural form also has a prefixal *n-* (148b):[61]

(148)   1.SG   1.PL

       a. requestive   ard-óò   n-ard-óò

       b. jussive   árd-ay   n-árd-ay

Finally, we see prefixal *n* surfacing in the pair *inni* 'my own' and *n-inni* 'our own' (Hayward 1998, 642).

However, in Class II verbs, perfective plural agreement for first person is suffixal (Hayward 1998, 633):

(149) fak -n   -eh
       open -1PL -PERF
       'we opened'

Plural agreement for second and third person is always realised as suffixal *-n*, in both Class I (150) and Class II verbs (151) (Hayward 1998, 633):

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[61]Cf. the corresponding forms of Class II verbs, represented by *nak-* 'drink milk', where we see that *-n* is suffixed:

i.   1.SG   1.PL
       a. requestive   nak-óò   nak-n-óò
       b. jussive   nák-ay   nák-n-ay

(150) 2PL.PERF teeḏege-n 'you(pl.) knew'

      2PL.IMPF taaḏige-n 'you(pl.) know'

      3PL.PERF yeeḏege-n 'they knew'

      3PL.IMPF yaaḏige-n 'they know'

(151) 2PL.PERF fakte-n 'you(pl.) opened'

      2PL.IMPF fakta-n 'you(pl.) open'

      3PL.PERF fake-n 'they opened'

      3PL.IMPF faka-n 'they open'

As to lexical nouns, number is realised by suffixation; indeed Hayward (1998, 633) notes that "[i]n general in Qafar morphology suffixation has to be seen as the typological default."

With regard to case, there is no clear case morphology in the Qafar pronouns in (144). With regard to lexical nouns, Hayward (1998, 629) states that "(o)vert nominative marking occurs only with vowel-final masculine nouns, in which a suffix *-i* replaces the terminal vowel." There is no evidence of case ever being realised as a prefix. Nonetheless, given that number morphology in pronouns seems to alternate between being suffixal and prefixal, it seems that we should entertain both possibilities for case as well.

Now, turning to the data in (144-146), the paradigm for third person pronouns (146) does not seem to involve suppletion: assuming that in the plural feminine is neutralised to masculine, the relation between masculine singular and plural seems fairly straightforward. With regard to the second person pronouns (145), there is suppletion for case but only in the singular; in the plural, the case contrast is (more or less) neutralised. Finally, turning to the first person pronouns in (144), we see that they do display case-driven sup-

pletion, both in the singular and the plural.

Importantly, we note that we see case-driven suppletion in first person pronouns (144), but not in third person pronouns (146), and that in the former number seems prefixal, whilst in the latter it seems suffixal.

Focusing for now on the first person pronouns, I will entertain two possible structures (in line with Greenberg's Universal that case is above number), the difference lying in whether case is suffixal (152) or prefixal (153).

(152)

  # D   K

(153) K

      # D
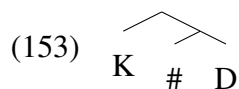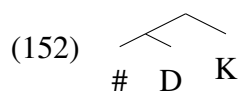
Thus, the corresponding linearity relations are as follows for (152) and (153), respectively:

(154)   #-D-K

(155)   K-#-D

Now, if linear adjacency is a restrictor on allomorphy only the structure in (152) allows for case-driven suppletion across the overt plural *n*, since, though structurally number intervenes, linearly K is adjacent to D, as shown in (154). That is, if linearity is a restrictor, then in (153) number intervenes linearly between K and D, as seen in (155).

Thus, both number and case are able to cause suppletion of the base in the structure in (152), under the hypothesis of linear adjacency. The (linearity sensitive) VI-rules involved in the formation of the first person pronouns would be the following:[62]

---

[62]I use the labels [ABS] and [GEN] rather than abstract [K] representations, since the relation between

(156) [1]   ⇔ y / __ K[ABS,GEN]

      [1]   ⇔ anu

      [ABS]   ⇔ -oo

      [GEN] ⇔ -i

      PL   ⇔ n

Implementing the rules directly gives rise to the following forms (items that diverge from the actual forms, see (144), are in boldface):

(157)

	SG	PL
NOM	anu	nanu
ABS	yoo	**nyoo**
GEN	yi	**nyi**

As seen in (157), the VI-rules in (156) give rise to the forms *nyoo* for the first person singular absolutive and *nyi* for the first person singular genitive, contrary to fact. However, when we look at the phonotactics of Qafar, it seems that /y/ cannot occur in the second position of a complex onset. Rather, the distribution that we see is that /y/ can be an onset, as in *yi* '1.SG.DAT' above, *yí* 'my' and *yimbidék* 'if he wakes up' (p.646-7, n.32); or it can be in coda position such as *nammay* 'two.ABS' (p.631) and *gaysa* 'horn.ABS' (p.630). Thus, I assume that *nyoo* is realised as *nee*, due to resolution of the illegitimite onset cluster /ny/ where the resulting form maintains the frontness of /y/ combined with the mid character of /o/, resulting in a long front mid vowel /ee/. Similarly, *nyi* is resolved by deleted /y/, which results in a surface realisation of *ni*.

---

nominative and absolutive is not clear in Qafar, nor is the status of genitive as a case category in general (see also note 40).

Returning to the main topic, we have now seen that case-driven suppletion in the presence of an overt plural is only observed in first person pronouns. Curiously, first person pronouns are the only pronouns where number is realised prefixally rather than as a suffix. Thus, we contrast the lack of case-driven suppletion when plurality is marked by suffixation and the presence of case-driven suppletion when plurality is marked by prefixation.

Now, on the hypothesis that linearity matters, we can account for this by positing that case is always suffixal in Qafar. If this is the case, the contrasting structures for first person (158) and second/third person (159) are as follows:

(158)
     #   D   K

(159)
     D   #   K
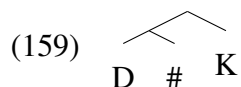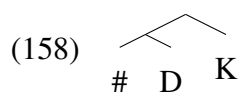
These structures give rise to different linear relations, with case being sufficiently close in first person pronouns (160), but not in second/third person pronouns (161):

(160)   #-D-K

(161)   D-#-K

Thus, on the hypothesis of linear adjacency, we can explain why it is the case that it is only in first person pronouns that we observe case-driven suppletion. In second and third person pronouns (161), K is linearly interrupted by the plural number marker *-n*. However, it bears repeating that this analysis crucially relies on first person pronouns having the structure in (158) with suffixal case.

Indeed, on the assumption that all inflectional material is prefixal in first person pronouns, we can interpret the Qafar data as exactly the opposite: a violation of linear ad-

jacency! If the structure of first person pronouns involves prefixal case (162), then, as in second and third person, number intervenes overtly, and under the hypothesis of linear adjacency we predict that case-driven suppletion should be blocked, presumably even if case itself is not overtly realised.

(162)   K   # D
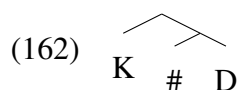
At this stage, there is not enough information to determine the correct structure of first person pronouns in Qafar. However, note that the pronominal pattern of Qafar is problematic for a structural adjacency account, irrespective of whether we assume case do be prefixal or suffixal, since case-driven suppletion is ruled out, irrespective of whether a node is realised as a prefix or suffix.

In contrast, it should be pointed out here that these data do not cause a problem for the ADH. If we take the set of VI-rules in (156) to be purely structural, without a linear adjacency condition, then the only delimitation is the Accessibility Domain. In pronouns, however, both number and case are able to condition suppletion, thus making the Qafar data, under either analysis, to fall in line with the ADH.

Georgian   Finally, consider the paradigm from the Georgian demonstrative pronoun *es* 'this one (by you)' (Hewitt 1995):[63]

---

[63]The genitive and adverbial forms of *es* 'this one (by you)' pattern with the non-nominative forms.

(163)

	SG	PL
NOM	es	ese-eb-i / ese-n-i[64]
ERG	ama-n	ama-ta
DAT	ama-sa	ama-ta
INSTR	am-ita	ama-ta

In (163), we see that in the nominative plural form there are three clearly identifiable morphemes: the base *es(e)*, the plural morpheme *-eb/-n* and the nominative morpheme *-i*. In contrast, in the other cases we only see two morphemes, suggesting that either there has been a portmanteau formed between two of the elements, or one of the elements is null in non-nominative contexts. Even though at first glance it might seem that the portmanteau is comprised of the base and number, I argue that a [#-K] portmanteau is formed. Firstly, if we were to suppose that [D -#] form a portmanteau, we miss the fact that there is no number distinction in the non-nominative bases: both singular and plural share the same base *am(a)*. Secondly, since there is a number distinction in the final suffix, this suggests that number is encoded on the suffix: *-ta* must encode plurality to distinguish it from the suffixes observed in the singular. As such, I assume that # and K form a portmanteau in non-nominative contexts in (163).

For, at least, a linear adjacency hypothesis, this would potentially bring case close enough to the root to condition suppletion of the base, since case (and number) information is then in the morpheme adjacent to the base. Indeed, if we assume that linear adjacency is evaluated not concurrent with cyclic VI but after VI has occurred within a spellout domain, portmanteaux indeed do change linear adjacency relations. The derivation would

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[64]*-eb-* is the regular plural marker; presumably *-n-* is an allomorphic variant. *-i* is the regular nominative marker.

be as follows: since base, number and case all fall within Embick's spellout domain, exponents are inserted for all these morphemes; then, given that number and case form a portmanteau, linear adjacency as a condition is satisfied.[65]

An additional analysis in line with the linearity hypothesis assumes that number becomes null in the presence of non-nominative case. There would then be three morphemes in the non-nominative cases, but one would have a null exponent. One could then argue that number survives long enough to condition the syncretism of case in the plural, after which it is pruned, bringing the base close enough to the case morpheme, and allowing for case-driven suppletion. However, the case morphemes are not the spelling out of (pure)

---

[65]It may be worth noting that Georgian constitutes a double look-ahead problem if we assume that linearity is evaluated concurrently with cyclic VI. In section 2.4 above, I argued that portmanteaux are formed only at the point that one of the elements involved in the portmanteau undergoes VI. Thus, in Georgian, given that we are dealing with a [#-K] portmanteau, this means that the portmanteau is only formed at the point that number undergoes VI. Assuming cyclic VI (Bobaljik 2000), we thus see that at the point that the base undergoes VI, number and case have not yet formed a portmanteau:

   i.

      D #   K
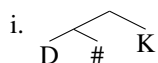
Applied to the Georgian demonstrative pronoun we thus see the following morpho-syntactic configuration for e.g. the non-nominative plural *amata*:

   ii.

                     K1,K2
      DEM   PL
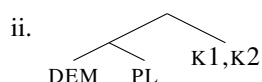
Crucially, (ii) is the structure at the point that the root undergoes VI. Thus, at this stage case information has not yet been brought closer to the base. It is only after the base has undergone VI, and by virtue of cyclic VI number undergoes VI next that the [#-K] portmanteau is formed:
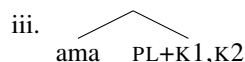
   iii.

      ama   PL+K1,K2

To conclude, we see that *-ta* is inserted as the exponent of the [#-K] portmanteau:

   iv.

      ama ta
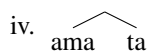
Thus, we see that the analysis of Georgian includes two instances of look-ahead in an approach to linearity where linearity is evaluated concurrent with cyclic VI.

ergative case in the plural forms: the ergative exponent in the singular is *-n*. Under this view, however, we see a paradox: the plural must survive in order to condition the allomorphy of the case suffix, but it must be missing in order for case to cause allomorphy of the base.

Thus, we see that the linearity hypothesis can be maintained in Georgian under the assumption it is a condition that is evaluated after VI of all nodes has occurred.

In sum, it has been shown that Khakas and Kayardild directly support linear adjacency as a delimiter of suppletion, and Qafar indirectly supports this hypothesis. Georgian shows that only linearity as a condition that is evaluated after cyclic VI within Embick's spellout domain results in portmanteaux having an effect on locality relations.

2.5.2 Against adjacency

As mentioned above, Embick (2010) assumes linear adjacency in addition to cyclic locality. As discussed above, from a theoretical perspective, it would be much more parsimonious if it were one or the other, either accessibility or linearity. Moreover, taking into account cyclic VI, there are serious conceptual problems with incorporating linearity as a restrictor on outward allomorphy.

For the reasons detailed above, in this section I raise the question whether adjacency can be removed from the theory in favour of an accessibility only hypothesis. Indeed, I will argue that this is not only possible, but necessary. Specifically, I will show that, in addition to the conceptual issues discussed above, Tamil shows a suppletion patterns that cannot be handled in any reasonable way under the adjacency hypothesis, whether phrased in terms of linear or structural relations.

Tamil The crucial case to discuss comes from Tamil (Schiffman 1999). In (164), we see that suppletion seems to occur across a plural *-(n)ga* suffix (Schiffman 1999, 118):

(164)

	SG	PL
NOM	naan	naanga
OBL	en	enga

Indeed, the same pattern holds in second person pronouns (165):

(165)

	SG	PL
NOM	nii	niinga
OBL	on	onga

Note that the presence of plural in both the nominative and the oblique means that no matter which form is taken as the non-suppletive one adjacency is violated.[66] Below I give the full paradigms for first person (166) and second person (167) pronouns in Tamil, crucially including the dative forms:

(166)

	SG	PL
NOM	naan	naan-ga
OBL	en	en-ga
DAT	en-akku	en-gal-ukku

---

[66]Indeed, an analysis which takes the nominative *naan* as the suppletive form and *en* as the default realisation we run into two separate problems. Firstly, we saw in section 2.2.1 that we argue in Smith et al. (2015) that case is structurally complex and thus any VI-rule that references the nominative also references other cases, predicting that either all forms should have (suppletive) *naan* or that there is 'double' suppletion, first for nominative and then for the dative and oblique. Secondly, we still see an adjacency violation since even if nominative does show suppletion for case then there is still the matter of the overt plural morpheme intervening between the base and K, given that K is presumably still located above number.

(167)

	SG	PL
NOM	nii	nii-nga
OBL	on	on-ga
DAT	on-akku	on-gal-ukku

A theory in which adjaceny is taken as a universal restrictor on allomorphy cannot account for this data. The problem is that *-ga(l)* clearly forms the number morphology in the form, yet we consistently observe suppletion across this morpheme for both oblique and dative case.

For the ADH, no such problems exist: even across the intervening number morpheme case is accessible to the base since we are dealing with functional items without a category-defining cyclic node. Thus, K lies within the same Accessibility Domain as the base, and we can formulate the following VI-rules, where [K1,K2] is oblique case and [K1,K2,K3] is dative case:

(168)   [1] $\Leftrightarrow$ en / ___] K$_{[K1,K2]}$]

        [2] $\Leftrightarrow$ on / ___] K$_{[K1,K2]}$]

        [1] $\Leftrightarrow$ naan

        [2] $\Leftrightarrow$ niin

        PL $\Leftrightarrow$ -ga(l)

        SG $\Leftrightarrow$ -$\emptyset$

        K1,K2 $\Leftrightarrow$ -$\emptyset$

        K1,K2,K3 $\Leftrightarrow$ -ukku

In sum, there clearly is an overt number morpheme in the Tamil paradigm, which results in the case morpheme not being (linearly or structurally) adjacent to the base, yet is

still able to condition suppletion. Thus, Tamil is a problem for approaches that incorporate linear adjacency as a restrictor as well as those that adopt structural adjacency as a delimiter on contextual allomorphy.

In contrast, whilst there is no clear basis for this under the adjacency approach, on the Accessibility Domain Hypothesis the Tamil data are no problem.

Lak In addition, in section 2.1.1 we saw that in Lak (Radkevich 2014) the item for 'moon/month' suppletes in the context of (ergative) case with an intervening number node; the data are repeated here:

(169)

	SG	PL	gloss
ABS	barz	barz-ru	'moon/month'
ERG	zur-ul	zur-dald-il	

On the analysis that the structure of Lak nominals is more complex, following Radkevich (2014), Lak nouns have the following structure, also repeated from above:

(170)
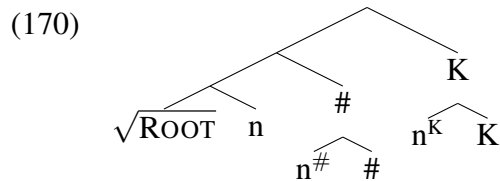
If, as suggested in section 2.1.1, we deterministically move up the tree to identify the highest cyclic node, we see that the full structure in (170) is contained within the AD. Thus, we can formulate the following interpretable VI-rules, where [K1,K2] is ergative case:

(171) $\sqrt{\text{MOON/MONTH}}$ $\Leftrightarrow$ zur / __] K$_{[\text{K1,K2}]}$]

      $\sqrt{\text{MOON/MONTH}}$ $\Leftrightarrow$ barz

      PL $\Leftrightarrow$ -dald / __] K$_{[\text{K1,K2}]}$]

      PL $\Leftrightarrow$ -ru

      KK $\Leftrightarrow$ -il

Basque Finally, we find another case of non-linearly conditioned root suppletion in Basque (Bobaljik 2012, 156-8); consider the suppletive adjectives *asko* 'much' and *on* 'good', which shows suppletion in the context of the comparative:

(172)

POS	CMPR	gloss
asko	gehi-ago	'much'
on	hobe	'good'

Note that in *gehi-ago* 'much-CMPR' we see the overt realisation of the comparative morpheme, but in *hobe* 'good.CMPR' we do not.

Crucially, in the presence of the morpheme *-xe* 'a little more X', which is located between the root and the comparative, we still see the suppletive variants occurring (third column):

(173)

POS	CMPR	'a little more much/good'	gloss
asko	gehi-ago	gehi-xe-ago	'much'
on	hobe	hobe-xe-ago	'good'

In *gehi-xe-ago* and *hobe-xe-ago*, we obviously see a linearity violation: comparative-driven root-suppletion across *xe*. Note that on the assumption that *xe* is a separate projection, we run into an apparent problem that the comparative is too far from the root to

condition root-suppletion, for any approach, be it linear adjacency, structural adjacency, or the ADH:

(174)

```
          CMPR
    xe
√ROOT   a
```
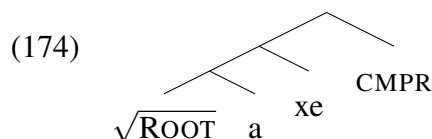
However, Bobaljik (2012), drawing on semantic considerations, argues that structure of this construction is as follows (adapted from Bobaljik 2012, 157):

(175)

```
              CMPR
√ROOT   a
            xe   CMPR
```
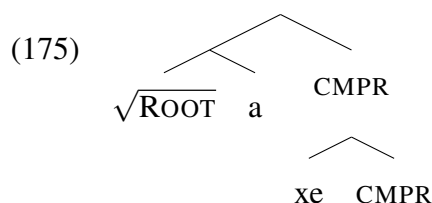
In (175), we see that the comparative falls within the AD by virtue of being one node above category-defining *a*.[67] Nonetheless, we see that the trigger (comparative) is not linearly adjacent to the target (root), if we follow Embick's view that linearity is computed over concatenated material.[68]

In addition, Bobaljik notes that the order of the comparative marker and morphemes deriving adverbs from adjectives varies cross-linguistically (Bobaljik 2012, 157):

(176) a. Kartvelian, Georgian [[[ADJECTIVE] COMPARATIVE] ADVERB]

  b. Basque [[[ADJECTIVE] ADVERB] COMPARATIVE]

For instance, we see the regular form *berri-ki-ago* 'more recently' decompose as follows:

---

[67]Cf. the analysis of Lak in section 2.1.1 above.

[68]Note that Bobaljik (2012) does not represent category-defining *a* (see also section 3.4 below); thus, Bobaljik makes the point that in (175) the (higher instance of the) comparative is structurally adjacent to the root, and we see a case of a linearity violation but not a structural adjacency violation.

(177) berri -ki   -ago
       new -ADV -CMPR
       'more recently'
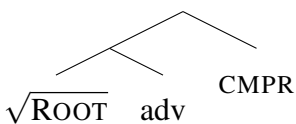
With regard to suppletive *on* 'good' we see the following pattern. First, we see that in the regular comparative form of *on* 'good' we see suppletion to *hobe*:

(178)   on   hobe

          'good'   'good.CMPR'

Furthermore, we see that in adverbial comparatives this same suppletive variant surfaces:

(179)   hobe-to   hobe-ki

          'better-ADV'   'better-ADV'

On the structure in (176b), based on the transparent embedding in regular forms such as (177), we see that the comparative causes suppletion of the root, despite the presence of the adverbial morpheme. This, on the structure in (176b), gives the structure in (180):

(180)

This would be a linear adjacency violation, as shown in (181), since the adverbial markers *-to* and *-ki* are overt and thus constitute a violation of adjacency.

(181) root-adv-CMPR

However, it should be noted here that Bobaljik takes the absence of the comparative morpheme *-ago* in (179) to be indicative that though Basque has the surface structure

in (176b), it is underlyingly (176a) and this is the structure in suppletive forms; in non-suppletive forms, as in (177), the morphemes surface in the order as in (176b). To fully appreciate this reasoning, we need to consider the VI-rules for the comparative morpheme *-ago*. Specifically, the relevant examples are as follows (from above):

(182)   a.   hobe   'better'

           b.   hobe-xe-ago   'good-xe-CMPR

           c.   hobe-ki/to   'better-ADV'

Focusing on the first two forms in (182), the fact that the comparative marker surfaces in (182b) suggests that *hobe* is not a portmanteau but rather is the root followed by a null realisation of the comparative marker: *hobe-∅* 'good-CMPR'. The distribution would then be that the comparative surfaces as null when adjacent to the root but as *-ago* elsewhere:

(183)   CMPR   ⇔   ∅ / hobe] __]

         CMPR   ⇔   -ago

However, if we assume the surface structure in (176b) to be the underlying structure, these VI-rules run into problems if we take into account (182c) which crucially lacks an overt comparative morpheme: since the comparative is not adjacent to the root the specific rule does not apply and we expect default *-ago* to surface, contrary to fact. However, if the underlying structure of Basque is (176a), then at the relevant point in the derivation the comparative is adjacent to the root and is predicted to be realised as a null morpheme.

Thus, though they may not cause problems for a hierarchically based adjacency restriction on VI, the cases which involve *xe* clearly are problematic for an approach that assumes linear adjacency.

In sum, we see clear instances of linear/structural adjacency violations in Tamil first and second pronouns, a linear adjacency violation in Basque comparative-driven root-suppletion for *on* 'good' and *asko* 'much' in the context of *xe*, and a linear/structural adjacency violation in the Lak datum 'moon/month' which shows case-driven root-suppletion across overt number. In contrast, the ADH naturally accounts for the suppletion from Tamil and Basque, and, provided the assumptions mentioned above, for the Lak datum.

2.5.3 Towards a theory without adjacency

Having shown the conceptual problems with the adjacency hypothesis of being forced to assume radical pruning or for linear adjacency to be evaluated after cyclic VI has occurred within a domain, as well as the empirical issue of Tamil first and second person pronouns, I reject adjacency as an additional restrictor on outward allomorphy. However, not recognising adjacency as a restrictor on suppletion leaves us with formalising the blocking effects in section 2.5.1 above. In this section, I will show that we can account for the blocking effects previously ascribed to adjacency by assuming hyper-contextual VI-rules which are in line with the ADH.[69]

In the following, I assume that suppletion in the context of Z occurs when Z is sufficiently local to the suppletive element. By virtue of the ADH, this means that Z must be accessible to the suppletive element (and so in the same domain). Thus, there is no locality encoded in the rule itself, but rather locality is independent, per the AD. Recall

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[69]Hyper-contextual VI-rules are reminiscent of span-conditioned allomorphy, which has been appealed to in various recent work, particularly in the nanosyntax framework (Svenonius 2012, Bye & Svenonius 2012, Merchant 2015). However, it should be noted that I am still maintaining that these rules are constrained by accessibility restrictions, i.e. the AD, and I do not see a natural restrictor in the cited works that has been proposed.

that, following Bobaljik (2000), I assume that VI proceeds from the root outwards. Thus, all the contexts Z here make reference to morphosyntactic features that are accessible to the root.

Kayardild   As discussed above, evidence that adjacency restricts suppletion came from blocking effects, whereby an intervening morpheme blocks suppletion that is otherwise observed. The effect is observed clearly in Kayardild, data repeated from above:

(184)

	SG	DU	PL
NOM	nga-da	nga-rr-a	nga-l-da
OBL	ngiju-wa	nga-rr(a)-wa	nga-la-wa

As discussed above, under an adjacency account, in order to capture the Kayardild blocking effect, one must assume that the SINGULAR is pruned in the context of oblique in order to ensure that (oblique) case is adjacent to the base.

In the ADH, we can model blocking effects by proposing that certain VI-rules are hyper-contextual. That is, some VI-rules make reference not to a single node, but rather a combination of two nodes, which then can be a context for suppletion. Concretely, consider the paradigm in Kayardild; I assume that *nga* is the elsewhere root, but there is a suppletive variant *ngiju* which arises in the context of the singular *and* the oblique. Upon including hyper-contextual VI-rules, (185) shows the relevant Kayardild VI-rules:

(185)   [1]   ⇔   ngiju / __] #$_{[SG]}$] K$_{[OBL]}$]

      [1]   ⇔   nga

      DU   ⇔   rr

      PL   ⇔   l(a)

      NOM   ⇔   (d)a

      OBL   ⇔   wa

Note that such hyper-contextual rules are not only possible but actually expected to exist. As mentioned before, VI-rules that make reference to case in lexical nouns are not at all ruled out by the grammar; rather, the reason that we so rarely observe them is that in canonical lexical nouns reference to case is uninterpretable since case does not fall within the Accessibility Domain. Thus, there is nothing in the operation of VI that would prevent hyper-contextual rules from existing. Indeed, the only restriction on the interpretation of VI-rules comes from the ADH. In pronouns, the AD comprises both number and case, and thus both number and case are interpretable, resulting in a hyper-contextual rule such as [1] ⇔ ngiju / __]#$_{[SG]}$] K$_{[OBL]}$] being a legitimate grammatical item. Thus, we see that positing a hyper-contextual rule allows us to account for the blocking effect in Kayardild.

Khakas   Turning to the second case of a blocking effect that seems caused by adjacency, recall the data from Khakas, repeated from above:

(186)

	SG	PL
NOM	ol	olar
ACC	anɨ	olarnɨ
DAT	aɣaa	olarɣa
LOC	ande	olarda
LAT	anɨŋzar	olarzar
ABL	anəŋ	olardaŋ / olarnaŋ

As mentioned, under an adjacency approach, the analysis for Khakas seems straight-forward: a suppletive root *an* appears whenever a non-nominative case is adjacent to the root. When the plural morpheme *-lar* intervenes and blocks this adjacency, this results in the case suffix no longer being adjacent to the base, and suppletion is not observed.

In an analysis that makes use of hyper-contextual rules at first glance might seem to miss a generalisation; that is, the blocking effects in Khakas are pervasive across all non-nominative cases, thus making these hyper-contextual rules a curious accident. However, if we take into account the decomposition of case argued for in section 2.2.1, we are led to an analysis like the one offered for the Kayardild paradigm given above: we only need a single hyper-contextual rule that gives rise to the blocking facts. Recall from section 2.2.1 that ABB case suppletion patterns result from the same VI-rule, namely a rule that changes the form of a base in the context of a marked case; that is, since cases are in a containment relation, a specific VI-rule that makes reference to a less complex case will necessarily lead more complex cases to take on that suppletive base. If we apply this to the Khakas third person pronoun pattern, we can capture the blocking effects with the following hyper-contextual VI-rule, where [К1,К2] is accusative:

(187)   [3] $\Leftrightarrow$ an / __] #$_{[SG]}$] K$_{[K1,K2]}$]

        [3] $\Leftrightarrow$ ol

This rule ensures that all other cases will pattern with the accusative, since all the cases are built on the [K1,K2] specification of the accusative (see Smith et al. 2015). Crucially for the discussion here, this results in what appears to be a blocking effect: [3] $\Leftrightarrow$ an / __] #$_{[SG]}$] K$_{[K1,K2]}$] is more specific for all other cases when they are also singular. In contrast, when the plural is used, the hyper-contextual rule in (187) is inapplicable, resulting in the base reverting to the elsewhere realisation, *ol*.

In sum, we have seen that the poster-child for the adjacency hypothesis, blocking, is able to be handled using only the machinery the ADH requires.

Thus, we can see in the analyses of Kayardild and Khakas that hyper-contextual rules account for blocking effects that seem to stem from adjacency considerations. However, it should be emphasised that such hyper-contextual rules are still subject to accessibility considerations by requiring to make reference to material that falls within the Accessibility Domain. Thus, whilst hyper-contextual VI-rules that would allow case driven root suppletion in lexical items can be formulated, as the first two VI-rules in (188), they will not be interpretable since the case node is inaccessible to the root by lying outside of the AD, thus making the hyper-contextual VI-rules in (188) ungrammatical items.

(188) $\sqrt{\text{ROOT}}$ $\Leftrightarrow$ Z / __] n] #$_{[SG]}$] K$_{[K1,K2,K3]}$]

        $\sqrt{\text{ROOT}}$ $\Leftrightarrow$ Y / __] n] #$_{[SG]}$] K$_{[K1,K2]}$]

        $\sqrt{\text{ROOT}}$ $\Leftrightarrow$ X

Finally, a note is in order on the null exponence of number in both Kayardild and Khakas. In the account, where adjacency effects are epiphenomenal, here it is an accident

that the singular morpheme is null in both cases that I have proposed hyper-contextual rules. Thus, we predict that we should see a situation where we have a hyper-contextual rule that makes reference to a (value of a) node that falls within the AD and is closer to the base, and a rule that realises this same (value of a) node overtly. We can schematically represent this by the following VI-rules, where *a* and *b* are overt exponents and with the relevant component X in boldface:

(189) D $\Leftrightarrow$ a / __] **X**] Y]

   X $\Leftrightarrow$ b

More concretely, we predict a hypothetical language Khakas' with an overt singular exponent, here *-pe*:

(190)

	SG	PL	
NOM	ol-pe	ol-lar	*Hypothetical language*
ACC	an-pe-nɨ	ol-lar-nɨ	

The relevant VI-rules would be, crucially containing a hyper-contextual rule with reference to the closest element, SG, which is also referenced in a VI-rule that realises it overtly:

(191) D $\Leftrightarrow$ an / __] #$_{[SG]}$] K$_{[K1,K2]}$]

   D $\Leftrightarrow$ ol

   SG $\Leftrightarrow$ -pe

   PL $\Leftrightarrow$ -lar

   KK $\Leftrightarrow$ -nɨ

Since singular is often not expressed overtly, we might also want to turn to another expected situation: instead of focusing on the singular, we expect to see a language contain-

ing a hyper-contextual rule with reference to a plural which is realised overtly, hypothetical Khakas":

(192)

	SG	PL	
NOM	ol	ol-lar	*Hypothetical language*
ACC	ol-nɨ	an-lar-nɨ	

The relevant VI-rules would be, crucially containing a hyper-contextual rule with reference to the closest element, SG, which is also referenced in a VI-rule that realises it overtly:

(193)　D　⇔　an / __] #$_{[PL]}$] K$_{[K1,K2]}$]

　　　　D　⇔　ol

　　　　PL　⇔　-lar

　　　　KK　⇔　-nɨ

These types of languages are possible if we assume hyper-contextual VI-rules, limited by the ADH. Unfortunately, I am not aware of such languages and I leave them as an open conjecture.[70]

At this stage it is worth noting that in this survey out of 13 languages which display case-driven pronominal suppletion 9 involve a portmanteau construction, thus bringing case linearly adjacent to the base. Thus, there seems to be a certain bias towards suppletion being driven by adjacent morphemes. However, given the theoretical issues of adjacency

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[70]Bobaljik (2015) also rejects a simple universal adjacency condition. Rather, following ideas in Calabrese (2005) and Nevins (2010) (see also Moskal 2014), he suggests that languages display cross-linguistic variation of three types of 'relativised locality': (i) certain languages allow for all intervening nodes to block suppletion relations (absolute adjacency); (ii) certain languages allow for marked intervening nodes to block suppletion relations (plural would block, but singular not); and (iii) in certain languages intervening nodes never block suppletion relations (no adjacency condition). I leave it to future research whether we need to superimpose a relativised locality of this type in the current proposal.

and the empirical problem of, most notably, Tamil, I argue that adjacency is not a universal restrictor on outward suppletion. Nonetheless, I do not exclude adjacency as a factor in suppletion; but rather than a property of the grammar, I consider that it likely plays a role from a functional perspective. That is, the grammar does not require (linear or structural) adjacency, but perhaps there are functional considerations that prefer trigger and target to be adjacent.

In contrast to adjacency, hyper-contextual VI-rules are a logical possibility in a system which assumes the ADH as a delimiter of contextual allomorphy triggers, and easily accounts for Tamil, Basque and the Lak datum discussed above. It seems that the sole argument against it is that we are left with a gap in its predictions since we expect languages of the type discussed above, where we have a hyper-contextual rule that makes reference to a (value of a) node that falls within the AD and is closer to the base, and a rule that realises this same (value of a) node overtly (see (189) above).

In sum, in this section I considered the implications of incorporating linearity as a universal restrictor on suppletion. However, I have shown that it cannot be maintained as a condition on outward allomorphy. In addition, Bobaljik (2000) argues that linear adjacency is violated in the interaction between affixes in Itelmen. Thus, this seems to cast doubt on adjacency as a universal condition on inward allomorphy conditioned by the root/base as well.

2.6 Summary of this chapter

In this chapter, I focused on the asymmetry between lexical nouns and functional nouns with regard to suppletion: pronouns show suppletion for both number and case, whilst lexical nouns show suppletion only for number, but not case. This asymmetry was argued to be the result of the following: (i) lexical nouns have more structure than functional nouns, most importantly, a category-defining node; (ii) category-defining nodes create an Accessibility Domain, which restricts what is able to trigger suppletion; and (iii) the Accessibility Domain crucially contains the category-defining node, and one node above the category-defining node. Now, since number lies internal to case, number can trigger suppletion but case cannot (in lexical nouns). Furthermore, we see that the formalisation of the AD as containing the category-defining node, and one node above it is supported by the observation that case-driven root-suppletion becomes possible when number is absent from the structure. Similarly, in case a node such as the diminutive intervenes, number-driven root-suppletion is blocked, as expected under the formalisation of the AD proposed here. In contrast, the pronominal base is not spelt out on its own, and so lies in the same AD as case.

In addition, the hypothesis of the Accessibility Domain is extended to account for apparent adjacency effects in suppletion. Embick has claimed that linear adjacency is an additional restrictor on allomorphy; that is, allomorphy can only happen when the trigger and target are linearly adjacent. This seems to be supported by blocking effects in languages like Khakas and Kayardild, where a suppletive variant is blocked when an overt number morpheme intervenes between trigger and target. However, in the same configuration, Tamil clearly shows that suppletion can occur across an overt number morpheme.

In addition to this empirical problem, we see that whilst linear relations can be encoded in VI-rules, there is a problem with outward looking allomorphy: there is a lookahead problem because the root undergoes VI before, e.g., #. Thus, at the point if VI of the root, it is not known whether # is going to be there or not, and therefore, we do not know whether the root will be adjacent to K or not. This problem is circumvented by a structural adjacency condition on suppletion (Bobaljik 2012), but this approach also cannot handle the Tamil data. Here, I argue that apparent adjacency effects can be handled without having to rely on any adjacency condition; instead, I show that we can formulate hyper-contextual VI-rules that make reference to both number and case, thus deriving the blocking effects. Crucially, the interpretation of these hyper-contextual VI-rules is still constrained by the AD. Note, though, that these are only possible in pronouns, where case information falls within the AD of the base. Note, also, that blocking effects in lexical nouns are accounted for by the fact that there is only one node above the category-defining node that is accessible to the root.

Chapter 3

Limits in the verbal domain

Turning to suppletion in the verbal domain, we see a clear parallel to lexical nouns in lexical verbs, assuming the following structure (Cinque 1999, Radkevich 2010):[1]

(194)
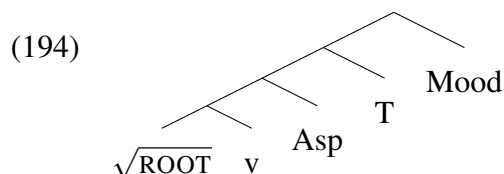
In the configuration in (194) *v* is a potential VI-node, which is confirmed as an actual domain delimiter at the point that Asp is accessed, resulting in a SOD consisting of the root and its concomitant AD which contains *v* and Asp.

Similarly, we can draw a parallel between pronouns and auxiliaries. Crucially, in the following representation of auxiliaries, they are functional and thus lack a category-defining *v*.[2]

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[1]Here, I do not discuss negation-driven and verbal number-driven root-suppletion; see Bobaljik & Harley (2013) on the latter. For a brief discussion on agreement-driven suppletion, see section 3.2.6.

[2]Alternatively, we could posit that they lack a root and are a 'pure' verbal category-defining node. The locality domains remain the same on this view, though: since category-defining nodes create an AD for their

(195)
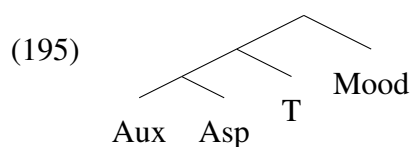
Given the asymmetries identified in the nominal domain, we can then formulate the following two hypotheses:

(196) In lexical verbs, tense-driven (or mood-driven) root-suppletion is impossible in the presence of aspect (or (aspect and) tense).

(197) As opposed to lexical verbs, suppletion in functional verbs should not be restricted.

On par with the ban on case-driven root-suppletion in nominals, tense-driven (and mood-driven) root-suppletion should not be observed in the presence of intervening categories (196). That is, given that aspect is located closest to the root, the strong prediction is that aspect-driven root-suppletion should be observed cross-linguistically, but that tense-driven and mood-driven root-suppletion should only occur under specific circumstances, viz. in the absence of an aspect node (cf. section 2.1.1 on cases of case-driven root-suppletion). On par with the asymmetry between pronouns and lexical nouns, we predict that auxiliaries should not be subject to the locality restrictions imposed by the category-defining node and thus they should be able to display both aspect- and tense-driven (and mood-driven) suppletion (197).[3]

My main source for verbal suppletion patterns is Veselinova (2006), who surveyed 193 languages for paradigms involving verbal suppletion. Below I show her findings concerning aspect-driven and tense-driven suppletion (adapted from Veselinova 2006, 200-202.

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complement, in the absence of a complement of *v* no domain is created (or its creation is moot). See also discussion below.

[3]However, as we will see these predictions, specifically (196) might be too restrictive, and I will later on distinguish between a strong hypothesis (196) and a weak hypothesis.

Firstly, in (198), I have set apart languages in which the copula 'be' shows (tense-driven) suppletion:

(198) Abkhaz
       Bengali
       Georgian
       Hunzib
       Khoekhoe
       Mundari
       Nahuatl (North Pueblo)
       Nahuatl (Tetelcingo)
       Persian
       Suena
       Supyire
       Swedish

   The table below lists all other verbs that Veselinova found that supplete for aspect and tense:

Language	Aspect	Tense
Alamblak		go
Armenian	come, eat, give, do, put, carry, become, cry	
Bengali	go	
Brahui		go
Bulgarian	come	
Burushaski	come	
Belorussian	say, take, catch	exist, have
Chamorro		be at, exist, have
Chinantec	come	
Czech	take, put	
Dani		go
Dutch		go
English		go
Ewe		be at
Fur		become, come, run, sit
Georgian	see, drink	give, have an inanimate object
German		go, stay
Greek	say, see, eat	
Hebrew (Modern)		exist, have say
Hindi	go	
Ika	go	
Ingush		see
Irish	carry	say, eat, hear, see
Kannada		be at
Kanuri		stay, live, come, die
Kewa		go, come
Kuot[4]		sit, live, walk, fall, wake up
Latvian		go, give
Lezgian	come, come again, do, give, eat, become, become cold, kill/die	

[4]The data from Kuot are listed in Veselinova as having come from Lindström (2002), which was at the

Language	Aspect	Tense
Mara	go/come, tell, take	
Maung		go
Mixtec	come, go	die
Mundari		be of identity, be/exist
Nahuatl (North Pueblo)		go
Nahuatl (Tetelcingo)	see	come
Nunggubuyu	go	
Oneida	say	
Oromo		exist
Otomí	go	
Pashto	go, come	
Persian	come, see	
Pipil		come
Polish	say, see, watch, take	
Russian	say, take, put	exist/have
Serbo-Croatian	say, look, hear	
Slave	become/happen/go, do	
Slovak	take, put, move	
Slovene	say, do, take, throw, hit/beat	
Sorbian (Upper)	take, put, aim, throw	
Spanish		do, make, give
Suena		be, go, come, say, do, live
Supyire	come, hear	
Swedish		be, go, get
Tepehuan	do, eat	
Tukang Besi		give
Turkana		be somewhere, have
Ukranian	say, take, catch	exist/have
Usan	say, stay	
Wichita	go	

In the following, I first briefly discuss aspect-driven suppletion (section 3.1), which is then followed by an extensive discussion on tense-driven suppletion (section 3.2), and

time 'in prep'. However, the data do not appear in the final version, and are thus unavailable.

finally a brief section on mood-driven suppletion (section 3.3). In section 3.4, I discuss portmanteaux which include the most deeply embedded element, i.e. root/base portmanteaux. Finally, I summarise the evidence from nominal and verbal suppletion, including a brief discussion of adjectival suppletion (Bobaljik 2012).

3.1 Aspect-driven suppletion

In this section, I illustrate that, as expected, we observe aspect-driven suppletion. As can be seen from the table above, aspect-driven suppletion is seen in verbs that are likely auxiliaries (such as 'to go'), as well as those more likely to be lexical (e.g. 'to tell').

Given that aspect-driven suppletion in verbs is predicted to occur irrespective of whether they are auxiliaries or lexical verbs, I only discuss a handful of cases here.

Lezgian As a first example of verbal suppletion in the context of aspect, consider Lezgian; Haspelmath (1993) lists a number of aspect-driven suppletive verbs, including 'to eat' and 'to do':

(199)   t'ü-na   eat-AOR

          ne-z   eat-IPFV

(200)   awú-na   do-AOR

          ijí-zwa   do-IPFV

The verb 'to eat' seems a clear case of a lexical verb, and for the sake of convenience I will represent 'do' as such as well. Indeed, whilst Veselinova lists 9 verbs that supplete for aspect in Lezgian, the only one suppleting for tense is the copula 'to be'.

Turning to (199), we see that the root for 'to eat' is *t'-* in the aorist but *ne-* in the imperfective; similarly, in (200), 'to do' surfaces as *awú* in the aorist but as *ijí* in the imperfective. Indeed, suppletion in Lezgian is clearly sensitive to an aspectual distinction between completedness. The imperfective stem and perfective stem are used in the following conjugations of the verb:

(201)

IMPERFECTIVE STEM	PERFECTIVE STEM
Imperfective	Aorist
Past Imperfective	Past Aorist
Continuative Imperfective	Perfect
Past Continuous Imperfective	Past Perfect
Infinitive	Continuative Perfect
Future	Past Continuous Perfect
Past Future	

Haspelmath notes that the aorist is used to express perfective events in the past, past aorist, and the remote past. The perfect is used to refer to past events with current relevance, and resultative meaning. The past perfect expresses temporal precedence. Thus, we can say that the observed suppletion groups together the [perfective] aspects, which are aorist and perfective.

As mentioned, suppletion for aspect does not cause any locality problems on the account here, on the well founded assumption (see e.g. Julien 2002) that aspect lies between the verb and tense. Thus, we can write the following VI-rules for Lezgian:

(202) $\sqrt{\text{EAT}}$ ⟺ t' / __] Asp$_{[\text{PERF}]}$]

$\sqrt{\text{DO}}$ ⟺ aw / __] Asp$_{[\text{PERF}]}$]

$\sqrt{\text{EAT}}$ ⟺ ne

$\sqrt{\text{DO}}$ ⟺ iji

AOR ⟺ -na

IMPF ⟺ -z

Alternatively, we could formulate VI-rules where [PERF] is the default:

(203) $\sqrt{\text{EAT}}$ ⟺ ne / __] Asp$_{[\text{IMPFV}]}$]

$\sqrt{\text{DO}}$ ⟺ iji / __] Asp$_{[\text{IMPFV}]}$]

$\sqrt{\text{EAT}}$ ⟺ t'

$\sqrt{\text{DO}}$ ⟺ aw

AOR ⟺ -na

IMPF ⟺ -z

The rules in (203) are potentially supported by the fact that the masdar (deverbal noun) forms of the suppletive verbs pattern with the perfective stem. On the other hand, the rules in (202) seem to be preferred, since the perfective stem seems to form a more coherent natural class.[5]

Irrespective of whether we assume (202) or (203), the context determining suppletion is clearly along the [perfective/imperfective] distinction, and therefore represents aspect-driven suppletion. Crucially, this is in accordance with the predictions according to the ADH, since aspect is immediately above category-defining *v*; thus, aspectual information is accessible to the root and thus is predicted to be a possible context for root-suppletion.

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[5]See section 5.3 for some comments on the relation between suppletion triggers and markedness.

Greek   In a similar vein, we observe that in Greek (Joseph & Philippaki-Warburton 1987) the verb 'see' suppletes for aspect, surfacing as *id* or *blep*, depending on the aspectual specification:

(204)   e-id-a   AUGMENT-see.PFV-1SG.AOR

   e-blep-a   AUGMENT-see.IMPF-1SG.PST

On the assumption that 'see' is lexical, we can formulate the following VI-rules:

(205) $\sqrt{\text{SEE}} \Leftrightarrow \text{id} / \underline{\quad} \,] \, \text{Asp}_{[\text{PERF}]} \,]$

   $\sqrt{\text{SEE}} \Leftrightarrow \text{blep}$

Wichita   Similarly, consider the following data from Wichita (Rood 1976), where we see the verb 'to go' suppleting for aspect:

(206)   wa   go.PFV

   hisha   go.IMPF

In (206), we observe different roots in the perfective and imperfective: *wa* and *hisha*, respectively. The VI-rules for the suppletive verb in Wichita (206) would be the following, where we have a rule that results in a suppletive variant in the context of the perfective and an elsewhere realization otherwise:

(207) $\sqrt{\text{GO}} \Leftrightarrow \text{wa} / \underline{\quad} \,] \, \text{Asp}_{[\text{PERF}]} \,]$

   $\sqrt{\text{GO}} \Leftrightarrow \text{hisha}$

3.2 Tense-driven suppletion

In this section, I discuss cases that Veselinova identified as tense-driven verbal suppletion. It bears repeating here that under the strong locality hypothesis, tense-driven root-suppletion is ruled out by virtue of tense not lying within the AD. Thus, there are two distinct situations under which we predict tense-driven suppletion to be possible in verbs:

(208) Tense-driven suppletion is possible in auxiliaries, given that they lack a category-defining node and thus the Accessibility Domain includes T.

(209) Tense-driven root-suppletion is possible in lexical verbs if T is sufficiently local to the root by being one node up from the category-defining node *v*.

In the following, I first discuss cases in line with the hypothesis above; that is, I start with tense-driven suppletion in auxiliaries (section 3.2.1) and cases of tense-driven suppletion which I argue do not constitute examples of suppletion but are reanalysed as cases of readjustment rules (section 3.2.2). Then, I turn to cases which are not immediately predicted in the account here; these divide in two groups: languages where we see evidence that tense is closer to the root than aspect (section 3.2.4) and those that seem truly problematic and lead to the introduction of a weaker version of the hypothesis introduced in (196) above (sections 3.2.6 and 3.2.5).

3.2.1 Auxiliaries

In this section, I discuss the main configuration where we expect tense-driven suppletion to occur: auxiliaries (208), which I assume to have the structure below:

(210)

```
      /\
     /  \
    /\   T
  Aux  Asp
```
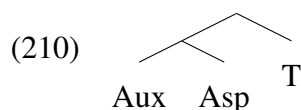
Here, I am assuming, fairly uncontroversially, that copulas are functional verbs.[6] In addition, as a quick evaluative tool, I assume a verb qualifies as functional if it is explicitly referred to as such in the grammar description and/or when it is semantically bleached and used as a 'support' for hosting aspectual, tense or mood information not on the main verb; e.g. 'HAVE + V' creates a perfect in English, and I then consider that suggestive of HAVE being an auxiliary.

This raises the question of what happens when such auxiliary verbs are used in a lexical capacity, as in *My husband has bushy eyebrows*. If this use of *have* is truly lexical, then under the current account it is predicted that this might lead to such verbs showing more permissive suppletion in their functional use as opposed to more restricted suppletion patterns in their lexical use.

However, I have not seen a verb with this distribution; indeed consider data from Suena (Wilson 1974), discussed in more detail below, where the verb 'to go' is suppletive in the context of tense. It has an auxiliary use, which, as such, does not cause a problem for the analysis here. However, when the verb is not used as an auxiliary, but rather stands alone as an apparent lexical verb, it remains suppletive (the root is in boldface):

(211)   pot-a-na **bayamuno**-ya

      'When I give it he will go.' (Future)

(212)   pot-e-na **susaw**-ia

      'I gave it and he is going.' (Present)

---

[6]For more discussion on what constitutes an auxiliary versus a light verb versus a lexical verb, see Butt (2003, 2006), Seiss (2009).

(213)   pat-i-na **bamu**-nua

'When I gave it he went.' (Remote past)

If, in non-auxiliary usage, the verb 'to go' has a full lexical structure, then we seem to encounter a problem, since tense information should be too far away to be a possible context for suppletion, since Asp closes off the Accessibility Domain:

(214)
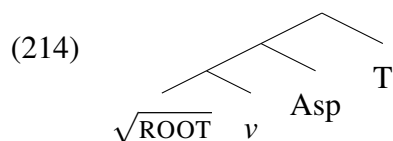
However, since patterns where suppletive auxiliaries are non-suppletive when used in non-auxiliary use are unattested, this could be taken as indicative of a restriction whereby verbs in a language do not instantiate both true functional and true lexical structures in a language.

Below, I offer two possible explanations as to why we do not see more restrictive suppletion patterns of auxiliaries when these are in non-auxiliary use. Firstly, it is not the case that when 'to go' is not used as an auxiliary it is necessarily being used as a full lexical verb; rather, it could well be the case that it is a light verb in these instances. Indeed, Newell (2008) argues that light verbs are category-defining nodes; if this is correct, and the verb in the Suena examples above is in v, then T is accessible to contextual allomorphy of v (see also note 2).

Secondly, we could posit that a verb that is functional in a language does not combine with lexical structure. Instead, the apparent lexical meaning then comes from the conceptual meaning of the root, and this meaning is overwritten/bleached when the verb is being used as an auxiliary. That is, verbs that have functional usage never combine with v and

the lexical use is not truly lexical, but rather reflects the fact that it is not being used as an auxiliary.

In sum, though at this stage I do not commit to either view, I take it to be meaningful that we never seem to observe verbs that have a less restrictive suppletion pattern in their auxiliary use and a more restrictive suppletion in their non-auxiliary use, and assume that verbs in a language do not instantiate both true functional and true lexical structures in a language.

In the following sections, I first discuss the clear case of Lezgian, where we see aspect-driven root-suppletion in lexical material, and tense-driven suppletion in functional material as an example of canonical suppletion in auxiliaries. After that, I discuss some additional languages that show tense-driven suppletion of functional verbs, but that, in addition, have interesting properties, such as the relation between suppletion and defective paradigms (Mundari), interactions with linearity (Khoekhoe), two complicated suppletion paradigms (Hunzib, Turkana), and the case of Suena where verbs that would prototypically be lexical nonetheless supplete for tense.

Lezgian   As discussed in section 3.1 above, we saw that Lezgian displays suppletion for aspect in lexical verbs. However, Lezgian has further suppletion for tense; whilst this seems to violate the claim here that a language cannot have tense suppletion when it also makes aspectual distinctions, the particular verb that shows tense-driven suppletion in Lezgian happens to be the copula; consider the data below:

(215)

	AFFIRMATIVE	NEGATIVE
PRESENT	ja	tuš
PAST	tir	tuš-ir
CONVERB	ja-z	tuš-iz
PARTICIPLE	tir	tuš-ir

The suppletion pattern of the affirmative form of the copula is captured by the following VI-rules:

(216)   BE   ⇔   tir / __] T$_{[PAST]}$]

   BE   ⇔   ja

Crucially, since the copula has an auxiliary structure and, as such, lacks a category-defining node, tense falls within the AD and both rules in (216) are legitimate grammatical items.

In the negative forms, given the clear use of tense morphology, it seems reasonable to treat the form *tuš* as a portmanteau realisation of BE + NEG. Indeed, this is supported by taking into account the form of the local copula *awa*, where there is no portmanteau formed between BE + NEG (nor is there suppletion for this form):

(217)

	AFFIRMATIVE	NEGATIVE
PRESENT	awa	awa-č
PAST	awa-j	awa-č-ir
CONVERB	awa-z	awa-č-iz
PARTICIPLE	awa-j	awa-č-ir

Mundari   In Mundari (Osada 1992), there are two forms for 'to be', *mena ʔ* is an existential copula, and *tan* is an identity copula (Osada 1992, 118).[7] Both of these only surface as such in the present, and in the past they display a suppletive variant which comes from the verb *tai* 'to stay'.

(218)   mena ʔ-   be.PRES

         tai-   be.PAST

(219)   tan   be.PRES

         tai-   be.PAST

(220)   tai   to stay

Defective paradigms, such as the ones for 'to be' in Mundari, raise questions about the relation between suppletion and defective paradigms of this sort.[8] One could argue in favour of a neutralisation view; that is, in the relevant forms of 'to be' (*tai-*), the difference between 'to be' and 'to stay' is erased. Neutralisation could occur at the level of the morpho-syntax where we could posit a rule where 'to be' becomes 'to stay' in the context of the past:[9]

(221)   BE → STAY / ___] T$_{[PAST]}$]

Under this view, whatever features constitute Mundari 'to be' are replaced by whatever features constitute 'to stay'. However, this seems a very arbitrary type of rule, and it does not seem clear how we could restrict its power.

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[7]Osada (1992, 120) notes that "the identity copula *tan* may be related to the progressive aspect marker *ta*."

[8]See also note 9 in chapter 2 above.

[9]For the sake of simplification, I do not represent 'to stay' here as a lexical root.

Alternatively, one could argue that the relation between 'to be' and 'to stay' in Mundari involves a subset or superset of features. Specifically, it could be the case that the present of 'to be' contains the characteristics of 'to stay' plus some other feature F, whilst in the past F is not present:

(222) BE.PRES = {STAY, F}

BE.PAST = STAY

We could either reach this contrast by assuming bleaching (or impoverishment) of F in the past, or by a diacritic specification on 'to be' in the present.[10]

Finally, one could assume that 'to stay' is extremely impoverished in meaning and, thus, if anything is absent from the specification this is interpreted as STAY. This, then, would be similar to 'dummy do' in English, where 'do' is inserted if a verb is not specified for further content.

However, such neutralisation, as can be seen above, is not formalised by using VI-rules. Nonetheless, from the material investigated here it seems that the locality restrictions for this type of neutralisation is the same as that of contextual allomorphy. Thus, it is the case that either (i) defective paradigms should be formalised as contextual allomorphy, or (ii) both defective paradigms and contextual allomorphy are subject to the same locality restrictions.

At this stage, for simplicity's sake, I choose to use the former representation. However, it might well be the case that (at least) this type of defective paradigms are subject to the same locality restrictions as identified for contextual allomorphy; an investigation

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[10]Note that BE.PAST = STAY is slightly different from BE → STAY / ___ [PAST] in that in the latter rule 'to be' necessarily changes into 'to stay', whilst in the former formulation it is not necessarily the case that a change of any sort occurs.

into lexical semantics and the historical linguistics of the relevant languages might reveal whether defective paradigms as in (218-219) should be analysed as contextual allomorphy or neutralisation.

Having established that I will formalise defective paradigms as contextual allomorphy, let us turn back to the analysis of the data in (218-219). Mundari displays a variety of aspectual markers (AM) (Osada 1992, 94ff). The following perfective markers can be identified: *-a, -ke, -le* and *-ja*; and the following imperfective markers are seen: *-ta* and *-aka*. Furthermore, Mundari has two transitivity markers (ITM) (*-n* and *-d*) which, together with aspect, serve as the identification of tense distinctions in the language.[11] In the absence of a transitivity marker, the verb form is in the future, and in the presence of a transitivity marker the distinction between present and past is made by the combination of aspect and transitivity markers. In the table below, the first morpheme is the aspectual marker and the second morpheme is the transitivity marker.

(223) Present | -ta-n, -ja-d, -aka-n

  Past | -ta-d, -ja-n, -aka-d, -le-n, -ke-n, -ke-d, -a-n, -a-d

Returning to the suppletive variants, we observe the following pairs in present, past and future for the existential copula:

(224) Soma oṛaʔ -re **menaʔ** -i   -a
  Soma house -in COP   -3SG -Predicator
  'Soma is in the house.'

(225) Soma oṛaʔ -re -ʔ   **tai** -ke -n   -a
  Soma house -in -3SG COP -AM -ITM -Predicator
  'Soma was in the house.'

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[11]In addition to transitive constructions being able to incorporate object pronominals, whilst intransitives cannot.

(226) Soma -eʔ **tai** -n   -a
       Soma -3SG COP -ITM -Predicator
       'It is going to be Soma who will be there.' (or: 'Soma will be there.')

Similarly, in the identity copula we see the same pattern:

(227) Soma **tan** -iʔ
       Soma COP -3SG
       'It is Soma.'

(228) Soma -eʔ **tai** -ke -n
       Soma -3SG COP -AM -ITM
       'It was Soma.' (or: 'Soma was there.')

(229) Soma -eʔ **tai** -n   -a
       Soma -3SG COP -ITM -Predicator
       'Soma will be there.' (or: 'It is going to be Soma who will be there.')

Note that in the present forms of 'to be' there is no AM or ITM present. This is in contrast with the present being marked by the complex of AM and ITM (see (223) above), as for instance in the following sentence (Osada 1992, 99):

(230) jilu -ñ   jom -ta -n   -a
       meat -1SG eat -AM -ITM -Predicator
       'I am eating the meat.'

However, in (224) and (227) we do not see any marking of an AM or ITM. Thus, we can say that in these cases AM and ITM is absent, creating an impoverished structure.[12] Then we could say that the suppletive forms *menaʔ* and *tan* occur in the context of agreement (with conflation of the two types of the verb 'to be' in the non-present):

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[12]Additional support for the absence of AM and ITM in the present construction of the copula comes from the negation of existential be, *menaʔ* (copula in boldface; adapted from Osada (1992, 119-120):

  i. Soma oṛaʔ -re **baŋ**   -gaʔi -i   -a
     Soma house -in COP.NEG.[+ANIMATE] -3SG -3SG -Predicator
     'Soma is not in the house.'

(231)   BE (EXISTENTIAL) ⇔ mena^ʔ/ __] Agr]

BE (IDENTITY) ⇔ tan / __] Agr]

BE ⇔ tai

Under this analysis, in the absence of AM and ITM, agreement is adjacent to the suppletive base and thus also falls within the AD.

However, another curious aspect of 'to be' is that the future form is listed as *tai-n* (see (226) and (229)), crucially with an ITM *-n* attached to it, even though generally the future interpretation is achieved by the absence of AM and ITM markers. We see that we then can analyse *tai* as the suppletive variant of 'to be' in the presence of AM or ITM (with conflation of the two types of the verb 'to be'); *mena^ʔ* and *tan* would then be the default realisations.

(232)   BE ⇔ tai / __] {AM, ITM}]

BE (EXISTENTIAL) ⇔ mena^ʔ

BE (IDENTITY) ⇔ tan

---

ii. parkom oṛa^ʔ   -re **bano^ʔ**   -a
    bed   house -in COP.NEG.[-ANIMATE] -Predicator
    'A bed stead is not in the house.'

iii. hon   -ko oṛa^ʔ   -re **baŋ**   -ko   -a
    child -PL house -in COP.NEG.[+ANIMATE] -3PL -Predicator
    'Children are not in the house.'

Again, we see that these forms lack AM or ITM (no examples of negation in non-present tense are given). Note that identity be *tan* is regularly formed by the negative marker *ka* before the verb (Osada 1992, 120):

iv. Soma ka   **tan** -i^ʔ
    Soma NEG COP -3SG
    'It is not Soma.'

Also under this analysis, the trigger of suppletion, AM and/or ITM, is adjacent to the suppletive base and thus also falls within the AD.

Given the peculiarity of *tai-n* seemingly being the only future form that takes an ITM, the latter analysis might be preferred.[13]

Hunzib   Next, consider data from Hunzib (van den Berg 1995). I assume that in Hunzib the aorist and/or preterite form involve an aspectual specification thus classifying it as an Asp-containing language.[14] Thus, Hunzib represents a case of tense-driven suppletion in a language that encodes both aspect and tense, but the tense-driven suppletion is crucially observed in functional material. Now, consider the suppletion observed in *zuq'u* 'to be' (van den Berg 1995, 99-101):

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[13]Negation in the copula shows additional suppletive bases and does not disambiguate between the two proposed analyses (see note above).

[14]However, it should be noted that whether or not there is Asp in Hunzib is irrelevant for the predictions here that T-driven suppletion is a possibility.

(233) lo, li   be.PRES

       lid-áč, lod-áč   be-local gerund

       lid-ér.u, lod-ér.u   be-present participle

       lid-áƛ', lod-áƛ'   be-if ever

       lít-t'o.n, lót-t'on   be-concessive

       lít-sə, lót-sə   be-while being

       zúq'u-r   be-PRET

       zúq'u-n   be-past gerund

       zuq'ú-r.u   be-past participle

       zúq'-oƛ   be-when

       zəǧ-á   be-AOR

       zəǧ-do   be-conditional

       zəǧ-á   be-infinitive

       ɑq-ár, zəǧ-ár   be-FUT

Specifically, according to van den Berg (1995), *zuq'u* 'to be' is suppletive and defective; the suppletive roots are *li, lo* (the *li/lo* alternation depending on the class of the verb) in the present and *zuq'u* in other forms. Then, there are 'missing forms' (defective) which are taken from different verbs: *-aq(u)* 'happen, usually be' or *zəǧ* 'find, appear to be, probably be'. Recall, though, that in the current study, I do not make a distinction between suppletive and defective paradigms, analysing both as contextual allomorphy (see discussion of Mundari above).

Hunzib provides a clear example of the function of *zuq'u* 'to be' as an auxiliary; for instance, in order to form the perfect in Hunzib, the verb combines with the past gerund

suffix *-(V)n* and *lo/li* (van den Berg 1995, 101):

(234) oλu   -l   kağár čax -en   li
      that.OBL -ERG letter.5 write -GER be.5
      '(s)he has written a letter.'

Similarly, we see the following schemas to create temporal constructions (forms of

zuq'u 'to be' are in boldface):

(235)   Perfect   V-GER **lo/li**

        Presumptive perfect   V-GER/PRES **zəğ**

        Pluperfect   V-GER/PRES **zuq'u**-r

        Evidential perfect   V-GER/PRES **zuq'u**-n **lo/li**

        Definite future   V-PRES-GEN **lo/li**

        Imperfect   V-PRES-GEN **zuq'u**-r

        Evidential imperfect   V-PRES-GEN **zuq'u**-n **lo/li**

        Continuous perfect   V-PPT **lo/li**

        Continuous pluperfect   V-PPT **zuq'u**-r

        Continuous evidential perfect   V-PPT **zuq'u**-n **lo/li**

        Imminent[15]   V-INF **lo/li**

Given its use to create compound tenses, I assume *zuq'u* 'to be' to be an auxiliary.

Thus, we see an analysis where suppletion is governed by tense but since it is an auxiliary,

the AD will include both aspect and tense.[16]

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[15]The grammar describes this compound tense as denoting "an action which will happen at the very next moment, which one is preparing to do right away" (van den Berg 1995, 105).

[16]Recall that I assume that the aorist and/or preterite form involve an aspectual specification thus classifying it as an Asp-containing language; however, again, whether or not there is Asp in Hunzib is irrelevant for the predictions here that T-driven suppletion is a possibility.

To paint a complete picture of the paradigm for 'to be', it is worth taking the negative form into account; Van den Berg (1995, 100) lists the negative counterparts of (some of) the forms of 'to be' as follows:

(236) gɑč'   be.NEG.PRES

      gáy-lčo   be-NEG.local gerund

      gá-s.u   be-NEG.present participle

      gáy-lƛ'o   be-NEG.if ever

      gač'-ído.n   be-NEG.concessive

      zuq'-ís   be-NEG.PRET

      zuq'-ít'(o)   be-NEG.past gerund

      zuq'-ís.u   be-NEG.past participle

      zuq'-íƛ, gáč'-oƛ   be-NEG.when

Although there is a regular negative suffix *-át'* in the present of regular verbs, it is absent in the other forms, and seems not to be observed in any of the negative forms of 'to be'. Negation is mainly encoded by regular tense suffixes that are specific to the negative paradigm.

What we see is that the same base, *zuq'(u)*, is used in past constructions, irrespective of whether the form is positive or negative; note, however, that we cannot say that the two are neutralised in the past and [NEG] is deleted, since then we cannot account for the specific negative tense morphology that is observed. The forms that correspond to *li, lo* in the positive surface with a *ga(y)* base in the negative. Unfortunately, no negative forms with the *zəğ* base are listed.

As to the specific VI-rules, I assume that *li, lo* is the elsewhere realization of 'to be';

thus, we observe the following VI-rules:

(237)   BE ⇔ gɑ(y) / ___] Neg] T$_{[PRES]}$]

   BE ⇔ zuq'(u) / ___] T$_{[PAST]}$]

   BE ⇔ zəǧ / ___] {aorist, conditional, infinitive}

   BE ⇔ li, lo

I assume, purely descriptively, that the aorist, conditional and infinitive are marked as contexts where the form *zəǧ* is used. The past form *zuq'(u)* is used in the preterite, past gerund, past participle and when-construction. Finally, I suggest that the default form is *li, lo*, which encompasses the present, local gerund, present participle, concessive, if ever- and while being-constructions. Since the verb is an auxiliary (shown by its usage as such above), the suppletion for tense in the presence of [NEG] does not cause a problem; in the absence of a category defining node, both tense and [NEG] are accessible to the base.[17]

The important point to take away from all of this is that, as an auxiliary verb, the Accessibility Domain causes tense to be accessible to the root, and able to govern suppletion.

Khoekhoe   In Khoekhoe the copula 'to be' displays suppletion (Hagman 1977, 83):

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[17]Alternatively, we can assume an analysis where *zuq'(u)* is the elsewhere realization; empirically, the two analyses make no difference, but the VI-rules form less of a natural class. For instance, there needs to be a rule of suppletion that groups {present, local gerund, present participle, concessive, if-ever, while-being together}, whereas in (237), this rule is replaced by one that makes reference only to the context of T$_{[PAST]}$:

i. BE ⇔ gɑ(y) / ___] Neg] T$_{[PRES]}$]
    BE ⇔ zəǧ / ___] {aorist, conditional, infinitive}
    BE ⇔ li, lo / ___] {present, local gerund, present participle, concessive, if-ever, while-being}
    BE ⇔ zuq'(u)

(238)   'ií   be.REMOTE PAST

        'ií   be.RECENT PAST

        'a   be.PRES

        ∅   be.FUT

        ∅   be.INDEFINITE

Given that it is a copula it is another example in line with the prediction that auxiliaries can display tense-driven suppletion (208).[18] However, there are a few peculiarities of Khoekhoe, worthy of further mention.

Let us first consider the template of an active verb phrase in Khoekhoe (adjusted from Hagman 1997, 64):

(239)   (NP) + (NP) + T + (Imp) + V + (Perf)

Though only an Imp(erfective) slot is given, Khoekhoe distinguishes punctual, perfective and imperfective aspect. With regard to tense, there are five types, shown below with their exponents:

(240)   remote past   kè

        recent past   kò

        present   ∅

        future   nìí

        indefinite   kà

Turning to the stative verb phrase structure, we see that it includes the copula 'to be' (Hagman 1977, 82):

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[18]Interestingly, Hagman (1977, 83) mentions that "[i]n some older texts of the language, *'ií* is found with the future and indefinite tenses, i.e., with all tenses except the present."

(241)   T + (predicate) + Copula

Returning to the suppletive paradigm we see the configurations in (242), where in all but the present tense, a tense morpheme precedes the predicate and the copula occurs after the predicate; in the present tense, we see that the copula precedes the predicate and no overt tense morpheme is observed.

(242)

remote past	kè	(pred)	’ií
recent past	kò	(pred)	’ií
present	’a	(pred)	
future	nìí	(pred)	∅
indefinite	kà	(pred)	∅

To illustrate the patterns in (242), sentences with the predicate *!ái* 'good' are realised as follows, in the remote past, present and future (adapted from Hagman (1977, 83):

(243)   ... kè   !ái   ’ií
         REMOTE PAST good be.PAST
         '...was good.'

(244)   ... ’a   !ái
         be.PRES good
         '...is good.'

(245)   ... nìí !ái
         FUT good
         '...will be good.'

In these data, we observe a few peculiarities: (i) in the past tense, we see T-driven suppletion of the copula with a linearly intervening element; (ii) in the present, which is normally null ∅ (see (240) above), the position occupied normally by T is realized as *’a*

when the position occupied normally by the copula is null; and (iii) suppletion seems to occur across 'words'.

With regard to (i), in the current approach, a linearly intervening element is not an issue given that I have rejected the adjacency hypothesis (see section 2.5). Furthermore, given that we are dealing here with functional material, a contextual allomorphy trigger is not limited to the Accessibility Domain identified in lexical material.

As to (ii), Hagman (1977, 83) analyses *'a* as a [tense-copula] portmanteau; however, under this approach, though possible, it is coincidental that it is only in the present that a portmanteau is formed. An alternative would be to regard the tense morphemes and copula as elements that integrate into a morphological word (see also below); we then see that *'a* in the present in (242) is simply a case of the copula being realised as a prefix rather than a suffix. Indeed, a potential motivation for why it is observed as a prefix only in the present tense is that in Khoekhoe preference might given to the prefixal slot, which, as opposed to the other tenses, is available in the present tense. This could be enforced by a peninitial requirement on the predicate (see Arregi & Nevins 2012 for discussion on such a requirement in Basque). Under this view, we account for the observation that *'a* surfaces only when T is $\emptyset$.

Finally, turning to (iii), we see that T, the predicate and the copula are written separately. Though Hagman (1977) identifies three types of morphological units, 'roots', 'particles' and 'suffixes', in Khoekhoe, these are entirely distinguished by virtue of their phonological shape. The class of roots contains morphemes that have two (or, rarely, three or more) morae. Thus, though roots include all morphemes that are are more "lexical" in nature, there are also a few that are "grammatical." The difference between particles

and suffixes is that the former are free forms and have one mora, whereas the latter are bound and have one mora or none. That the classification is purely phonological is seen in for instance the tense morphemes (238): the future tense morpheme (*nìí*) is classified as a 'root', but all others belong to the class of 'particles'. Thus, though (most) tense morphemes and the copula 'to be' are classified as particles, this does not seem to indicate their morphological status.

This is relevant for the following reason: Bobaljik (2012) and Bobaljik & Harley (2013) argue that suppletion is restricted to occur within a maximal projection:

(246)   Locality:

   β may condition α in (a), not (b):

   a. $\alpha...]_{X^0}...\beta$

   b. *$\alpha...]_{XP}...\beta$

Thus, if their claim is correct, T and the copula in Khoekhoe must all be located within a maximal projection. However, we then run into a problem if we assume the standardly assumed structure of predicates (den Dikken 2007) given below, where X is the linker head that gets realised by the copula:

(247) TP

```
        TP
       /  \
          T'
         /  \
        T    XP
            /  \
      subject   X'
               /  \
         predicate  X
```
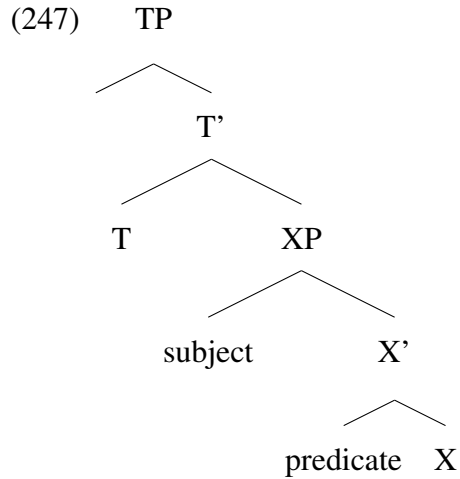
If Bobaljik (2012) and Bobaljik & Harley (2013) are correct and Khoekhoe predicates have the structure in (247), then we run into a problem: in order for the copula (X) to be suppletive in the context of T, the copula and T cannot split by a maximal projection, but in the structure in (247), a maximal projection does intervene: XP.

Since this is not the main focus of this study, I will not attempt an answer to this conundrum here, and only point out that Khoekhoe might potentially be problematic for an approach that restricts suppletion to occur within a maximal projection.

Leaving this issue aside, below I give the relevant Khoekhoe VI-rules for the data discussed here (248):

(248) BE $\Leftrightarrow$ -'ií / __] T$_{[\text{PAST}]}$]

BE $\Leftrightarrow$ $\emptyset$ / __] T$_{[\text{FUT}],[\text{IND}]}$]

T$_{[\text{REMOTE PAST}]}$ $\Leftrightarrow$ kè-

T$_{[\text{RECENT PAST}]}$ $\Leftrightarrow$ kò-

T$_{[\text{FUT}]}$ $\Leftrightarrow$ nìí-

T$_{[\text{INDEFINITE}]}$ $\Leftrightarrow$ kà-

BE $\Leftrightarrow$ 'a-

T $\Leftrightarrow \emptyset$

To return to the main concern in this chapter, though, Khoekhoe displays tense-driven suppletion in the verb 'to be' but this is in line with the locality restrictions identified here since it is an auxiliary. Furthermore, it constitutes an additional case of linear adjacency not being a restrictor on contextual allomorphy.

Turkana The copula 'to be somewhere, to have' shows suppletion in Turkana (Dimmendaal 1983). With regard to verbal morphology, person agreement is marked prefixally. In addition, the language distinguishes indicative, conditional, subjunctive, subsecutive, imperative and exclamative mood; only the indicative is not marked by a mood morpheme. With regard to tense, we observe a contrast between past, and present and future; only past is marked with a past tense morpheme. Finally, there is a distinction between perfective and imperfective aspect, both of which can be expressed by particular aspect suffixes. However, Dimmendaal (1991, 284) observes that only dynamic verbs take aspectual suffixes, but stative verbs do not, which suggests that aspect is absent in these forms altogether.

Turning to the pattern that we observe for suppletive 'to be somewhere, to have', we see the following distribution; here I show only (first person) roots (there is no suppletion for person but tones move around) (Dimmendaal 1983, 465-466):[19]

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[19]The form for exclamative mood is not given.

(249)

		SG	PL
Indicative	Past	yè	ya'
	Present	ye	yà ∼ yaka
	Future	mɪn	mɪn ∼ pen
Conditional	Past	yè	ya'
	Present	ye	yà ∼ yaka
	Future	mɪn	mɪn ∼ pen
Subjunctive		yaka	yaka
Subsecutive	Past	ye	yaka
	Present	ye	yaka
	Future	mɪn	pɛn[20]
Imperative		mɪn	pɛn

Thus, we see three roots in (249): *yV(ka)*, *mɪn* and *pen*. The form *mɪn* is observed in the future tenses of the indicative, conditional and the subsecutive, as well as the imperative; *pen* is its plural counterpart; and the remaining forms take *yV(ka)*. Note that as a stative verb, 'to be somewhere, to have' it does not take aspectual morphology.

We can represent the pattern in (249) with VI-rules in (at least) two ways (here I assume that agreement features are visible on T, see section 3.2.6 below for discussion). The first analysis considers *yV(ka)* to be the default:

(250) be somewhere/have ⇔ pen / __] T[FUTURE, PLURAL]]

be somewhere/have ⇔ mɪn / __] T[FUTURE]]

be somewhere/have ⇔ yV(ka)

---

[20]Turkana has ATR vowel harmony, thus *pen* ∼ *pɛn* is a regular alternation.

In addition to these rules, we need to assume that the imperative contains the feature [FUTURE] in order for it to pattern with the suppletive form.

Alternatively, one could analyse the future tense as the literal absence of T (see e.g. Wurmbrand 2014b for a view that future irrealis infinitives are tenseless and involve a modal *woll* instead). We then see that imperative and future pattern together in both lacking T; under that analysis the context of suppletion could be argued to be the presence of T, resulting in the following VI-rules:

(251)   be somewhere/have ⇔ pen / __] T[PLURAL]]

be somewhere/have ⇔ yV(ka) / __] T]

be somewhere/have ⇔ mɪn

Both analyses have the drawbacks: the first one requires imperative to be marked [future], and the second one requires future to be the absolute absence of tense. At this stage, it is unclear which one is to be preferred.

Suena   Veselinova (2006) lists various verbs as being suppletive, according to the description of the language given in Wilson (1974). The verbs in question are 'to be', 'to go', 'to come', 'to say', 'to do' and 'to live'; note that some of these are clear candidates for lexical verbs. Given that they are listed as suppleting for tense, they would constitute a clear counter-example to the hypothesis advocated here if Suena also encodes aspect. Indeed, this seems to be the case; Wilson (1974, 40) lists the following aspectual distinctions in Suena:

(252)   a. *Punctiliar:*

       ma uri-wa
       taro plant.PAST-3.PL
       'They planted taro (once).'

    b. *Short duration:*

       ma uri-noso-wa
       taro plant.PAST-CONT-3.PL
       'They planted taro often.'

    c. *Long duration:*

       ma uri   susau-wa
       taro plant go.PAST-3.PL
       'They planted taro for a long time.'

    d. *Very long duration:*

       ma uri   susaw-iso-wa
       taro plant go.PAST-CONT-3.PL
       'They used to continually plant taro for a long time.'

We can clearly see that aspect is morphologically marked. Thus, the cases where we observe tense-driven root-suppletion would be clear counter-examples. Turning to the suppletive verbs, we observe the following allomorphs Wilson (1974):

(253)   a. se ∼ tona 'say'

    b. we ∼ inona 'do'

    c. noi ∼ nona 'live'

    d. mu ∼ tupena 'come'

    e. bamu ∼ susawena 'go'

Firstly, the verbs in (253a), (253b) and (253d) are listed explicitly in the grammar as functioning as auxiliaries in Suena; Wilson (1974, 34) gives the following list of auxiliaries:

(254)

Simple	gloss	Auxiliary use	gloss
wai	'do'	gitawa wai	'to sleep'
sai	'say'	asio sai	'to sneeze'
mai	'come'	sore mai	'to help'
awai	'rest'	oni awai	'to burp'

Since they are auxiliary verbs in the language, tense suppletion is expected, given that the AD of the verb includes tense information.

Now, let us turn to the verb for 'to go'; the forms on the right in (253) above are present continuative forms, which are marked by the suffix *-(V)na*. Thus, the fact that the context for suppletion is the present tense is shown by looking at the continuative forms, shown in (255), where the seemingly regular base *bam(u)* is realised as *susaw* in the present tense:[21]

(255) a. pot-a-na bayamuno-ya 'When I give it he will go.'

b. pot-e-na susaaw-ia 'I gave it and he is going.'

c. pot-e-na bam-ia 'When I gave it he went (today).'

d. pot-e-na bamu-ta-ya 'When I gave it he want (yesterday).'

e. pot-e-na bamu-s-ia 'When I gave it he want (past).'

f. pot-i-na bamu-nua 'When I gave it he went (remote).'

---

[21]Alternatively, we could say that suppletion is in the context of all non-present tenses, and that the form of the present tense, *susaw* is the default; see also section 5.3.

However, we can also see evidence that, even though it is not listed as such in the grammar, we can analyse 'to go' as a functional verb in Suena. The criterion here for determining functional status of a verb is that a functional verb is used to host tense and/or aspect for another verb. Indeed, *bamu ∼ susawena* is used exactly as such in the language; as we could see in (252) above, repeated here, it indicates duration when combined with another verb:

(256)   a. *Punctiliar:*

      ma uri-wa
      taro plant.PAST-3.PL
      'They planted taro (once).'

   b. *Short duration:*

      ma uri-noso-wa
      taro plant.PAST-CONT-3.PL
      'They planted taro often.'

   c. *Long duration:*

      ma uri   susau-wa
      taro plant go.PAST-3.PL
      'They planted taro for a long time.'

   d. *Very long duration:*

      ma uri   susaw-iso-wa
      taro plant go.PAST-CONT-3.PL
      'They used to continually plant taro for a long time.'

Thus, we see that the verb is being used to host aspectual information that we would otherwise expect to be hosted on the main verb; and moreover, the lexical meaning (motion) appears to be missing. This leads me to conclude that *bam(u) ∼ susawena* is there-

fore used as a functional verb in the language.[22] As such, the Accessibility Domain is large enough to include tense information.

Finally, I do not consider 'to live' in (253) to be suppletive: the alternation *noi* ∼ *nona* does not seem to involve two separate roots; in particular given that *nona* contains the suffix *-(V)na*, making the alternation *noi* ∼ *no*. Thus, the suppletive verbs in Suena do not constitute a counter-example to the predictions here.

3.2.2 Non-suppletion

In this section, I discuss cases that Veselinova lists as showing suppletion; however, I argue that they should not be analysed as such, either by virtue of being reanalysed as readjustment rules, or it being reanalysed as aspect-driven suppletion.

Alamblak First, I will discuss the purportedly suppletive paradigm for *yi* 'to go' in Alamblak (Bruce 1984). Before we continue, a note on the underlying form of *yi* is in order. The verb surfaces as *yi* in various constructions, such as the remote past below:

(257) yi -më -r → [yiměŘ]
    go -REM.PAST -3SG.M
    'He went.'

However, it shows reduction in certain hiatus environments. Consider the structure in (258) where a reduced form *i* surfaces, with, in the phonetic form, [y]-epenthesis to

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[22]This analysis is further supported by the fact that 'to come', which is explicitly listed as an auxiliary by Wilson (1974), is also apparently used to indicate (long) duration:

 i. diga   meni mai dero nonoise i   tupe-we-ra
    heathen Rl   men kill eating   do come-CONT-3.PL
    'The heathen used to cannibalize people and they continue to do so up to the present time.'

resolve hiatus of /ia/. Indeed, whilst allowing for certain hiatus sequences, /y/ epenthesis is a common strategy in Alamblak to resolve hiatus constructions (Bruce 1984, 54ff). In the imperative context in (259) we see that 'to go' is reduced or fused with the preceding vowel (Bruce 1984, 56):

(258) rim -i -ak -n -t → [řimiyákint]
       ELEV- go -get -2SG -3SG.F
       'You went (and) got it in a level movement.'

(259) wa   -i -∅   → ['waⁱ] ∼ ['we]
       IMPER- go -2SG
       'Go!'

Now, if we assume that the underlying form of 'to go' is a pure vowel *i*, the question arises about its distribution in cases such as (257) above. I suggest that [y]-strengthening occurs when the verb occurs word-initially.[23] Hence, I will assume in the following that the form of 'to go' is *i*, rather than *yi*.

In the table below, I now introduce the Alamblak tense and aspect system (Bruce 1984, 133):[24]

(260)

	Remote past	Near past	Immediate past	Present	Future
Perf.	-më	-rë	∅ ∼ f- ∼ -fë ∼ tawë	∅	-rhw ∼ -rah
Impfv.	-më-w	-rë-w	–	-wë ∼ -w	-rhw ∼ -rah

---

[23]At this stage, I assume that this is a rule particular to the verb 'to go' since Alamblak does allow for vowel-initial words; however, I have not found any instance of an [i]-initial word, but [yi] is a fairly common word-initial syllable, as in e.g. *yimatt* 'friend', *yinhi* 'under' and *yire* 'fish'.

[24]Alamblak also encodes agreement on verbs, but that is irrelevant here.

Thus, we identify the following morphemes:

(261)   [perfective] $\Leftrightarrow \emptyset$

      [imperfective] $\Leftrightarrow$ -wë[25]

      [remote past] $\Leftrightarrow$ -më

      [near past] $\Leftrightarrow$ -rë

      [immediate past] $\Leftrightarrow \emptyset \sim$ f- $\sim$ -fë $\sim$ tawë[26]

      [present] $\Leftrightarrow \emptyset$

      [future] $\Leftrightarrow$ -rhw $\sim$ -rah[27]

We see that Alamblak encodes both tense and aspect information (contra Radkevich 2010, 195-6). However, it seems that T is expressed closer to the root than Asp, as seen in forms such as the one below (Bruce 1984, 135):

(262)   dbën -më   -w   -m
       sick -REM.PAST -IMPF -3PL
       'They were being sick.'

Thus, it would not be an issue if we would observe T-driven suppletion, given that T would fall within the AD by virtue of being one node up from category-defining *v* (see also section 3.2.4).

Let us, however, finally turn to the paradigm for *i* 'go'; below I give the surface forms (Bruce 1984, 146):[28]

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[25]The *-wë* $\sim$ *-w* alternation is phonologically conditioned with *-w* occurring when the adjacent vowel is 'w' or 'y', and *-wë* elsewhere.

[26]The allomorphy of the immediate past morpheme depends on verb conjugations.

[27]The allomorphy of the future tense is morphologically conditioned: *-rhw* occurs before 1S person-number marker *-a(n)*, or the presupposition marker *-a*, and *-rah* is observed elsewhere (see also discussion below).

[28]Note that I assume a decomposition in line with Bruce (1984) presented in (260) above, which is

(263)

Remote past	Near past	Immediate past	Present	Future
yi-më	rië	yifi	kit-wë	(yi)riah

Whilst the remote past and immediate past contain the root *i-* (with word-initial [y]-strengthening), we seem to observe a different root in the present, *kit*, as well as in the near past (*rië*).

Leaving aside the present form *kit* for the moment, let us take a closer look at the allegedly suppletive variant in the near past. Both Veselinova (2006, 66) and Radkevich (2010, 196) assume that the near past as well as the future form are suppletive, and they cite *riah* rather than *(yi)riah* for 'go.FUT.' However, I will I argue below that *rië* and *riah* result from a readjustment rule rather than being suppletive. I will return to the optional presence of *yi* in the future form.

Specifically, it is striking that both the near past morpheme and the future morpheme are /r/-initial (see (261) above), and, as alluded to by Bruce (1984, 145-146), I propose that the combination *i-r* is metathesised to *ri*, thus we see the following for *rië* 'go.NEAR PAST' and *riah* 'go.FUTURE', respectively:[29]

(264)   i-rë → rië

(265)   i-rah → riah

Note that the alternation between *riah* and *yiriah* is naturally accounted for by assuming that metathesis is copy and deletion (Harris & Halle 2005; see also Moskal 2009); thus,

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different from (Veselinova 2006, 66) (and Radkevich (2010) who assumes Veselinova (2006), who actually cites (Bruce 1984, 146) as her source.

[29]Note that we see similar metathesis in the third person singular masculine form (as in (i) below), where we see that a sequence of /ir/ is realised as a palalized voiceless rhotic [Řʸ] (Bruce 1984, 56):

i. a-   i -r   → [áŘʸ]
    HORT- go -3SG.M

riah surfaces when the vowel is copied and consequently deleted (266), whilst *yiriah* surfaces when the vowel is copied but not deleted and triggering word-initial [y]-strengthening (267):

(266)   /irah/

ir**i**ah (vowel copy)

riah (copy deletion)

[riah]

(267)   /irah/

ir**i**ah (vowel copy)

yiriah ([y]-strengthening)

[yiriah]

Indeed, the metathesis analysis is confirmed upon taking into account the allomorphy of the future tense. As noted above in note 27, the allomorphy of the future tense is morphologically conditioned: *-rhw* occurs before 1S person-number marker *-a(n)*, or the presupposition marker *-a*, and *-rah* is observed elsewhere.

Thus, when *i* 'to go' combines with for instance the presupposition marker *-a*, the future allomorph will be *-rhw*. Now, putting everything together we predict that in this case we should observe the following form:

(268)   i-rhw-a → rihwa

This is indeed exactly what we observe according to Bruce (1984, 134). Crucially, an analysis along the lines of Radkevich (2010) that assumes *riah* is a suppletive variant of *i*

'go' which encodes [GO; future] cannot plausibly account for the fact that when the presupposition marker *-a* is added the root changes to *rihw-a*. Below, I give the full paradigm for *i* 'to go' with the presupposition marker *-a* (adapted from Bruce 1984, 134):

(269)

	Remote past	Near past	Immediate past	Present	Future
Perfective	yi-më	rië	yifi	yit-a	–
Imperfective	yi-më-w-a	rië-w-a	–	yit-w-a	rihw-a

Finally, we return to the present form *kit*, see (263) above; the paradigm is repeated here for convenience.

(270)

Remote past	Near past	Immediate past	Present	Future
yi-më	rië	yifi	kit-wë	(yi)riah

Again, this does not seem to be a case of suppletion. Rather, verb conjugations in Alamblak are characterised by certain morpho-phonological changes; these include the prefixation of *f-* in the immediate past tense and diphthongization (Bruce 1984, 143). In addition, there is a regular process where the root-initial consonant alternates in the past (*f*), present (*k*), and future (*y*) tense; thus we see the following regular verb alternations in 'to fell' and 'to get', conjugation class III and IV, respectively (Bruce 1984, 144):

(271)

	Remote past	Near past	Immediate past	Present	Future
'fell'	foh-më	foh-rë	foh	koh-wë	yoh-rah
'get'	fak-më	fak-rë	fayk	kayk-wë	yak-rah

Thus, we see that there is a regular process where /k/ is associated with the present, thus accounting for its presence in the present form of 'to go'.[30]

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[30]Given that the root-initial consonant is affected, it seems like a prefix; indeed consider the following

In addition, (Bruce 1984, 145) cites that irregular conjugation class II is associated with a process where vowel-final roots undergo the following morpho-phonological rules:

(272)   V → Vy/ immediate past

V → it/ present tense

V → i/ future tense

Thus, we see the following paradigm for 'to swim' (Bruce 1984, 145):

(273)

	Remote past	Near past	Immediate past	Present	Future
'swim'	fune-më	fune-rë	funey	funit-wë	funi-rah

Assuming that *i* 'to go' is subject to the rule for the present tense replacing the vowel with *it* in the present tense, we now see that the present form for 'to go', really is a combination of various conjugation rules.[31]

Finally, we are left with the immediate past form *yifi* which, while clearly not suppletive, seems irregular. Whilst it does not explain the fact that in *yifi* the labio-dental fricative is not in initial position, it is worth pointing out that one of the morpho-phonological conjugation rules is the prefixation of *f-* in the immediate past tense.

In sum, upon closer scrutiny the purported suppletion in Alamblak does not seem to exist.

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paradigms (Bruce 1984, 146):

i.

	Remote past	Near past	Immediate past	Present	Future
'diswant'	kur-më	kur-rë	fokr	kokr-wë	kur-rah
'burn'	kur-më	kur-rë	fukr	kukr-wë	kur-rah

In these structures it seems that the *f* of the immediate past and the *k* of the present are prefixed to the root. It should be noted that this process seems morphological in nature; that is, it does not seem to be stemming from general phonotactic restrictions on consonant clusters in the language.

[31]I have no idea why the present root is [yit] rather than [kit] in the present of the presupposition marker (see (269) above).

Dani Whilst Veselinova (2006) lists Dani (Bromley 1981) as a language in which the verb 'to go' displays suppletion, I could not find it. The (subclass of the) paradigm for the verb *la=* 'to go' is given below, and is clearly not suppletive (Bromley 1981, 132).

(274)   la=   go.PRES

        la-ka   go-PAST

Kewa Another case listed as tense suppletion in Veselinova (2006) comes from Kewa (Franklin 1971). The relevant verbs are *ipú* 'to come' and *pú* to 'go'; I give a partial paradigm below in (275) and (276), respectively:

(275)   present | ípula   'he is coming'
        past | épaa   'he came recently'
        future | épalia 'he will come'
        remote past| ípisa   'he came sometime ago'
        perfect | épea   'he has come'

(276)   present | púla   'he is going'
        past | púaa   'he went recently'
        future | pália   'he will go'
        remote past| písa   'he went sometime ago'
        perfect | péa   'he has gone'

We can see from the data that the verbal root alternates between *íp* and *ép* for 'to come' and between *pú, pí* and *pé* for 'to go'. Whilst these data are listed as irregularities in Franklin (1971), these data are not the strongest cases of suppletion. Indeed, Franklin

(1971) actually notes that whereas a rule that changes the base from *pú* to *pí/pé* is unmotivated in the language, as is one that changes *íp* to *ép*, once the underlying forms of the base are taken to be *épa* and *púa* for 'to come' and 'to go', respectively, then sound changes that are noted elsewhere in the language explain the transformations: "[o]nce this is done the 'irregularities' are resolved by more regular morphophonemic rules" (Franklin 1971, 59).

In the case of 'to come', a morpho-phonemic rule that changes [e] to [i] is noted as applicable elsewhere (Franklin 1971, 43). Furthermore, with the underlying form as *púa* for 'to go', this places the verb in Class A verbs in the language, which all end in the vowel [a]. Indeed, this class of verbs undergoes a rule which deletes the vowel of the base in the presence of the remote past and perfect. Since, *-ea* is the regular exponent of the perfect, we see that [pu] does not become [pe], but rather the entire vocalic content of the base is deleted, leaving [p], which then combines with [-ea] to produce [péa]. With regard to the remote past, class A verbs are shown to delete the final vowel, and add an epenthetic [i] before the remote past suffix. Thus, there is no [pu] to [pi] readjustment, but again deletion of [ua] followed by [i] epenthesis. Both of these processes can be seen as applying to *áda*, where Franklin (1971, 42) gives the first person singular forms of this verb.[32]

(277) a. ád-e   (1.SG.PF)   deletion of vowel on base

       b. ád[i]-su   (1.SG-REM.PST)   deletion of vowel + [i] epenthesis

It should be noted however, that there is no clear reason stated in the grammar for why the base is *pá* in the future form and not *pú*. I put this aside, since this alone is not sufficient to consider Kewa as showing suppletion.

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[32]For purposes of comparison, the 1.SG.REM.PST form of 'to go' is *písu*, and the 1.SG.PF form is *pé*, both of which involve the regular morphophonemic alternations seen in (277).

3.2.3 Interim summary

So far, in this chapter we have seen that aspect-driven root-suppletion is attested (section 3.1). Furthermore, we have seen that in auxiliaries both aspect-driven and tense-driven suppletion is possible (section 3.2.1). In addition, I have discussed three cases of purported tense-driven suppletion (Alamblak, Dani and Kewa), but I have shown that they do not constitute convincing cases of tense-driven suppletion at all.

Crucially, this is in line with the main predictions identified in (196-197) above, if we take the locality hypotheses identified in the nominal domain (chapter 2) seriously; viz. in functional verbs (auxiliaries) suppletion patterns should not be restricted, but in lexical verbs aspect-driven but not tense-driven (and mood-driven) root-suppletion should be possible.

Below, I first discuss two languages that seem to have a verbal structure where tense is located closer to the root than aspect (section 3.2.4); importantly, these languages display tense-driven suppletion in the presence of aspect, but since T is closer to the root than Asp this is in line with the predictions made here. Finally, in sections 3.2.6 and 3.2.5, I turn to a number of problematic cases of tense-driven root-suppletion that lead us to consider a weakening of the locality hypotheses in the verbal domain.

3.2.4 Root-v-T-Asp

As mentioned above in (209), a particular prediction of the locality hypothesis as proposed here is that tense-driven root-suppletion can occur in the absence of aspect, given that T would then become sufficiently local to the root.

(278)

$$
\begin{array}{ccc}
& & \\
\sqrt{\text{ROOT}} & v & T
\end{array}
$$
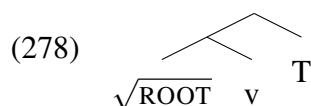
Indeed, on the assumption that if a language does not display any morphological evidence for realising aspect morphologically then that node is not present in the structure, we see that in these languages we get the structure in (278) for verbs, where the root and T are sufficiently close for tense to govern root-suppletion.

At this stage, it is good to explicitly draw a contrast between the consistent absence of a particular category in a language and most analyses discussed in section 2.1.1 (on case-driven root-suppletion) where I argue that the category number is absent in very specific (idiosyncratic) contexts.[33]

Curiously, rather than the absence of aspect in the structure (as in (278)), I found two instances of tense-driven suppletion where we clearly see that aspect is morphologically outside of tense, thus giving the following (surface) structure:

(279)

$$
\begin{array}{cccc}
& & & \\
\sqrt{\text{ROOT}} & v & T & \text{Asp}
\end{array}
$$
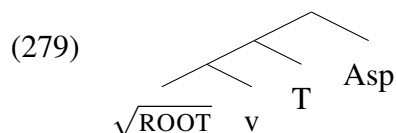
It should be pointed out that this structure seems somewhat problematic from a typological point of view. Julien (2002) argues that cross-linguistically it is overwhelmingly the case that if aspect and tense are both realised synthetically, then aspect precedes tense. Furthermore, if only one of category, aspect or tense, is realised synthetically, and the

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[33]Indeed, I assume that there is a preference to keep nodes intact. Indeed, work on (adjectival) suppletion, Bobaljik (2012), seems to show that the lack of an exponent does not change structural relations; that is, if pruning of (null) CMPR were freely available, then SPRL would be expected to trigger root-suppletion, which is unattested. Thus, pruning seems to be a highly marked configuration; presumably, missing features are derivationally costly, but this falls outside the scope of this dissertation and I leave an investigation into the nature of pruning to future research. See also section 3.2.5.

other periphrastically, then it is aspect which combines with the verb, and tense is the category that is realised periphrastically. Combining these insights with the Mirror Principle of Baker (1985) and an antisymmetric view of syntax has been taken as evidence that T is located in a projection above Asp. However, as shown in data from Fur and Alamblak, we clearly see that the verb forms in those languages show an order where tense precedes aspect. It should be noted here that Julien (2002) does note some counterexamples to her generalizations; however, these usually are configurations in which tense is realised as a suffix and aspect is realised as a prefix (or separate, preverbal word), such as in Adamanese below (Julien 2002, 275):

(280) ḍexo mu-   utthu:w -bo
      PERF 1PLEXCL- come.out -PAST
      'We have come out.'

In these instances, Julien (2002) usually assumes that the apparently preverbal aspect element is not an instantiation of aspect, but rather an adverb which gives an aspectual interpretation. Indeed, she argues that this is the case in Adamanese, showing that adverbs occupy the same position as the apparent perfect marker:

(281) itta:xe ṭa- jiyo -bom
      now   1S- eat -NONPAST.CONT
      'I am eating now.'

However, in the following cases there is no analysis where we can say that the aspectual markers are adverbs, since they are all clearly verbal suffixes.

Another alternative is to consider the aspectual markers clitics and the tense markers suffixes; indeed, given the tendency for clitics to appear at the periphery of words (Zwicky & Pullum 1983) and on the assumption that the peripheral position is also represented

syntactically this would give the observed word order. Unfortunately, the data in each of the grammars where we observe the relevant configuration is too scarce for me to commit to this analysis, so I leave it open. Importantly, though, under a view where the aspectual markers are clitics, tense will be one node up from category-defining *v* and, as such, able to govern root-suppletion.

Thus, irrespective of the status of the aspectual markers as clitics or affixes, under the approach to locality advocated here, we predict tense-driven root-suppletion to become a possibility. In addition, given that Asp is outside of T, we predict that in these languages aspect-driven root-suppletion is not observed. Whilst a detailed study remains to be conducted, it is worth mentioning here that concerning the two languages identified here as having tense closer than aspect, Fur and Alamblak, Veselinova notes only tense-driven and no instances of aspect-driven suppletion.

Fur Veselinova (2006) cites tense-driven suppletion in Fur based on Jakobi (1993) and personal communication. The grammar does not list the tense-driven suppletive verbs, 'to become', 'to come', 'to run' and 'to sit', but Jakovi (1993, 99) states that the verbal morphology is characterised by "the frequent occurrence of suppletion, i.e. of irregular paradigms which are composed of different verbal roots." Thus, for now, I entertain the possibility that there indeed is suppletion for tense in the verbs listed by Veselinova.

Jakobi (1993) states that there are three obligatory elements in the Fur verbal complex: (i) the verbal root, (ii) the person prefix, and (ii) the tense marker. Leaving the person prefix aside, which is irrelevant here, we see that Fur distinguishes three tenses: present, future and perfect. Jakobi (1993) uses the label 'perfect' to refer to the affix which "situates the completed action in the past" (Jakobi 1993, 101), but it should be noted that she mentions

that other authors working on Fur have labelled it as past tense. In addition to these tense specifications, Fur makes an aspectual distinction, where Jakobi (1993, 114) notes the following: "There is a morphologically marked aspect distinction between the completed and the uncompleted action in the past. The completed action is marked by the perfect suffixes, the uncompleted action is marked by the past continuous suffixes." According to the description given by Jakobi, the past continuous aspect is formed with the addition of the suffixes -*ìNì*, which, in all but the third person plural forms alternates with -*à*; following Jakobi (1993), these morphemes are here glossed as 'past continuous'. Curiously, Jakobi writes that these past continuous suffixes are added to a form that includes the present tense marker, which is realised as -*èl*, -*ì* or -*ù*, -*itì* or -∅.

Thus, we see below that the root *šu* 'burn' takes -*èl* as a present tense suffix (282), and in the past continuous form (283-284), both the present tense suffix as well as the past continuous suffix -*ìNì* or -*à* are observed.

(282) šu   -èl
       burn -PRES
       'burns'

(283) šu   -èl   -ìNì
       burn -PRES -PAST CONTINUOUS
       'was burning'

(284) šu   -èl   -à
       burn -PRES -PAST CONTINUOUS
       'was burning'

However, Jakobi (1993, 114) writes that "[i]f the present tense form ends in a vowel, which is the case with the present tense suffixes {-ì}, {-ù} and {-itì}, the final vowel is

deleted before the past continuous suffix is attached. The tone of the deleted vowel spreads to the (first) vowel of the past continuous suffix."

Thus, we see that in a root such as *fùNg* 'to peel', the present tense suffix is marked by *-ù* (285), and in the past continuous constructions (286-287) we see no separate present tense morpheme, given that it is (and thus also ends in) a vowel:

(285) fùNg -ù
       peel -PRES
       'peels'

(286) fùNg -ìNì
       peel -PAST CONTINUOUS
       'was peeling'

(287) fùNg -â
       peel -PAST CONTINUOUS
       'was peeling'

When we look at the data in (282-286) it seems that we only observe the present tense suffix only in one out of five realisations (*-èl*) and that the past continuous suffix *-ìNì* is identical in the forms in (283) and (286), irrespective of whether the present tense suffix is overt. However, it is the form in (287) that shows that the present tense morpheme survives in the past continuous: we observe that the past continuous suffix *-à* is realised with an additional tone as [â], which it, according to Jakobi's description, inherits from the present suffix.[34]

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[34]Jakobi (1993, 114-115) notes a third past continuous suffix, but is inconsistent in her description of it. In the first mention of this suffix it carries a tone on each vowel, *-òlà*, however in the second mention it is described as *-olà*. The second mention includes a handful of examples which again show *-olà*, and she writes that this suffix is unproductive and that "[i]t occurs in the perfect and subjunctive forms of some verbs which have a lexically determined iterative or repetitive meaning." It is unclear whether this means that it is exclusively used in these contexts, and, as such, not used in the past continuous.

If we are to believe Jakobi's analysis of the language, we clearly see that aspect in Fur is located outside of tense: the present tense suffixes *-èl*, *-ì* or *-ù* and *-itì* are located closer to the base than the past continuous suffixes *-ìNì* and *-à*. To the extent that we would consider the continuous suffix an instance of aspect, then we have to conclude that Fur has the structure below:

(288)
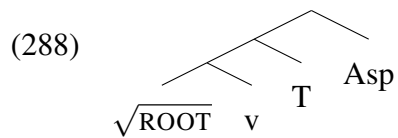
Thus, we see that although there is an aspectual node, tense is closer to the root, and therefore constituting a case where we see the configuration $[[\sqrt{\text{ROOT}}\ v]\ T]$. Crucially, in this structure T is one node up from category-defining *v*, and thus falls within the AD to govern root-suppletion.

Alamblak   The other case that I have seen where tense is located inside aspect is from Alamblak. Since Alamblak is not considered suppletion (see section 3.2.2 for extensive discussion as to why we should not consider the alternations suppletive), I do not go into much detail here. However, note the following table of verbal affixes:

(289)

	Remote past	Near past	Immediate past	Present	Future
Perf.	-më	-rë	$\emptyset \sim$ f- $\sim$ -fë $\sim$ tawë	$\emptyset$	-rhw $\sim$ -rah
Impfv.	-më-w	-rë-w	–	-wë $\sim$ -w	-rhw $\sim$ -rah

Importantly, note the alternation between, on the one hand, the perfective remote/near past, and, on the other hand, the imperfective remote/near past. We again clearly see that

the imperfective suffix *-w* lies outside the *-më* suffix, showing that aspect lies outside of tense in this language.

In sum, in this section I have shown three languages where we see that tense suffixes are closer to the root than aspect suffixes. This morpheme order is contrary to what is predicted to be possible according to Julien (2002), where it is argued that aspect is universally closer to the verb root than tense. However, as mentioned above, there is not enough information about these languages to make any concrete claims about why aspect should lie outside of tense in these situations. I suggested above that a possible analysis would be to regard the aspectual markers as clitics rather than affixes, in which case their more peripheral order would be accounted for.

However, the crucial point here is that tense driven suppletion is possible in languages where tense is the first node above the category-defining node, even if aspect is also present in the structure. Note, as discussed in section 2.5, that I assume that suppletion for tense does not become possible due to the adjacent nature of tense in these languages; rather, I argue that tense-driven root-suppletion is possible in these configurations because tense lies within the Accessibility Domain of the root:

(290)

√ROOT v T Asp
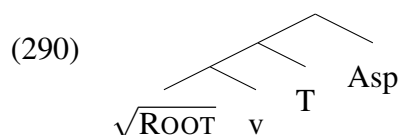
3.2.5 Weak hypothesis

Throughout this chapter, I have assumed the strong hypothesis that in the verbal domain, root-suppletion in the context of tense should not be possible if aspect is present in the structure. Thus, tense-driven root-suppletion should not be possible in a language that

encodes aspect, unless the verb is functional in nature and thus is not subject to the Accessibility Domain induced by category-defining nodes.

On the sample of Veselinova's languages that I have looked at, this seems by and large to be the case. A large number of languages allow for tense-driven suppletion in copular verbs (e.g. Hunzib, Khoekhoe), as well as other types of auxiliaries (Suena). Three languages were argued not to involve suppletion at all: Alamblak, Dani and Kewa. Finally, there were certain languages where tense was argued to fall within the Accessibility Domain. For Fur (and Alamblak), I argued that, if aspect is present at all in the language, it is located outside of tense.

However, here I discuss an alternative to the strong hypothesis that tense-driven root-suppletion should be unattested by weakening the proposal by including (early) syntactic fusion of tense and aspect. At the end of the section, I include a brief discussion that weakening the proposal for the verbal domain does not necessarily lead to weakening the nominal domain, thus still allowing for a restrictive account of the suppletion patterns identified in the previous chapter.

English An analysis that allows tense-driven root-suppletion which crucially relies on Asp not being present in the relevant construction is also reminiscent of the well-known alternation *go/went* in English.[35] English encode aspect in the language in the form of continuation, as can be seen in (291-292), and thus would constitute a case of tense-driven root-suppletion across aspect, since the distinction is made in some constructions.

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[35]Note that Embick (2010) assumes that *go* in English is not lexical but functional; under this view, tense-driven suppletion would not be a problem since we are dealing with functional material that is not restricted by an AD induced by a category-defining node.

(291) I laughed at my husband.

(292) I was laugh**ing** at my husband.

However, it is worth pointing out that we can draw on the observation that in English tense and aspect generally do not co-occur, and that we only have Asp in the structure when we see an aspectual suffix. Indeed, English never shows tense and aspect on the same morphological word: whenever the aspectual suffixes are seen, the verb does not combine with T and tense must be realised periphrastically on an auxiliary, which is clearly separated from the verb, *was* in (292). Further support for this analysis comes from the observation that whenever there is an aspectual suffix, we correctly predict tense-driven suppletion to fail, since it would be blocked by intervening Asp:

(293) I went to the Lake District to get married.

(294) I was going to the Lake District to get married.

(295) *I wenting to the Lake District to get married.

However, at least for English, there is an alternative analysis which is supported by independent evidence (Bobaljik & Thráinsson 1998, Radkevich 2010). If we assume that a language bundles verbal heads within the syntax, such that all verbal heads are contained under the same node, then tense would then be brought into the Accessibility Domain, since it lies within the first node above the category defining node *v*. As such, tense-driven root-suppletion becomes a possibility.

(296)
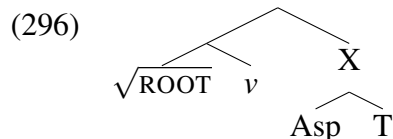
Such bundling has been proposed by Bobaljik & Thráinsson (1998) for English, in order to explain certain differences between English and Icelandic. Bobaljik & Thráinsson argue that languages differ in whether they express tense and aspect on separate nodes or that they are fused (as in (296) above); specifically, languages that do have two separate nodes syntactically have a range of functional heads between V and T allowing for more landing sites for object shift compared to languages that bundle Asp and T. This is relevant for the present purposes, because if a language merges Asp and T within the syntax, then they are bundled at the point of VI without this bundling being purely motivated by the morphology; rather, there are two independent reasons to assume the structure in (296) for English: one morphological (suppletion) and the other syntactic (fewer landing sites for object shift).

As mentioned above, the structure in (296) allows for T to condition root-suppletion in the presence of Asp, and, indeed, Radkevich (2010) takes exactly this approach: she proposes that in languages where tense and aspect are never expressed simultaneously this is evidence that Asp and T are bundled within the syntax.

Alternatively, we could assume that when tense and aspect do not co-occur there is no aspectual node in the structure at all. Whilst this does not seem to be problematic in a language like Brahui (discussed below, in section 3.4.1.2) where there is never any evidence of aspectual morphology, it is reasonable to ask whether in languages like English there is bundling of aspect and tense in the relevant configurations.[36]

Before answering that question, it is worth considering the parallel construction in the nominal domain. If syntactic bundling of Asp and T is freely available, then we might

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[36]See also section 3.2.6 where I discuss a potential branching structure containing T and Agr.

make similar predictions in the nominal domain. Indeed, in section 2.1.1 we saw that case-driven root-suppletion was possible when number was missing in the structure. I argued above that there are three explanations for this. In Lak, there were multiple instances of *n* which extended the AD so that K fell within the Accessibility Domain of the root, even when # is in the structure. The other cases, in Archi and Lezgian, were explained on the proposal that # was missing in certain environments. For Archi's *father*, this was the result of the noun being a *singulare tantum*, but for Lezgian and Archi's *child*, I proposed that # was pruned, with the result that K was the node above *n*. As to why pruning (and hence case-driven root-suppletion) is not seen more regularly, I offered the explanation that there was a general preference to keep nodes intact.

Indeed, an alternative explanation would be to say that # and K are bundled within the syntax in these languages. Notably, in these nouns, we did not see K and # co-occurring (hence the appeal to pruning), and, as such, one could say that rather than pruning we see bundling in these languages. Note, that in order to maintain that portmanteau formation is only at the point of VI of the relevant item (see section 2.4), then this bundling would have to be pre-syntactic. Furthermore, rather than the fusion of aspect and tense observed in English which is across-the-board, in these cases bundling would have to occur in individual items.

Given that it would have to be an idiosyncratic marking on individual lexical entires, this, in effect, makes bundling equally powerful as pruning. Indeed, the two operations are very similar: they apply in the same environments, and achieve the same goal. From a conceptual perspective, on the one hand, one may favour bundling over pruning given that it it independently required for whole languages, as argued for by Bobaljik & Thráinsson

(1998) for English. However, on the other hand, one may favour pruning given the scarcity of examples that involve idiosyncratic bundling/pruning; that is, one may well posit, as I have done, that there is a preference to keep nodes intact, but this logic does not hold for bundling. Finally, though at first glance being redundant, it may be the case that in the verbal domain we deal with bundling, but for the nominal domain no parallel to Bobaljik & Thráinsson's has been proposed and we may well have cases of pruning.

Note, though, that whilst this is a theoretical concern, it should be possible to distinguish the two approaches empirically. That is, an investigation into idiosyncratic pruning versus idiosyncratic bundling ought to be researchable: theoretically there should be an empirical difference in features that are lost (pruning) versus features that are retained but combined (bundling).

3.2.6 Potentially problematic cases

In this section, I discuss languages that do encode aspect in the language in general, but do not do so in all environments, raising the same issues as we saw above for English. Thus, these languages run counter to the prediction that tense-driven root-suppletion of lexical verbs should not be attested if aspect is present in a language. However, I discuss possible interpretations of these data that are in line with the hypothesis advocated here, drawing on some insights from section 3.2.5, but acknowledge that more in-depth analyses are required before we can truly adopt them.[37] In this section, I also briefly discuss agreement-driven suppletion.

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[37]In addition, Georgian seems to constitute another case where we observe both aspect-driven and tense-driven suppletion; following Jenny Lee (p.c.), the data below show the root in boldface:

Pipil The first case I will discuss is Pipil (Campbell 1985), which is listed in Veselinova's

survey as displaying tense-driven suppletion. Below I give the paradigm for the suppletive

verb 'to come' (Campbell 1985, 94).[38],[39]

In (297) I give the present paradigm, in (298) the preterite/simple past paradigm,[40] and

	Aorist	Perfect	Present	Future	gloss
i.	da-**li**-a	da-u-**l**-evia	**svam**-s	da-**l**-ev-s	'drink'
	s-**c**-a	mi-u-**c**-i-a	a-**jl**-ev-s	s-**c**-em-s	'give'
	ga-i-**kts**-a	ga-**kts**-eula	**mirbi**-s	ga-i-**kts**-eva	'run'
	kn-a	u-**kn**-ia	**shv**-eb-a	i-**zam**-s	'do'
	tkv-a	u-**tkv**-am-s	**amb**-ob-s	i-**t'q'v**-i-s	'say'
	mo-**vid**-a	mo-**sul**-a	mo-**di**-s	mo-**va**	'come'
	i-**ar**-a	u-**vl**-i-a	dadis	i-**vl**-i-s	'walk'

However, these data came too late for me to provide a full analysis.

[38]I am leaving aside the imperative here, which shares its base with the present form: *xi-wi* 'IMPERATIVE-come' and *xi-wi-kan* 'IMPERATIVE-come-PL' (Campbell 1985, 94).

[39]It should be noted here that Campbell (1985, 140-1) writes that *wi:ts* 'to come', along with *ki:sa* 'to leave' and *-neki* 'to want', "ha[s] a function intermediate between full, main verbs and auxiliaries"; he cites the following examples, but no further explanation is given.

i. yahika   ne urakaneros en realidad wi:ts -et de   chiltiupan, wi:ts -et k-   wi:ka
   therefore the hurricaners in reality   come -PL from Chiltiupan, come -PL 3.SG.PRON.OBJ.- take
   -t e:lu   -t pal ki-   kwa
   -PL roasting ear -PL for 3.SG.PRON.OBJ- eat
   'Therefore the Hurricaner in reality came from Chiltiupan, they came to carry off ears of corn for eating.'

ii. wal-   temu wi:ts
    DIRECTIONAL- come
    'It comes descending.' = 'It's coming down.'

iii. wan mu-   chiw -ki   proponér ke era demás   tay wi:ts -et ki-   chiwa -t
     and REFLEX.- do -PRET. propose that was too much what come -PL 3.SG.PRON.OBJ- do   -PL
     ni:n tik tu-   chan
     here in POSS- town
     'And it was proposed that it was too much which they come to do here in our town.'

Since it does not seem clear to me that this allows for *wi:ts* 'to come' to be analysed as an auxiliary, I do not pursue this any further. Note that if it is a functional item in Pipil, there is no problem for the current approach, since the AD includes both aspect and tense information.

[40]Note that in the plural forms of the simple past, I did not give a gloss for the morpheme *-ke*; I will return to this later.

in (299) the perfect paradigm.[41]

(297)   ni-wi:ts   1.SG-come   'I come, am coming'

        ti-wi:ts   2.SG-come   'you come, are coming'

        wi:ts   come   'he/she/it comes, is coming'

        ti-wi:ts-et   1.PL-come-PL   'we come, are coming'

        an-wi:ts-et   2.PL-come-PL   'you (pl.) come, are coming'

        wi:ts-et   come-PL   'they come, are coming'

(298)   ni-wa:lah   1.SG-come.PAST   'I came'

        ti-wa:lah   2.SG-come.PAST   'you came'

        wa:lah   come.PAST   'he/she/it came'

        ti-wa:lah-ke-t   1.PL-come.PAST-?-PL   'we came'

        an-wa:la:h-ke-t   2.PL-come.PAST-?-PL   'you (pl.) came'

        wa:la:h-ke-t   come.PAST-?-PL   'they came'

(299)   ni-wa:la:h-tuk   1.SG-come.PAST-PERFECT   'I have come'

        ti-wa:la:h-tuk   2.SG-come.PAST-PERFECT   'you have come'

        wa:la:h-tuk   come.PAST-PERFECT   'he/she/it have come'

        ti-wa:la:h-tiwi-t   1.PL-come.PAST-PERFECT.PL-PL   'we have come'

        an-wa:la:h-tiwi-t   2.PL-come.PAST-PERFECT.PL-PL   'you (pl.) have come'

        wa:la:h-tiwi-t   come.PAST-PERFECT.PL-PL   'they have come'

In (297-299), we see what looks like suppletion for (past) tense even though there is

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[41] At this stage, I use a descriptive gloss of the suffix *-tuk* as 'perfect', but below I will argue that this suffix should always be decomposed as *tu-k* 'past.participle-adj' (cf. Campbell 1985, 63). Campbell is somewhat inconsistent in his glosses, sometimes referring to *-tuk* 'perfect', and sometimes decomposing it into *tu-k* 'past participle plus *k*'.

(perfect) aspect in the structure; specifically, the form of the verb changes from *wi:ts* to *wa:la(:)h* in the simple past, but crucially *wa:la(:)h* is the form that is also seen in the perfect. In addition, we see that in Pipil in all paradigms person is marked by a prefix and plural number is realised as a suffix *-(e)t* at the end of the verb. In the simple past, we see the unglossed morpheme *-ke* (see note 40 above); and in the perfect we see an alternation between *tuk* in the singular and *tiwi* in the plural to mark the perfect.

Before we continue, I give a template for the formation of regular verbs in Pipil, which include a paradigm for the present tense, simple past, the perfect, and also the future tense; for clarity, person agreement is shortened to π, and plural agreement given as PL.[42]

(300)

	PRESENT	SIMPLE PAST	PERFECT	FUTURE
1.SG	π-$\sqrt{\text{ROOT}}$	π-$\sqrt{\text{ROOT}}$-k(i)[43]	π-$\sqrt{\text{ROOT}}$-tuk	π-$\sqrt{\text{ROOT}}$-s
2.SG	π-$\sqrt{\text{ROOT}}$	π-$\sqrt{\text{ROOT}}$-k(i)	π-$\sqrt{\text{ROOT}}$-tuk	π-$\sqrt{\text{ROOT}}$-s
3.SG	$\sqrt{\text{ROOT}}$	$\sqrt{\text{ROOT}}$-k(i)	$\sqrt{\text{ROOT}}$-tuk	$\sqrt{\text{ROOT}}$-s
1.PL	π-$\sqrt{\text{ROOT}}$-PL	π-$\sqrt{\text{ROOT}}$-ke-PL	π-$\sqrt{\text{ROOT}}$-tiwi-PL	π-$\sqrt{\text{ROOT}}$-s-ke-PL
2.PL	π-$\sqrt{\text{ROOT}}$-PL	π-$\sqrt{\text{ROOT}}$-ke-PL	π-$\sqrt{\text{ROOT}}$-tiwi-PL	π-$\sqrt{\text{ROOT}}$-s-ke-PL
3.PL	$\sqrt{\text{ROOT}}$-PL	$\sqrt{\text{ROOT}}$-ke-PL	$\sqrt{\text{ROOT}}$-tiwi-PL	$\sqrt{\text{ROOT}}$-s-ke-PL

From the table above, we see that the suffix *-k(i)* represents the simple past in the singular. However, though it also potentially would be represented in the plural by *-ke* this very same morpheme *-ke* resurfaces in the future paradigm in the plural forms, but (i) it does not make any sense to have a past tense morpheme in the future, and (ii) it cannot represent a 'non-present' morpheme since in the future we clearly see the future marker *-s*

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[42]I am only using an abstract template since Campbell (1985) gives no coherent paradigm for a single regular verb form.

[43]The simple past suffix *-k(i)* alternates with $\emptyset$ in all singular forms, depending on verb class but also idiosyncratically within a verb class. With Class I verbs, both *-k(i)* and $\emptyset$ are observed; in Class II, only *-k* is observed; in Class III and IV, the only exponent of simple past is $\emptyset$.

in both the singular and plural. Since it does not seem to be paramount to the discussion here, I leave an analysis of this morpheme for future research.

This leaves us with the perfect markers: *-tuk* in the singular, and *-tiwi* in the plural. Under an analysis that, in the singular, the perfect marker is decomposable into *-tu* which would represent perfect and *-k* which would be the simple past tense morpheme also seen in the the simple past paradigm, we get the structure in (301) below. Note that the position of the perfect is debatable (Iatridou et al. 2001); here, since past tense *-k(i)* and future tense *-s* seem to occupy tense, I here represent perfect on an aspectual node.

(301)

```
              /\
             /  \
            /\   \
           /  \   T
        root  v  Asp[PERF]
```
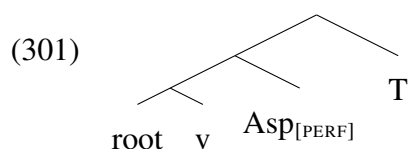
Now, returning to the suppletion data for the verb 'to come' in (297-299), we run into a problem; recall that the suppletive variant *wa:la(:)h* occurs both in the simple past and the perfect, thus seemingly conditioned by the past tense.

Clearly, though, if we assume that Pipil has the structure in (301) then this would be a counter-example to the claims about locality made here. Since Asp is one node above category-defining *v* it is the only node above *v* that should be able to govern suppletion; crucially, tense does not fall within the AD and thus should not be able to be a context for root-suppletion.

Whilst below (in section 3.2.5), I will consider a weakening of the hypothesis that tense-driven root-suppletion should not be attested, there is some reason to believe that we are not dealing with a structure as in (301).

Though the morpheme *-tuk* is glossed here as 'perfect', Campbell indeed already notes that it is actually composed of *-tu-* 'past participle' + *-k*, whose synchronic status is not

noted.[44] Thus, it appears as though the perfective meaning is formed by using the participle form rather than by aspect. Indeed, this is further supported by the past imperfect construction in Pipil (Campbell 1985, 70):[45,46]

(302) ni-   k-   itskih -tu   -ya
        1.SG- 3.SG.PRON.OBJ.- grab   -PAST.PART. -IMPF
        'I had been grabbing it.'

(303) ni-   k-   chiw -tu   -ya
        1.SG- 3.SG.PRON.OBJ.- do   -PAST.PART. -IMPF
        'I had been doing it.'

(304) ti-   k-   chiw -tu   -ya
        1.PL- 3.SG.PRON.OBJ.- do   -PAST.PART. -IMPF
        'We used to be doing it.'

From these examples we see that the perfect cannot be located in Asp. Furthermore, since T is also not available we would have to posit a separate Perfect head; whilst this is not too controversial, perfect is usually posited to be located further away from the root than aspect (see e.g. Iatridou et al. 2001, Pancheva 2003), resulting in the following structure:

(305)
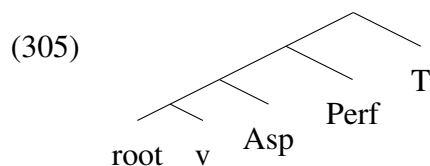
However, this gives us the incorrect linear order with regard to the past imperfect constructions in (302-304) above.

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[44]Campbell (1985, 67) states that it is "probably in origin the 'preterite' ".

[45]Note, though, that the past imperfect is "exceedingly rare in today's usage" (Campbell 1985, 70).

[46]We predict that the verb 'to come' should surface as the suppletive variant *wa:la(:)h* if the suppletion is indeed governed by features of the past participle *-tu-*; unfortunately, no examples of 'to come' in the past imperfect are given.

Finally, in perfect conditional constructions, also noted to be quite infrequent by Campbell, we again see the past participle surface (Campbell 1985, 68):

(306) ahsi -tu   -skiya
       arrive -PAST.PART. -CONDITIONAL
       'She would have arrived.'

(307) ni-   k-   taxtah -tu   -skiya
       1.SG- 3.SG.PRON.OBJ.- pay   -PAST.PART. -CONDITIONAL
       'I would have paid it.'

(308) yah -tu   -skiya
       go   -PAST.PART. -CONDITIONAL
       'He would have gone.'

(309) yah -tu   -skiya   -t
       go   -PAST.PART. -CONDITIONAL -PL
       'They would have gone.'

Thus, it seems incontrovertible to separate the morpheme *-tuk* into the pieces *-tu* and *-k*. However, though the nature of *-tu* as the past participle also is clear, the status of *-k* rests exclusively on the observation that the simple past suffix is *-k(i)* in the singular. Recall, though, that even the simple past suffix in the singular has two alternations: *-k(i)* and *-∅* (see note 43). Thus, there seems reasonable doubt as to whether *-k* in the perfect should be analysed as the simple past tense suffix.

Indeed, I argue that the morpheme *-k* that surfaces in the perfect paradigm is actually an adjective marker, and that the perfect in Pipil is of an adjectival nature. Campbell (1985, 61-63) recognises four classes of adjectives in Pipil.[47] The basic adjective is formed by attaching *-k* (after a root-final vowel) or *-tik* (after consonants):

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[47]In addition, he notes that there some adjectives that do not fit in any of the four classes, most of which include loanwords from Spanish.

(310) ahwiya-k   delicious

 pipini-k   grainy

 chi:'l-tik   red

 wits-tik   thorny

The second class of adjectives, formed by adding *-nah*, is different in nature and corresponds to English '-ish'; examples include *takwak-nah* 'hard-ish' and *tultik-nah* 'yellowish'. Campbell (1985, 62) notes that these adjectives also can take a basic adjective stem as their input.

The third class of adjectives morphologically contains the inchoative marker *-wa*, followed by the regular adjectival marker *-k*:[48]

(311) ala:-wa-k   smooth, slick

 chipa:-wa-k   clear, clean

 tuma:-wa-k   fat

Finally, the fourth class of adjectives is derived from what Campbell (1985, 63) on this page glosses as the 'perfect' suffix *-tuk*. He notes that these "are used adjectivally just as corresponding forms in English, e.g. "the hated task", "the desired outcome"." (Campbell 1985, 63).

(312) chika:h-tu-k   ripe

 i:xihka-tu-k   steep

 utsti-tu-k   pregnant

 yu:l-tu-k   alive

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[48]There is also a shorter variant *-a-k* which occurs instead of *-wa-k*, but no examples are given.

Thus, we see that *-k* is a regular adjectival marker occurring virtually in any adjectival construction. Furthermore, the fourth class of adjectives (312) shows *-k* being used in conjunction with the past participle *-tu* to form deverbal adjectives. Hence, I propose that the perfect is constructed adjectivally and includes person- and number-agreement. If this is the case, then the *-k* in the perfect is crucially not (past) tense, thus showing that the past participle *-tu* and tense do not necessarily need to be on two separate nodes.[49]

Indeed, Wiese (2008) and Bobaljik (2012, 158-63), who builds on Wiese's discussion, argue that, in German, present, participle and past features are on a single node. In order to analyse the suppletion pattern in (297-299) so that they are in line with the strong hypothesis that tense-driven root-suppletion should not be attested in the presence of an intervening node between the category-defining node and T, this is exactly what we want. First, let us consider the ablaut patterns in the German verbal system that led Wiese (2008), and Bobaljik (2012, 158-63), to an analysis of present, participle and past features to be on a single node.

In German, ablaut in verbs can distinguish between present, preterite (simple past) and perfect participle. Wiese shows that not all patterns are attested, however. Specifically, (i) verbs can be distinct for all three forms, (ii) the present can be distinct from all others, and (iii) the preterite can be distinct from all others, or (iv) the vowel quality of the stem of all three verbs remains the same. However, crucially, we do not observe a pattern where the present and preterite are identical, but the participle is distinct.

Wiese's solution is to analyse the participle as being in a subset relation to the preterite. Thus, the participle is characterised by [PAST], and the past is [PAST,FINITE], with the

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[49]Though technically they can be on the same node under view that the *-k* in the perfect is (past) tense if we assume fission.

present being the default form:

(313)　Present　　　　　=　[]

　　　　Perfect participle　=　[PAST]

　　　　Past　　　　　　　=　[PAST,FINITE]

Now, since the features of participle are in a subset relation to the past, any rule of ablaut that is triggered the feature 'past' will ensure that the participle and past (at least) share the same form.[50]

On the arguable assumption that we can take a similar approach to Pipil, we locate both simple past tense and the past participle features on a single node. Here, I use a feature [PART] to distinguish the participle from the past, but it is irrelevant whether we use a different feature or an additional feature on the simple past, just as long as we distinguish the two in some way. Below, I give the Pipil representation of the simple past in (314) and the perfect in (315).[51]

(314)

π

$\sqrt{\text{ROOT}}$　v　[PAST]

\#

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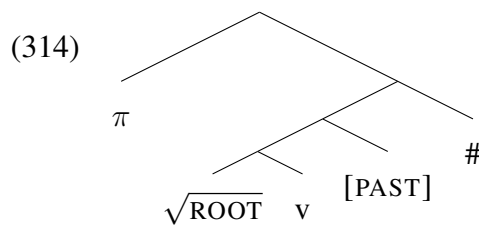
[50]They can also have distinct forms, when there are separate ablaut rules for [PAST,FINITE] as well as [PAST].

[51]For expository reasons, I represent person (π) above number (\#); at this stage I have no evidence that one is higher than the other, but it is irrelevant to the discussion at hand.

(315)
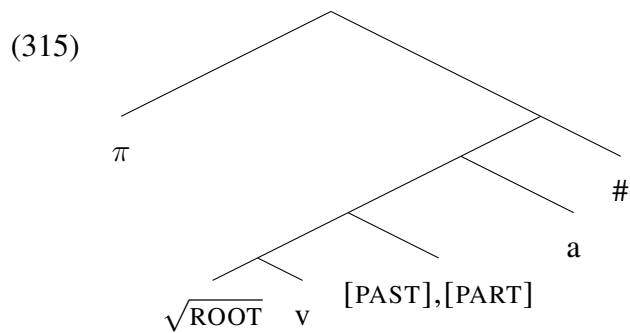
Thus, root-suppletion in the context of features located on the node that hosts [PAST], [PART] becomes available, since it falls within the Accessibility Domain.

Focusing for the moment only on the VI-rules for the root, what we then see is that in Pipil suppletion occurs in the context of the feature [PAST], which falls within the AD, which groups the simple past and the perfect together:

(316) $\sqrt{\text{COME}}$ $\Leftrightarrow$ wa:lah / __] [PAST]]

             $\sqrt{\text{COME}}$ $\Leftrightarrow$ wi:ts

For the sake of completion, I give the remaining VI-rules for the verbal paradigm in Pipil (except the morpheme *-ke*, which has an unclear status; see the discussion immediately under the table in (300)):

(317) [PAST, PART] ⇔ -tiwi / __] #[PL]]

      [PAST, PART] ⇔ -tu

      [PAST] ⇔ ∅ / {Class 3, 4, $\sqrt{\text{FIND}}$, ...}[52]] __]

      a ⇔ ∅ / __] #[PL]]

      [PAST] ⇔ -k(i)

      [FUT] ⇔ -s

      a ⇔ -k

      [1.SG] ⇔ ni-

      [2.SG] ⇔ ti-

      [1] ⇔ ti-

      [2] ⇔ an-

      [3] ⇔ ∅

      [PL] ⇔ -(e)t

Under this analysis, Pipil falls within the predictions of the strong hypothesis of local-ity that in lexical material, only the first node above the (highest) category-defining node falls within the Accessibility Domain. However, it should be clear that this analysis relies on a number of assumptions that need to find independent support; most notably, whether

---

[52]This is a simplification of the exponence of [PAST] in Pipil. As mentioned above, in addition to *-k(i)*, ∅ is also a frequent exponent of the simple past, the difference (partially) depending on verb class: Class 2 verbs always take *-k*, Class 3 and 4 always have a null exponent, and there is variation in Class 1 (see also note 43). Campbell orders the classes from Class 1 having the largest number of words to Class 4 containing the fewest verbs.

In (317), purely for expository reasons, I list *-k(i)* as the default exponent and ∅ as the specific exponent of the past tense, its context including Class 3 and 4 verbs, as well as specific verbs from Class 1 such as *na:miki* 'to find', which is realised as *na:mik* in the past: null exponence combined with final vowel loss. However, nothing hinges on whether *-k(i)* or ∅ is the default realisation.

In addition, I leave out whether or not the past tense morpheme is null or not in the plural; recall that the affixes in the past tense plural are *-ke-t*, but the status of *-ke* is unclear (see in-text).

there is additional evidence that participle features are realised on the same node as the feature [PAST], as well as the hypothesis that the perfect in Pipil is based on an adjectival construction.

Kanuri Another apparent counter-example discussed here to the generalization that tense suppletion is not seen in a language with aspect comes from Kanuri (Hutchison 1981). Indeed, Kanuri distinguishes both tense and aspect; with regard to aspect, the grammar lists both imperfect and perfect aspect. The imperfect is used "to describe incomplete or imperfect actions in the past, present, progressive and future" (Hutchison 1981, 117), as well as expressing continuous and habitual actions. In addition, Kanuri also displays perfect aspect, which is used to "neutrally describe actions completed in the past" (Hutchison 1981, 121).

Furthermore, Hutchison (1981) also notes that Kanuri appears to mark future tense and past tense. With regard to the future, he notes that it is rarely used in the language synchronically. The past seems to be more frequently used, and Hutchison states that it "differs from the perfect in many of the same ways that the English past differs from the English present perfect" (Hutchison 1981, 124).

First, consider the regular endings of the imperfect verb, given here for 'to eat'; the perfect differs from the imperfect by having an additional *à* attached.[53] I will return to the future and past tense later.

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[53]Kanuri distinguishes two types of verbs; Class 2 verbs actually are complex in that they always include the Class 1 verb root 'to say, think'. Since the relevant, suppletive, verb *ís* 'to come' is of Class 1, I limit myself to this class in the discussion below.

(318)

		gloss	surface realisation
1.SG	bù-k-ìn	eat-1.SG-IMPF	búkìn
2.SG	bù-m-ìn	eat-2.SG-IMPF	búmìn
3.SG	s-∅-bù-ìn	3-SG-eat-IMPF	zéwìn
1.PL	bù-y-ìn	eat-1.PL-IMPF	búiyèn
2.PL	bù-w-ì	eat-2.PL-IMPF	búwì
3.PL	s-a-bù-ìn	3-PL-eat-IMPF	záwìn

We see that the first and second person agreement markers follow the root, but in the third person we see that they precede the root. The perfect marker *-ìn* is regular, except surfacing without *n* in the second person plural marker, which is regularly realised as *-ì*; note that the *n* also is absent in the perfect, thus resulting in the regular second person plural perfect suffix being *-à*, rather than its regular *-(V)nà*.[54]

Thus, we can make the following abstract schema for Kanuri verbs in the imperfect/perfect:

(319)

1/2 $\quad \sqrt{\text{ROOT}}\text{-}\pi\text{-Asp}$

3 $\quad \pi\text{-\#-}\sqrt{\text{ROOT}}\text{-Asp}$

Now, consider the paradigm of the suppletive verb *ís* 'to come' given below, first focusing only on the imperfect and perfect paradigms (Hutchison 1981, 337):

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[54]Potentially the second person plural perfect suffix is underlyingly *-íà*, but this sequence is subject to hiatus resolution, which is very common in Kanuri, of *-íà* to *-à*.

(320)　　　　　Imperfect　Perfect

    1.SG　ísə̀kìn　ísə́kə́nà

    2.SG　ísə̀mìn　ísə́mmà

    3.SG　íshìn　ísə́nà

    1.PL　íshìyèn　íshíyénà

    2.PL　ísùwì　ísúwà

    3.PL　ísài　ísánà

As will be motivated below, I am assuming the decomposition of these forms as follows (the root is given in bold):

(321)　　　　　Imperfect　Perfect

    1.SG　**ís**-ə̀k-ìn　**ís**-ə́k-ə́n-à

    2.SG　**ís**-ə̀m-ìn　**ís**-ə́m-m-à

    3.SG　**ísh**-∅-ìn　**ís**-ə́n-à

    1.PL　**ísh**-ìy-èn　**ísh**-íy-én-à

    2.PL　**ís**-ùw-ì　**ís**-úw-à

    3.PL　**í**-s-à-i　**í**-s-á-n-à

The decomposition of first and second person singular is fairly straightforward, where I assume that ə is an epenthetic vowel; indeed, Hutchison (1981, 101) notes that both *ísə̀kìn* and *îskìn* are possible realisations for the first person singular. Leaving aside the third person singular for the moment, we turn to the plural forms.

In the first person plural, we see a slightly different vowel quality in the aspectual suffix, where it surfaces as *-èn* rather than *-ìn*; however, this seems a regular process (cf. *bù-y-ìn* 'eat-1.PL-IMPF' realised as *bùiyèn* in (318) above). In addition, we observe a high

front vowel before the first person plural marker *y-*, which is epenthesised (cf. *bù-y-ìn* 'eat-1.PL-IMPF' realised as *bùiyèn* in (318) above again). Finally, I assume that *s* is palatalised before the high front vowel *i*, as also suggested by Hutchison (1981, 18).

In the second person plural form, we observe *u* before the second person plural marker *w-* which, in parallel to *i*-epenthesis in front of *y*, I assume to be epenthetic. As mentioned above, the aspect marker in second person plural lacks an *n*, thus resulting in the form *ísùwì*.

Turning to the forms for third person, we notice something peculiar. Though in general third person and number information precedes the root, we do not seem to observe this here. If it were the case, then we would incorrectly predicts forms such as:

(322) a. 3.SG: s-∅-is-ìn

  b. 3.PL: s-a-is-ìn

However, the forms rather seem to involve third person and number information to be followed by the root, as can also be seen in the decomposition in (321):[55]

(323) a. 3.SG: is-s-∅-ìn

  b. 3.PL: is-s-a-ìn

I assume that the form in (323a) undergoes degemination of *s* and again the earlier observed palatalisation before a high front vowel. As to (323b), this form also undergoes degemination of *s* and the third person plural aspectual suffix in the perfect lacks its *n*, which seems an idiosyncratic property of certain verbs, including the verb 'to drink', 'to believe', 'to cough', and more (Hutchison 1981, 100).

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[55]Whilst we could posit the form in (322a) with deletion of the initial *s*, the form in the plural (322b) seems unsalvageable.

Now, having motivated my decomposition of the imperfect and perfect we can finally give the full paradigm for the suppletive verb *ís* 'to come', including the past and future tense forms.

(324)   Imperfect   Perfect   Future   Past

1.SG   **ís**-ɔ̀k-ìn   **ís**-ɔ́k-ɔ́n-à   cá-**dù**-k-ò   ká-**dí**-k-ò

2.SG   **ís**-ɔ̀m-ìn   **ís**-ɔ́m-m-à   cá-**d**-ɔ̀m-∅   ká-**dì**-m-∅

3.SG   **ísh**-∅-ìn   **ís**-∅-ɔ́n-à   cá-**dì**-o   ká-**dì**-o

1.PL   **ísh**-ìy-èn   **ísh**-íy-én-à   cá-**sh**-ìy-e   ká-**sh**-ìy-e

2.PL   **ís**-ùw-ì   **ís**-úw-à   cá-**d**-ùw-∅   ká-**dì**-u-∅

3.PL   **í**-s-à-i   **í**-s-á-n-à   cé-**sh**-ù   ká-**sh**-ò

Focusing first on the future and past morphology, we see that in the future the prefix *t(V)-* is added (with significant regular phonological adjustment), whilst in the past the prefix *k(V)-* is added (again this prefix often involves significant regular phonological adjustment). The tense prefixes appear to delete the third person singular and plural subject morpheme *s-*, but not the subject number morpheme of the third person plural, *a-* (Hutchison 1981, 117). Thus, we see for instance *ti-a-bù-ò* 'FUT-3.PL-eat-FOC' for the third person plural form of 'to eat' in the future tense being realised as *jáwò*, where the sequence *ti-a-* is realised as *já-*.[56]

Then, we see that in the first person forms there are two morphemes: the agreement marker, *-k* in the singular and *-y* in the plural, and a final suffix *-ò* to which I return below. In the second person forms, the person marker *-m* is clearly identifiable in the singular, and in the future we see the second person plural marker *-w*, which leads me to analyse

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[56]Following Wolff & Löhr (2006), I analyse *-ò* as a predication focus marker (see below).

-u in the past as a (vocalic version of) the second person plural marker as well.[57] In the third person forms, we do not see any agreement morphology, but again see the *-ò* suffix surfacing in both singular forms and in the plural past form, leading me to analyse the future suffix *-ù* as an alternant of *-ò*.

At last, we can turn to the suppletive alternations of the root: in (320) we can see that the verb seems to alternate between two roots: *ís* and *d(V)*. This seems like a clear case of suppletion, and there is no evidence in the grammar that *ís* 'to come' is used as an auxiliary in the language. In the imperfect and perfect the root is always realised as *ís*. However, though, by and large, in the past and future tenses we see the root *d(V)*, in the first and third person plural it seems that the root *ís* resurfaces.[58] Thus, it seems that suppletion is not exclusively in the context of (future and past) tense, but agreement is also taken into account.

In addition, it should be noted that tense and aspect never co-occur: verbs are either marked for aspect (imperfect or perfect) or for tense (future or past).

Turning to Hutchison's (1981) analysis of the verbal structure of Kanuri, he recognises the following positions:

(325)   1.   Class 2 verb root[59]

       2.   aspect prefix morpheme

       3.   3rd person subject morpheme

       4.   3rd person number morpheme

---

[57]In (324), I include a null realisation of the morpheme that usually surfaces as *-ò* for clarity.

[58]Note that I have to stipulate either idiosyncratic palatalisation or a high front vowel which is consequently deleted in third person plural forms in the future and present in order to get the palatalised root.

[59]See note 53 above.

5. Class 1 verb root

6. 1st and 2nd person subject pronoun morphemes

7. aspect suffix morpheme

The positions in the verbal template are exemplified for the verb *cìlàdə́kò* 'I sold it' (past tense) in (326) (Hutchison 1981, 114):

(326) 1 2 3 4 5   6 7 Form

  - ki - - lád k ò cìlàdə́kò

Note that Hutchison lists the final suffix as being in the place normally occupied by aspect suffixes (position 7), which makes it seem like an aspectual marker, but there is little reason to analyse it as a true aspectual marker. Indeed, Wolff & Löhr (2006) argue that this morpheme is a predication focus marker, which, following Rizzi (1997), would be located higher than tense.

Indeed, if *-ò* is not an aspectual suffix, then this allows for an analysis that in the past and future aspect is altogether absent in Kanuri. Indeed, recall that the two never seem to cross: verbs are identified as either marked for aspect or for tense.

Leaving aside agreement for the moment, this would then bring T close enough to the root to be able to condition root-suppletion, as represented in the following structure that shows the structure of (future and past) tense forms:[60]

(327)

```
              /\
             /  \
            /    \
           /\     F
          /  \
         T   /\
            /  \
        √ROOT   v
```

---
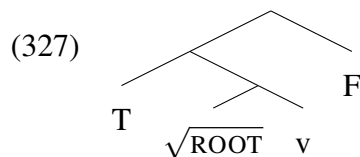
[60]Cf. case-driven root-suppletion where we lack number (section 2.1.1).

This, then would allow us to formulate the following VI-rules for the Kanuri verb root 'to come' (to be revised below):

(328) $\sqrt{\text{COME}}$ $\Leftrightarrow$ d(V) / __] T]

$\sqrt{\text{COME}}$ $\Leftrightarrow$ is

In order to discuss the influence of agreement in the Kanuri suppletion pattern, I will turn to a well-known example of agreement-driven suppletion from Italian.

Italian   In the data below, we see that the Italian verb *andare* 'to go' shows an alternation between two forms: *and-* and *va-*. Note also that 'to go' is not clearly identifiable as a functional verb in Italian, and, thus, as a lexical verb subject to the Accessibly Domain induced by category-defining *v*.[61]

(329)

Agreement	Present	Imperfect	Future
1.SG	va-do	anda-v-o	and-r-ó
2.SG	va-i	anda-v-i	and-r-ai
3.SG	va-∅	anda-v-a	and-r-á
1.PL	andi-amo	anda-v-amo	and-r-emo
2.PL	and-∅-ate	anda-v-ate	and-r-ete
3.PL	va-nno	anda-v-ano	and-r-anno

Looking at the distribution, it seems that the root *and-* appears to be the elsewhere form, and that the suppletive variant *va-* appears in the present tense, but only for the 1SG/2SG/3SG and 3PL. That *-and* is the elsewhere form is not at issue, and has been

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[61]Note that in the related language French 'to go' is an auxiliary to express the future.

proposed in other work on the topic (Embick 2010, Calabrese 2013, 2014). What is interesting about these data is the fact that the information on the agreement morpheme plays into suppletion. Indeed, the morphological structure of Italian verbs seems to contain an aspectual node; however, other than in the Imperfect, aspect is expressed by combining an auxiliary with a participle, and I assume it is absent in forms other than the imperfect. Furthermore, the agreement markers lie outside the tense suffix, as is transparently seen in the future form: *-r* is the exponent of future tense, which is then followed by agreement markers. Thus, I assume that the structure is as follows:[62]

(330)
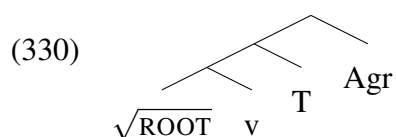
In the above structure, we expect agreement-driven suppletion to be impossible, since Agr falls outside of the AD. However, it should be noted here that the suppletion is not only governed by agreement, but is sensitive to the tense feature as well.

In his analysis of the Italian agreement-driven suppletion pattern, Embick (2010) proposes that we can understand the suppletion if there is a rule of impoverishment that deletes present tense when the agreement morpheme is 1.PL or 2.PL:[63]

(331) Impoverishment

T[pres] $\rightarrow \emptyset$ / __ [+part,+pl]

Embick further gives the VI-rules as follows, where we see that *va-* is inserted in the context of present tense. Since T is impoverished/pruned in the context of [+part,+pl],

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[62]Note that in the imperfective aspect suppletion is blocked; this is predicted on the approach here, since in that configuration aspect is one node up from category-defining *v*, and thus would be the final node in the AD.

[63]It should be noted that Embick considers *andare* 'to go' to be functional rather than lexical; under a view that 'go' is functional agreement-driven suppletion is not an issue since Agr would fall in the AD.

this means that T[pres] is missing in 1.PL and 2.PL forms, resulting in the elsewhere form *-and*. In other words, suppletive *va(d)* is inserted in the context of the present, which is effectively removed in the first and second plural, thus resulting in the default realisation *and* in those instances.

(332) $\sqrt{\text{GO}}$ $\Leftrightarrow$ va(d)- /___] T$_{[\text{PRES}]}$]

          $\sqrt{\text{GO}}$ $\Leftrightarrow$ and-

Such an analysis would bring Italian in line with the theory here, since it would then not be suppletion for agreement *per se*, but rather suppletion for (present) tense, as in (333):

(333)

$$\sqrt{\text{ROOT}} \quad \text{v} \quad \text{T}_{[\text{PRES}]} \quad \text{Agr}$$
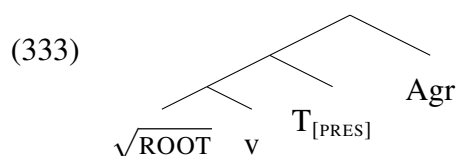
However, in first and second plural (present) tense is missing due to (331), thus allowing agreement to be sufficiently local to govern root-suppletion:

(334)

$$\sqrt{\text{ROOT}} \quad \text{v} \quad \text{Agr}$$
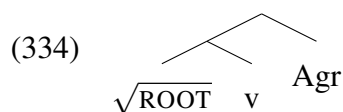
However, despite the attractiveness of Embick's account, there is a problem. Calabrese (2013) highlights a problem with impoverishment of tense in the relevant forms. The problem is that we see the thematic /ya/ inserted in *andiamo*. Calabrese argues that the insertion rules of /ya/ must make reference to both present tense and agreement features. Thus, it cannot be the case that T[pres] is impoverished prior to Vocabulary Insertion.

A potential way out is to assume that whilst T and Agr form separate morphemes, they do so in a branching structure.[64,65,66]

(335)
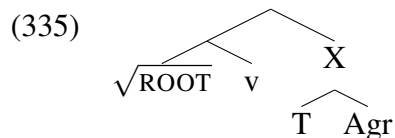
Indeed, this is reminiscent of the analysis of aspect and tense as a branching structure proposed for English in section 3.2.5, but this time T and Agr are dominated by a single node X. The branching structure allows the root to make reference to both Tense information and Agreement information, since they are both hosted under the same node X in the tree, which, being one node above the category defining node is in the accessibility domain of the root (cf. the analysis of Lak in section 2.1.1 above). We can then write the following VI-rules:[67]

(336) $\sqrt{\text{GO}}$ ⇔ va(d)- /__] T$_{\{[\text{PRES},+\text{SG}], [\text{PRES},-\text{PARTICIPANT},-\text{SG}]\}}$]

$\sqrt{\text{GO}}$ ⇔ and-

Thus, we see that the Italian data can be accounted for by assuming that T and Agr form a branching structure, which brings both T and Agr into the Accessibility Domain.

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[64]Many thanks to Peter Smith for discussion of this analysis.

[65]Note that syntactically, it is widely assumed that T and agreement share a very close relationship, with much work in minimalist syntax taking T to be a probe that agrees with the agreement features on the goal. Note, though, that earlier versions of minimalism assumed that there were separate AgrS and AgrO projections (Chomsky 1995, Bobaljik 1995, Bobaljik & Thráinsson 1998).

[66]We could equally assume that, in the present, T and Agr are expressed on a single node in a complex feature bundle (cf. the analysis for Pipil in section 3.2.6). However, since they are not expressed by a single morpheme in the imperfect and future, I represent a branching structure also in the present tense.

[67]Note that these rules treat the fact that the root *va(d)-* occurs in both the present singular and third person plural as accidental homophony. This is related to the issue of defective paradigms, where I discussed neutralisation of lexical entries as an alternative (see section 3.2.1); potentially, the VI-rules do reflect the diachronic process of the merging of two paradigms, but synchronically, in an individual speaker's grammar, they are accidental.

Returning to Kanuri, we saw that the verb 'to come' displayed suppletion in the context of tense and agreement. Recall that, not taking the agreement morphemes into account, we had the following structure (repeated from above):

(337)

```
        ⟋⟍
      ⟋    F
    T  ⟋⟍
      √ROOT  v
```
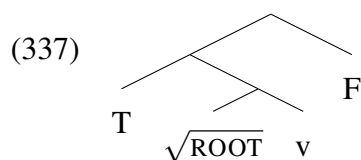
However, agreement in Kanuri is expressed closer to the root than tense (or aspect), which as such should intervene if it were a separate projection (cf. the blocking effect of the diminutive in section 2.1.3):[68]

(338)

```
          ⟋⟍
        ⟋    F
      T  ⟋⟍
        ⟋  Agr
     √ROOT  v
```
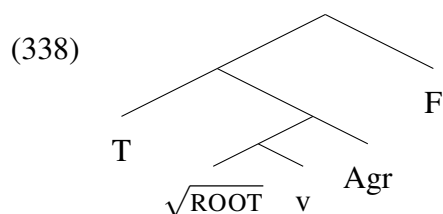
However, if we take the same approach as we adopted in Italian, then agreement and tense are represented as a branching structure, and we see that this again brings the Agr and T complex within the AD:[69]

(339)

```
          ⟋⟍
        ⟋    F
      X  ⟋⟍
     ⟋⟍ √ROOT  v
    T  Agr
```
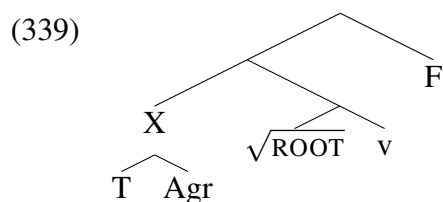
However, both the Kanuri and Italian data crucially rely on T and Agr being expressed as a branching structure, but whether agreement should always be represented as such is

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[68]Note that Agr sometimes is prefixal and sometimes it is realised as a suffix; here I represent it as a suffix for expository reasons.

[69]At this stage, I leave aside the actual position of agreement morphemes as alternating between prefixes and suffixes; indeed, Trommer (2008) notes that there is no good correspondence between the head position and affix position of person and number agreement morphemes, and thus I leave this issue aside.

an open question. An alternative to a branching structure would be that, for reasons that at this stage are not clear, agreement does not function as an intervener, or that whether or not agreement blocks is parametric (cf. Calabrese 2005, Nevins 2010, Moskal 2014). Another option would to not have Agr and T bundled, but the features on Agr are transferred to T by an Agree relationship in the syntax (Harbour & Bonet 2010, Adger et al. 2003). This would obviate the need to postulate a branching node for T and Agr. At this point, I leave an in-depth investigation into agreement-driven suppletion for future research.

3.2.7   Summary of T-driven suppletion

In sum, we have seen that tense-driven suppletion often occurs in copulas (e.g. Hunzib, Khoekhoe), as well as other types of auxiliaries (Suena). In addition, I argued that the instances that Veselinova's identifies as root-suppletion in Alamblak, Dani and Kewa are not actually instances of suppletion. Finally, there were certain languages where tense was argued to fall within the Accessibility Domain. For Fur, I argued that, if aspect is present at all in the language, it is located outside of tense. For Brahui (discussed below), there is no evidence at all of any aspectual morphology. Finally, the last class discussed so far constitutes cases where, though aspect is encoded by affixation in certain configurations, it is missing in the contexts where we see suppletion (English, Pipil, Kanuri, and Italian). That is, given that in the relevant constructions there is no clear aspectual morphology, this allows for an analysis where aspect is either absent in the relevant configurations, or fused with tense. In this way, T is brought within the AD, allowing for tense-driven root-suppletion in these languages.

In the table below, I give an overview of the languages investigated in this study, in-

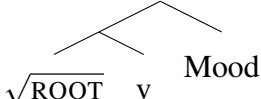cluding their classification per the analyses proposed here:

(340)

	Aux	Non-suppletion	T within AD
Alamblak		✓	
Brahui			✓
Dani		✓	
English			✓
Ewe	✓		
Fur			✓
Hunzib	✓		
Italian			✓
Kannada	✓		
Kanuri			✓
Kewa		✓	
Khoekhoe	✓		
Lezgian	✓		
Mundari	✓		
Persian	✓		
Pipil			✓
Suena	✓		
Supyire	✓		
Turkana	✓		

3.3 Mood-driven suppletion

Finally, turning to mood-driven root-suppletion, both Veselinova (2006) and Radkevich (2010) observe that this is restricted to imperatives. Consider the verbs for 'to come' and 'to go' in Jacaltec (Day 1973, 61):

(341) toyi go.INDICATIVE

       asi' go.IMPERATIVE

(342) tita come.INDICATIVE

       cata come.IMPERATIVE

We see that the root for 'to go' is *toyi* in the indicative, but *asi'* in the imperative. Curiously, aspect and tense are not indicated on imperatives in Jacaltec, however, thus creating a structure which allows for (imperative) mood to govern root-suppletion, since it falls within the AD of the root:

(343)

$$\sqrt{\text{ROOT}} \quad \text{v} \qquad \text{Mood}$$

Interestingly, Kaufmann observes that "cross-linguistically, the main verb (the imperative verb) is often morphologically meagre. In many languages, it lacks at least some temporal or aspectual oppositions encoded by other (finite) forms, or it is even just a verbal root" (Schwager 2012, 37).

It should be noted that even though Kaufmann actually argues in favor of there being tense information in imperatives semantically, one of two alternatives she proposes is an account where all functional information is merged into one imperative operator; relevant here is that in that approach tense information would not be encoded on T.

Indeed, it has been argued that imperatives are not specified for tense and hence lack a T projection in the syntax (Plazack & Rosengren 1998, Wratil 2005), supporting a structure as in (343) above.[70]

3.4 Portmanteaux part two

In section 2.4, we discussed portmanteaux that did not contain the most deeply embedded element. We saw that languages that employ [#-K] portmanteaux, suppletion is driven by number rather than case, which led to a 'late' view on portmanteaux, where the morphosyntactic structure of nodes that are involved in portmanteaux is kept intact up to the point of Vocabulary Insertion of the relevant node.

In this section, I consider a parallel situation in the verbal domain: [Asp-T] portmanteaux, where aspect and tense information is expressed on a single node. Now, on par with the nominals, we expect that in the verbal domain suppletion is driven by aspectual rather than tense features. Intriguingly, we seem to observe that this is the case; consider data from Modern Eastern Armenian (Jasmine Dum-Traugut p.c. to Veselinova, cited in Veselinova 2006, 72):

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[70]Note, however, that Aikhenvald (2010) discusses languages in which there is an added tense contrast in imperatives.

(344)   gal   come-INF

        gal-is   come-PRES.PTCP

        gal-u   come-FUT.PTCP

        ek-el   come-PERF.PTCP

        ek-ats   come-RES.PTCP

        ek-a   come-AOR

As Veselinova points out, the cut between the two roots *gal-* and *ek-* is based on per-fectivity, with *gal-* being used in forms associated with the perfective, and *ek-* in those associated with the imperfective. Indeed, according to Veselinova (2006, 72-73), other languages that divide along perfectivity in spite of lacking a specific aspectual morpheme include Hindi, Bengali, Burushaski, Chalcatongo Mixtec and Mara. Thus, we see an exact parallel situation to that of the number and case portmanteaux in the nominal domain: aspect and tense are expressed on a single node, but the suppletion pattern is still governed by aspect.

Mayali   In a similar vein, we observe aspect-driven suppletion in Mayali (Evans 2003). Again, both aspect (perfective and imperfective) and tense (past and non-past) are marked morphologically and they are expressed in a single TAM affix slot, thus qualifying as a [Asp-T(-M)] portmanteau. An overview of the TAM system of Mayali is given in (345), from Evans (2003, 361). The choice of specific affix depends on what conjugation class a verb belongs to.[71]

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[71]Not included in the table is conjugation class 9, which is comprised of the suppletive verb *re* 'to go' and its derivatives, discussed below.

(345)

		MOOD			
	IMPERATIVE	REALIS			IRREALIS
		TENSE			
		NON-PAST	PAST		
			ASPECT		
			PERFV.	IMPF.	
Affixes	-n, -men, -ngimen, -un, -mimen	-n, -ng, -ngen, -men	-ng, -neng, -m, -om, -y, -i, -ey, -nj, -nginj, -inj, -minj	-i, -yi, -ni, -ngi, -nj, -ngeni, -y	-ninj, -meninj, -yi(nj), -yi, -ngémeninj, -wirrinj, -uwirrinj

Turning to the Mayali suppletive paradigm, we see that the verb *re* 'to go' shows suppletion in the past perfect.

(346)

		MOOD			
	IMPERATIVE	REALIS			IRREALIS
		TENSE			
		NON-PAST	PAST		
			ASPECT		
			PERFV.	IMPF.	
re 'go'	ray	re	**wa**-m	re (rayi)	ra(y)winj, rayinj

It should be noted that although Radkevich (2010, 197) cites *wam* as a single form which expresses the verbal root ($\sqrt{\text{GO}}$), aspect ([perfective]) and tense ([past]), it seems

that this form is decomposable into a suppletive root *wa-* combined with a past perfective suffix *-m*. The past perfective suffixes *-m* and *-om* (see the table in (345)) are associated with conjugation class 4, which decomposes into 4a, which consists of verbs which contain *wa-* as a bound root, and 4b, which includes *bun* 'to hit' and verbs with *bu-* as a bound root.[72] Indeed, the affix *-m* expresses past perfective in conjugation class 4a: bound root *wa-*.

Thus, we see that suppletion occurs in the context of the perfective; the relevant VI-rules are given below:

(347) $\sqrt{\text{GO}} \Leftrightarrow \text{wa} / \underline{\hspace{1em}}] \text{Asp}_{[\text{PFV}]}]$

   $\sqrt{\text{GO}} \Leftrightarrow \text{rV}$

   $[\text{perfective}] \Leftrightarrow \text{-m} / \text{V}_{[\text{class 4a/9}]}] \underline{\hspace{1em}}]$

Again, Mayali supports the observation that suppletion in [Asp-T] portmanteaux is governed by aspectual information rather than tense.

In sum, we have seen that by and large the verbal domain supports the observations discussed in the nominal domain. Recall that in number and case portmanteau configurations, root-suppletion was governed by number rather than case, keeping in order with the underlying structure of nominal elements. Similarly, as discussed here, in aspect and tense portmanteau configurations, root-suppletion is governed by aspect rather than tense.

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[72]Evans (2003) uses the term 'thematic', which seems to correspond to bound root; specifically, he writes that "[m]ost verb stems are either simple monosyllabic roots, like *yo* 'lie' or *bu* 'hit', or can be broken down into a PREPOUND plus a monosyllabic THEMATIC[, which] may be formally identical to a simple root." Regarding *wa*, he notes that "[a]n interesting halfway-type is the root *wa*, which surves [sic] as thematic for such verbs as *yawa* 'search' and *wakwa* 'not know, forget', but as a root is restricted to the past perfective form *wam* of the suppletive verb 'go', whose root is *re* in other TAM values. In Dalabon, however *wa* is a fully independent root, meaning 'follow', suggesting that the semantic shift that resulted in it joining the suppletive 'go' verb in Bininj Gun-wok has left it severely restricted as an independent root, predominantly surviving as a thematic on complex verbs" (Evans 2003, 336).

3.4.1 Root portmanteaux

Finally, we turn to portmanteaux that involve roots; again note the difference with the type of portmanteaux discussed above. Given that I am concerned with root-suppletion, in portmanteaux that involve roots the items involved in the portmanteau are subject to suppletion, whilst in the previous section the suppletive root itself was not part of a portmanteau. That is, I argued that the portmanteaux discussed in the section above were not relevant at the point that the root was undergoing VI, and, as such, did not affect suppletion patterns.

In contrast, root portmanteaux are relevant at the point that VI of the most deeply embedded terminal node takes place, and, as such, could affect sensitivity to suppletion. Indeed, it has been argued that portmanteaux result in restructuring and, as a consequence, locality domains can be extended (Radkevich 2010, Bobaljik 2012, Bobaljik & Wurmbrand 2013). In the following, I first discuss the idea of domain suspension, taking Bobaljik & Wurmbrand (2013) as representative of this view. Then, I will discuss how it relates to the theory assumed here and the observations made here.

3.4.1.1 Domain Suspension

Before we turn to domain suspension, we first need to briefly summarise the observations in Bobaljik's cross-linguistic study on adjectival suppletion patterns (Bobaljik 2012). The crucial observation is that, although there are five possible suppletion patterns in positive-comparative-superlative triples only three of these are attested (see also section 2.2.1):

(348) POS CMPR SPRL

A   A   A   big-bigger-biggest

A   B   B   good-better-best

A   B   C   bonus-melior-optimus (Latin)

In contrast, we do not observe the remaining two logical possibilities:

(349) POS CMPR SPRL

A   B   A   *good-better-goodest

A   A   B   *good-gooder-best

As a crucial ingredient to derive the correct patterns, Bobaljik argues that the superlative properly contains the comparative:[73]

(350)

```
              s
           /     \
          c       SPRL
        /   \
       a    CMPR
       |
      ADJ
```
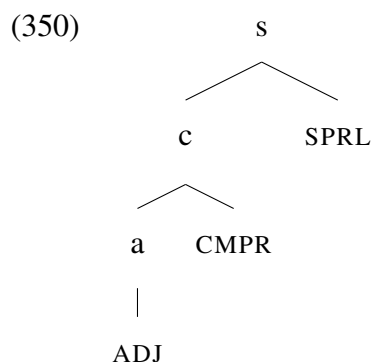
The structure in (350), combined with VI-rules, excludes ABA patterns: the superlative contains the comparative, and, as such, any VI-rule making reference to the comparative will automatically have to be used in the superlative.

Furthermore, in order to exclude AAB patterns, Bobaljik assumes the following. As mentioned in section 1.1, Bobaljik assumes a slightly different view of locality than I

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[73]Bobaljik does not include the adjectival category-defining node in his representations.

have done so far. Without assuming an AD, he proposes that CMPR is cyclic and triggers spellout of its complement: ADJ, which is then no longer available as a target of suppletion. Thus, at the point that the superlative becomes relevant the adjectival root is frozen and cannot be subject to superlative-driven suppletion, ruling out AAB as a pattern.

However, as Bobaljik notes, this view is too restrictive given the existence of ABC patterns, where we do see superlative-driven root-suppletion, as in the Latin *bonus-melior-optimus* triple. Crucially, though, we only see superlative-driven root-suppletion when we also see comparative-driven root-suppletion; i.e. ABC but *AAB. In order to capture this, Bobaljik & Wurmbrand (2013, 186) draw on Domain Suspension, which is defined as follows for morphology:

(351)   If X is a cyclic head, then Y^n is a Spell-Out Domain, unless Y depends on X for its interpretation.

Furthermore, they assume the following VI-rules for the Latin *bonus-melior-optimus* triple (Bobaljik & Wurmbrand 2013, 188):

(352)   GOOD,CMPR   ⇔   opt- / __] SPRL

        GOOD   ⇔   mel- / __] CMPR

        GOOD   ⇔   bon-

Domain Suspension thus is relevant, since the CMPR is a cyclic head and the root is a Spell-Out Domain, unless the root depends on the comparative for its interpretation. Crucially, given the existence of the VI-rule GOOD ⇔ mel- / __] CMPR in Latin, in which the root is suppletive for the comparative, Domain Suspension applies. In effect, this means that if a cyclic head triggers suppletion of an element, then the (Bobaljik-style) Spell-Out Domain is suspended, allowing for further suppletion to become possible.

3.4.1.2 123 is easier than ABC

Applied to the theory of locality here, we can translate Domain Suspension as an extension of the Accessibility Domain, but before we spell that out, let us first briefly go over how Bobaljik's generalisations would be analysed according to the theory here. Adjectives would contain a root and category-defining node a, which then can be followed by a comparative and superlative (I retain Bobaljik's insight that superlatives properly contain comparatives), thus giving rise to the following structure:

(353)

$$\sqrt{\text{ROOT}} \quad a \quad \text{CMPR} \quad \text{SPRL}$$
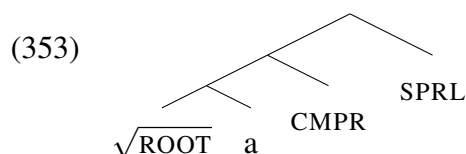
Under the locality restrictions here, the comparative but not the superlative would fall within the AD. Thus, we correctly predict AAA and ABB to be attested, and ABA and AAB to be unattested. Crucially, we run into the same problem of not being able to derive the ABC without appealing to a mechanism such as Domain Suspension.

It is worth mentioning here, however, that no ABC patterns were found in either the nominal or the verbal domain. That is, there were no cases of root-suppletion of a lexical noun where we saw double suppletion for first number, then case. Similarly, I have seen no cases of root-suppletion of a (lexical) verb where there is double suppletion, first for aspect, then for tense.[74] Indeed, in the current account, given that the AD is established by the category-defining node, which triggers the AD and SOD, there is no natural place for portmanteaux to extend the AD, since it is established prior to any VI. Note that this only holds for lexical material; in functional material such as pronouns and auxiliaries we

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[74]Though Radkevich (2010) assumes that Mayali has a suppletive portmanteau that contains aspect and tense, I have shown above that Mayali is a case of straightforward aspect-driven suppletion.

do expect to see ABC patterns, as are indeed observed in pronouns, which are discussed in Smith et al. (2015).

Thus, we see that the only cases that are problematic for the approach taken here are the adjectival ABC cases that seem not to occur in the nominal and verbal domain.[75] If it is truly the case that they are unattested, this raises the question whether there is something special about adjectives. Indeed, one difference is that for adjectives Bobaljik proposes that the superlative universally contains the comparative. In contrast, in the nominal and verbal domain, I do not assume that a representation necessarily must contain number or aspect; it is commonly the case that languages do so, but there is no universal requirement that they must. In his book, Bobaljik (2012) draws on the semantic relation between the superlative and comparative to motivate the containment relation; I do not see an immediate parallel to the nominal domain regarding number and case, nor in the verbal domain regarding aspect and tense. It is worth noting here as well that the other class where we have seen ABC patterns is pronouns (see section 2.2.1), where we again rely on an (obligatory) containment relation.

Thus, I do not see a reason to posit a general mechanism where portmanteaux extend locality domains; rather, we seem to see this effect only in adjectives, thus potentially necessitating an operation of Domain Suspension particular to adjectives, but I see no reason to posit it as a generally available process.

Below, I discuss two cases, Brahui and Korean, as two potential cases that involve root-portmanteaux, which, as such, could extend locality domains.

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[75]Recall that Georgian may well constitute a counterexample, being a language that may show ABC suppletion patterns in the verbal domain (Lee 2015). If this is indeed the case, then we have to adopt a general mechanism of portmanteaux extending locality domains as in for instance Bobaljik & Wurmbrand (2013). Note, though, that this does not bear on the general claims made here.

Brahui In Brahui (Andronov 1980, 58-9,62-3,67,69), we see suppletion of the verb 'to go'; the paradigm for the indicative is given below:[76,77]

(354) (a)-kā-   *a*-go.PRES/FUT

       ʔin-ā-   go-SIMPLE PAST

   (a)-ʔin-ā-   *a*-go-SIMPLE PAST (past continuous)

       ʔin-ā-n-   go-SIMPLE PAST-PST.PERF.

       ʔin-ā-s-   go-SIMPLE PAST-PLUPERFECT[78]

In the present/future form, we see an optional prefix *a*-; Andronov (1980, 57) notes that "[a]s a rule, forms of the Present-Future also take on the prefix *a*-, although in some cases (especially in popular speech and in the dialects) forms without this prefix are used, too." This same optional prefix *a*- surfaces in the past continuous form and "the choice between forms with the prefix *a*- and those without this prefix is determined by the same criteria as in deriving Present-Future forms" (Andronov 1980, 62).[79]

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[76]In addition to aspectual and temporal information, different tense, aspect and mood configurations are indicated by different classes of agreement markers.

[77]Though both the morphological decomposition here and in Veselinova (2006, 65) is based on Andronov (1980), the one here is different from Veselinova (2006).

[78]This form is not listed but follows from the description of the grammar.

[79]Note that, in addition to the prefix, the simple past and the past continuous are also distinguished by their person markers; (i) gives the person suffixes of the simple past, and (ii) gives the person suffixes of the past continuous (Andronov 1980, 61-2):

i.
	SG	PL
1	-T	-n
2	-s	-re
3	∅	-r

ii.
	SG	PL
1	-(u)Ta	-(u)ne
2	-(u)sa	-(u)re
3	-(a)ka	-(u)ra

Brahui also has a potential mood, where we see that there are only two possible tenses, [present] and [future]. However, as opposed to the indicative where I assume that [present] and [future] are syncretic given that there is a single form that expresses these tenses, in the potential mood, [present] and [future] take different roots: the root for the potential present corresponds to the one in the indicative present/future (*kā*) and the one for the potential future corresponds to the one in the past tenses (*ʔin*).
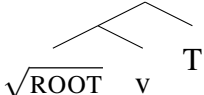
(355) kā-   go.POTENTIAL PRES

     ʔin-ō-   go-POTENTIAL FUT

Finally, Brahui has imperative mood, and 'to go' surfaces with the root *ʔin* and a zero suffix:[80],[81]

(356) ʔin-∅   go-IMPER

On the assumption that imperatives lack aspect and tense unless proven otherwise (see section below), and there is no evidence that there is tense in the imperative, we cannot say that the allomorph *ʔin* is conditioned by T.

Rather, *ʔin* must be the default form, and *kā* is the suppletive variant. We can then offer a fairly straightforward account by assuming the following structure for Brahui; note that since there is no evidence of any kind of aspectual morphology in the language, I assume that there is no Asp node.

(357)

√ROOT   v   T

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[80]The imperative is not always null, but has the following allomorphs: *-a, -ak, -e/ē* and ∅.

[81]In addition, Brahui has conditional mood, but from the description it seems there are no tense distinctions, and the verb 'to go' is not discussed; hence, I do not include a discussion of the conditional mood here.

Under this structure, tense is accessible as a context for suppletion since it is one node up from category-defining *v* and thus falls within the Accessibility Domain. As such, the following VI-rules for the Brahui verb 'to go' are all interpretable:

(358) $\sqrt{\text{GO}} \Leftrightarrow$ kā / __] T$_{[present]}$]

$\sqrt{\text{GO}} \Leftrightarrow$ ʔin

Such an analysis is supported by the taking into account that Brahui finite forms divide into positive forms (discussed above) and negative forms. Curiously, it seems that the verb 'to go' ceases to be suppletive and the only stem used is *ʔin* (Andronov 1980, 70,72):

(359) (a)-*ʔin-p(a)* '*a*-go-NEG' (realized as *(a)ʔimp(a)*.)

Furthermore, the negative suffix is located between the root and past tense morpheme (-*v* in the negative):

(360) *bin-ta-v-* 'hear-NEG-SIMPLE PAST'

Thus, if we assume that Neg is located below T this naturally accounts for the blocking of the suppletive variant, since in the structure below Neg is one node up from category-defining *v* but T is too far away to condition suppletion, thus making the specific rule in (358) that makes reference to a feature on T an ungrammatical item.[82]

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[82]Negation playing a blocking role like this is also seen in a similar way in English, given the contrast between:

  i. He plays football.
  ii. He doesn't play football.

In (ii) *play* is unable to combine with the tense suffix -*s*, which is then supported by dummy-do insertion. Without the negation, *play* in (i) freely combines with T, resulting in the synthetic realization of the verb and tense.

(361)

$$\sqrt{\text{ROOT}} \quad \text{v} \quad \text{Neg} \quad \text{T}$$
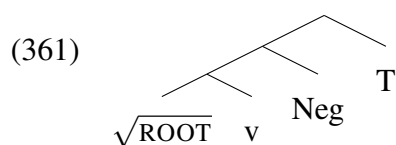
Whilst this analysis works straightforwardly, it makes reference to the context of present tense as a trigger for suppletion. Though an investigation into the relation between suppletion triggers and markedness falls outside the scope of the dissertation (see also section 5.3), it is worthwhile to consider an alternative analysis, which does not make reference to present tense as a context for allomorphy.

Indeed, as an alternative the allomorph *kā* can be analysed as the realisation of a portmanteau of the root and present tense. Crucially, only a portmanteau is formed when T carries the feature [present], thus giving rise to the following VI-rules:

(362) $\left[\sqrt{\text{GO}}, \text{T}_{[\text{present}]} \right] \Leftrightarrow \text{kā}$

go $\Leftrightarrow$ ʔin

Thus, the observed pattern results not from suppletion of the same element, but rather a contrast between a portmanteau involving the root, versus the elsewhere form of the root.[83] This analysis also accounts naturally for the non-suppletive form in the negative (359), since Neg would intervene between the root and T, thus not allowing for a portmanteau to be formed. Note, though, that under this analysis the locality domain does not seem

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Note indeed that negation also prevents a suppletive form from arising, since tense information is expressed the expletive *do*:

iii. he didn't go.

iv. *he didn't went.

[83]In addition, if we take seriously the hypothesis that present cannot be a context for suppletion, then this analysis makes a crucial distinction in that portmanteau formation is not subject to markedness restrictions, whilst potential suppletion triggers are.

to be extended; specifically, despite the root forming a portmanteau with tense, no further suppletion patterns are observed.

Korean A second case that can be argued to involve root-portmanteaux comes from Korean (Chung 2007, 2009), where we observe suppletion in the context of negation (363), as well as in an honorific context (364):[84]

(363)   al-   'know'

         molu-   'know.NEG'

(364)   mek-   'eat'

         capswu-si-   'eat.HON-HON'

Note that in the negative suppletive forms the regular negation marker *an(i)* (which is prefixal) is not observed, these can be argued to form a portmanteau of the root and Neg.[85] For the sake of the discussion, let us assume it is for now. In contrast, in the honorific suppletive forms the regular honorific suffix *-si* is obligatory, thus making an analysis of portmanteauhood unavailable.

Following Chung, the relevant structure for Korean is as follows:

(365)

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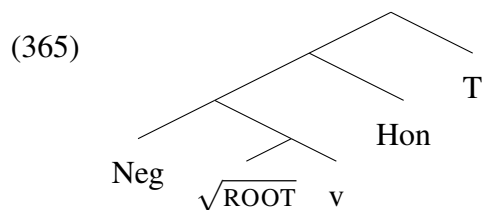
[84] Chung (2009) also lists the pair *ca-* 'sleep' and *cwumu-si* 'sleep.HON-HON' as another instance of honorific-driven root-suppletion.

[85] Chung (2009) makes a distinction between 'lexical' prefixes and *an(i)*, showing that the latter is a syntactic construction; however, for current purposes all that is relevant is that *an(i)* can govern contextual allomorphy (see also Bobaljik 2012).

On the assumption that Neg suppletion involves a portmanteau construction in Korean, there are no restrictions on the verb 'to know' (363) to prohibit suppletion in the context of negation. The verb 'to eat' (364) can also display suppletion in the context of Hon since, in the absence of Neg, it is still local enough to the root, though no portmanteau is formed between the root and Hon.

At this stage, the question arises what happens to 'to eat' (364) when we have both Neg and Hon in the structure. Leaving aside the datum for now, we would predict suppletion to be blocked in the presence of Neg even if we take a portmanteau approach: since 'to eat' is not suppletive and thus does not form a portmanteau it can never extend locality domains. Only in a verb that is suppletive both in the context of Neg and Hon can we potentially see whether locality domains are extended or not.

Indeed, the verb 'to exist' displays exactly this three-way contrast, showing suppletive variants in both a negative and a honorific context:[86]

(366)   iss-   'exist'

        eps-   'exist.NEG'

        kyey-si- 'exist.HON-HON'

Now, under an account that the root and Neg form a portmanteau that extends locality, we predict that in a form with both Neg and Hon we should observe the suppletive form *kyey-*. This is indeed what we see, but curiously the regular negation marker *an(i)* is obligatorily overtly realised in this construction!

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[86]Note that *eps-* 'exist.HON' is not the only way to form a negative form of 'to exist', but the construction *an(i) iss-* 'HON exist-' has a different meaning (see Chung 2009 for details).

(367) apeci -kkeyse   silhemsil -ey **an(i)** kyey   -si   -ta
      father -HON.NOM lab   -LOC NEG exist.HON -HON -DCL
      'Father is not in the lab (honorific).'

Thus, in the construction in (367) the root 'to exist' and Neg cannot possible form a portmanteau, and thus no domain extension can occur. Note that under this view it is not the suppletion in the context of the honorific that is the issue, but the overt realisation of the negation marker.

Comparing this to an analysis that assumes no portmanteau and exclusively relies on the AD, we see that we also run into a problem, however. The cases in (363) and (364) are accounted for straightforwardly; the verb 'to know' (363) can supplete in the context of negation, since Neg is one node up from category-defining *v* and thus within the AD; similarly, the verb 'to eat' (364) can display suppletion in the context of Hon since, in the absence of Neg, this is the node immediately above category-defining *v*. Note, though, that under this analysis Neg is realised as a null allomorph in the context of suppletion: thus, technically the negative form of 'to know' is *molu-∅* 'know.NEG-NEG' and the negative form of 'to exist' is *eps-∅* 'exist.NEG-NEG'.

It is again the suppletion pattern of 'to exist' that is problematic, though for a slightly different reason than in the portmanteau approach; the observation that Neg is realised overtly in (367) is not an issue since, as mentioned above, Neg still remains a separate node, free to show contextual allomorphy itself. However, under an approach that does not allow for domain extension, there is no possible way to have Hon be sufficiently local to a root to allow for root-suppletion.

Finally, I return to the question of what happens to 'to eat' (364) in the context of Neg

and Hon; in line with the pattern for 'to exist' it is realised with a suppletive form:[87]

(368) an(i) capswu-si

Similarly, the form for 'to sleep' is realised with the form that is observed in an honorific context rather than the default realisation when it is used in the context of both Neg and Hon (see note 84 above):[88]

(369) an(i) cwumu-si

(cf. *ca-* 'sleep' and *cwumu-si-* 'sleep.HON-HON')

Note, again, that these forms are counter to all predictions, since Hon should never be able to govern suppletion across an overt Neg morpheme, irrespective of whether we assume a portmanteau approach with domain extension or an account that exclusively relies on the Accessibility Domain to restrict suppletion patterns.

In order to account for the Korean facts, I adopt Bobaljik's (2012) proposal that we are dealing here with two separate lexical items rather than suppletion. He suggests that the difference would be *capswu-* 'to eat (of an honorific agent)' and *mek-* 'to eat' and compares it to German *fressen* 'to eat (of animals)' and *essen* 'to eat.'

In sum, I have not found any evidence that portmanteaux extend locality domains in Brahui, Korean or any of the cases investigated in this study. Thus, I do not see any reason to posit a general mechanism where portmanteaux extend locality domains.

However, this does raise the question whether we need to include portmanteaux as a general operation available in the grammar, in particular if we allow for the hyper-contextual VI-rules (see section 2.5.3). Indeed, the difference between hyper-contextual

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[87]Jungmin Kang, p.c.
[88]Jungmin Kang, p.c.

VI-rules and portmanteaux is most visible in the portmanteau approach being able to naturally allow for domain extension. If we adopt hyper-contextual VI-rules, then positing both mechanisms seems redundant. However, a weak point of a theory that exclusively relies on hyper-contextual VI-rules is that it misses the point that a morpheme is expressed by a null exponent. Thus, whether we can truly do away with portmanteaux altogether I leave to be investigated in future research, but it should be noted once more that in this study, there is no evidence that locality domains can be extended to a head beyond the accessibility domain as defined here.

3.5 Summary of this chapter

In this chapter, we have seen that the Accessibility Domain makes parallel predictions in the verbal domain as compared to the nominal domain. Specifically, on the assumption that aspect is closer to the verbal root than tense, we predict that in lexical verbs, suppletion should be seen for aspect but not tense (when aspect is present in the structure); however, if aspect is not present in the structure, then tense suppletion should become a possibility. In contrast, functional material (here taken to be auxiliaries) is expected to show suppletion for both tense and aspect.

Indeed, aspect-driven root-suppletion is well attested in lexical verbs, as expected on the approach here. Interestingly, tense-driven suppletion is argued to be commonly found by Veselinova (2006); however, taking a sample of Veselinova's tense suppletion languages shows that some of her cases of tense-driven root-suppletion do not involve suppletion at all, thus showing that it is not as common as one might think. In the cases that

we do find it, we observe the following: (i) tense-driven suppletion is found in languages where tense appears to be closer to the root than aspect (e.g. Fur) or (ii) tense-driven suppletion is found in languages that do not usually show aspect as a separate node (Pipil, Kanuri, Italian and English). The remaining cases are auxiliaries that show tense-driven suppletion, exactly as predicted by the formalisation of locality argued for here. However, it should be noted here that only a sample of Veselinova's languages have been looked at, and it remains to be seen whether the hypothesis put forward here can be maintained.

Finally, I have argued in this chapter that portmanteaux do not extend domains in general, but that, in lexical material, this seems to be limited to adjectives.

Chapter 4

A Modest Proposal

4.1 Introduction

In this chapter, I consider a particular consequence for the morpho-phonology if we take the hypotheses advocated above seriously. To recap, on the basis of suppletion asymmetries, I argued that lexical material and functional material have different structure; taking nominals as representative, I argued that lexical nouns have the following abstract structure:

(370)

$$\sqrt{\text{ROOT}} \quad n \quad \# \quad K$$
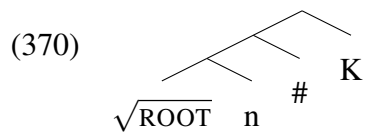
In contrast, pronouns, as functional material, contains less structure:

(371)

$$D \quad \# \quad K$$
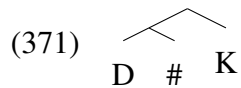
Whilst in the previous chapters I have been focusing on the Accessibility Domain, here I turn to another predicted asymmetry. As discussed in chapter 1, parallel to syn-

tactic domains, Embick (2010) proposes that cyclic nodes induce Spell-Out; following Bobaljik (2012), it is the complement of a cyclic node that undergoes Vocabulary Insertion (the morphological correspondent of Spell-Out). Given that lexical material has a cyclic category-defining node, this results in the complement of the category-defining node being a Spell-Out Domain. In contrast, in functional material there is no cyclic node low in the structure and the base does not form a Spell-Out Domain of its own. Thus, if we accept Spell-Out as an operation that is relevant for morphology, we predict a discrepancy in the Spell-Out Domains of lexical and functional material, with the former being smaller than the latter.

Now, on the hypothesis that morphology feeds into phonology, we expect the smaller and larger Spell-Out Domains for lexical and functional material, respectively, to play a role in the (morpho)phonology as well. That is, we predict an asymmetry, mirroring the one we saw in the discussion on limitations on suppletion, between lexical and functional material in that the former is more restrictive and the latter is more permissive in phonological interactions.

Indeed, though the root has also been identified as a privileged position for morphophonological purposes (e.g. Beckman 1998, Alderete 1999, i.a.), according to the theory here, the root forms a separate SOD, and on the strongest hypothesis, this would predict that the root should be closed off for further interaction, counter to fact.

Nonetheless, we do observe an interesting asymmetry: prefixes usually are less closely related to the root than suffixes (e.g. Nespor & Vogel 1986, see also Cutler et al. 1985, Hawkins & Cutler 1988, Bybee et al. 1990, van Oostendorp 1999, Cysouw 2003).

Here, I will show another asymmetry between prefixes and suffixes in their relation to

roots. Specifically, we will see that in languages that show vowel harmony it is never the case that a prefix spreads a harmonic value onto a (lexical) root, though suffixes are free to do so. In a similar vein, we will see that in languages were lexical accent resolution is resolved by demoting accents it is again never the case that a prefix causes an accent on a (lexical) root to be demoted, in contrast to suffixes.

In section 4.2.2, I will discuss how this apparent ban on prefixes influencing a root can potentially be tied to a domain that corresponds to the SOD, defined as the complement of a cyclic category-defining node. Specifically, I will propose that a boundary is inserted at the left edge of a domain that corresponds to the SOD which inhibits interactions between prefixes and roots.

Now, relating the limited interaction between prefixes and roots directly to a domain that corresponds to the SOD results in the predication that lexical and functional structures behave differently, given that lexical material contains a category-defining node that induces a smaller domain compared to that of functional material which crucially does not contain a category-defining node. Leaving aside the details of the restricting effect of the boundary for now, we can formulate the following initial statements:

(372)   In lexical material, given the presence of a category-defining node which induces a domain comprised of its complement (usually solely the root), a prefix and a root have a restricted relation.

(373)   In functional material, given that it lacks a category-defining node, a prefix and root should have no restrictions on their interaction.

In the following, I first briefly introduce the relevant vowel harmony interactions, and in section 4.2.1, I discuss occurrences of dominant prefixes in vowel harmony. Then, in

section 4.2.2 I introduce the No Dominant Prefix Hypothesis for lexical material and its absence in functional material, and analyse the data according to this hypothesis. Finally, in section 4.2.3 I consider the consequences of the No Dominant Prefix Hypothesis for compound structures.

Then, in section 4.3, I turn to lexical stress assignment, where we again see evidence in favour of the No Dominant Prefix Hypothesis, followed by a discussion of apparent counterexamples. Finally, in section 4.4, I relate the current proposal to the literature.

4.2   Vowel harmony

Before we continue, I briefly discuss some basic assumptions that I adopt in the representations used here for vowel harmony interactions; these will be discussed in more detail in section 4.2.1 below.

Whilst canonical vowel harmony involves affixal alternations which depend on the harmonic value of the root, in this chapter I focus on harmony systems that are characterised by both roots and affixes being possible donors of a harmonic value.

Indeed, such harmony systems are traditionally called 'dominant-recessive harmony' (or dominant harmony), and are prototypically characterised by a harmonic value spreading from one morpheme to another, not being limited to spread in one direction. In contrast, in a directional approach to vowel harmony the harmonic value spreads at the segmental level and is usually either progressive (left-to-right) or regressive (right-to-left). The difference between dominant-recessive harmony and directional harmony is irrelevant here in so far that I address the (limited) interaction between a prefix and corresponding

root, whether this is stated in terms of dominancy or directionality. Thus, the ban on prefixes influencing their corresponding root can be seen as a ban that is superimposed on both types of harmony, if we want to maintain the difference. Whether or not the two types of harmony can be reconciled I leave as an open matter.[1]

However, for practical purposes, I will use the term dominant harmony, though it should be noted that we can state the same restriction in terms of (bi-)directionality; this is done for expository purposes since it straightforwardly encodes the intuition of a harmonic value spreading from one morpheme to another, irrespective of how exactly it is encoded or directionality. At this stage, again mostly for expository ease, I do not assume that dominancy is represented on morphemes but rather is a segmental property, but I will return to the question whether it should indeed be analysed as a segmental property or as a morphemic property after having introduced the general pattern of dominant harmony that we are interested in and analyse the relevant cases in detail (see section 4.2.2).[2] Thus, for ease of exposition, when I refer to a dominant morpheme, this means that the morpheme contains a feature that spreads onto underspecified nodes.

Concretely, consider an example of dominant harmony in Kalenjin (Nilo-Saharan) (Hall et al. 1974, Hall & Hall 1980, Lodge 1995). The language displays ATR vowel harmony and vowels fall into two classes:

(374)   Dominant ([+ATR]): /i,e,ɒ,o,u/

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[1]It is worth pointing out that in his framework Nevins (2010) assumes an exclusively directional approach to Kalenjin, discussed immediately below, reanalysing this system as bidirectional rather than as it usually is analysed, i.e. dominant-recessive.

[2]Though again the ban on prefixes influencing their corresponding roots can be phrased in terms of a ban on a diacritic on morphemes or on dominant features, or as a general ban on both if we want to maintain a contrast, we will see that in the case of vowel harmony it may be best stated in term of a ban on a dominant feature (see section 4.2.2).

(375) Recessive ([-ATR]): /ɪ,ɛ,ɑ,ɔ,ʊ/

For now, I assume that the set of [+ATR] vowels spread their [+ATR] value onto un-derspecified vowels. Thus, I represent vowels as underspecified for [ATR] when they do not contain dominant [+ATR], and that [-ATR] is the default realisation in the absence of harmony spreading throughout a word.[3]

In the following I use a shortened notation, where morphemes in CAPITAL LETTERS are underspecified for [ATR] and thus contain (an) alternating vowel(s) with regard to their harmonic value ([ATR] in Kalenjin), roots are underlined and morphemes containing dominant vowels are in boldface. The arrows indicate a morpheme donating its domi-nant [+ATR] value to the indicated morphemes, which, originally unspecified for [ATR], receive an [+ATR] value by virtue of harmony.

Thus, below, in (376), we see that the root *ke:r* 'see' is dominant and affects its preced-ing prefixes, originally unspecified for [ATR], resulting in an overall [+ATR] realization (Hall & Hall 1980, 205; Hall et al. 1974, 247).

(376)   KI-   A-   **ke:r**   → [kiŋger]
         PAST-   1SG.SUBJ-   see
         'I saw it.'

Similarly, in (377), we see that the dominant root *ke:r* 'see' provides [+ATR] to the suffix, as well as the prefixes. As such, the root is donating its value to all alternating affixes (Hall et al. 1974, 247).

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[3]Alternatively, we could assume that vowels that do not contain dominant a [+ATR] feature are specified as [-ATR] and vowel harmony overwrites [-ATR] to [+ATR]; however, this is problematic when we see certain [-ATR] vowels block harmony (see also discussion below).

(377) KI- A- **ke:r** -IN → [kiŋge:rin]
PAST- 1SG.SUBJ- see -2.OBJ
'I saw you.'

In contrast to dominant roots, the root KER 'shut' is not dominant and in the absence of a dominant ([+ATR]) morpheme, an unspecified [ATR] value is realised as [-ATR]; thus, the word surfaces with default [-ATR] vowels (Hall & Hall 1980, 205; Lodge 1995, 33):

(378) KI- A- KER → [kɪɑgɛr]
PAST- 1SG.SUBJ- shut
'I shut (it).'

Turning to dominant affixes, in (379), we see that the suffix *-e* (analysed as progressive tense by Hall & Hall 1980 and as continuous by Lodge 1995) is dominant and provides [+ATR] to an alternating root (KER 'shut') as well as alternating prefixes (Hall & Hall 1980, 205; Lodge 1995, 33):

(379) KI- A- KER **-e** → [kiŋgere]
PAST- 1SG.SUBJ- shut -CONT
'I was shutting it.'

We see the same pattern in the pair below: the alternating root KU:T surfaces as default [-ATR] in the absence of dominant [+ATR] affixes (380), but in the presence of the dominant continuous marker the root and prefixes surface as [+ATR] (381) (Lodge 1995, 32).

(380) KU:T -UN → [kʊ:tʊn]
blow -DIRECTIONAL SUFFIX
'blow it here'

(381)

KA-   A-   KU:T   **-e**   → [kɒ:ɣu:te]
PAST-   1SG.SUBJ-   blow   -CONT
'I was blowing.'

To complete the paradigm, I give a form that contains both a dominant root and a dominant suffix, where we again see all morphemes surfacing as [+ATR] (Hall & Hall 1980, 205):[4]

(382)   KI-   A-   **ke:r** -e   → [kiŋge:re][5]
         PAST 1SG.SUBJ- see   -CONT
         'I was looking at (it).'

Thus, we see that in Kalenjin both roots and suffixes can be dominant in determining the harmonic value of alternating morphemes.

Now, recall that we made the following descriptive statements concerning the interaction between prefixes and their corresponding roots (repeated from above):

(383)   In lexical material, given the presence of a category-defining node which induces a domain comprised of its complement (usually solely the root), a prefix and a root have a restricted relation.

(384)   In functional material, given that it lacks a category-defining node, a prefix and root should have no restrictions on their interaction.

Before fleshing out the proposal further, below, I first go over the data from languages that support the predictions concerning prefixes above, and after that I will turn to an analysis of each case.

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[4]Here I leave open whether it is the root or the suffix that determines the [+ATR] value of the prefixes.
[5]The source does not give the phonetic form but can clearly be construed from the description.

4.2.1 Dominant prefixes

As we saw above, we saw that roots and suffixes can be dominant and, as such, determine the harmonic value of alternating morphemes. Interestingly, it has been claimed in the literature that there indeed are no dominant prefixes. The earliest mention seems to be from Hall & Hall (1980, 227,n.2), who observe the following:[6]

> "It is interesting to note that in Nez Perce, as in the African languages we report on below, there seem to be no true cases of Dominant grammatical prefixes which cause harmony to themselves. Apparent counterexamples like *watwa; ꞏyiksana* 'I waded across long ago' are clearly compounds of *wat-* 'to wade' and *wæꞏyik* 'to go across'."

In a similar vein, Krämer (2002) writes that "[p]refix controlled harmony is unattested so far, as is triggering by prefixes in dominant-recessive harmony" (Krämer 2002, 3). In his dissertation on stem-controlled and dominant-recessive vowel harmony, Baković also emphasizes the lack of dominant prefixes, but explicitly notes that he "does not explain its universality" (Baković 2000, 228). In effect, he gives an Optimality Theoretic analysis which crucially relies on the assumption that suffixes integrate into stems whilst prefixes do not do so. Nonetheless, as he notes explicitly, no motivation for this assumption is offered.

Whilst these claims are in line with the statements above with regard to lexical items, by linking the delimiting effects of prefixes directly to the presence of category-defining

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[6]For a discussion on vowel harmony in compounds, see section 4.2.3.

nodes we expect there to be some instances of dominant prefixes but these are crucially restricted to functional items.

Indeed, this is exactly the configuration that we find in the languages discussed immediately below: Tunen (Dugast 1971), KiBudu (Kutsch Lojenga 1994) and Kinande (Bbemo 1982, Kahindo 1981, cited in Hyman to appear).

It should be noted here that Hyman (to appear) makes a suggestion along the following lines: linking the scarcity of prefix-controlled harmony to functional considerations, he suggests that roots are bad targets for prefix-induced harmony due to "stem-initial resist[a]nce/strengthening/faithfulness effects", and that numeral stems (a closed class) are not "strong enough to resist progressive VH" (Hyman to appear, 23), though he does not further comment how to evaluate such 'strength'.

Tunen Tunen (Dugast 1971) displays dominant-recessive harmony along the feature [ATR]. As in Kalenjin, we again see two classes of vowels (adapted from van der Hulst et al. 1986, 112).[7]

(385)   Dominant: /i,ə,o,u/

(386)   Recessive: /ɛ,a,ɔ,o/

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[7]Note that /o/ falls into two categories: certain instances are dominant (inducing [+ATR] on alternating morphemes) and certain instances are recessive, as seen in the minimal pair *kol* 'to create' which contains a dominant /o/ and KOL 'to go and buy protective medicine' which contains a non-dominant /o/ (van der Hulst et al. 1986, 115):

i.	kol	'to go and buy protective medicine'	**kol**	'to create'
	kol-ɛn	'idem-APPLICATIVE'	**kol**-in	'idem-APPLICATIVE'
	kul-**i**	'idem-CAUS'	**kol-i**	'idem-CAUS'

As seen in *kul-i* 'to go and buy protective medicine-CAUS', non-dominant /o/ alternates with /u/ in the presence of a dominant [+ATR] suffix. This will be discussed more below in section 4.2.2.1.

Also, /i/ usually alternates with /ɛ/, but with /e/ in most prefixes (though this /e/ tends to be realised as /ɛ/) van der Hulst et al. (1986).

The language displays dominant roots and dominant suffixes, just as we saw in Kalenjin before. In (387), we see an alternating root TAL 'to put down' and a dominant causative suffix *-i* (van der Hulst et al. 1986, 113):

(387) tal 'to put down'

     təl-**i** 'to put down-CAUS'

These forms are analysed as follows; in (388), a root that is unspecified for its [ATR] value is realised as [-ATR] by default; in (389), this same root receives a [+ATR] value since it is harmonised by the dominant causative suffix that is specified as [+ATR]:

(388)   TAL   → [tal]

      put down

(389)

    TAL   **-i**   → [təli]
    put down   -CAUS

Similarly, in (390), we see an alternating class prefix MA-, which combines with a dominant root *bil* 'oil palms' as well as an alternating root *bat* 'clothes' (van der Hulst et al. 1986, 113):

(390) mwə-bil 'cl.6-oil palms'

     ma-bat 'cl.6-clothes'

These forms are analysed as below, where (391) shows that the class prefix is affected by the dominant root, and in (396) we see that, in the absence of a dominant morpheme, the word surfaces as default [-ATR].

(391)

    MA-   **bil**   → [mwəbil]
    cl.6-   oil palms

(392)   MA- <u>BAT</u>   →   [mabat]

    cl.6- clothes

Turning to dominant prefixes, we see that in Tunen we see that two functional words display an alternation that is conditioned by a (class) prefix; below we see that the base for 'this!' alternates between a [+ATR] *-tənə* and [-ATR] *-tana* realisation (van der Hulst et al. 1986, 113):[8]

(393)   a. mi-tənə 'cl.4-this!'

    b. mu-tənə 'cl.3-this!'

    c. ba-tana 'cl.2-this!'

Specifically, in (393), we see that the emphatic demonstrative (nearby), TANA, surfaces as [+ATR] in the presence of a dominant (class) prefix (393a,b) and as default [-ATR] in the absence of a (dominant) [+ATR] prefix (393c).

Thus, we see that in (393a,b) the alternating base is influenced by the prefix, as shown in (394) and (395) below. Note that in these cases we are not dealing with (lexical) roots but with a (functional) base.

(394)
    mi-   TANA   → [mitənə]
    cl.4-   this!

(395)
    mu-   TANA   → [mutənə]
    cl.3-   this!

In the absence of a morpheme carrying a dominant [+ATR] feature, we see that the word surfaces with default [-ATR] vowels:

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[8]It should be noted here that, given that they occur with both lexical as well as functional material, I assume that class morphemes are not the realisation of category-defining *n* (cf. Taraldsen 2010).

(396)   BA- TANA   →   [batana]

         cl.2- this!

In a similar vein, we see that the item for 'one, some' displays the same pattern, alternating between a [+ATR] *-moti* form and a [-ATR] *-mɔtɛ* form:

(397)   o-moti 'cl.3-one'

         ɔ-mɔtɛ 'cl.1-one'

As before, we see that the [ATR] value of a base is influenced by a dominant (class) prefix, when one is present:

(398)
         ⎯⎯⎯⎯⎯⎯→
         o-   MOTE   → [omoti]
         cl.3-   one

In the absence of a dominant [+ATR] prefix, default [-ATR] is observed:

(399)   ɔ-   MOTE   →   [ɔmɔtɛ]

         cl.1- one

If we compare this situation to a lexical item in Tunen, we see that whereas vowel harmony from a prefix onto a following morpheme is observed in the functional items, as in (393) and (397), the same configuration fails in a lexical context.

In (400), we see the same prefix *mu-* 'cl.3' as we saw in (393b) above, but the root is unaffected and surfaces as [-ATR] (Dugast 1971, 69):

(400)   mu-and 'cl.3-roof'

Indeed, we see that the prefix and root surface disharmonic, rather than the prefix spreading [+ATR] onto the root.

(401)   **mu**- <u>and</u>   →   [muand]

          cl.3- roof

Thus, we see in the data from Tunen that the situation that prefixes induce [+ATR] onto a following base is attested in functional material, but when these prefixes combine with a lexical root, the prefix does not spread its [+ATR] value, resulting in a disharmonic sequence.

KiBudu   In KiBudu (Kutsch Lojenga 1994) we see a similar pattern. Again, the vowels distribute into the following two classes, but this time /a/ is 'transparent': it has no [+ATR] counterpart and though /a/ surfaces as [-ATR] it is compatible with both a [+ATR] and a [-ATR] environment.

(402)   Dominant ([+ATR]): /i,e,o,u/

          Recessive ([-ATR]): /ɪ,ɛ,a,ɔ,ʊ/

Turning to prefixes in KiBudu, the relevant set of prefixes here are two types of class prefixes: those that combine with nouns and those that combine with numerals. Though some members of the two sets of prefixes seem the same, some numeral prefixes are different from their corresponding nominal prefixes; below, I give both sets of prefixes (Kutsch Lojenga 1994, 132):

(403)

	Nominal prefixes	Numeral prefixes
cl.1	mʊ-, a-, ∅-	mʊ-
cl.2	ɓa-	ɓa-
cl.3	mʊ-	ʊ-
cl.4	mɪ-	ɓe-
cl.5	ɪ	mɪ-
cl.6	ma-	ka-
cl.8	ɗɪ-	ɗí-
cl.10	∅-	ɓe-
cl.11	ʊ-	mʊ-
cl.14	ɓʊ-	mʊ-

It should be noted that only the numerals 'one', 'two' and 'three' display concord with the noun which is manifested by a (numeral) class prefix. Furthermore, 'one' cannot combine with plural prefixes.

It turns out that the cl.4, cl.8 and cl.10 numeral prefixes are dominant: when they combine with an alternating numeral base we see that the [ATR] value of the base is influenced by the prefix. As we saw in Tunen, we see that two functional items in KiBudu, the numeral items /-PÍNI/ (or /-PÍI/) 'two' and ⁼TÚ 'three' (which induces a high tone on its preceding morpheme), alternate between a [+ATR] and [-ATR] realisation.[9] Consider the forms for 'two' below, where we see an alternation between [+ATR] -*píni* in (404a,b) and [-ATR] -*pɪ́nɪ* in (404c,d) (Kutsch Lojenga 1994, 132):

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[9]The dominant numeral prefixes (class 4, 8 and 10) that contain [+ATR] vowels which spread their value onto the following morpheme happen to be associated with plural and thus the base for 'one' does not combine with them.

(404)   a. ɓe-píni 'cl.4/10-two'

b. ɗi-píni (→ [ɟepíni]) 'cl.8-two'

c. ɓa-pínɪ 'cl.2-two'

d. ka-pínɪ 'cl.6-two'

In (404a,b) we see that a dominant prefix determines the [ATR] value of the base resulting in a [+ATR] realization, [píni]:

(405)

ɓe-   PÍNI   → [ɓepíni]
cl.4/10- two

(406)

ɗi-   PÍNI   → [ɟepíni]
cl.8-   two

In contrast, when we observe a non-dominant prefix (404c,d) the base is realised as default [-ATR], [pínɪ]:

(407)   ɓA- PÍNI   →   [ɓapínɪ]

cl.2- two

(408)   KA- PÍNI   →   [kapínɪ]

cl.6- two

We see the exact same pattern in (409) for class prefixes combining with ꞱTÚ 'three'. The forms in (409a,b) contain dominant prefixes which result in a [+ATR] realisation of the base, *-tú*, and the ones in (409c,d) contain non-dominant prefixes, resulting in the surfacing of default [-ATR], *-tʊ́* (Kutsch Lojenga 1994, 132):

(409)   a. ɓĕ-tú 'cl.4/10-three'

      b. ɗi-tú (→ [ɟĕtú]) 'cl.8-three'

      c. ɓǎ-tʊ́ 'cl.2-three'

      d. kǎ-tʊ́ 'cl.6-three'

Parallel to the cases above, we see that the base is influenced by a dominant [+ATR] prefix, which, as such, surfaces as [+ATR] as well:

(410)

    ɓe-   ꞌTÚ   → [ɓĕtú]
    cl.4/10-   three

(411)

    ɗi-   ꞌTÚ   → [ɟĕtú]
    cl.8-   three

In the absence of a dominant prefix, default [-ATR] is observed:

(412)   ɓA- ꞌTÚ   → [ɓǎtʊ́]

       cl.2- three

(413)   KA- ꞌTÚ   → [kǎtʊ́]

       cl.6- three

Thus, we see that, as in Tunen, in KiBudu there are prefixes that influence a following base in functional material, viz. the numerals 'two' and 'three'.

Contrast this to the prefixes that combine with nouns; we see that neither the class 4 prefix (414) nor the class 8 prefix (415) affects the root (Kutsch Lojenga 1994, 130-131):

(414)   a. mi-kpékpé 'cl.4-seed, grain, kernel'

           mi-tánji 'cl.4-type of animal'

    b. mɪ-gyɛ̆ndɔ 'cl.4-village, lining the road'

       mɪ-tɪmá 'cl.4-heart'

(415) a. ɗi-siɓó 'cl.8-rainbow'

       ɗi-pínga 'cl.8-toddler'

    b. ɗɪ-kyɛmʊ 'cl.8-complete bridepiece'

       ɗɪ-njɛ́ngwa 'cl.8-rope for tying firewood'

Rather, what we see that in these cases is that the root determines the [ATR] value of the prefix: in (414a) and (415a) we see that a dominant [+ATR] root results in a [+ATR] realization of the prefix, and in (414b) and (415b) we observe a [-ATR] root and [-ATR] realisation of the prefix. The examples in (414a) and (415a) are exemplified here by *ɗisiɓó* 'cl.8-rainbow', where we see that the dominant root spreads its [+ATR] value onto the prefix:

(416)

ɗɪ-   **siɓó**   → [ɗisiɓó]
cl.8-   rainbow

The examples in (414b) and (415b) involve default [-ATR] realisations and are exemplified here by *mɪtɪmá* 'cl.4-heart':

(417) Mɪ- T̲ɪ̲M̲Á̲ → [mɪtɪmá]

      cl.4- heart

Thus, we see a complete reversal in dominancy in lexical and functional material: in the former the root determines the character of the prefix, whilst in the latter the prefix determines the character of the base.

Returning to the table in (403), we see that the nominal and their corresponding numeral prefixes are not all identical but there are still clear resemblances across most classes. We cannot say whether nominal and numeral prefixes are allomorphic alternants of each other or that they are two independent morphemes; here I have represented them as separate forms as can be seen from the fact that the nominal class 4 and 8 prefixes are represented as unspecified for their [ATR] value in (417) (indicated by capital letters).[10] Either way, again we observe that in constructions consisting exclusively of functional material dominant prefixes are a possibility, but in lexical constructions we never observe dominant prefixes that donate their value onto a following root.

Kinande Kinande (Hyman to appear) shows ATR harmony, and vowels fall in the following familiar two classes. Note that, similar to KiBudu, /a/ does not have an ATR counterpart.[11]

(418) Dominant ([+ATR]): /i,e,o,u/

Recessive ([-ATR]): /ɪ,ɛ,a,ɔ,ʊ/

Below, we see the root conditioning the harmonic class of an alternating applicative suffix -IR, which surfaces as [+ATR] *-ir* (419) or as [-ATR] *-ɪr* (420) (Hyman to appear, 19):[12]

(419)

$$\overrightarrow{\text{-lím}} \quad \overrightarrow{\text{-IR}} \quad \text{-a} \qquad \rightarrow \text{[-lį́mira]}$$
'exterminate for/at'

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[10]See also section 4.2.2.1 below.

[11]However, in contrast to KiBudu it behaves differently depending on the directionality of vowel harmony: it is transparent or an undergoer in regressive ATR harmony, but it is opaque in progressive ATR harmony.

[12]Progressive harmony in Kinande only targets high vowels.

(420)

-lɪm   -IR   -a   → [-lɪmɪra]
'exterminate for/at'

In (419), a dominant [+ATR] root imposes its ATR value on the following alternating suffix, whilst in (420), the root is not dominant and default [-ATR] surfaces.

Similarly, we see in (421) that the agentive suffix -*i* is dominant and determines the ATR value of a non-dominant root LIM 'cultivate' (Hyman to appear, 18):[13]

(421)

ɔ-   Mʊ-   LIM   -i   → [omulimi]
'cultivator'

In (421), we also see that prefixes are subject to harmonising with a dominant root or suffix, if one is present.

Turning to dominant prefixes, we see that the class 4 and 10 numeral prefix *i*- spreads [+ATR] onto its following morpheme (Bbemo 1982, Kahindo 1981, cited in Hyman to appear, 21).[14] Thus, we see that the base for 'two' varies between a [+ATR] *βiṛi* (422) form and a [-ATR] *βɪrɪ* (423) form:

(422)   i-βiṛi 'cl.4/10-two'

(423)   βa-vɪrɪ 'cl.2-two'

Similarly, the base of the numeral 'four' alternates between [+ATR] *ni* realisation (424) and a [-ATR] *nɪ* realisation (425):

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[13]Though Hyman (to appear) does not give alternating forms for the prefixes and root, he gives /ɔ-mʊ-lɪm-i/ as the underlying form, crucially without [+ATR] vowels.

[14]Since, in Kinande, progressive harmony only targets high vowels, we see ATR harmony provided that the following vowel is high; if it is not, ATR harmony fails:

i. **i**-tanʊ 'cl.4/10-five'

Note also that here we see that /a/ is opaque in progressive harmony: [-ATR] [ʊ] is observed in the base rather than [+ATR] [u].

(424)   i-ni 'cl.4/10-four'

(425)   ba-nɪ 'cl.2-four'

Thus, we see that in the data in (422) and (424) above that the prefix spreads its [+ATR] value onto the following base:

(426)

i-   βɪRɪ   → [iβịrị]
cl.4/10-   two

(427)

i-   NI   → [ini]
cl.4/10-   four

Thus, again we see that dominant prefixes are attested, but that they are crucially only observed in functional material.

In contrast, when no dominant morphemes are present default [-ATR] is observed, as in the data in (423) and (425) above:

(428)   βa-   βɪRɪ   →   [βavɪrɪ]

        cl.2- two

(429)   βa-   NI   →   [banɪ]

        cl.2- four

Finally, we turn to the behaviour of the class 5 prefix in Kinande.[15] Here, I follow Hyman's analysis, which is summarised below. The form of the class 5 prefix alternates between [eri-] (430-431) and [ɛrɪ-] (432) (Hyman to appear, 21-12):[16]

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[15]Hyman (to appear) decomposes the prefix into two parts *ɛ-ri-* but given that it is given as a single class prefix I use *ɛri-*.

[16]Hyman (to appear) also mentions a variant /i-/, but gives no further data.

(430) [eri-rı̣ba] 'cl.5-spring'

[erí-kúndo] 'cl.5-knot'

[erí-kánzi] 'c.5-plantain'

[eri-tsengû] 'cl.5-big head'

(431) [erí-bɛ́rɛ][17] 'cl.5-breast'

[eri-bɔndɔ] 'cl.5-wild palm'

[eri-gana] 'cl.5-hundred'

[erí-balɛ̀] 'cl.5-callus'

[eri-gɔmba] 'cl.5-drum'

(432) [ɛrí-hɪrì] 'cl.5-crab'

[ɛrí-tʊgʊ̀] 'cl.5-yam'

[ɛrí-tʊmbì] 'cl.5-night'

In (430), the [+ATR] realization of the class 5 prefix is ambiguous between stemming from the ([+ATR]) lexical root through regressive harmony or being an inherent property of the class 5 prefix. However, the data in (431) shows that the [+ATR] character of the prefix cannot stem from the root, since the lexical roots in (431) are [-ATR]; thus, the prefix must have some inherent [+ATR] component. Its failure to spread onto the following root then is ambiguous between two sources: (i) it could be the case that it fails to spread since the vowels in the root are non-high and progressive harmony in Kinande only targets high vowels, or (ii) it could follow from the generalisation identified so far that prefixes do not spread their value onto a following root in lexical material. Indeed, it is the data in (432)

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[17]Hyman lists the underlying for as /-bére/ with [+ATR] vowels, but this seems to be a typo, since it's classified as a non-ATR stem and other forms contain [-ATR] /ɛ/: *a-má-bɛ́rɛ* 'breasts'.

that shows it cannot be simply the case that harmony fails due to the target vowel being non-high, since in (432) the root contains the high vowels /ɪ/ and /ʊ/ (cf. (419-420) above where we see that the target vowel in the applicative suffix is high).

Hyman (to appear, 22) captures the pattern by analyzing the prefix as underlyingly /ɛri-/.[18] In (430) and (431), [+ATR] /i/ spreads leftward, resulting in a [+ATR] realization of the mid vowel: [e], and the roots remain unaffected since they are compatible (430) or insensitive to harmony since it is a non-high target (431). When it combines with a [-ATR] high root - as in (432) - Hyman (to appear, 22), drawing on Baković's (2000) 'dominance reversal', proposes that in these cases [+ATR] delinks from from /i/, which is "triggered by the fact that /i, u/ cannot co-occur with /ɪ, ʊ/ within a word at the lexical level in Kinande".[19] Given that [+ATR] is delinked it then cannot spread its value onto the preceding vowel, and the prefix surfaces as [ɛrɪ-].

Hyman notes, though, that "[p]erhaps the most puzzling thing about Kinande is why there is dominance reversal rather than progressive harmony in [(432)]." However, in the framework adopted here, it follows from the generalisation that prefixes do not spread their harmonic value onto a following root that progressive harmony is not an option in lexical material. Rather, the surprising fact here is that the prefix does not surface as its underlying [+ATR] realisation *eri-*, resulting in forms such as (unattested) [eri-tʊgʊ̀] 'cl.5-yam'.

Concretely, Hyman's representation of the prefix corresponds to /ɛri-/ in the notation used here: the mid vowel is not specified for its [ATR] value and the high vowel of the prefix is a dominant [+ATR] high vowel.[20] However, if it is the case that prefixes cannot

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[18]In Hyman (to appear) /ɛ-ri-/ (see note 15 above).

[19]Note that /ɛ/ co-occurs with /i/ elsewhere, e.g. *mó-tw-a-kí-hék-ir-ɛ̀* 'we carried it' (Hyman to appear, 19).

[20]Note that we could also assume that both the mid and high vowel of the suffix are prespecified as

spread a harmonic value onto their following lexical root, then when the prefix combines with a lexical root which presumably otherwise would be available to be a target for ATR harmony, this interaction is blocked, even though from a phonological perspective the root would otherwise be available to be a target for ATR harmony. This then results in a sequence which contains both [i] and [ʊ], which, following Hyman (to appear), I assume to be a disallowed configuration in Kinande. Again, following Hyman (to appear), I assume that this then triggers a repair where [+ATR] is delinked leaving the vowel [ɪ]. Note, though, that the prefix is realised as [ɛɪɪ-] rather than [eɪɪ-]. There are two ways to analyse this: (i) the resolution of [i] and [ʊ] must be immediate in order to ensure [+ATR] does not spread leftward onto the mid vowel; or (ii) we extend the ban on two sequences of vocalic elements and include [e] and [ɪ] as a disallowed configuration, which can be subsumed under a constraint *[+ATR],[-ATR,+high] (see also section 4.2.2 below).[21]

Compare this to a situation where we see the dominant character of the prefix; when the prefix combines with a root that does not result in a sequence of [+ATR] followed by [-ATR, +high], such as *erigɔmba* 'cl.5-drum', which is realised as disharmonic.

Crucially, though, in accordance with the generalisation identified, harmony does not spread onto a lexical root. Rather, again we see that only in functional material we observe dominant prefixes that spread their harmonic value onto a following base. Indeed, the approach here clearly predicts that if this class 5 prefix combines with the (alternating) numerals 'two' or 'four', then it should spread its [+ATR] value onto the base; unfortunately, I do not have these data.

In sum, we have seen that empirically we do observe dominant prefixes, but that these

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[+ATR] resulting in /eri-/; see also section 4.2.2.1.

[21]In the data given there were indeed no sequences of [e] and [ɪ].

are crucially restricted to occurring in functional material. Thus, we see that the claims of Hall & Hall (1980) and Baković (2000) that dominant prefixes do not exist are only valid for lexical material. In the following section, I will introduce the No Dominant Prefix Hypothesis, which aims to formalise the generalisation uncovered here that dominant prefixes do not cause harmony on their corresponding lexical roots.

4.2.2 No Dominant Prefix Hypothesis

Having identified the generalisation that dominant prefixes do not spread in lexical material, we turn to its formalisation. A crucial observation here is that we do observe dominant prefixes in functional material; thus we cannot say that there is some universal restriction on dominant prefixes in general. Instead, I propose that the generalisation that we do no observe dominant prefixes in lexical material can be tied to a domain that is defined as the complement of a cyclic category-defining node, which corresponds to the Spell-Out Domain. Specifically, I propose the following:

(433)   The left edge of prosodic words aligns with the left edge of the complement of a category-defining node.

Regarding (433), the complement of a category-defining node coincides with the Spell-Out Domain. Indeed, as a motivation for the insertion of a left edge boundary at the left edge of a SOD, I suggest that at the point that a SOD is formed, prosodic words begin to be built left-to-right (cf. edge alignment theory Selkirk 1986, Downing 2010, Cheng & Downing 2012; see also Kim 2014).[22]

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[22]Cf. Hyman (to appear, 23) who mentions stem-initial resistance/strengthening/faithfulness effects, which he suggests might not occur in closed class items.

Thus, we see that the category-defining node creates a Spell-Out Domain containing the root and thus the left edge of a prosodic word is introduced, in accordance with (433); this is represented below by a prosodic boundary at the left edge of the SOD:

(434) The left edge of prosodic words aligns with the left edge of the SOD:

$(_\omega$ **root**

In addition, I propose the following hypothesis:[23]

(435) In a configuration x $(_\omega$ y

x cannot alter (properties of) y,

y can alter (properties of) x.

At this stage, the hypothesis in (435) stands as a stipulation, but the data seem to lead us to this conclusion; cf. Kim (2014) who introduces a prosodic boundary between a prefix and root for similar reasons (see also section 4.4.3 for some more thoughts on the nature of this boundary). Thus, in accordance with (435), prefixes cannot alter a root, which crucially lies inside a separate prosodic domain:

(436) In a configuration x $(_\omega$ y, x cannot alter (properties of) y:

prefix $(_\omega$ root

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[23]An alternative that derives a similar effect is to assume that the structure inside the prosodic word (here the root) is closed off (cf. the freezing effect of spellout in syntax). In effect, this would mean that outer material cannot alter (certain properties of) material across a prosodic boundary. However, though this seems to achieve the correct result for the interaction between prefixes and roots, we run into a problem when we consider a structure where a suffix that does affect the root is located higher than a prefix. That is, given that certain suffixes that are higher than the prefixes are able to alter material within the root, it is not truly the case that material within the root is fixed. Thus, I do not pursue this view any further.

Note that the proposed boundary that is inserted is a left edge boundary and (435) is mono-directional: it bans prefixes from influencing roots in lexical material, whilst allowing roots to influence prefixes.

In contrast, given that functional material does not contain category-defining nodes, no SOD low in the structure is created and the prosodic word boundary is placed higher, crucially above the prefix:

(437)   The left edge of prosodic words aligns with the left edge of the SOD:

      ($_\omega$ **prefix** **base**

Given that the prefix now is contained within the same prosodic domain, it is free to interact with its base:

(438)

      $\longrightarrow$

      ($_\omega$ prefix base

Thus, we can formulate the following hypotheses which specifically refer to vowel harmony in lexical and functional material:

(439)   No Dominant Prefix Hypothesis (NDPH): In lexical material, a (dominant) prefix cannot determine the harmonic class of its root (and suffixes).

(440)   In functional material, the NDPH is inapplicable, thus allowing a (dominant) prefix to determine the harmonic class of its base.

It should be noted that, in its current formulation, the NDPH applies both in terms of dominant-recessive vowel harmony and directional vowel harmony, since the restriction is superimposed on any interaction between prefix and root. In the following, I briefly

go over the data from Tunen, KiBudu and Kinande again, showing how it is analysed by assuming the two hypotheses introduced above.

Tunen   Here I repeat the relevant data from Tunen (van der Hulst et al. 1986) that showed dominant prefixes in functional material; specifically, as we can see in the data below (441), the base for 'this!' alternates between a [+ATR] *tənə* and [-ATR] *tana* realisation. Similarly, the base for 'one, some' alternates between a [+ATR] *moti* and a [-ATR] *mɔtɛ* form (442).

(441)   a.   mi-tənə 'cl.4-this!'

b.   mu-tənə 'cl.3-this!'

c.   ba-tana 'cl.2-this!'

d.   mo-tana 'cl.1-this!'

(442)   a.   o-moti 'cl.3-one'

b.   ɔ-mɔtɛ 'cl.1-one'

Implementing the hypotheses proposed above, we see that given that we are dealing with functional material the NDPH is inapplicable and the prosodic boundary is placed to the left of the prefix allowing for unconstrained interaction between prefix and base; thus, we can represent (441a) as (443), and (442a) as (444).

(443)

$(_\omega$ **mi-**   TANA$\qquad \rightarrow$ [mitənə]

(444)

$(_\omega$ **o-**   MOTE$\qquad \rightarrow$ [omoti]

Crucially, the above items contain functional material only, and there is no root in the structure. No prosodic boundary is then created immediately adjacent to the prefix, which allows for the possibility of vowel harmony spreading from it onto the next morpheme.

In contrast to functional material, we saw that in lexical material the same prefix *mu-* 'cl.3' as we saw in (441b) does not spread its [+ATR] value, resulting in a disharmonic sequence when it combines with a non-ATR root:

(445)   mu-and 'cl.3-roof'

This is exactly what we predict given the NDPH: given the presence of a morphological root, a prosodic boundary is placed at the left edge of a root, creating a prosodic word into which prefixes cannot spread their harmonic value:

(446)

mu- $(_\omega$ <u>and</u> $\rightarrow$ [muand]

Thus, even when *mu-* 'cl.3' combines with a [+ATR] root, we see both surfacing as [+ATR], but crucially this does not stem from the prefix determining the harmonic class of the root (Dugast 1971):

(447)   mu- <u>ɔnj</u> 'cl.3-bracelet'

Thus, we see that the data from Tunen supports the hypothesis of the NDPH as formulated here.

KiBudu   The relevant data from KiBudu (Kutsch Lojenga 1994) are repeated here from above; thus, we see that in the bases of the numerals 'two' (448) and 'four' (449) show a [+ATR] variant in the context of a (dominant) class 4/10 or class 8 prefix, and a [-ATR] variant elsewhere.

(448)   a.   ɓe-píni 'cl.4/10-two'

b.   ɗi-píni (→ [ɸepíni]) 'cl.8-two'

c.   ɓa-pínɪ 'cl.2-two'

d.   ka-pínɪ 'cl.6-two'

(449)   a.   ɓě-tú 'cl.4/10-three'

b.   ɗi-tú (→ [ɸětú]) 'cl.8-three'

c.   ɓǎ-tʊ́ 'cl.2-three'

d.   kǎ-tʊ́ 'cl.6-three'

Again, these configurations involve functional material and thus the prosodic boundary is placed above the prefix, crucially including the prefix and base in a single prosodic domain, allowing for unrestricted interaction, here exemplified by *ɓepíni* 'cl.4/10-two' (450) and *ɓětú* 'cl.4/10-three' (451):

(450)
    (ω   **ɓe-**   PÍNI   → [ɓepíni]

(451)
    (ω   **ɓe-**   ⁺TÚ   → [ɓětú]

In contrast, prefixes that combine with nouns never affect the root; in (452b) and (453b) we can see that neither the class 4 prefix (452) nor the class 8 prefix (453) result in a [+ATR] realisation of the root when it is not already prespecified as such.[24]

(452)   a.   mi-kpékpé 'cl.4-seed, grain, kernel'

mi-tánji 'cl.4-type of animal'

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[24]I return to the observation that we do not observe a disharmonic root in section 4.2.2.1.

    b. mɪ-gyɛ̌ndɔ 'cl.4-village, lining the road'

        mɪ-tɪmá 'cl.4-heart'

(453)   a. ɗi-siɓó 'cl.8-rainbow'

        ɗi-pínga 'cl.8-toddler'

    b. ɗɪ-kyɛmʊ 'cl.8-complete bridepiece'

        ɗɪ-njɛ́ngwa 'cl.8-rope for tying firewood'

Again, the fact that the prefixes do not determine the harmonic class of their root is expected given the NDPH. The category-defining node in lexical material induces a SOD comprised of its complement at which a left edge boundary is inserted at the left edge, which prohibits any potential prefixes from influencing their corresponding root which is in a separate prosodic domain. The situation is exemplified by *ɗi-siɓó* 'cl.8-rainbow' below, where, as before, I do not assume the class prefix in nouns and numerals is the same (see also section 4.2.2.1 below), and thus the prefix here is not represented as dominant:

(454)

ɗɪ-   (ω   **siɓó**   → [ɗisiɓó]
cl.8-   rainbow

We see clearly in (454) that the boundary only prohibits material to its left to influence material to the right, but not vice versa: the root is free to determine the harmonic class of the prefix.

Thus, again we see that the formulation of the NDPH is empirically supported by the fact that dominant prefixes are not attested in lexical material, but they are attested in functional material.

Kinande Finally, below I give data from Kinande (Hyman to appear), where again we see that a numeral base show two forms: [+ATR] in (455a) and (456a), and [-ATR] in (455b) and (456b).

(455) a. i-βịrị 'cl.4/10-two'

  b. βa-vɪrɪ 'cl.2-two'

(456) a. i-ni 'cl.4/10-four'

  b. ba-nɪ 'cl.2-four'

We analyse these forms exactly the same way as we saw in KiBudu above; since there is no category-defining node the boundary is placed above the prefix, allowing free interaction in either direction between the prefix and the root:

(457)
$(_\omega$ **i-** $\overrightarrow{\beta \text{IRI}}$ $\rightarrow$ [iβịrị]

(458)
$(_\omega$ **i-** $\overrightarrow{\text{NI}}$ $\rightarrow$ [ini]

Turning to the data involving lexical material, we saw the following pattern in nouns that combine with the class 5 prefix; here each pattern is represented by one example:

(459) eri-rịba 'cl.5-spring'

(460) eri-gɔmba 'cl.5-drum'

(461) ɛrí-tʊgʊ̀ 'cl.5-yam'

We see that in (459) both prefix and root are [+ATR], the source here for the ATR values is ambiguous between being inherent or copied from one morpheme to another.

In (460), we see that the prefix is actually inherently [+ATR], and, under a view of dominant features, this then constitutes a dominant morpheme. Now, according to the hypothesis here, the fact that we do not observe an [+ATR] root is due to the NDPH, which would block a prefix spreading onto a root, even if this results in a disharmonic sequence, as schematised in (462). Note that I represent only the high vowel as containing the dominant feature [+ATR], rather than the entire morpheme, and, as such, we see leftward spreading of [+ATR] from /i/ onto the mid vowel on its left (see also section 4.2.2.1).

(462)

$$\overset{\longleftarrow\,\longrightarrow\!\!\times}{\text{Eri-}\quad(_\omega\quad\underline{\text{gɔmba}}}\qquad\rightarrow\text{[erigɔmba]}$$

However, there is another possible explanation which does not draw on the NDPH: rightward ATR harmony in Kinande never spreads onto non-high vowels (Hyman to appear). On that analysis, we fail to see [+ATR] vowels on the root, simply because [+ATR] never spreads rightward onto mid vowels.

Whilst Hyman's analysis seems much simpler, we run into a problem when taking into account (461). There we see that the root vowels are high, and, as such, are, phonologically, appropriate undergoers of ATR harmony (cf. (419) above, where we see a configuration where the trigger is a [+ATR] high front vowel and the target is a [-ATR] high front vowel and harmony is successful: *-lím*-IR-*a* 'exterminate for/at' is realised with [+ATR] vowels as [-lími̥ra].).

Nonetheless, harmony fails in (461), and Hyman (to appear, 22) is forced to say that "[t]he ATR trigger of /ɛ-ri-/ is delinked if followed by /ɪ, ʊ/ in the following class 5 noun stem." Specifically, the disallowed configuration where /ɪ, ʊ/ and /i, u/ co-occur within a word at the lexical level triggers 'dominance reversal' (Baković 2000), which in turn

results in the delinking of [+ATR] from /i/. However, there is no clear explanation as to why the disallowed sequence needs a repair rather than spreading its [+ATR] value onto its following morpheme.[25]

In contrast, the approach here has no problems explaining why the prefix does not spread onto the root: this interaction is blocked due to the presence of a prosodic boundary which prohibits altering the harmonic class of material within the prosodic domain. This is represented below for *ɛrítʊgʊ̀* 'cl.5-yam':[26]

(463)

Eri- (ω   tʊgʊ̀   → [ɛrítʊgʊ̀]

Thus, there is no question why it is the case that the combination of prefix and root does not result in the prefix spreading its [+ATR] value onto the root. Nonetheless, if the prefixation cannot spread its harmonic value onto a following root, this results in a disharmonic sequence, as we indeed saw in (460), where we saw a [+ATR] prefix followed by a [-ATR] root.

However, following Hyman (to appear), I assume that the configuration of [i] and [ʊ] is indeed disallowed in Kinande, and is resolved by virtue of delinking [+ATR].[27] It is important to realise, though, that given that the NDPH removes the option of the prefix spreading onto the root, it is not surprising that Kinande has to resort to other means to

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[25]Hyman (to appear, 23) states that roots are bad right-targets, which may be related to stem-initial resistance/strengthening/faithfulness effects; and that prefixes are bad (left-)triggers.

[26]I discuss the surface form of the initial vowel below.

[27]There seems to be somewhat of a conspiracy here in that both vowel harmony and the constraint against [i] and [ʊ] with subsequent delinking of [+ATR] have the same effect: namely, to make a sequence harmonic. However, it seems difficult to unify the two especially since at least in Kinande there must be something particular, rather than general, to the configuration which triggers delinking of [+ATR], given that we only observe the delinking when the root vowel is high; when the root vowel is mid this result in a disharmonic sequence.

avoid this unaccepted configuration.

This leaves us with a final minor issue with the initial vowel of the prefix, which is re-alised with a [-ATR] rather than [+ATR] vowel: [ɛɪɪ-] rather than [eɪɪ-]. One way to derive the correct result would be to assume that the resolution of [i] and [ʊ] must be immediate in order to ensure [+ATR] does not spread leftward onto the mid vowel. Alternatively, we extend the ban on VV sequences and include [e] and [ɪ] as a configuration that needs to be repaired, which can be subsumed under a constraint *[+ATR],[-ATR,+high]. Assuming the latter, we can see the following steps in deriving the surface form for 'cl.5-yam'. First, we see that the dominant [+ATR] feature on /i/ in the prefix spreads leftward onto the mid vowel, but is prohibited from spreading onto the following root by virtue of the NDPH, which results in an intermediate realisation [erí-tʊgʊ̀]:

(464)

Eri- (ω   tʊgʊ̀   → [erí-tʊgʊ̀]

However, the ban on *[+ATR],[-ATR,+high] then first results in [+ATR] delinking from [i], [erítʊgʊ̀], and then in [+ATR] delinking from [e], resulting in the attested surface form: [ɛrítʊgʊ̀].

Thus, we see again that though dominant prefixes are observed in functional material, in lexical material they fail to spread onto a following root, in accordance with the formulation of the NDPH proposed here.

4.2.2.1   Dominancy

Finally, we return to the question whether dominancy should be encoded as it is done here, as the result of features spreading onto underspecified vowels, or that it should be encoded

as a property of a morpheme. As noted above, so far I have not motivated the choice assumed here but used it mostly for expository reasons. In the following, I will go over the reasons why dominancy may well be best represented as resulting from underspecification for and spreading of a feature in the languages discussed here.

This issue bears on the formalisation of the restrictive powers of the prosodic boundary that is proposed to have a delimiting effect on prefix-root interactions. For instance, if we can represent dominancy as a property of a morpheme then we could be more specific in the hypothesis introduced in (435) above of which properties of y cannot be altered by x across a prosodic boundary by positing that it is morphological information that cannot be altered across a boundary.

Tunen We begin the discussion by reviewing the vowel inventory of Tunen (van der Hulst et al. 1986), which divides into two classes:

(465)   Dominant ([+ATR]): /i,ə,o,u/

(466)   Recessive ([-ATR]): /ɛ,a,ɔ,o/

Ignoring for the moment that /o/ falls in both the dominant and recessive category, we see that the vowels divide along the ATR feature; thus clearly suggesting that dominancy here is the result of underspecification for a feature and subsequent spreading of a [+ATR] value.

Turning to the 'double' status of /o/, it seems that we may want to assign the dominant property to morphemes, given that it seems that this (surface) [+ATR] vowel is not always dominant. In the data below, we see that [o] alternates with [u], which surfaces in the context of the dominant causative suffix (van der Hulst et al. 1986, 114):

(467)   a. bol 'to disappear'

      b. bul-i 'to disappear-CAUS'

(468)   a. kolah 'to enlarge a hole in a palm wine tree'

      b. kuləh-i 'to enlarge a hole in a palm wine tree-CAUS'

However, this by itself does not necessarily lead to Tunen having to be analysed as a system where dominancy is encoded on morphemes. Indeed, van der Hulst et al. (1986) argue that the phonological representations of the two types of /o/ are different, thus disambiguating between the two at the level of the phonology.

Indeed, we find some additional support for an analysis that does not rely on marking dominancy on morphemes. Given that there are two types of /o/ in Tunen there is inconsistency even within a single lexical item; compare the truly recessive root *lobon* 'to weed' in (469) with the root *sokom* 'to work in vain' given in (470) (van der Hulst et al. 1986, 120,n10):

(469)   a. lobon 'to weed'

      b. lobon-ɛn 'to weed-APPL'

      c. lobun-i 'to weed-CAUS'

(470)   a. sokom 'to work in vain'

      b. sokom-in 'to work in vain-APPL'

      c. sukum-i 'to work in vain-CAUS'

In (469b) and (470b) we see the alternating recessive applicative suffix -EN: *lobon* is recessive and thus a [-ATR] variant of the suffix is observed: [-ɛn] (469b); in contrast,

sokom seems to be dominant as it causes the applicative suffix to surface with a [+ATR] vowel: [-in].

However, when we now turn to (469c) and (470c), we see something curious when these roots combine with the dominant causative suffix *-i*. Firstly, the form with *lobon* undergoes harmony and surfaces as [lobuni] (469c), but it fails to spread the harmony to the initial vowel.

Even worse, though, is the form in (470c), where we see that 'dominant' *sokom* undergoes harmony in the context of the dominant causative suffix, surfacing as [sukumi]. Thus, it seems entirely impossible to give a classification of dominancy to the root *sokom* 'to work in vain', since in one context it seems dominant (470b) and in another recessive (470c), thus losing any advantage that a view that assumes dominancy on a morpheme would provide.

Note, though, that an account that does not assume dominancy to be a morphemic property but assumes this follows from underspecification runs into the same problem in forms that show binary behaviour (469-470). Nonetheless, since all vowels but /o/ clearly fall into either a dominant or recessive class, under a morphemic dominancy account we would have to say that it is a coincidence that they divide as such. Thus, I argue that the binary behaviour of /o/ is not enough reason to classify Tunen as a language which encodes dominancy on morphemes.

KiBudu   Below I also repeat the vowel inventory of KiBudu (Kutsch Lojenga 1994) from above; recall that /a/, though [-ATR], is compatible with both a [+ATR] and [-ATR] context.

(471)   Dominant ([+ATR]): /i,e,o,u/

   Recessive ([-ATR]): /ɪ,ɛ,a,ɔ,ʊ/

Again we see that vowels simply divide along the feature [ATR] suggesting that the observed dominancy effects result from underspecification of the feature [ATR].

KiBudu raises an interesting issue, however. Recall that in Tunen when a dominant [+ATR] prefix combined with a [-ATR] root the sequence surfaced as disharmonic: *mu-* 'cl.3-' is [+ATR] and *and* 'roof' is [-ATR].

(472)   mu-and 'cl.3-roof'

In contrast, in KiBudu we see that the class 4/10 and class 8 prefixes that are dominant when they are dominant not only fail to spread onto a following root, but they actually are recessive and take on the ATR value of the root:

(473)   a.   mi-kpékpé 'cl.4-seed, grain, kernel'

      mi-tánji 'cl.4-type of animal'

   b.   mɪ-gyɛ̆ndɔ 'cl.4-village, lining the road'

      mɪ-tɪmá 'cl.4-heart'

(474)   a.   ɗi-siɓó 'cl.8-rainbow'

      ɗi-pínga 'cl.8-toddler'

   b.   ɗɪ-kyɛmʊ 'cl.8-complete bridepiece'

      ɗɪ-njɛ́ngwa 'cl.8-rope for tying firewood'

Thus, if it were truly the case that we are dealing with the same prefix here, it would contain a [+ATR] vowel which should spread onto underspecified vowels. Though it is

expected that it does not spread onto the root given the NDPH, we would then predict it to surface disharmonic, as we saw in Tunen (472). However, this is not what we observe; rather, if we are dealing with a dominant prefix here, we see a situation that would involve overwriting of a [+ATR] value to a [-ATR] value. In other words, the KiBudu data is problematic on a view that assumes that [+ATR] spreads onto any underspecified vowel since in (473b) and (474b) we see that the prefix surfaces as [-ATR].[28]

One way to get the attested forms would be to posit a wellformedness constraint which prohibits disharmonic sequences and then delinks [+ATR] from the prefix (cf. the discussion on the class 5 prefix in Kindande in section 4.2.2).

However, there is an alternative view: in KiBudu we may not necessarily be dealing with the same prefix in the context of numerals and nominals. Consider again the full list of nominal and numeral prefixes given by Kutsch Lojenga (1994), repeated here for convenience:

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[28]Note that this seems equally problematic if we assume dominant morphemes.

(475)

	Nominal prefixes	Numeral prefixes
cl.1	mʊ-, a-, ∅-	mʊ-
cl.2	ɓa-	ɓa-
cl.3	mʊ-	ʊ-
cl.4	mɪ-	ɓe-
cl.5	ɪ	mɪ-
cl.6	ma-	ka-
cl.8	ɗɪ-	ɗɪ-
cl.10	∅-	ɓe-
cl.11	ʊ-	mʊ-
cl.14	ɓʊ-	mʊ-

Focusing on the dominant prefixes, though the shape of the class 8 prefix seems identical, when we look at class 4 and 10, they are markedly different. Looking at (475), we see that of all 10 prefixes, only three seem identical: class 1, 2 and 8. In contrast, though most of the others often seem related there is no clear correspondence; for instance, in class 3 we see that the numeral prefix seems a vowel-only version of the nominal prefix, but in class 11 this is exactly the reverse: the nominal prefix seems a vowel-only version of the numeral prefix. Thus, there seems enough doubt to posit that we are not dealing with the same prefix here. Potentially, a diachronic perspective might shed more light on the disambiguation between analysing nominal and numeral prefixes as the same or different morphemes.

Kinande   Last, we turn to Kinande (Hyman to appear), where we saw the following vowel inventory; /a/ behaves similarly as in KiBudu (but see note 11).

(476)   Dominant ([+ATR]): /i,e,o,u/

Recessive ([-ATR]): /ɪ,ɛ,a,ɔ,ʊ/

As we saw in Tunen and KiBudu, it seems that Kinande also constitutes a language where [+ATR] vowels spread their value onto underspecified vowels.

Worth discussing is the dominant class 5 prefix, which we saw carries [+ATR]; the three patterns that the prefix is involved in are repeated from above:

(477)   eri-ri̭ba 'cl.5-spring'

(478)   eri-gɔmba 'cl.5-drum'

(479)   ɛrí-tʊgʊ̀ 'cl.5-yam'

As discussed in section 4.2.2, we can see in (478) that the prefix has an inherent [+ATR] value. Now, this means that it spreads onto underspecified vowels and is thus necessarily dominant.[29]   However, on the view here the NDPH rules out rightward spreading of a harmonic value across a category-defining node induced boundary, the form surfaces, as predicted, as disharmonic (cf. (472) above).

It is the configuration in (479) that is more interesting; as discussed in section 4.2.2 the prefix surfaces as [-ATR], counter to what we would predict. Following Hyman (to appear), the representation of the prefix was given as /ɛri-/, and I offered two ways to

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[29]In contrast, on a view that dominancy is a morphemic property, it does not need to be dominant; however, pursuing this view would lead us to say then that though all other instances of ATR harmony in Kinande seem to correspond to [+ATR] vowels, it happens not to be be involved in spreading in this particular prefix.

derive the attested form which crucially involves a [-ATR] harmonic form.[30] Firstly, we could assume that the resolution to the disallowed sequence of [i] and [ʊ] of delinking [+ATR] was immediate so that [+ATR] would not spread leftward onto the mid vowel. Secondly, we could assume that the disallowed sequence was generalised to any sequence of [+ATR] and [-ATR, +high] being disallowed and successive delinking of [+ATR], first for [i] and then for [e].

Note that under the morphemic approach we would be forced to assume the morpheme as a whole to be marked for dominant [+ATR], thus necessarily having the following representation of the prefix: /eri-/. Under this view, we would have to adopt the second solution, since there never is spreading of [+ATR] onto the preceding mid vowel. Indeed, the dominant feature approach includes the process of leftward spreading, which is expected to be unrestricted in the approach here. Given that the boundary is placed at the left edge of the root, material to its left should freely interact, as is the case in the analysis of class 5 prefixes in Kinande discussed above.[31]

Though we see that we could encode dominancy on the morpheme in Kinande, there seems little reason to adopt this. Furthermore, this would make the prefixal harmony different from the remaining harmony observed in the language, which clearly seems to

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[30]Again, note that we could also assume both vowels of the prefix to contain [+ATR] vowels resulting in /eri-/.

[31]Indeed, we predict that in a configuration where there are two prefixes that combine with a root, both prefixes can freely interact:

i.

pfx- pfx- ($_\omega$ <u>root</u>
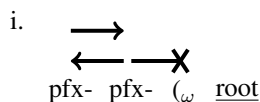
Unfortunately I am not aware of any such cases. It may be worth mentioning here that Hyman (to appear, 15-16) gives an impressionistic judgment that the configuration of inner prefix spreading a value onto the outermost prefix does occur, whilst he is not certain that the reverse situation occurs.

involve [+ATR] spreading onto underspecified vowels.

In sum, we see that in the languages under discussion the dominant behaviour is best represented as deriving from a feature spreading onto vowels that are underspecified for this feature. Nonetheless, it should be pointed out here that the ban on dominant prefixes should operate on both the formalisation of vowel harmony as spreading of a feature onto underspecified vowels and dominant morphemes.

Finally, this raises the question why it is the case that dominant prefixes are so scarcely observed, in particular in systems that make use of underspecification and spreading. That is, why is it that we so rarely observe prefixes that show dominant behaviour and spread their harmonic value onto underspecified vowels? If it is exclusively a segmental property rather than a characteristic of idiosyncratic morphemes, then we expect no different distribution on phonological grounds.

This is potentially related to the fact that, without further operations, dominant prefixes in lexical material lead to disharmonic words, as was observed in Tunen (472). However, this is obviously the exact opposite point of the operation of vowel harmony in general. Thus, in KiBudu we saw, on the arguable assumption that the prefixes in numeral and nominal constructions are the same, that rather than observing disharmonic forms the prefixes accommodated to their root. Indeed, Kinande seems to constitute an intermediate case: when the dominant prefix combines with roots containing non-high vowels we observe a disharmonic word (478) but when it combines with roots that contain high [-ATR] vowels we see that a repair is triggered to ensure that the word is harmonic (479). Thus, given that dominant prefixes in lexical material lead to disharmony which is contrary to the process of harmony, languages generally avoid this situation. Note that this allows for dominant

prefixes that are specific to functional material only, as indeed I have suggested is the case in KiBudu.

4.2.3 Compounds

Taking the hypothesis of the insertion of a prosodic boundary at the left edge of the complement of the category node, and its subsequent mono-directional blocking of material to the left spreading onto material to the right of the boundary, we make specific predictions for the subclass of compounds that combine two roots (e.g. Newell 2008, Piggott & Travis 2013).[32] Specifically, we should observe that compounds are free to interact in either direction since they are both within the same prosodic domain; that is, on a view that compounding can occur at the root, we predict that interactions between both members are possible. Consider (480), where we see a root-root compound with the category-defining node x crucially located above the roots:

(480)

$$\sqrt{\text{ROOT}} \quad \sqrt{\text{ROOT}} \quad x$$
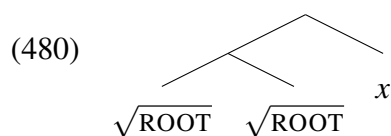
    Category-defining x creates a single Spell-Out Domain of its complement which is comprised of both roots, and thus the prosodic boundary aligns at the left edge of the leftmost root:

(481)   The left edge of prosodic words aligns with the left edge of the SOD:

      $(_\omega$ **root**   **root**

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[32]For a discussion on compounding at the stem level, see section 4.3.2.

Since there is no intervening prosodic boundary between the two lexical roots neither the lefthand nor the righthand member are subject to restrictions; notably, the righthand (482) as well as the lefthand member (483) are free to be dominant.

(482)
$$(_\omega \quad \underline{\text{root}} \quad \underleftarrow{\underline{\text{root}}}$$

(483)
$$(_\omega \quad \underrightarrow{\underline{\text{root}}} \quad \underline{\text{root}}$$

Indeed, as mentioned above, the claim from Hall & Hall (1980) that dominant prefixes seem unattested crucially relied on analysing purported dominant prefixes in Nez Perce as compound structures (Hall & Hall 1980, 227,n.2):

> Aoki (1970:84ff) calls these "compound verb stems which consist of an adverbial prefix and a verb root". However, an examination of the semantics of these "adverbial prefixes" which contain Dominant vowels leaves little doubt in our minds that they are all either denominal or deverbative in origin. Of the 167 members of the class which he cites, the only ones with Dominant vowels are: *c'aw* 'with shell- or bead-like object'; *láʕw* 'in speech'; *nî* (Dominant) 'leave behind'; *tôxpíl* 'with leg'; *waqi* 'in arms'; *wat* 'wade'; and *waʔwa* 'fish'. The four nominal prefixes which have Dominant vowels are: *taliˑ* 'short'; *tam* 'throw'; *waʔ* 'with hand'; and *wiwaqi* 'old'. These are, as Aoki says (1970:57) "generally attributive" and the resulting forms can also certainly be seen as compounds with adjectival, deverbative, or denominal first members.'

In the following, I discuss two languages that show a lefthand member of a compound to be dominant: Nez Perce and Nawuri. At this stage, I take for granted that the compounds discussed in these two languages involve root-compounding, but I return to this issue in section 4.3.2.

Nez Perce The dominant-recessive vowel pairs in Nez Perce (Crook 1999) are as follows (/i/ falls in both classes):[33]

(484)   Dominant: /a,o/

   Recessive: /æ,u/

Crook (1999, 23-24) uses the following compounds to exemplify progressive harmony in Nez Perce:[34]

(485)   mac'áyo + sǽtæy → [màc'yóːsàtay]
    'ear'   + 'hair'   'ear hair'

(486)   háːma + tìnúːn   → [háːmàtnon]
    'man' + 'divorcee'   'divorced man'

In (485) and (486), we see that the second member of the compound alternates between two forms: *sǽtæy* vs. *sàtay* and *tìnúːn* vs. *tnon*, respectively. Indeed, we see that, in (485), the dominant root *mac'áyo* 'ear' determines the vowel quality of the following root: *sǽtæy* 'hair' surfaces with dominant /a/ rather than recessive /æ/. Similarly, in (486), dominant *háːma* 'man' results in the recessive root *tìnúːn* surfacing with dominant /o/ rather than recessive /u/.[35] This can be represented as follows:

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[33]It is not entirely clear what the dominant feature is; Crook (1999, 252) argues against an analysis along [ATR] or [RTR].

[34]According to Crook (1999, 252), the vowel harmony system of Nez Perce is fragile and speakers are "mostly loosing [sic] the harmony system." Most dominant morphemes are roots, but there are a few dominant suffixes.

[35]No other forms with 'hair' or 'divorcee' are given.

(487)

$(_\omega$ **mac'áyo** S͛ÆTÆY $\quad \rightarrow$ [màc'yóːsàtay]

(488)

$(_\omega$ **háːma** TÌNÚːN $\quad \rightarrow$ [háːmàtnon]

Though not a compound structure, we see one instance of bi-directional harmony (Crook 1999, 249):

(489) 'e- nées- láwyala -ce $\rightarrow$ ['ànáaslàwyalàca]
3OB- PLOB- gaff -INC 'I am gaffing them.'

In (489), we see that the root *láwyala* 'gaff' is dominant and spreads its [+ATR] value both left- and rightward:

(490)

'E- NÉES- $(_\omega$ **láwyala** -CE $\quad \rightarrow$ ['ànáaslàwyalàca]

Note again that the boundary only prohibits material to its left to alter material to its right, but not vice versa.

Nawuri Similar to Nez Perce, we see relevant compound structures in Nawuri (Casali 2002, 2003). First consider the form for 'gossiper' below (Casali 2003, 321):

(491) ɔ- dɪ bojii -pu $\rightarrow$ [òdìbójíípû]
NC- sleep break -AGENTIVE 'gossiper'

In (491), we see that leftward harmony and the ATR value of the leftmost root is determined by a morpheme on its right, either the rightmost member of the compound or the agentive suffix, both of which contain dominant vowels. Specifically, we see that the alternating root DI 'sleep' surfaces as [+ATR] [di] in the context of a dominant morpheme (cf. *gá-dí* 'NC-village', Casali 2002, 25).

(492)

ɔ- (ω DI- **bojii** -PU → [ɔ̀dìbójíípû]

In the compound below, we see a similar pattern, but now it is the leftmost root *tʃu* 'water' that causes the following root to be [+ATR] (Casali 2003, 321):

(493) gɑ- tʃu tʊʊ → [gɔ̀tʃútúú]
       NC- water throw   'water throwing (a funeral rite)'

In (493), we see that the alternating root TUU 'throw' is realised with [+ATR] vowels in the context of a dominant root *tʃu* 'water' (cf. *tʊ̀ʊ̀* 'to throw', Casali 2002, 25). Since the rightmost root does not form a prosodic domain of its own its phonological shape is not fixed, and the leftmost root is free to influence the ATR value of the rightmost root. In addition, the dominant root *tʃu* 'water' spreads its [+ATR] value to the prefix which lies outside of the prosodic domain, thus showing bi-directional harmony. The situation is represented below:

(494)

GA- (ω **tʃu** TUU → [gɔ̀tʃútúú]

Thus, we see that if we take this compounding to occur at the root-level, the current proposal makes the right prediction that either member of the compound can be influenced by the other member, irrespective of direction.[36]

4.2.4 Conclusion

In sum, we have seen that empirically we observe a ban on dominant prefixes, but crucially only in the case that a lexical root would be the target of the harmony. In contrast,

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[36]Again, see section 4.3.2 for a discussion on compounding at the stem level.

functional material is not subject to this restriction and we observe a number of cases from a variety of languages. This contrast is related here to the distinct morpho-syntactic structures of lexical and functional material, which is proposed to be (partially) reflected in phonological behaviour. Specifically, I assumed the following two hypotheses, repeated from above:

(495)   The left edge of prosodic words aligns with the left edge of the SOD:

   $(_\omega$ **root**

(496)   In a configuration x $(_\omega$ y

   x cannot alter (properties of) y,

   y can alter (properties of) x.

This led to the formulation of the No Dominant Prefix Hypothesis for vowel harmony, which has a delimiting effect on harmony in lexical material, but is irrelevant in functional material:

(497)   No Dominant Prefix Hypothesis (NDPH): In lexical material, a (dominant) prefix cannot determine the harmonic class of its root (and suffixes).

(498)   In functional material, the NDPH is inapplicable, thus allowing a (dominant) prefix to determine the harmonic class of its base.

Thus, I explicitly assume a grammatical explanation for why dominant prefixes are unattested in lexical material.[37] As mentioned above, the number of languages that display

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[37]As pointed out by Andrea Calabrese, an alternative grammatical explanation would be to relate the divergent behaviour of prefixes in lexical and functional material not to the representational differences between lexical and functional material but to a representational difference between the two types of prefixes.

dominant prefixes in functional material is still very low. As discussed above, this may be related to whether a prefix occurs both in functional and lexical material, all else being equal, it results in disharmonic roots. Thus, we only expect prefixes to be dominant when they are designated prefixes for functional material.

A further reason for the lack of dominant prefixes in directional vowel harmony systems is offered by Hyman (to appear, 24), where he argues that vowel harmony that is not motivated by reduction (rightward harmony) is always anticipatory (leftward harmony) and is based on "articulatory, perceptual, and/or conceptual 'pre-planning'." Thus, we see that a configuration where a prefix initiates vowel harmony on a following morpheme is a marked configuration, thus accounting for its scarcity. Relatedly, consonant harmony displays a similar situation: consonant harmony divides into root-controlled or directional left-ward harmony but neither affix-controlled nor directional rightward harmony is attested (Hansson 2001, 198-199). Note, though, that this only holds for directional vowel harmony systems and not for dominant-recessive systems, which show bidirectional harmony.

Importantly, though, we see that functional explanations can be drawn on to account

Specifically, we could assume that morphemes can be intrinsically specified [+cyclic] and [-cyclic], and that [-cyclic] morphemes do not trigger or undergo harmony, whilst [+cyclic] morphemes do participate in harmony. Then we could say that prefixes in general tend to be [-cyclic] but that in the particular instances discussed we are dealing with [+cyclic] prefixes, such as verbal and numeral prefixes in Kinande (as opposed to [-cyclic] nominal prefixes), [+cyclic] nominal and numeral prefixes in KiBudu, and nominal prefixes in Tunen falling into two classes, some marked [+cyclic] (prefixes that trigger/undergo harmony) and some marked [-cyclic] (invariant prefixes). In such a system, the asymmetry would not lie between prefixes versus suffixes, but rather between [+cyclic] and [-cyclic] affixes.

However, an approach that assumes that morphemes are idiosyncratically marked for their cyclic status seems to have less predictive power than the approach here, which categorically rules out the spreading of a harmonic value of a prefix onto a lexical root, though whether we can maintain this strong hypothesis is ultimately an empirical issue.

See also the discussion on Chamorro in section 4.3.1.2 on the relation between cyclicity and dominant prefixes.

for (in)frequency of dominant prefixes in functional material, but the categorial absence of dominant prefixes in lexical items is better accounted for by morphologically-driven domain effects independently motivated by the suppletive allomorphy patterns discussed in the earlier chapters.

4.3 Lexical accent

In this section, I put the predictions of the No Dominant Prefix Hypothesis in lexical material to the test in the area of lexical accent.[38] Recall that I proposed that material to the left of a boundary cannot alter the material to the right of the boundary; thus, we can formulate the NDPH as it relates to lexical stress assignment:

(499) No Dominant Prefix Hypothesis (NDPH): In lexical material, a (dominant) prefix cannot alter the accentual landscape of its root (and suffixes).

If this hypothesis is correct, then, on par with the discussion on vowel harmony, we thus predict that there are no prefixes that have an effect on root accentuation. An important qualification is in order here; in the case that two lexical accents are present in a structure and the language is culminative, i.e. only allows for a single primary accent in a word, we can represent accent resolution in two ways: deletive or additive. In a deletive approach, in a configuration of two lexical accents, one accent is demoted (deleted). For instance, in a configuration of two adjacent lexical accents this accent resolution could be resolved by demoting (deleting) the rightmost lexical accent resulting in primary accent falling on the leftmost syllable; this is represented below using grid marks (Prince 1983):

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[38]Here, I use the 'accent' as an abstract marking assigned to a vowel/syllable, following van der Hulst (2010), among many others.

(500)　　x　x　　　　x
　　　　　σ　σ　→　σ　σ

Alternatively, in an additive approach, in a configuration of two adjacent lexical accents this accent resolution could be resolved by promoting (adding) a grid mark to the leftmost syllable, again resulting in primary accent falling on the leftmost syllable:

(501)　　　　　　　　　　x
　　　　　x　x　　　　x　x
　　　　　σ　σ　→　σ　σ

Thus, even though the end result is the same, there are two distinct mechanisms to derive accent resolution. Whilst it might seem redundant to have both strategies, it seems that languages vary as to whether they have deletive or additive accent resolution; specifically, we will see that the two types of languages are distinguished in the markedly different behaviour of lexically accented syllables that are phonetically reduced and do not surface with primary accent.

We will see below that the NDPH only applies in languages that have deletive accent resolution. This follows if we consider the term 'alter' in more detail, as used in the delimiting power of the boundary, repeated here:

(502)　　In a configuration x ($_\omega$ y

x cannot alter (properties of) y,

y can alter (properties of) x.

Consider again the two strategies to accent resolution discussed above, (500-501); whilst both configurations alter the representations as a whole, only deletive (500) is altering existing material - viz. by removing it. In contrast, in additive systems (501), the

existing configuration is only altered to the extent that something - here a grid mark - is added; in other words, the end result of (501) is a subset of the input in (501).

We can then say that the boundary has the effect that though a prefix can *see* inside the prosodic word across it, but the prefix cannot alter existing material across it (cf. the Morph Integrity Hypothesis of Bermúdez-Otero 2012). We can then think of the situation as if the root were a gift wrapped in cellophane; the prefix can see the gift but is not allowed to open it, though, if it so inclined, it can *add* something to the gift, for instance a ribbon.[39] In this sense we can interpret the NDPH for lexical accent to be operative in languages that deploy deletion to resolve an accent clash, but to be irrelevant in languages that take an additive approach to accent resolution.

Below, I first discuss dominant prefixes in both deletive and additive systems (section 4.3.1), and then in section 4.3.2 I return to compound structures, discussing two types: root compounds and stem compounds; I will show that whilst root compounds can have deletive or additive accent resolution, the current account predicts that stem compounds can only be resolved by virtue of additive accent resolution.[40]

4.3.1 Dominant prefixes

In the following, I first discuss languages that show deletive accent resolution and discuss apparent counter-examples of dominant prefixes that, as such, seem to violate the NDPH (section 4.3.1.1). Then, in section 4.3.1.2, I turn to languages that display additive accent

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[39]In a slightly different way, we can also think of a lemon cake where, if we want to keep it intact, we cannot take a slice away from but we can add raspberries on top of.

[40]Note that the accent patterns discussed here involve accent as a morphemic property; see also section 4.3.3.

resolution and, given that the NDPH is not active, we expect that dominant prefixes should become a possibility, as is indeed observed in Chamorro and Nez Perce.

4.3.1.1 Deletive accent resolution

In this section, I discuss Russian and Cupeño as instances languages that employ deletive accent resolution. Although it seems impossible to definitively show that a language does not employ additive accent resolution, the two types of languages are distinguished in the markedly different behaviour of lexically accented syllables that are phonetically reduced and do not surface with primary accent. In addition, I take the stance that in the absence of evidence that a language is additive, it is deletive. It is not my goal in this dissertation to assess the validity of this assumption, rather I take this to be the null hypothesis.

Russian An accentual system that displays no evidence of being additive is Russian; importantly, there is a five vowel contrast in accented syllables, /i,e,a,o,u/, but in unstressed syllables only a three vowel contrast is observed, /a,i,u/ (Crosswhite 2000, i.a.).[41] Specifically, in unstressed position mid vowels undergo neutralisation, as in (503-504) (Halle 1973, 314) and (505) (Gribanova 2015, 15):

(503) kar**ó**l' kar**a**l'-á

  king (NOM.SG) king-GEN.SG

(504) kal'**é**b-a-e-t'e kal'**i**b-á-l-a

  rock-TV-PRES-2PL rock-TV-PAST-FEM

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[41]A sixth phoneme /ɨ/ for accented syllables has been proposed, but see Padgett (2004, 2011) for arguments against its status as a separate phoneme and that it should be analysed as an allophone.

(505) mólət-yj   maló-t'

       ground-MASC   grind-INF

In (503) and (505), we see that when accented the vowel surfaces as [o], but when unaccented it is realised as [a]. Similarly, in (504), the front mid vowel [e] is observed when the syllable is accented but in unaccented position the vowel is realised as [i]. Furthermore, in Russian these reduced vowels do not display any effects that are different from /i,u,a/ vowels that never surface accented, that is, these vowels show no signs that they were accented at one stage in the derivation. Thus, they pattern with vowels that have never been accented, and we can assume that the accent that might have been on them initially has been demoted.[42]

Thus, we see that unstressed syllables sustain less vocalic contrasts compared to stressed syllables. This 'weaker' position seems naturally accounted for by a deletive approach to accent (cf. the Destressing rule in Halle 1973). We could say that full vowels can be hosted on syllables that bear a stress mark 'x', whilst syllables that bear none can only host the reduced vowels /i,a,u/.[43]

Turning to cases of dominant prefixes, Alderete (1999) discusses two instances of a dominant prefix influencing the root in Russian. First consider the perfectivising prefix /vi-/ (i.e. *vy-*) (Alderete 1999, 78):

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[42]We will see that this is crucially different in additive accent resolution languages: in Chamorro phonetically reduced lexical accents always surface with secondary accent and triggered gemination, and in Nez Perce they always surface with secondary accent. For details, see section 4.3.1.2.

[43]The absolute number of stress marks does not matter; relevant here is that full vowels can be hosted on syllables that bear at least one more stress mark.

(506)   PERF   IMPF

     p'isát'   ví-p'isat'   vi-p'ísivat'   'write/write out'

     skazát'   ví-skazat'   vi-skázivat'   'say/express'

     vest'í   ví-vest'i   vi-vod'ít'   'lead out'

We see in the data in (506) that before the affixation of *vy-*, the form already bears accent. Upon perfectivising the form the prefix carries accent, and the stem does not, thus seemingly in violation of the NDPH.

Similarly, we see that the prefix *pro-* takes on the primary accent in Standard Russian (though in Colloquial Russian it remains on the stem); *ži-t'* 'to live' and *pro-ži-t'* 'to live (a period of time)' (Alderete 1999, 77):

(507)   *Standard*   *Colloquial*

     MASC   ží-l   pró-ži-l   pro-ží-l

     FEM   ži-lá   pro-ži-lá   pro-ži-lá

     NEUTER   ží-lo   pró-ži-lo   pro-ží-lo

     PLURAL   ží-li   pró-ži-li   pro-ží-li

Again, we observe that the prefixal accent seems to erase the accent on the root, in clear violation of the NDPH.

However, Gribanova (2010, 2015) argues that a subclass of prefixes in Russian are lexical prefixes (LP), which merge directly with the root, crucially below category-defining *v*:

(508)

     LP   √ROOT   v
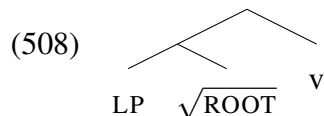
She lists the following properties of lexical prefixes, as opposed to the properties of superlexical prefixes which merge above the root: lexical prefixes (i) contribute to idiomatic, spatial and resultative meanings; (ii) do not stack; (iii) do not combine with the secondary imperfective; (iv) can restrict the type of object that can combine with the verb, thus changing the argument structure; (v) are much more likely to have corresponding nominal forms; and (vi) can form adjectival and participial passives. These properties, she argues, follow if we assume that lexical prefixes merge directly with the root, as in (508), crucially below the category-defining node. For instance, the idiomatic nature of lexical prefixes follows on the assumption that lexical information is determined in the first phase (Arad 2005); similarly, the failure of lexical prefixes to stack follows if they are required to combine with a root: on a binary branching structure there is only one slot for a lexical prefix.

Now, given that lexical prefixes are low in the structure, beneath the category defining node, the prosodic boundary is inserted immediately before the lexical prefix, since the complement of category-defining v is composed of the root and the lexical prefix:

(509)   The left edge of prosodic words aligns with the left edge of the SOD:

($_\omega$ lex.pfx   <u>root</u>

Given that the lexical prefix is in the same prosodic word, the prefix is free to alter the accentual landscape of the root.

Indeed, Gribanova (2010) lists both *vy-* and *pro-* as lexical prefixes, which explains their behaviour in (506) and (507): since the prefixes are within the same prosodic domain as the root, they are free to interact bidirectionally and do not constitute counter-examples to the No Dominant Prefix Hypothesis.

Cupeño   Cupeño is another case where there seems to be no evidence of additive accent resolution, and it has been cited as a language with certain (but not all) roots, suffixes and prefixes lexically specified for accent (Alderete 1999).[44]   Consider the data below (Alderete 1999, 39):

(510)   né-yax   →   [né-yax]   'I say.'

        pé-yax   →   [pé-yax]   'He says.'

        čém-yax   →   [čém-yax]   'We say'.

        pém-yax-wen   →   [pém-yax-wen]   'They said.'

In (510), we see that the subject person and number prefixes bear main stress when they combine with an unaccented root.

In order to show that this is not default initial accent, Alderete (1999, 40) cites the following, where we see that in the presence of a preceding object prefix accent still falls on the subject prefix:

(511)   mi-né-tew   →   [mi-né-tew]   'I saw them.'

        mi-pé-tew   →   [mi-pé-tew]   'He saw them.'

        mi-čém-tew   →   [mi-čém-tew]   'We saw them'.

        pi-pém-wen   →   [pi-pé-wen]   'He put it.'

        ʔi-pém -max   →   [ʔi-péʔ-max]   'They gave you...'

Note that default initial accent in Cupeño is observed when none of the combining morphemes are lexically specified for an accent (Alderete 1999, 40):

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[44]But see below for Newell (2008), who argues in favour of an analysis of Cupeño without dominant prefixes.

(512) yax-em → [yáx-em] 'You.PL say!'

max-an → [máx-an] 'Give it to me.'

Returning to the data in (510), on the assumption that *yax* 'say' is a lexical verb[45] these data at first blush this might seem a violation of the NDPH. However, recall that the NDPH crucially states that a prefix cannot *alter* the accentual landscape of its root; thus, given that the roots in (510) are not marked for a lexical accent they have no accentual landscape of their own at the point that the prefix combines, and the NDPH is satisfied. This can be represented as follows; the root bears no lexical accent inherently:

(513) yax

Then, when a prefix that does bear accent combines, we see that the accent of the root has not been changed (it remains flat); as below, where accent is marked by a grid mark:

(514)   x
ne- yax

Returning to the NDPH, we predict that when a root that does bear a lexical accent combines with an accented prefix, the prefixal accent should not surface; this is exactly what we see (Alderete 1999, 41):

(515) pé-ŋíy-pi → [pe-ŋíy-pi] 'He would go away'

pé-ŋéye-yax → [pe-ŋéye-yax] 'It shakes'

čém-náačin → [čem-náačin] 'We passed on'

pém-čáŋnu → [pem-čáŋnu] 'They got angry'

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[45]But see Newell (2008), discussed below, that unstressed verbs are not lexical roots but are light verbs moving to or originating in *v*.

In (515), we observe that in case the root is marked for a lexical accent; e.g. *náačin*:

(516)   x
         naačin

Then, when a prefix that bears accent combines, we see the following configuration:

(517)   x   x
         čem- naačin

In accordance with the NDPH, this situation is resolved by the prefixal accent not influencing the accentual pattern of the root, which is here represented by deletion (demotion) of the prefixal accent:

(518)   x
         čem- naačin

Thus, we see that root-accent wins over prefixal accent; however, in the absence of a root accent (unaccented root) the prefixal accent surfaces.

Now, according to the NDPH, we predict that when an unaccented root combines with an accented prefix and with an accented suffix, the prefix should not influence the accentual landscape of the prosodic word. Since only a left-edge boundary is inserted, the Spell-Out Domain comprises of both the root and the suffix. Again, this is what we observe in Cupeño; suffixal accent wins over prefixal accent:[46]

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[46]Note that root-accent wins over suffixal accent (Alderete 1999, 39):

 i. píq-pe-pál → [píq-pe-pal] '...touched him'

Indeed, root-accent wins over any lexical accent, be it prefixal or suffixal (Alderete 1999, 41):

 ii. pé-ʔáyu-qál → [pe-ʔáyu-qal] 'He would go away'

In both (i) and (ii), we see that in the presence of a lexical accent on the root, it always surfaces as the main accent, irrespective of any lexically accented affixes.

(519) pé-yax-qál   →   [pe-yax-qál]   'He was saying.'

       (neʔep) né-yax-qál →   [(néʔep) ne-ya-qál] 'I was saying.'

       ʔi-né-max-qál   →   [ʔi-ne-max-qál]   'I was giving you.'

       čim-pé-max-qál   →   [čim-pe-max-qál]   'He was giving us.'

       né-wen-qál   →   [ne-wen-qál]   'I was putting.'

Thus, Alderete's (1999) analysis of the Cupeño data is accounted for naturally in the approach advocated here.

It should be pointed out that Newell (2008) reanalyses the accentual properties of Cupeño; relevant for present purposes is that she argues that it is a language in which there are no dominant prefixes.[47] Rather, she argues that subject person number prefixes that seem to be dominant are the result of default initial accent assignment. Specifically, she crucially assumes that primary accent assignment ('main prominence marking') in Cupeño is assigned at the first spelled out morpho-syntactic phase.

Given that roots are within the first spellout domain, roots that receive accent on the initial syllable are thus the result of default initial accent assignment. Furthermore, she argues that the class of unstressed roots in Cupeño is not a random collection of verb roots diacritically marked for being unstressed, but that unstressed roots are light verbs that move into or originate in *v* and are part of a spellout domain which includes subject prefixes.[48] Given that light verbs and subject prefixes are then in the same spellout domain, this gives the illusion of dominant prefixes. Finally, she argues that the object prefixes in (511) are outside of the spellout domain and thus the initial elements in the those con-

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[47]Indeed, as Newell points out, the only time we observe dominant prefixes in Cupeño they are subject agreement prefixes, and, more tellingly even, it is all subject agreement prefixes that take accent when they combine with unstressed verbs.

[48]This is a simplification, see Newell (2008) for details.

structions are again the subject prefixes. Thus, we can draw the following configurations in which default initial stress is assigned, where parentheses denote the first spelled out morpho-syntactic phase:

(520)   (root)

(521)   (subj.pfx *v*)

(522)   obj.pfx (subj.pfx *v*)

Thus, this leads Newell to conclude that the only morphemes lexically specified for an accent are roots that have non-initial stress and the same set of dominant suffixes that Alderete assumes to be dominant, but no prefixes are lexically specified for an accent. Note also that under her account Cupeño does not classify as an accent resolution language since accent is only assigned once, at the innermost phase.

Thus, on neither Alderete's nor Newell's analysis Cupeño is in violation of the NDPH. On Alderete's interpretation, Cupeño constitutes a prototypical case of how dominant prefixes are expected to behave according to the NDPH. In contrast, under Newell's approach Cupeño the NDPH is irrelevant since there are no dominant prefixes. However, it is worth pointing out here that Newell's analyses crucially relies on different spellout domains in the light 'unstressed' verbs and lexical verbs, thus supporting the identified contrast between lexical and functional material as argued for here. That is, the current account ties the potential dominancy of prefixes to their position in a SOD, which is crucially claimed to differ in lexical and functional material, exactly as we see in Newell's analysis of Cupeño.

Tokyo Japanese Finally, in Tokyo Japanese (Alderete 1999), we find a number of prefixes that seem dominant, and it seems a deletive accent resolution language. In the following I will show that most of these are clearly in line with the NDPH.

Firstly, the class of so-called 'Aoyagi' prefixes are shown by Poser (1990) to have two (pitch) accents, thus constituting cases where both a prefix and root retain an accent when an accented root combines (Alderete 1999, 108):[49]

(523) móto- d__ áiziN
       former minister

(524) hán- sh__ ákai
       anti- social

In general, this situation is excluded due to most languages being subject to culminativity, which is the requirement of having a maximum of one accent per word. However, it seems that Aoyagi prefixes are not subject to culminativity. Alternatively, we could assume they are separate prosodic words (though it should be noted, as mentioned in note 49, that they never occur on their own). Either way, these cases do not constitute counter-examples to the NDPH since the accentual landscape of the root remains unaffected.

In addition, a number of allegedly dominant prefixes are analysed as compound structures by Alderete; these will be discussed below in section 4.3.2, where I discuss accent resolution in (root and stem) compounds. In addition, though Alderete analyses the morpheme *ma-* 'true' as a dominant prefix, I will argue that it also seems to follow compound accentuation rules (section 4.3.2).

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[49]Interestingly, when Aoyagi prefixes combine with an unaccented root, they still show the patten of two elements: the accented Aoyagi prefix and the default realisation of an unaccented word; that is, when Aoyagi prefixes combine with an unaccented root, they are not incorporated and form a single unit, but constitute two minor phrases. However, they do not constitute fully separate words since Aoyagi prefixes can only attach to stems.

4.3.1.2 Additive accent resolution

As mentioned above, additive accent resolution is not restricted by the NDPH, since these constructions vacuously satisfy the condition that material within a prosodic word initiated by the category-defining node induced prosodic boundary remains unaltered.

However, the current account crucially relies on the NDPH to rule out dominant prefixes in lexical material; this is done by virtue of a prosodic boundary being introduced at the left edge of the root. Crucially, as mentioned before, there is nothing inherent about prefixes that they cannot be dominant. Thus, we expect that in additive accent resolution systems, where the NDPH is irrelevant, to observe certain instances of prefixes with lexical accent that are dominant. Here, I discuss two clear cases of this exact configuration.

Thus, the observation that lexically accented prefixes exist as a phenomenon constitutes an argument in favour of the NDPH.

Chamorro In Chamorro (Chung 1983), we seem to observe a clear violation of the hypothesis that there can be no dominant prefixes that combine with accented roots; below we see an accented prefix combining with an accented root, resulting in primary accent being on the prefix (Chung 1983, 42):

(525) góf-adǽhi 'very-be careful' → gófadàhi 'be very careful'

However, in the following I assume, following Chung (1983), that accent is assigned cyclically in Chamorro by additive accent resolution.[50] As explicated in Chung, I show that accent is assigned additively at each stage that a cyclic morpheme merges; thus, the

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[50]In this section, I use 'cyclic' to refer to the phonological cycle, which I assume to be related to but not identical to the domains discussed so far; see also section 4.4.2.

root accent pervades throughout the whole derivation, irrespective of whether it is phonetically realised as accented or not. Thus, I will argue that this is a case where we see in a configuration where both prefix and root are accented that both retain their accent; abstracting away for the moment from the distinction between primary and secondary accent this results in the following configuration, where primary accent simply means 'the presence of (any) accent':

(526)   préfix + róot

As mentioned above, this configuration is in line with the hypothesis advocated here, since the accent on the root is crucially not removed and in that sense remains unaltered. Furthermore, I will assume that is only at the end of the full derivation of the word that accents are resolved and one is identified as primary.[51]

Below, I first discuss the Chamorro data, focusing on Chung's argument for a word-internal cycle in Chamorro, and how this is an argument for the configuration in (526). Then, I return to how primary accent is determined.

Firstly, in mono-morphemic words primary accent falls on one of the final three syllables, with penultimate being the default. When these combine with suffixes, stress always falls on the penultimate syllable of the newly created configuration (Chung 1983, 39) (secondary stress is not indicated here):

(527)   SIMPLEX   COMPLEX

        sáŋan   'to say'   saŋán-i   'to say-Dative Movement' ('to say to')

        dáŋkulu   'big'   daŋkuló-nña   'big-CMPR'

        bapót   'ship'   bapot-níha   'ship-3PL.POSS'

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[51]This is reminiscent of accent resolution in stem compounds; see also section 4.3.2 below.

Prefixes fall into two categories. As expected from an accentual algorithm that assigns accent to the penultimate syllable, many prefixes do not have an effect on the accentual pattern (Chung 1983, 40) (again, secondary stress is not yet indicated):

(528) SIMPLEX   COMPLEX

géftaw   'generous'   man-géftaw   'PL-generous'

kadúku   'crazy'   man-kadúku   'PL-crazy'

díkikiˀ   'small'   man-díkikiˀ   'PL-small'

kádadaˀ   'short'   naˀ-kádadaˀ   'CAUS-short' ('to shorten')

                       ma-naˀ-kádadaˀ   'PASS-CAUS-short'

                                        ('to be shortened')

faˀgási   'to wash'   naˀ-faˀgási   'CAUS-to wash'

                                        ('to cause to wash')

                       ma-naˀ-faˀgási   'PASS-CAUS-to wash'

                                        ('to cause to be washed')

These non-accented prefixes include most inflectional and some derivational prefixes, such as the plural, causative, passive and Chung (1983, 40) also mentions that various infixes fall in this category.

However, the other group of prefixes, consisting of a few inflectional and many derivational prefixes, result in prefixal primary accent when they combine with a root (Chung 1983, 40) (again, secondary stress is not marked):

(529) SIMPLEX   COMPLEX

púgas   'uncooked rice'   mí-pugas   'abounding in-uncooked rice'

mantíka   'fat'   mí-mantika   'abounding in-fat'

díŋu   'to leave'   ā́-diŋu   'RECIPR-to leave'

                                                 ('to leave one another')

paníti   to strike'   ā́-paniti   'RECIPR-to strike'

                                                 ('to strike one another')

mā́ypi   'hot'   sén-maypi   'VERY-hot' ('very hot, too hot')

agradési   'to give thanks'   sén-agradesi   'VERY-to give thanks'

                                                 ('to give many thanks')

Thus, we seem to see a clear case of dominant prefixes.

However, two further processes show that the lexical accent on the root is not truly
absent in these forms (Chung 1983). The first one is secondary stress, which in the case of
a root combining with a suffix surfaces on the syllable which was assigned primary accent
on the previous cycle of assignment; note that primary accent still falls on the penultimate
syllable (Chung 1983, 42):

(530) SIMPLEX   COMPLEX

swéddu   'salary'   swèddu-nmámi   'salary-1.PL.EXCL.POSS'

                                               ('our (excl.) salary')

inéŋŋulu^ʔ   'peeping'   inèŋŋuló^ʔ-ña   'peeping-3.SG.POSS'

                               inèŋŋulu^ʔ-níha   'peeping-3.PL.POSS'

A configuration with secondary accent on the first syllable and primary accent on the

second syllable results in the surfacing of only one accent: that of primary accent.[52]

(531) SIMPLEX   COMPLEX

swéddu   'salary'   sweddó-mmu   'salary-2.SG.POSS' ('your salary')

With dominant prefixes we see a similar picture: secondary accent falls on the syllable that originally bore primary accent; however, primary accent falls on the prefix (rather than on the penultimate syllable) (Chung 1983, 42):

(532) SIMPLEX   COMPLEX

néŋkanuʔ   'food'   mí-nèŋkanuʔ   'abounding in-food'

adã́hi   'be careful'   gófadàhi   'VERY-be careful'

dómmuʔ   'to punch'   ã́-dòmmu   'RECIPR-to punch'

úcan   'to rain'   kéʔ-ùcan   'to be about to-to rain'

Thus, we see that in both suffixal and prefixal complex words, the accent of the root surfaces as secondary accent. Note that in this situation, an adjacent primary and secondary stress is not resolved, as can be seen in *ã́dòmmu* 'to punch one another' (532).

Indeed, if we abstract away from the distinction between primary and secondary we see that both the prefix and the root maintain an accent, exactly the configuration in (526), repeated below.

(533) préfix + róot

Further evidence that the accent of the root must be present in the structure comes from more complex forms, and gemination. As Chung (1983) discusses, not all secondary

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[52]Note that this is not a straightforward case of clash resolution, since resolution occurs in the configuration discussed here (σ́σ̀), but not in the reverse situation (σ̀σ́).

accents in Chamorro correspond to a primary accent at an earlier cycle; consider the forms below (Chung 1983, 43):

(534)　SIMPLEX　　　　　　　COMPLEX

　　　　àtmaygósu　'vegetable sp.'

　　　　kìmasón　　'to burn'

　　　　magágu　　'clothes'　　màgagú-ña　　'clothes-3.SG.POSS'

　　　　bapót　　　'ship'　　　bàpot-níha　　'ship-3.PL.POSS'

　　　　kadúku　　'crazy'　　　màn-kadúka　　'PL-crazy'

　　　　kǎdada^{ʔ}　'short'　　　mà-na^{ʔ}-ǎdada^{ʔ}　'PASS-CAUS-short'

None of these secondary accents stem from a primary accent at an earlier stage in the derivation. Curiously, Chamorro distinguishes the two types of secondary accents: those that derive from a previous primary accent cause gemination, and those that do not derive from a previous primary accent do not.

The gemination rule is as follows: a once primary accented closed syllable results in the gemination of certain CV morphemes, on the condition that the syllable immediately preceding the geminating morpheme is open.[53] Below, this is represented schematically with the root underlined and carrying an accent, whilst the geminating consonant is underlined and boldfaced:

(535)　CV́C- CV- **C**V

Thus, we see the following pairs (Chung 1983, 39,43):

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[53]Gemination is triggered by the possessive *-hu* '1.SG', *-mu* '2.SG', *-ña* '3.SG', *-ta* '1.PL.INCL.', and the comparative *-ña* (Chung 1983, 43).

(536) SIMPLEX   COMPLEX

kánta   'song'   kantá-kku   'song-1.SG.POSS'

maléffa   'forgetting' maleffá-mmu   'forgetting-2.SG.POSS'

mã̌ypi   'hot'   maypé-nña   'hot-CMPR'

In all these cases the simplex form contains an accented closed syllable, which is followed by an open syllable and thus results in the gemination of the suffix. Below, we see that the triggering accented syllable can be further away:

(537) SIMPLEX   COMPLEX

dáŋkulu   'big'   dàŋkuló-nña   'big-CMPR'

Note that in some of these cases, as in (536), the triggering accented syllable does not bear any accent at the surface anymore, due to resolution of the $\acute{\sigma}\grave{\sigma}$ configuration.

Compare the forms in (536-537) to the form below, in which the accented syllable is not closed but open, and we fail to observe gemination of the suffix:

(538) SIMPLEX   COMPLEX

dúda   'doubting'   dudá-mu   'doubting-2.SG.POSS'

Turning to the type of secondary stresses in (534), which do not derive from a primary accent, we see that these do not result in gemination, despite otherwise meeting all of the requirements of the gemination rule (Chung 1983, 44):

(539) SIMPLEX   COMPLEX

sitbésa   'beer'   sìtbesá-ña   'beer-3.SG.POSS'

iskwéla   'school'   ìskwelá-ña   'school-3.SG.POSS'

cincúlu   'fishing net' cìnculú-mu   'fishing net-2.SG.POSS'

Thus, we see on the basis of secondary accent assignment and gemination that despite not always being marked as such on the surface, the primary accent of the root must be present at the point of secondary accent assignment as well as gemination and is retained throughout the derivation.

A particularly interesting question is what happens when we combine the gemination rule with dominant prefixes. We predict that even when a dominant prefix is present in the word the primary accented syllable of the root should trigger gemination (in the relevant configuration). This is indeed what we observe (Chung 1983, 44):

(540) | SIMPLEX | | COMPLEX | | COMPLEXER | |
|---|---|---|---|---|---|
| bátku | 'ship' | mí-bàtku | 'abounding.in-ship' | mì-batkó-nña | 'abounding.in-ship-CMPR' |
| códda[54] | 'green banana' | mí-còdda | 'abounding.in-green banana' | mì-coddá-nña | 'abounding.in-green banana-CMPR' |

Compare this to a form in which the primary accent of the root does not meet the requirement of being closed, where we fail to observe gemination (Chung 1983, 44):

(541) | SIMPLEX | | COMPLEX | | COMPLEXER | |
|---|---|---|---|---|---|
| bóti[55] | 'boat' | mí-bòti | 'abounding.in-boat' | mì-botí-ña | 'abounding.in-boat-CMPR' |

It is worth mentioning that the accented root syllables in (540) that result in the geminated suffixes are described by Chung (1983, 44) as "not phonetically distinct from lack of stress on the surface," again making the point that though imperceptible at the surface they

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[54]This form is not given but can clearly be reconstructed.
[55]This form is not given but can clearly be reconstructed.

must still maintain an accentual marking at the point that the second affix is combined and potentially result in gemination.

This leads us to the final topic of Chamorro: accent resolution of the various accents to a single primary accent. We have seen that (i) default penultimate accent is assigned at every cycle, and (ii) lexical accent is assigned to roots and prefixes but not to any suffixes.

On the assumption that accent in Chamorro is additive, and that an accent mark is assigned at each cycle, we see that the accent that is assigned last ends up as the primary accent (cf. Chung 1983). Consider the complex forms below (Chung 1983, 41):

(542) [ä́[[kwentùs]i]]   'RECIPR-to speak-Dative Moment'

  [[mì[mantiká]]ña]   'abounding in-fat-CMPR'

  [[ma[fà^ʔtinás]]ña]   'PASS-to make-??'

  [nà^ʔ[[tattí]yi]]   'CAUS-behind-suffix'

The above shows that primary accent is assigned to the last stressed syllable that is involved in accent assignment, reflecting the morphological composition of the complex word. Furthermore, secondary accent is assigned to the syllable that was highest on the previous cycle, clearly reflecting the additive character of Chamorro accent assignment. Indeed, were it a deletive system, then we could not account for the secondary accent corresponding to the syllable that received primary accent on the previous cycle. Thus, we can represent the grid structure of *ä́kwentùsi* as follows (adapted from Chung 1983, 41):

(543)

```
          x
   [kwentus]          Cycle 1


            x
        x  x
   [[kwentus]i]       Cycle 2


    x
    x       x
    x    x  x
   [ä[[kwentus]i]]


     ä̋kwentùsi        surface accent
```

Note also that on the assumption that default accent assignment occurs at each cycle, prefixes do not seem to induce a cycle of their own. In (544), we see that even though we add the non-dominant plural prefix *man-* the accentual pattern of the root is not changed into default penultimate accent.

(544) díkiki^ʔ 'small' man-díkiki^ʔ 'PL-small'

Similarly, in more complex forms, we see that if the final affix that combines is a non-dominant prefix, the accentual landscape is not determined based on the last affix but rather on the affix that attaches before the non-dominant prefix.

(545) [man[ä̋[[tugì^ʔ]i]]] 'PL-RECIPR-to write-Dative Moment'

In other words, if all affixes resulted in a new cycle, then we would predict primary accent on the penultimate syllable given that the non-dominant prefix *man-* would trigger the default accent rule, and given that it is the highest affix it would be the determinant of primary accent.

Dominant prefixes are compatible with a view that they are cyclic or non-cyclic. If they are cyclic they simply induce a new cycle and a grid mark is placed in that cycle; consider the derivation for *mìmantikáña* under an analysis where dominant prefixes are cyclic:

(546)

```
            x
      [mantika]              Cycle 1


       x
       x        x
      [mi[mantika]]          Cycle 2


            x
       x        x
       x      x x
     [[mi[mantika]]ña]       Cycle 3


     mìmantikáña          surface accent
```

If they are non-cyclic, I assume that within a cycle the left-most grid mark is promoted; consider the derivation for *mìmantikáña* under an analysis where dominant prefixes are non-cyclic, with the left-most grid mark being promoted in case there are equal grid marks on a single cycle (Left head):

(547)

```
            x
      [mantika]              Cycle 1


       x        x
      [mi[mantika]]


       x
       x        x
      [mi[mantika]]          Left head


            x
       x        x
       x      x x
     [[mi[mantika]]ña]       Cycle 2


     mìmantikáña          surface accent
```

In sum, Chamorro clearly constitutes a case where we see that root accent survives all the way throughout the derivation, as is evidenced by secondary accent and the gemination rule. Thus, Chamorro is a clear instance of an additive accent resolution language which displays dominant prefixes.

It bears repeating, however, that I assume that additive accent is not a universal characteristic of systems; indeed, if we would assume it a universal characteristic, the NDPH would be a moot point. Rather, unless there is good evidence, as we saw in Chamorro, I assume that accent resolution is deletive.

Nez Perce In Nez Perce (Crook 1999), we see a situation that is very similar to that of Chamorro in that there is clear evidence that the Nez Perce stress system is additive in nature, thus being in line with the NDPH in the same way as Chamorro was shown to be. However, in contrast to Chamorro, primary accent is not determined on the basis of the last stressed syllable that is involved in accent assignment. Instead, we see that main accent seems to be assigned by a desire to be located on a word edge, with a preference for the right edge (see Bjorkman 2010 for a formalisation in Optimality Theoretic terms).

First, in the absence of lexical accent, default main accent is assigned to the penultimate syllable, and an initial syllable receives either primary stress by virtue of being penultimate or otherwise secondary stress (Crook 1999, 294,300):

(548)   pískis   pìskí-na

         door   door-OBJ

(549)   hàníi-sa   hàni-sáaqa

         make-INC   make-REC

Turning to morphemes that are marked for lexical accent, we see that a single lexical accent surfaces as such, irrespective of its position in the word (Crook 1999, 319):

(550)   'iníit → ['ìníit]   'iníit-ne → ['ìníit-ne]

house   house-OBJ

(551)   láwyala -ceeqa → [láwyàlacàqa]
gaff   -REC
'I gaffed recently.'

In (550), we clearly see that a lexical accent is realised on the same syllable, and secondary accent is assigned to the initial syllable (as above), and in (551) we see that the main accent is on the initial syllable irrespective of the length of the word.

We see the same pattern with lexically accented suffixes:

(552)   hip -ú'   → [hipú']
eat -IRR
'I will eat.'

In (552), we see that the suffix carries lexical accent, which is realised even though it is on the final syllable, which we will see is a position usually avoided by primary accent.

In the case of multiple accents that do not involve lexically accented prefixes, we see that the rightmost lexical accent on a non-final syllable is picked as the main accent, but all non-primary lexical accents are realised as secondary accent, and thus in a sense are retained throughout the derivation.

Next, in (553), there are two underlying lexical accents; the rightmost accent is on the final syllable and thus is not promoted to primary accent, but is realised as a secondary accent (Crook 1999, 352).

(553) sepíinewi -ú' → [sèpíinèwiyù']
       measure -IRR

       'I will measure.'

In (554), we again see two lexical accents. Since the rightmost accent is not on a final syllable this one surfaces as primary; however, the leftmost lexical accents surfaces as a secondary accent (Crook 1999, 458).

(554) páay -núu   -saaqa → [pàynóosàqa]
       arrive -toward -REC

       'I recently arrived toward.'

As such, we see a situation similar to that in Chamorro: lexical accent is never re-moved. Crucially, we see that all lexical accents again are realised, as either primary or secondary accents, classifying Nez Perce as a language that resolves accent additively; thus, in that sense the Nez Perce data again do not provide a convincing counter-example to the NDPH.

However, it is also somewhat different given that, at the relevant level, it is not the highest affix that is picked out as the primary accent. Indeed, as mentioned above, accent resolution in Nez Perce is not straightforward. As we saw, in the absence of lexical prefixes accent resolution is done by assigning primary stress to the rightmost non-final accent. Taking lexical prefixes into account we see a different pattern (Crook 1999, 462):

(555) siléew-   cúukwe -cee → [siléewcùkwèce]
       by.seeing- know   -INC

       'I know by seeing.'

(556) sepée- siléew-   cúukwe -cee → [sepéeslèwcùkwèce]
       CAUS- by.seeing- know   -INC

       'I make you (SG) know by seeing.'

(557) nées- sepée- siléew-   cúukwe -cee → [néesepèslèwcùkwèce]
       PLOB- CAUS- by.seeing- know   -INC

       'I make you (PL) know by seeing.'

(558) hii- nées-   wéeyik -see → [hìnéeswèyìkse]
       3- PLOB- cross   -INC

       'He is crossing them.'

As we can see in (555-558), primary accent is realised on the lexical accent that is *left*most in the word, irrespective of whether the lexical accent is on a root or prefix.

Now, when we combine a lexical prefix and lexical suffix we see that the 'old' rule of assigning primary stress to the rightmost non-final accent is in effect:

(559) hii- nées-   wéeyik -úu   -see → [hìnèswèyikúuse]
       3- PLOB- cross   -toward -INC

       'He is crossing toward them.'

In (559), we see that rather than picking the leftmost lexical accent on the plural object marker *nées-*,it is the rightmost accent on *-úu* 'toward' that is primary.

In contrast to Chamorro, this is not a matter of which affix was attached latest; in (560), the prefix is outside of the root-suffix sequence (Crook 1999, 481; Bjorkman 2010, 9) as indicated by the bracketing in the phonological form:

(560) hii- [nées- [páay -núu]]   -see → [hìnàspàynóosa]
       3- [PLOB- [arrive -toward]] -INC

       'He arrives to them.'

Based on the fact that main accent is on the suffix despite the prefix being attached later we see that primary accent assignment cannot be a matter of cyclicity as it was in Chamorro. Rather, Bjorkman (2010), working in Optimality Theory, analyses Nez Perce as a case where primary accent is assigned to a word edge by virtue of being assigned to the rightmost affixal element if present, and in the absence of a suffix to the leftmost affixal element.

Leaving aside the complicated situation of selecting the syllable that carries primary accent in Nez Perce, what is crucial for the purposes here is that all lexical accents are preserved, as either primary or secondary accents. Thus, again we see clear evidence that in Nez Perce accent assignment is additive, and thus in line with the NDPH.

In sum, we saw that there seems to be a contrast between Chamorro-type languages where accent clearly is retained throughout the derivation, whilst in Russian-type languages it has no further effects. I take this to be suggestive of two types of accent resolution strategies: additive or deletive. Furthermore, it is only in deletive languages that we can test the No Dominant Prefix Hypothesis. Data from Russian and Cupeño as analysed by Alderete (1999) support the NDPH, as well as Japanese Aoyagi prefixes.

4.3.1.3 Functional material

Finally, the current account makes a clear prediction with regard to functional material: even in a deletive accent systems, dominant prefixes should be attested, given that the inhibiting boundary is placed above the prefix. That is, in lexical material the presence of a category-defining node results in a domain comprised of its complement, at which left edge the boundary is placed. However, given that functional material lacks category-

defining nodes, the boundary is crucially placed higher. Thus, we expect that dominant prefixes can alter the accentual landscape of their corresponding (functional) base.

Although this prediction is somewhat difficult to test since functional material often is unaccented, here I discuss exactly such a case from Russian.

Russian As we saw above in section 4.3.1.1, Russian seems a clear case of a language that resolves accent by demoting accents. Recall that a five vowel contrast in accented syllables, /i,e,a,o,u/, is reduced to a three-way contrast in unaccented syllables /a,i,u/. In addition, these unstressed vowels can weaken even further to [ə].

Now, the relevant item that we will discuss is the accented negation morpheme *njé-*.[56] Note that this is a morpheme that is different from an unaccented negation morpheme *nje-*, which freely combines with both verbs (561) and nouns (562):

(561) On nje napisál   pismo
       He not write.PAST.3.SG letter.ACC
       'He did not write the letter.'

(562) On prinjos   nje jábloki a   gruši
       He bring.PAST.3.SG not apples but pears
       'He brought not apples but pears.'

Indeed, the accentual landscape of the following roots is independent of the negation prefix *nje-*.

In contrast, the accented negation prefix *njé-* seems to be restricted to combine with pronouns, as in the following:

---

[56]Many thanks to Jonathan Bobaljik for drawing my attention to these data, and to Ksenia Bogomolets for answering all my questions about them.

(563) mnje   njé- kuda idti
      me.DAT NEG- where go
      'There is nowhere for me to go.'

However, *kuda* contains only vowels that surface in accented as well as unaccented syllables, we cannot say whether there is any demoting of accents in the base.

The question is what happens when we combine (accented) *njé-* with a pronoun that contains a vowel that occurs only in accented syllables, such as *kto* 'who'. Indeed, consider the input *njé-kto* 'somebody':

(564) njé-   kto   →   [njɛ́ktə]

    NEG-   who   'somebody'

In (564), we observe is that the vowel in the base, *kto*, surfaces as [ə], which is typical in post-accented syllables, and the accent falls on the prefix.

This is exactly the prediction that follows from the NDPH: since we are dealing with functional material the boundary is crucially placed above the accented prefix, which, as such, can alter the accentual landscape of its following base, allowing for demotion of accent in the base *kto*:

(565) The left edge of prosodic words aligns with the left edge of the SOD:

    ($_ω$ njé- kto

Note that there is a minimal contrast between *kto* 'who' combining with the accented negative prefix *njé-* as we saw in (564), and when *kto* 'who' combines with the unaccented negative prefix *nje-*:

(566) nje-   kto   →   [njiktɔ́]

    NEG-   who   'nobody'

Crucially, we see in (566) that in the absence of a dominant prefix *kto* carries an accent, and no vowel reduction is observed; rather, we observe that the /e/ in the prefix is realised as its correspondent in accented syllables: [i].

This effect of the accented negative morpheme *njé* is not restricted to a single lexical item; when *njé* combines with *chto* 'what' we again see that it is the prefix that carries the accent and the base that shows a reduced vowel:

(567) njé-   čto   →   [njɛ́čtə]

NEG-   what   'something'

Another minimal pair showing the two types of negation prefixes is given below:

(568) Emu   njé- gde   zhit'
He.DAT not- where live.INF
'He has no place to live.'

(569) On nje- gdé   nje byl
He not- where not was
'He hasn't been anywhere.'

Indeed, the relevant forms are realised as [njɛ́gdə] in (568) and [njigdɛ́] in (569), where we again see clear vowel reduction when syllables are unaccented.

Finally, *njé-* can also combine with the copula in Russian in the from *njé-bylo* 'there was no', which is usually used in impersonal clauses or existential clauses:

(570) njé-bylo edy

'There was no food.'

Curiously, in this form again the prefix is always stressed and we see that the final /o/ is reduced:

(571) njé-   bylo   → [njɛ́bɪlə]

      NEG- be.PAST.NEUT.   'there was no'

Thus, we see from the Russian data that also in the area of lexical accent that the NDPH makes the right cut: in languages with deletive accent, where the NDPH is operative, dominant prefixes cannot alter material in lexical material, but they are free to do so in functional material.

4.3.2 Compounds

On par with compounds in vowel harmony, we predict that root-compounding leads to a single Spell-Out Domain where there is no prosodic boundary between the two roots, and thus, both members are free to interact:

(572) The left edge of prosodic words aligns with the left edge of the SOD:

      ($_\omega$ **root   root**

However, it has been shown that at least certain processes of compounding do not involve roots, but must involve larger units, crucially involving the category-defining node as well as inflectional material. For instance, consider Icelandic:

(573) haf rannsókn -ar   skip
      sea research -GEN ship
      'oceanic research ship'

(574) eink -a-   bíl -a-   stæði
      private -GEN- car -GEN- space
      'private parking spot/parking spot for private cars'

In (573-574), we clearly see that the structure contains multiple category-defining nodes, as schematised in the tree below, where the inflectional nodes are left out for expository reasons (cf. Hardarson 2015b):

(575)

$$\sqrt{\text{ROOT}} \quad \text{n} \qquad \sqrt{\text{ROOT}} \quad \text{n} \qquad \sqrt{\text{ROOT}} \quad \text{n}$$
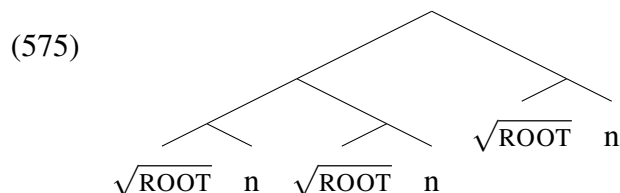
Since each root is associated with its own category-defining node, the structure above contains three Spell-Out Domains which are comprised of each root.

Clearly, stem-level compounding is predicted to have crucially different characteristics from root-compounding regarding lexical accent: given that each root is in its own Spell-Out Domain, each will have its own concomitant left-edge prosodic boundary:

(576)   The left edge of prosodic words aligns with the left edge of the SOD:

($_\omega$ **root**   ($_\omega$ **root**   ($_\omega$ **root**

Thus, we predict that given that altering the accentual landscapes of roots in compounds is restricted. Specifically, we adopted the following hypothesis:

(577)   In a configuration x ($_\omega$ y

x cannot alter (properties of) y,

y can alter (properties of) x.

This then means that leftward interactions between the roots are possible but rightward interactions are not:

(578)

$$(_\omega \; \underline{root} \quad (_\omega \quad \underline{root} \; (_\omega \quad \underline{root}$$
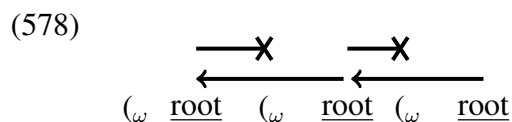
Thus, the NDPH allows for a right member to alter the accentual landscape of a left member, but not vice versa.

The only way that rightward interactions would be allowed is if the NDPH is irrelevant; that is, when accent resolution is additive. Recall that additive accent resolution does not violate the NDPH since no material is altered, but material is only added to the representation. Thus, we predict that in case leftward accent resolution is required the only mechanism is additive accent. Thus, we expect that in a language like Russian, which clearly uses deletive accent resolution, stem-compounds would not lead to reduced vowels in a lefthand member of the compound.

The predictions can be summarised as follows. In (579), we see the predictions for root-level compounding; given that in these cases, the boundary is placed outside both roots, all interactions are unrestricted, irrespective of whether a language uses additive or deletive accent resolution.

(579)

additive accent resolution	deletive accent resolution
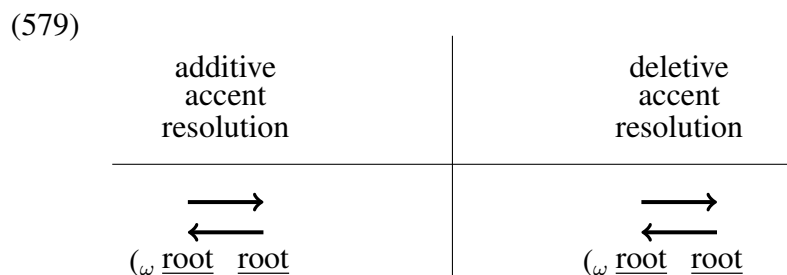
In (580), we see the predictions for stem-level compounding. Given that in additive accent resolution systems the NDPH is irrelevant both members of the compound structure

are free to interact; however, in deletive accent resolution systems we predict that a left member of a compound cannot alter the accentual landscape of the root to its right.

(580)

additive accent resolution	deletive accent resolution
$\longrightarrow$ $\longleftarrow$ $(_\omega \underline{root} \ (_\omega \underline{root}$	$\longrightarrow\!\!\times$ $\longleftarrow$ $(_\omega \underline{root} \ (_\omega \underline{root}$
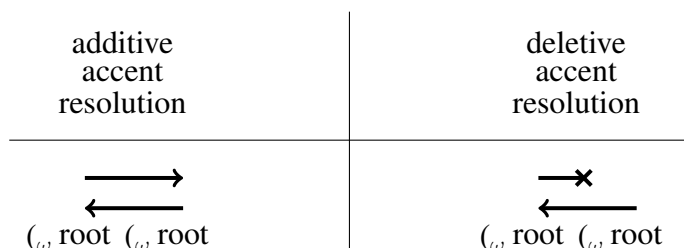
Below, I first discuss Japanese as a case study of root compounding, primarily since they involve morphemes that have been argued to be prefix-root constructions and thus in direct violation of the NDPH (see also above). After that, I discuss Icelandic as a case study of a stem-compounding.

4.3.2.1 Root compounds

Japanese Though Alderete (1999) argues that certain apparent prefix-root constructions, such as in (583) below, are compounds rather than sequences of a prefix and root, he argues that one of the prefixes does actually constitute a dominant prefix. Specifically, when the prefix *ma-* 'true' combines with an unaccented root, the prefix imposes an accent on the first syllable of the root (Alderete 1999, 190):

(581)   ma-futatu   →   [mappútatu]   'exactly half'

ma-usiro   →   [maúsiro]   'right behind'

Similarly, when it combines with a previously accented root it overrides the root accent (Alderete 1999, 190):

(582) ma-yonaká   →   [mayónaka]   'dead of night'

       ma-súgu   →   [massúgu]   'straight ahead'

In (581-582), we see that the prefix induces an accent on the first syllable of the root, irrespective of whether the root itself is unaccented or accented. Thus, it constitutes a clear counter-example to the hypothesis advocated here.

Similarly, there are other prefixes such as *sin-* 'new' and *ko-* 'little' that seem at first glance to be dominant:

(583) sín-gétsu   →   síngetsu   'new moon'

       kó-hári   →   kóbari   'little needle'

However, though it seems in the data in (583) that a dominant prefix is removing the accent of a corresponding root, here I follow Alderete's analysis of forms such as the ones in (583) as compounds, which is summarised below.[57] In addition, I will argue that the prefix *ma-* 'true' (581-582) also may well constitute a compound structure.

Firstly, basing himself on Otsu (1980), Poser (1984, 1990) and Kubozono (1995), Alderete (1999, 97) identifies the following characteristics that noun-noun compounds have:[58]

---

[57]It should be noted here that Alderete (1999) does not specify what type of compounding is involved. Here, I assume Japanese to be an instance of root-compounding purely based on the predictions here. Firstly, I take deletive accent resolution to be the default of languages, and since we will see interactions between a lefthand element that alters the accentual landscape of a righthand element, we can analyse them as root-compounds rather than stem-compounds. However, clearly a more detailed analysis of Japanese is required to determine whether we are indeed dealing with root-compounding here.

[58]Note that *dvandva* compounds, characterised by semantic conjunction of two morphemes, do not conform to the characteristics here; for instance, they do not show Rendaku voicing. However, it is clear that the structures under discussion do not involve *dvandva* compounds such as *eda-ha* 'branches and leaves' or *kúro-siro* 'black and white'.

(584) a. Semantic modification or complementation;

   b. Rendaku Voicing;

   c. Distinction between short and long second members;

   d. Final syllable extrametricality;

   e. Medial accent in N_2.

The first criterion in (584) correlates relatively well with the other diagnostics but obviously not only compounds involve semantic modification. Turning to (584b), Rendaku, the operation where an obstruent of a second member of a compound is voiced, is a diagnostic particular to compounds. (584c) refers to the observation that the accentual landscape of a compound differs, depending on whether the second member of a compound is long or short (discussed in more detail below). Next, some compounds show final syllable extrametricality in the computation of accent (also discussed in more detail below). Finally, Alderete assumes that (584e) is a condition on compounds: that is, non-final inherent accents are never lost so if we see a non-initial accent (which would be the default, (585b) below) or a non-final accent this means that the inherent accent of the second member of the compound is preserved.

Having introduced the properties of compounds, let us return to the criterion in (584c) in more detail. The accentual landscape of Japanese compounds is, aside from idiosyncratic exceptions, exclusively determined by the phonological shape of the second member of the compound, and whether or not the first member of the compound carries an accent is irrelevant; indeed, Alderete (1999) assumes that the first member of a compound is always deaccented, in line with the predictions here that a righthand member of a compound

can alter the accentual landscape of the lefthand member of a compound. Specifically, the compound rules in Japanese are as follows:

(585)   If the second member of a compound is long (three or more moras), then:

   a. If the second member of the compound has any non-final syllable accent, this accent is preserved;

   b. Otherwise, the accent goes on the first syllable of the second member of the compound.

(586)   If the second member of a compound is short (two or less moras), then:[59]

   a. If the second member of the compound has any non-final syllable accent, then this accent is preserved;

   b. If the second member of the compound has no inherent accent, then the accent goes to the final syllable of the first member of the compound (but there are exceptions to this rule);

   c. If the second member of the compound has an accent on the final syllable, then the accent goes to the final syllable of the first member of the compound (again there are exceptions to this rule).

Thus, we see the following forms, all of which involve a second member of a compound that is long:

---

[59]We already see the diagnostic for compounds in (584d) reflected here by the fact that the effect of the rule in (586c) is that accent on a final syllable of the second member of the compound is treated as the absence of this accent, as in the rule in (586b).

(587)   a.   yámato-nadésiko   →   yamato-nadésiko   'Japanese lady'

       b.   ne-syoogatú   →   ne-syóogatu   'lazy New Year holiday'

       c.   me-kusuri   →   me-gúsuri   'eye wash'

Thus, in (587a) we see that the second member of the compound, *nadésiko* is long and bears a non-final inherent accent, which is retained; in (587b) we see that the second member of the compound, *syoogatú*, is also long but since its inherent accent is on the final syllable (585a) does not apply and we see the default (585b) and accent falls on the first syllable of the second member of the compound; in (587c) we see that the absence of any inherent accent also results in an accent on the first syllable of the second member of the compound, if the second member of the compound is long (585b).

Turning to compounds with a short second member, we see the following:

(588)   a.   faasuto-kísu   →   faasuto-kísu   'first kiss'

       b.   kensetu-syoo   →   kensetú-syoo   'Ministry of Construction'

       c.i.   témuzu-kawá   →   temuzú-gawa   'Thames River'

       c.ii.   garasu-tamá   →   garasu-dama   'glass bead'

The first example in (588) shows that when the second member of the compound is short, such as *kísu*, and carries an inherent non-final accent, this accent is preserved in the compound. In (588b), we see that when the second member of the compound is short, *syoo*, and does not have an inherent accent, the compound surfaces with an accent on the final syllable of the first member of the compound (585a).[60] In (588c.i) we see that the second member of the compound bears accent on the final syllable, which results in accent again falling on the final syllable of the first member of the compound, making accent on

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[60]As noted above, this rule has exceptions, but Alderete (1999) does not list actual examples.

the final syllable effectively invisible (extrametrical). However, in (588c.ii) we see that the rule that an accent on the final syllable results in 'default' accent on the final syllable of the first member of the compound is not always adhered to; rather, we see that the whole form surfaces without an accent: *garasu-dama* 'glass bead'.

Alderete (1999) then proceeds to discuss a number of purported cases of prefix-root constructions, arguing that most of these are actually compounds. His summarising table is given in (589) below, with each of the prefixes evaluated against the characteristics of compounds introduced above (adapted from Alderete 1999, 107). The numbers between parentheses refer to the number of instances that the prefix satisfies the diagnostic of being a compound; e.g. *sin-* 'new' shows in one out of twelve instances the desired effect of extrametricality. A question mark between parentheses indicates that only one or two examples are found that support the diagnostic.

(589)

Prefix	(584a)	(584b)	(584c)	(584d)	(584e)	n =	Result
sin- 'new'	Y	Y	Y	Y(1/12)	Y(5/12)	41	compound
ma- 'true'	Y	N	–	Y/N	Y/N	32	dom.prefix
ko- 'little'	Y	Y	Y	Y	Y(3/12)	49	compound
oo- 'big'	Y	Y	Y	Y	–	42	compound
han- 'anti-'	N	N	Y	–	–	22	compound
su- 'bare'	Y	Y	Y	Y	–	22	compound
hi- 'non-'	N	N	Y(?)	–	–	12	compound
hu- 'non-'	N	Y(?)	Y(?)	Y(3/11)	–	12	compound
mu- 'un-'	N	N	Y(?)	Y	–	8	compound
mi- 'no yet'	N	N	Y(?)	Y(?)	–	10	compound
zi- 'REFL'	N	N	Y	Y(?)	–	30	compound
hi- 'PASS'	N	N	Y	Y(?)	–	15	compound

We see in the last column in the table in (589) that Alderete analyses all prefixes except one, *ma-* 'true', as a first element in a compound structure.[61] Specifically, he analyses it as a post-accentuating prefix: a prefix that imposes an accent on its immediately neighbouring syllable on the right.

However, it should already be noted that we see in the table that there is a lot of variation and it does not seem so clear that we should classify *ma-* 'true' as separate from the other prefixes. Indeed, as is the case with the other prefixes investigated by Alderete (1999,

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[61]In addition, there might be a post-accentuating honorific prefix *o-* but "[t]his post-accentuation has a fair number of exceptions, with /o-/ sometimes behaving as a deaccenting prefix (e.g., *o-mánzyuu* → [o-manzyuu] 'Japanese cake' and *o-imó* → [o-imo] 'potato'), and sometimes behaving as accentually neutral (e.g., *o-misosíru* → [o-misosíru] 'miso soup')" (Kawahara 2015, 469); see also Poser (1984, 77). As we will see for the prefix *ma-* 'true', it seems to be behaving roughly like a compound.

section 3.3.4), it should be noted that there is considerable variation; below I show the data that Alderete (1999, 100) gives, which is based on Poser (1984) with some additions of his own research. We see four groupings: (590) shows *ma-* 'true' combining with unaccented short roots, (591) shows *ma-* 'true' combining with accented short roots, (592) shows *ma-* 'true' combining with unaccented long roots, and (593) shows *ma-* 'true' combining with accented long roots.

(590) kura 'darkness' ma-kkúra 'total darkness'

      ura 'back' ma-ura 'right in back'

      saki 'front' ma-ssáki, ma-ssakí 'foremost'

      siro 'white' ma-ssíro 'snow white'

      maru 'circle' ma-mmaru, má-mmaru 'a perfect circle'

      ue 'top' ma-ué 'right on top'

      yoko 'side, flank' ma-yoko 'just beside, abeam'

(591) áka 'red' ma-kká 'deep red'

      kúro 'black' ma-kkúro 'pitch black'

      fuyú 'winter' ma-fuyu 'dead of winter'

      náka 'center, box' ma-nnaka 'dead center, box'

      kita, kitá 'north' ma-kitá 'due north'

      áo 'red' ma-ssáo 'deep red'

      máe 'front' ma-mmáe 'right in front'

      súgu 'at once' ma-ssúgu 'straight ahead'

      hirú 'noon' ma-hiru 'high noon'

(592)   futatu   'two'   ma-ppútatu, -futátu   'exactly half'

        hadaka, hadáka   'naked'   ma-ppádaka   'stark naked'

        hiruma   'noon'   ma-ppíruma   'high noon'

        minami   'south'   ma-mínami   'due south'

        mukai   'opposite'   ma-múkai   'directly opposite'

        mukoo   'opposite'   ma-múkoo   'directly opposite'

        sakari   'zenith'   ma-ssákari   'in full bloom'

        sakasama   'head over heels' ma-ssákasama   'topsy-turvy'

(593)   sikakú   'rectangle'   ma-ssikáku, -ssíkaku,   'a perfect square'

                                               -sikáku, -síkaku

        syoozíki, syoozikí   'honesty'   ma-ssyóoziki   'downright

                                                                    honesty'

        syooméN   'front'   ma-ssyóomeN,   'straight ahead'

                                               ma-syooméN

        yonaká   'midnight'   ma-yónaka   'dead of night'

        kokóro   'heart'   ma-gókoro   'sincerity'

        tadánaka, tadanaka   'in the middle' ma-ttádanaka   'right in the

                                                                    middle'

        atarasíi   'new'   ma-atarasíi   'truly new'

        itimónzi   'straight line' ma-itimónzi   'in a straight/

                                                                    direct line'

Firstly, we again note the wide range of accentual patterns in forms containing *ma*-'true': though some forms, like in (581-582), are post-accentuating, we also see forms

that surface unaccented after combining with the prefix, such as *ma-ura* 'right in back' and *ma-nnaka* 'dead center, box'. In addition, we observe variations such as *ma-ssáki* ∼ *ma-ssakí* 'foremost', and *ma-ssyóomeN* ∼ *ma-syooméN* 'straight ahead'. Once, we even observe variable accent on the prefix itself: *ma-mmaru*, *má-mmaru* 'a perfect circle'. Finally, we also see clear instances where the accent of the root is maintained on a final vowel, as in *ma-atarasíi* 'truly new' and *ma-kitá* 'due north'.

Turning to the diagnostics for noun-noun compounds that Alderete (1999) identified (584), we see in the table in (589) that *ma-* passes the semantic modification or complementation test for compounds. However, as also noted in the table in (589), there are no cases of Rendaku voicing (584b) in the sample. Firstly, though, it should be noted here that some of the other prefixes that Alderete classifies as compounds do not pass this diagnostic either; furthermore, even in the case that we do see Rendaku, not all forms show it.[62] Thus, it seems that Rendaku voicing cannot be taken as the decisive factor in classifying a morpheme as a prefix or not.

The third criterion was whether a distinction is made between a short second member of a compound and a long second member of a compound. This contrast can be seen by the accentual landscape of the full form, given the compound rules in Japanese that were listed in (585-586).

Focusing first on forms where *ma-* 'true' combines with long roots (592-593), we see that they by and large seem to fall under the rule for compounds in Japanese: 13 out of 16 show the pattern of (585b) where accent falls on the first syllable of the second member of the compound. Two further forms (and some more variably) show retention

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[62]Itô & Mester (1986) note that Rendaku only occurs in a subclass of compounds; specifically, we only see Rendaku voicing when the morphemes in question are of the Yamato type.

of their original accent on a final syllable (*ma-atarasíi* 'truly new' and *ma-itimónzi* 'in a straight/direct line'), thus failing the extrametricality criterion in (584d). The remaining form is *ma-gókoro* 'sincerity' from *kokóro* 'heart' where we expect that the original accent is retained (585a), but instead we see the default (585b) pattern (ironically, this is the only form where we do observe Rendaku). Thus, we see that most of the instances when *ma-* combines with long roots behave like compound structures. Though two forms fail the extrametricality test, we see that extrametricality is quite often not consistently observed in other constructions as well: in the table in (589) we see that in only one out of twelve cases we see it when *sin-* 'new' combines and only three out of eleven cases when *hu-* 'non-' combines. Thus, we are left with one form that shows un expected default arising; furthermore, though certainly not common we do see this configuration in one other form: when *akínai* combines with *ko-* 'little' we see that this is realised as either *ko-ákinai* or *ko-akínai* 'retail business', the former showing the pattern of *ma-gókoro* 'sincerity'.

With regard to the short second member of a compound (590-591), it is less clear. Given that (590) are unaccented, we predict the final syllable of the first element of the compound to be accented (586b); instead, we see that the forms surface without an accent (e.g. *ma-ura* 'right in back' and *ma-yoko* 'just beside, abeam') or with an accent on the first syllable of the root (e.g. *ma-kkúra* 'total darkness' and *ma-ssíro* 'snow white'). Recall, though, that Kubozono (1995) clearly notes that there are exceptions to this rule. Indeed, the expected pattern of accent on the final syllable of the first element of the compound is actually rarely observed in any of the other prefixes that Alderete discusses. For instance, when *sin-* 'new' combines with a short unaccented root, the resulting form is usually unaccented, and only once accented on the first element of the compound; when

ko- 'little' combines with a short unaccented root, we see the same situation. When *oo-* 'big' combines with a short unaccented root (595), two forms are realised as unaccented, and two have an accent on the first syllable, the same as we saw in (590) for *ma-* 'true' (Alderete 1999, 103):

(594)	kaze	oo-kazé	'wind'
	azi	oo-azi	'insipid (taste)'
	atu-atu	oo-átu-atu	'in love/deeply in love'
	mozi	oo-mozi	'letter/capital letter'

Thus, it again seems unwarranted to isolate *ma-* 'true' as the sole morpheme that is a dominant prefix rather than a compound element.

Finally, turning to the data in (591), which shows forms where *ma-* 'true' combines with short accented root, we see the following. If the second member of a compound has any non-final accent, we expect it to be preserved (586a); two out of three non-final accents are preserved and in one case we see that the form surfaces with no accent at all: *na-nnaka* 'dead center, box' deriving from *náka* 'center, box'.[63] However, this is not restricted to *ma-* 'true'; other prefixes also result in unaccented forms counter to the rules identified in (586), such as:

(595)	géki	sin-geki	'play'
	-réki	sin-reki	'year'
	áyu	ko-ayu	'sweetfish'
	báka	ko-baka	'look down on'
	hári	oo-hari	'needle'

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[63]It is unclear what is happening with *ma-kká* 'deep red', from *áka* 'red' since the form is truncated.

If the second member of a compound has no inherent accent or an accent on the final syllable, we expect that the accent surfaces on the final syllable of the first member of the compound (586b-586c). Rather, we see that in these cases the form either surfaces unaccented (two instances: *ma-fuyu* 'dead of winter', from *fuyú* 'winter; and *ma-hiru* 'high noon' from *hirú* 'noon') or retains its accent on the final syllable (*kitá* 'due north' from *kita, kitá* 'north'; *ma-ssáo* 'deep red' from *áo* 'red'; and *ma-mmáe* 'right in front' from *máe* 'front'). However, as noted, this rule has exceptions, and, indeed it is quite common that the form surfaces as unaccented when the other prefixes that Alderete investigated combine with a short accented root that would otherwise be subject to default accent on the final syllable of the first element of a compound; some examples are given below:

(596) katá   sin-gata   'style'

       isí   ko-is i   'rock'

       imó   ko-imo   'potato'

       matá   oo-mata   'long stride'

       uké   oo-uke   'success'

With regard to retaining an accent on the final syllable of the compound, we see that this pattern is not particularly common, but is observed in a few forms (sometimes only variably):

(597) kóe   oo-góe   'voice/loud voice'

       té   su-dé, sú-de   'hand'

       hosí   su-bosi, su-bosí 'dry'

Thus, what we see is that all these forms show a lot of variation, and that the accentual rules for compounding in Japanese (585-586) are not followed strictly. Based on the

above, I do not see a reason to classify the morpheme *ma-* as separate from the other morphemes and identify it as a post-accentuating prefix.[64] However, this raises the question whether the forms that Alderete (1999) analyses as compounds are truly compounds or whether they are prefixal. In order to answer this question, a more detailed investigation into variability patterns in compounds is required, as well as whether we can uncover clearer patterns of the accentual behaviour of the morphemes in table in (589).

4.3.2.2 Stem compounds

Icelandic   As we saw above, Icelandic clearly involves compounding of units larger than the root. Thus, as discussed above, once accent is assigned to a root it cannot be altered by an element to its left:

(598)   The left edge of prosodic words aligns with the left edge of the SOD:

($_\omega$ **root**   ($_\omega$ **root**

Accent in Icelandic is always on the initial syllable; in addition, we see an alternating rhythmic pattern (note that orthographic accents in Icelandic mark vowel quality; thus, here primary accent is indicated by ´ and secondary accent by ˛ at the beginning of the accented syllable) (Árnason 2011, 271):

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[64]One final reason to be suspicious of an analysis of *ma-* 'true' as a post-accentuating prefix: this seems to be the only instance of a post-accentuating prefix that I could find. The only other potential candidate for a post-accentuating prefix would be the Japanese honorific prefix *o-*, but see note 61.

  Though Alderete, citing Pike & Scott (1963), lists the Papuan language Fore as having a post-post-accentuating prefix (Alderete 1999, 191), Scott (1990) reanalyses the Fore data as a tonal language rather than an accentual language. Nonetheless, it is intriguing that in his reanalysis of Fore accent he notes that there are only two types of morphemes in the language that do not fit his system so neatly; specifically, "[p]refixes do not influence the roots to which they are attached. Rather, the reverse is true" (Scott 1990, 148) (the other type of morpheme that requires additional machinery is sentence-final mood morphemes).

(599) ˈhöfðingˌja   'chieftain-GEN'

ˈforusˌta   'leadership'

ˈakvaˌrella   'aquarelle'

ˈbíóˌgrafíˌja   'biography'

Turning to compounds, we observe the following when we have a compound composed of two bisyllabic words:

(600) ˈhúsa   ˈleiga   → [ˈhúsa ˌleiga]

house-GEN.PL   rent-NOM   'rent'

This is straightforwardly analysed by assuming that accent resolution is additive (leftmost wins), and primary accent is marked by two grid marks and secondary accent by one:

(601)
```
      x
   x    x
  húsa leiga
```

Note that rhythmic secondary accents are never observed next to any accent (Árnason 2011, 272):

(602) forustu   sauður   → [ˈforustu ˌsauður]

leadership-GEN   sheep   'leading sheep'

(603) höfðingja   vald   → [ˈhöfðingja ˌvald]

chieftains-GEN   power   'aristocracy'

(604) framsóknar   flokkur   → [ˈframsóknar ˌflokkur]

progress-GEN   party   'progressive party'

We see that in each of these cases we see that the first member of the compound is now a dactyl, in order to avoid a clash with the accent of the second member of the compound.

Next, consider a three-member compound, where we see the following pattern:

(605)　fjár　　　　hús　　dyr　　　　→　[ˈfjár hús ˌdyr]

　　　　sheep-GEN　house　door-NOM　　'sheep barn door'

We see that given that additive accent resolution applies, resulting in the leftmost element receiving primary accent.

(606)
```
        x
        x
        x       x
        x   x   x
     [[fjár hús] dyr]
```

Then, we see that primary accent is on the first element and secondary accent on the last element.

However, a complication arises in case the first member of a two-member compound is mono-syllabic. given that this configuration creates a clash, i.e., two adjacent accents, we see that accent appears to shift onto the next syllable of the second member of the compound:

(607)　ˈhús　　ˈleiga　　　→　[ˈhús leiˌga]

　　　　house　rent-NOM　　'rent'

Crucially, this would involve the first member of the compound, *hús* to change the accentual landscape of the second member of the compound, *leiga*; clearly, this is counter to the predictions here, given that compounding in Icelandic occurs at the stem-level and thus each member is confined to its own SOD.[65]

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[65]There seems no reason to posit an additive account here.

However, when syllables are accented in Icelandic they are strengthened by vowel or coda lengthening. Thus, the first syllable of the compound *'hús leiˌga* 'rent' is lengthened. Now, according to Gísli Harðarson (p.c.) it seems that the final secondary accent in (607) does not cause strengthening; if we assume that this secondary accent is simply the result of a rhythmic beat we see a parallel with Chamorro discussed above: in Icelandic, a secondary stress that is purely rhythmic does not cause strengthening of its syllable.[66]

If this is correct, we predict that the secondary accent in (605/606), which derives from a lexical accent and is crucially not purely rhythmic in nature, should indicate strengthening effects. According to Gísli Harðarson (p.c.) this indeed seems to be the case; that is, in the pairs below the secondary accents in (a) stem from lexical accents and are accompanied by strengthening, whilst those in (b) are analysed as rhythmic beats and accordingly do not surface with strengthening.

(608) a. ˈfjár   ˈhús   ˈdyr   →   [ˈfjár hús ˌdyr]

           sheep-GEN   house   door-NOM   'sheep barn door'

       b. ˈhús   ˈleighur   →   [ˈhús leiˌghur]

           house   rent-NOM-PL   'rents'

(609) a. fjár   hús   kú   →   [ˈfjár hús ˌkú]

           sheep-GEN   house   cow   'sheep barn cow'

       b. hús   léigha   →   [ˈhús leiˌgha]

           house   rent-NOM   'rent'

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[66]Árnason (2011) is not entirely consistent in transcribing secondary accent, sometimes marking lengthening. However, it seems that there are no phonetic studies on the relation between secondary stress and lengthening effects.

It is important to emphasise though, that these are impressionistic data and would need to be confirmed phonetically to confirm their validity.[67]

Thus, whilst the predictions of the current proposal are clear and, at least preliminarily, Japanese and Icelandic seem to conform to them, clearly more languages need to be investigated before we can make a definitive claim concerning accent resolution in compound structures, and we may well have to weaken the hypothesis.

However, if the predictions hold, we can add the accentual landscape of a word as an evaluation tool to distinguish between root-level and stem-level compounding. That is, if the hypotheses here are correct, then, even in the absence of overt inflectional material as we have in Icelandic, whenever we see that a lefthand member of a compound changing the accentual landscape of a righthand member of a compound the structure this is a diagnostic in favour of stem-level compounding rather than root-level compounding.[68]

4.3.3 Conclusion

In this section, I have shown that additive accent resolution systems such as Chamorro and Nez Perce show that the grammar does not prohibit dominant prefixes *per se*. In contrast to additive accent resolution languages, in deletive accent resolution systems, the NDPH made the correct prediction that we should not observe dominant prefixes in lexical items. Furthermore, we saw that in case prefixes are attached below the category-defining node,

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[67]Note that in order to get the rhythmic beat on forms such as (608b) and (609b), I assume that rhythm is a late, phonetic, process, and the original primary accent on the first syllable of the second member of the compound is no longer recognisable as such, given that Icelandic does not tolerate two adjacent accented syllables and thus secondary accents are removed before rhythm applies.

[68]Note that languages are not restricted to a single type of compounding; for instance, Fábregas (2015) discusses data from Spanish that clearly show two types of compounding, which he argues correspond to root-level and stem-level compounding (see also Bloomfield 1933, among others).

as in Russian, dominant prefixes are again attested, exactly as is predicted in the current formulation of a boundary being inserted at the left edge of a domain that corresponds to the complement of the category-defining node rather than the root (though usually the SOD does constitute (exclusively) the root). In Cupeño, we saw that Alderete's (1999) analysis supports the NDPH very neatly, and Newell's (2008) analysis, though not requiring any dominant prefixes in Cupeño, supports a contrast in the SOD of functional and lexical material, which is also argued for here.

In addition, we predict that in functional material these restrictions should not hold and we expect to have dominant prefixes; though this prediction is somewhat difficult to test given that functional material often is unaccented, we saw that the negative prefix *nyé-* in Russian seems to be a dominant prefix that exclusively combines with functional material, exactly in line with the predictions here.

Finally, I discussed the predictions of the current proposal with regard to compounding patterns, both at the level of roots and stems. These were (somewhat) supported by data from Japanese and Icelandic, though a more thorough investigation into these languages and compounding in general is required before we can achieve anything more than a tentative conclusion.

At this stage, a further note on how we represent dominant morphemes is in order. Recall that in section 4.2.2.1 we saw that dominant prefixes were best formalised as deriving from underspecification coupled with spreading, thus making vowel harmony a segmental property. In contrast, the cases discussed in this section clearly constitute dominancy being encoded on specific morphemes. As such, it seems that we cannot unify the dominant prefixes in vowel harmony and lexical accent by analysing both as a morphemic property

or segmental property.[69]

4.4 Discussion

The proposal here advocates that morpho-syntactic structure has consequences on (certain aspects of) the phonology. Drawing on structural differences between lexical and functional material leads to the insight that category-defining node induced domains result in a prosodic boundary at the left edge of a domain that is the complement of the category-defining node, which in turn accounts for the apparent lack of dominant prefixes in lexical material. Note that when these prefixes are located lower than the category-defining node, as in the case of the Russian lexical prefixes (section 4.3.1.1), these prefixes can be dominant given that there is no intervening boundary between them and the root. Thus, we see that it is not the case that the prosodic boundary aligns with the left edge of a root, but rather a domain that corresponds to the complement of a category-defining node.

This lack of dominant prefixes in lexical material is crucially not the result of a general ban on dominant prefixes altogether. Indeed, we do observe dominant prefixes in vowel

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[69]Note, though, that I do not exclude vowel harmony systems in which we see dominancy encoded on the morpheme, and these systems are still predicted to be subject to the same restriction: dominant prefixes are allowed in functional material but not lexical.

As a potential parallel to vowel harmony that results from the segmental make-up of a language, we may draw on the distinction between languages that are quantity-insensitive and quantity-sensitive with regard to accent. The languages investigated here are quantity-insensitive and dominance is encoded on morphemes. However, in languages that are quantity-sensitive the property of being accented follows from wether a syllable is light or heavy, which is a segmental property.

Indeed, the prediction here is that we still observe restricted interactions between a prefix and root in such languages. For instance, consider a language that places accent on the first heavy syllable and otherwise it places it on the last syllable. Then, if there are multiple heavy (accented) syllables in the structure, we predict that accent should be on the first heavy syllable *within the prosodic domain*, which, in lexical material, excludes any prefixes (unless the system is additive and the NDPH is irrelevant). Many thanks to Harry van der Hulst for drawing my attention to this.

harmony systems and lexical accent systems, but crucially only in functional items, as derived here by the lack of category-defining nodes in functional material.

In this chapter, I thus crucially rely on the left edge of prosodic words aligning with the left edge of a domain that corresponds to the SOD (433) and the hypothesis that in a configuration x ($_\omega$ y, x cannot alter (properties of) y, even though y is free to alter (properties of) x (435). Thus, (433) and (435) interact to derive the ban on dominant prefixes in lexical forms (NDPH), but given that functional material does not contain a category-defining node, the NDPH is inapplicable.

In the following, I briefly discuss the place of this boundary in the grammar, relating it to literature that has singled out the root as a special constituent since most often the complement of a category-defining node is simply a root, as well as some thoughts on its nature and delimiting effects. In section 4.4.3 I also note additional and independent support for the existence of a prosodic boundary of the sort discussed here based on work by Kim (2014), who also invokes the need of a prosodic boundary in order to restrict certain prefix-root interactions.

4.4.1 (In)direct reference

Firstly, in the syntax-phonology interface literature, a difference is made between a direct reference approach and an indirect reference approach. The direct approach assumes that syntax and phonology are directly connected, whilst the indirect approach advocates a view where though syntax and phonology are connected, this relation is indirect, mediated through prosodic structure. Here, the indirect approach is represented by Edge-based alignment theory Selkirk (1986), Downing (2010), Cheng & Downing (2012) (see also

Nespor & Vogel 1986, Kanerva 1990, Truckenbrodt 1995); and the direct approach is represented by the Modular PIC D'Alessandro & Scheer (to appear, 2013) (see also Kaisse 1995, Odden 1995, Pak 2008, Seidl 2001). Below, I will show that though the current proposal is compatible with both views, the indirect reference approach seems a more natural fit.

A particular version of the theory that introduced the notion of alignment of prosodic words with syntactic constituents is Edge-based Alignment theory Selkirk (1986), Downing (2010), Cheng & Downing (2012), i.a.. In this framework, syntactic constituents are mapped asymmetrically to prosodic constituents. In addition, mapping is asymmetrical: only one edge of a syntactic constituent aligns with an edge of a prosodic constituent. Thus, Edge-based Alignment theory makes use of statements such as the following (phrased as an OT constraint here), where the syntactic constituent is a syntactic phase:

(610)   ALIGNR[PHASE, INTPH]: Align the right edge of every phase (vP/CP) with the
         right edge of an Intonation Phrase (IntPh).

This raises the question why the mapping from syntax to phonology needs to be indirect, which seems to make the theory more complicated (see also below). The motivation for prosodic structure mediating between syntax and phonology is exemplified by Cheng & Downing (2012), where they argue that there is no one-on-one mapping of syntactic phases and prosodic constituents. Specifically, they show on the basis of Bantu phonological interactions (high tone interactions) that certain prosodic domains do not match but include multiple syntactic phases.[70] The crucial mechanism that edge-based alignment has

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[70] In addition, they argue that in certain cases a single syntactic phase contains two prosodic domains.

at its disposal is that multiple syntactic phases can be contained within a single prosodic domain rather than always having to form an independent prosodic domain.

However, Scheer (2010, 2012) and D'Alessandro & Scheer (2013) argue, largely on conceptual grounds, against the possibility of diacritics such as a prosodic boundary being inserted into the phonology. Firstly, under a view where prosodic units derive from universal (non-dynamic) syntactic phases isomorphically and any language-specific variation occurs in the phonology, the question arises "why the chunk defining job should be duplicated: if chunks can be defined by phases alone, what is the purpose of prosodic constituents?" (D'Alessandro & Scheer 2013, 309). Secondly, on a strongly modular view of the grammar, morpho-syntactic information, such as a prosodic boundary diacritic, cannot be interpreted in the phonology since the phonological module exclusively deals with phonological vocabulary; as D'Alessandro & Scheer (2013, 310) put it, "[morpho-syntactic diacritics] have the same ontological status as bananas". Finally, they raise the point that since these diacritics have no inherent phonological content there is no restriction on what these diacritics can do; that is, since it has no defined phonological function in principle the diacritic can do anything and thus has no predictive power.

Instead of prosodic constituency, D'Alessandro & Scheer (2013) assume that all prosodic constituents derive directly from syntactic phases. However, they assume the framework of 'Modular PIC' (D'Alessandro & Scheer to appear) in which the delimiting property of phases (the Phase Impenetrability Condition, PIC) is optional and module-independent. That is, not every phase is subject to the PIC; and not every phase that is specified as (not) adhering to the PIC in the syntax is specified as such in the phonology. Thus, they argue that (universal or language-specific) phases come in four flavours: (i) PIC-effects are ob-

served in both syntax and phonology, (ii) PIC-effects are observed in the syntax but not in the phonology, (iii) PIC-effects are observed in the phonology but not in the syntax, and (iv) no PIC-effects are observed in the syntax or the phonology.[71] In the case of a phase that is subject to the PIC in the phonology, as an alternative to diacritics, they propose that syllabic space, i.e. a CV syllable, is the only unit that can be inserted. They posit that as a well-defined phonological object, this then makes more concrete predictions than a wildcard diacritic; for instance, a CV syllable is likely to cause lengthening or fortition but not shortening or lenition. However, they make one more adjustment to canonical phase theory: they argue that syllabic space can be inserted either at an edge of a phase head or at an edge of a phase head complement (i.e., the spelled out complement of a phase head). Thus, we see that their system can capture Cheng & Downing (2012)'s problem of a single prosodic constituent containing two syntactic phases by positing that one of the syntactic phases contained within the prosodic domain is not associated with the PIC and thus will not 'count' as a phase for the phonology (whilst still being a phase with potentially syntactic PIC-effects). In sum, we see that they circumvent the problem of introducing prosodic constituency, but they do so at the cost of having a much more permissive system of phases than usually assumed.

Firstly, it should be noted that the proposal here is not particularly compatible with D'Alessandro & Scheer (2013). However, since it does not rely on prosodic constituents beyond the boundary that is inserted at the left edge of the complement of the category-defining node, it does not commit to a full prosodic hierarchy. Thus, we could implement the modification that the prosodic boundary should be redefined as syllabic space, which

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[71]Phaseheads (irrespective of whether or not they are subject to the PIC) are defined as "those heads where unvalued (and uninterpretable) features are merged" (D'Alessandro & Scheer 2013, 312).

then has a strengthening effect which surfaces as the prohibition of material to the left of the boundary altering material to the right of the boundary. However, the question is what we gain by such a move. Firstly, it seems inevitable that certain diacritics that are not phonological in nature, such as declension and conjugation classes, must be present in the morpho-phonology. Hence I do not consider the diacritic nature of a prosodic boundary to be an issue. Obviously, though, D'Alessandro & Scheer (2013) are correct in pointing out that the nature of any diacritic needs to be defined; however, this does not necessarily need to be done in terms of purely phonological vocabulary. Immediately below I will discuss some potential restrictions to create a testable working hypothesis for the future, though it should be noted already that I do not expect to be able to identify the exact workings of this boundary. A second argument against adopting D'Alessandro & Scheer (2013) is that I argue that the boundary at the left edge of the complement of category-defining nodes is not an optional operation but a universal; whilst they presumably could incorporate the obligatory insertion of syllabic space at the left edge of the complement of category-defining nodes into their theory, the optionality of the PIC effect is a fundamental part of their proposal. Similarly, I argue that the phonological boundary always goes hand in hand with the formation of the Accessibility Domain, thus again having a situation where universal PIC effects (albeit reflected in different constituents) are observed in both the morphology and the phonology, in contrast to their hypothesis of module-independence. Again, one could modify their theory to include that, in contrast to the syntax and phonology, morphological effects are universal and obligatory, but that seems odd.

In addition, though orthogonal to the proposal here, as D'Alessandro & Scheer (2013) point out, the original program of Prosodic Phonology did not relegate language-specific

prosodic variation to the phonology but variation resulted from the mapping of syntax onto the phonology; thus, the assumption of prosodic units does not necessarily entail that every syntactic phase should be linked to a phonological (prosodic) unit isomorphically. Furthermore, though they argue in favour of removing prosodic constituents from the theory of phonology, it is, as D'Alessandro & Scheer (2013) stress, an empirical question whether all research analysed in line with Prosodic Phonology can be reanalysed without the Prosodic Hierarchy.[72]

Thus, I retain the representation of the boundary assumed here as a prosodic boundary that aligns with the left edge of the root.

In sum, though I do not necessarily align myself with a direct or indirect approach to the syntax-phonology interface, I assume an indirect approach in the representation. Note, though, that both approaches are compatible with the proviso that the boundary would have to be redefined as a phonological unit in a direct reference approach.

Finally, a brief note on the status of the Spell-Out Domain is in order here. In section 1.1, I pointed out that whilst drawing on parallels in the syntax, I make a distinction between syntactic and morphological phases and Spell-Out; whether this distinction needs to be maintained in the future remains to be seen. For now, considering the SOD as a morphological domain rather than a syntactic spellout domain allows us to single it out as different from syntactic effects; in its most extreme version this means that one could

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[72]Independent from the grammatical reality of syntax-independent prosodic units, from a purely heuristic perspective, it might be worthwhile to regard prosodic constituency as independent from syntactic phases. In addition to there being no universally agreed-upon theory of syntactic phases, I have argued in chapter 2 that category-defining node induced Spell-Out Domains are not necessarily derived in exactly the same way as syntactic Spell-Out domains. Remaining agnostic on whether these two operations need to be the same or not, prosodic constituency might serve as a means to potentially disambiguate between various approaches to morpho-syntactic domains.

have a model of Modular PIC as suggested above, where morphological domain effects are fundamentally different from syntactic domain effects. In general, though, I assume that syntactic and morphological domains (and their boundaries) co-exist: thus, phonology and prosody are informed by syntactic as phases well as morphological domains (see also below).

4.4.2   Cyclicity and phases

So far, I have discussed the SOD as a domain that is specific to the morphology; however, it is natural to question whether we can derive similar effects from mechanisms that we already have at our disposal. Most notably, two candidates would be phonological cycles, and phases.

Regarding cyclicity, we see that cyclic accent assignment in Chamorro occurs when every suffix is added; Topping & Dungca (1973) list both derivational and inflectional suffixes. Thus, if we would universally want to link phonological cyclicity to syntactic phases, then we would have to posit that, at least in Chamorro, all suffixes, irrespective of whether they are derivational or inflectional, would be phasal, which does not seem likely. Similarly, we saw that a cyclicity approach does not seem to be promising in the analysis of (dominant and non-dominant) prefixes in Kinande, KiBudu and Tunen, see note 37 in chapter 4. Thus, I assume that given that we need independent phonological cycles as seen in at least Chamorro that phonological cycles and the SOD are independent. Indeed, in the current approach all I am proposing is that at the left edge of the SOD a prosodic boundary is inserted, which demarcates a prosodic constituent, which in turn delimits processes. In contrast, morphemes that trigger phonological cycles do not trigger the demarcation

of a prosodic constituent but traditionally trigger a phonological process, such as accent assignment. Thus, to repeat, I assume that the two are independent mechanisms.

However, a possibility would be that when a SOD is created, a phonological cycle is automatically induced. This is reminiscent of Newell (2008), who proposes that main prominence (i.e. accent), but not prosodic structure, is assigned either at the first phase (in her terms, cyclically), or when the last word-phase has applied (in her terms, post-cyclically). She takes the position that morphological phases are purely syntactic, and thus the (morpho-)syntax determines phasehood, although, like D'Alessandro & Scheer (to appear, 2013), she assumes that phonological evidence is also indicative of morpho-syntactic phases. Nonetheless, on the assumption of universal phases, presumably every syntactic phase would have a phonological effect. This is the position criticised by Cheng & Downing (2012), who show that phasehood does not correspond to phonological do-mains. Thus, to me it seems too strong to posit a direct relationship.

Turning to the other candidate, phases, Newell (2008) proposes that in addition to the syntactic CP, DP, and *v*P phases, there are also phases at the word level. Specifically, she identifies category-defining nodes as well as PossP and NumP as phasal. Indeed, given that all the work in this dissertation is done by category-defining nodes, it seems reasonable to see whether the NDPH can stem from that. The parallels are natural: phases in syntax essentially capture where certain material is fixed, and cannot be altered. This is similar to what the SOD does: certain phonological properties cannot be altered, and they cannot be altered due to the category-defining node. It *could* then be the case that it is phases that cause a boundary to be inserted at the left edge.

However, whilst phases in syntax are, arguably, frozen as a whole, I have shown that

in the morphological SOD the contents are only unalterable to processes that are driven by elements from the left of the boundary. Processes that are driven by elements from the right of the SOD, i.e., suffixes, are still allowed to impact the root, so in this sense the similarity to phases is only part way. Thus, I note the similarity of the domain that is defined as the complement of the category-defining node to the notion of a Spell-Out Domain, but ultimately recognise that the two do not necessarily need to be same.

Indeed, another issue with equating the Spell-Out Domain assumed here with syntactic Spell-Out is that here I explicitly assume that cyclic nodes, in addition to a SOD, also create an Accessibility Domain. Though the AD need not line up with any phasal constituent (especially if phases already line up with the SOD) this has effects for what can and cannot count as a cyclic node. Thus, if we want to keep the source of SODs and ADs the same, we run into trouble with Newell's proposal of NumP being cyclic. In chapter two, I have extensively argued that number cannot be cyclic, since then it would extend the Accessibility Domain to include case as a potential context for root-suppletion, counter to what we observe.

It is, of course, possible to separate the SOD and AD, however; thus, we could say that only category-defining nodes induce an AD but every cyclic node induces a SOD.

Then, if we say that SODs are equated with phases, then we make specific predictions about structures like the following, where x is a category-defining node, and y a cyclic (non-category-defining) node:

(611)
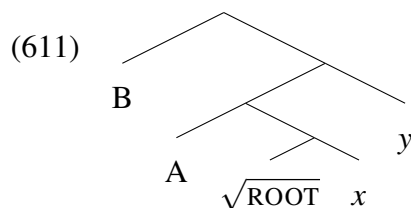
In a nominal structure, we could for instance see:

(612)
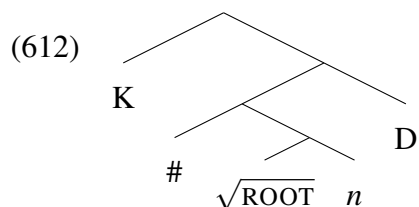
Under an approach where D induces a phase, and, as such, a SOD, we crucially predict that B (K) cannot alter material of A (#), in addition to A (#) not being able to alter material in the root, since there are two SODs and, as such, two prosodic boundaries:[73]

(613)   The left edge of prosodic words aligns with the left edge of the SOD:

   B   ($_\omega$ **A**   ($_\omega$ **root**

However, if we do *not* assume that SODs are phases, then we make different predictions for interactions in the structures in (611-612). Under an approach where only category-defining nodes induce SODs, we predict that B (K) and A (#) are free to interact (A (#) still is not able to alter material in the root), since there is only one SOD and, as such, one prosodic boundary:

(614)   The left edge of prosodic words aligns with the left edge of the SOD:

   B   **A**   ($_\omega$ **root**

Thus, we can empirically disambiguate whether every cyclic or only category-defining nodes induce a SOD, thus suggesting a view where SODs are syntactic phases or independent domains.

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[73]Note that on the assumption here D is free to influence the root, given that only material to the left of a prosodic boundary is restricted to alter material to the right of a boundary.

It seems to me that the deciding factor whether the morphological SOD can be equated with phases relies on whether categories such as number are (syntactic) phase inducing. If they are (as Newell suggests), then I believe they are better considered separate domains, since a particular strength of the current proposal is that both the SOD and the AD have a single source. However, if we do not consider number to be a phase, then I see no reason not to pursue the hypothesis that the two are the same.

4.4.3 The boundary

In the above, I have introduced the prosodic boundary as a delimiter on prefix-root interactions. It should be noted here that I assume that this restriction does not hold on 'low-level' phonological requirements. For instance, the prefix can sometimes influence the root when, for instance, prefixes 'integrate' into the root for purposes of phonotactics (see e.g. van Oostendorp 1999 and also Kim 2014), or they can be involved in local assimilation effects.

To recap, we saw in section 4.2 that regarding vowel harmony there are no dominant prefixes in lexical material, but they are allowed in functional material. In section 4.3 we saw that dominant prefixes in accent systems are slightly different: given that accent can be additive this means that the root remains as it is and dominant prefixes are allowed.[74] However, in deletive systems we saw that dominant prefixes are again unattested in lexical material (except for the dominant lexical prefixes in Russian, see section 4.3.1.1), and we

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[74]Though we can conceive of vowel harmony as additive, especially in approaches that assume privative elements, this does not necessarily need to be the case; under an approach where we assume that vowels involved in harmony contain an element variable, and the operation of harmony is governed by licensing such a variable element (Van der Hulst 2005, 2012), then, as long as licensing does not count as a structure additive operation, then it is not absolutely necessary to regard such a system as additive.

have one instance of a dominant prefix in functional material (see section 4.3.1.3).

A particular characteristic of the boundary is that it seems to be associated with the complement of category-defining nodes, which most often comprises the root; indeed, in various previous approaches the root has been singled out as a special category. Alderete (1999) argues that root accentuation always wins over affix accentuation. Working in Optimality Theory, he assumes a universal ranking of faithfulness constraints of the roots outranking faithfulness constraints of affixes. Any cases where the accentual specifications of an affix seem to win over an accented root necessarily involves a change in the accentual pattern on the root. Drawing on Anti-Faithfulness of the root, which in essence entails a root-driven obligatory change in the accentual specification of the root, he then derives that the cases in which root accentuation does not win (due to Anti-Faithfulness of the root) have a default accentual pattern, given that in OT the general accent constraints will then take over. A crucial aspect of his theory is, since OT evaluates surface forms, that there can be no pre- or post-accentuating roots, since in those cases it is not the accentual landscape of the root that is changing.

However, Alderete's claim that there should be no pre- or post-accentuating roots is incorrect; Revithiadou (1999) shows that at least post-accenting roots do exist. For instance, consider the following data from Greek. In (615), we see a post-accentuating root *aɣor'* 'market', where ' means post-accentuating; compare this to (616), where we see the same suffix but this time the accent falls on the root (Revithiadou 1999, 18):

(615) aɣor'-a   →   aɣorá

       market-NOM.SG

(616)   ɣónðol-a   →   ɣónðola

        gondola-NOM.SG

Furthermore, Alderete's claim here is the relation between roots and affixes; thus, he predicts that in case of a reversal (due to Anti-Faithfulness) suffixes as well as prefixes can carry main accent (cf. Baković 2000). However, this is not observed in this study; rather, we see that when the root does not win, it is only suffixes that can carry main accent.

In contrast to Alderete, Revithiadou (1999) does not assume faithfulness of the root to always outrank faithfulness of affixes. Rather, she appeals to the notion of the head of a structure that determines the accentual landscape. Though the languages she discusses in her dissertation do not show any dominant prefixes, she notes that they are not particularly revealing "because most prefixes fall outside the prosodic domain of the word" (Revithiadou 1999, 44-45); this is exactly what we expect given the assumptions made here.

The current proposal may not seem at odds with approaches that specifically favour the root to the extent that one can simply immediately relate the prosodic boundary to a root. However, under the approach here, it is not actually the root that is associated with the prosodic boundary directly; rather, it happens to be realised at the left edge of the root since that is the left edge of the SOD induced by a category-defining node. The crucial piece of evidence comes form the lexical prefixes in Russian (section 4.3.1.1) where we saw that we observe dominant prefixes in lexical material when they are crucially located below a category-defining node.

In addition, from a conceptual perspective, in the current approach I assume that both domains (AD and SOD) are created by a single entity: category-defining nodes. The

question remains what makes category-defining nodes so special, but on the assumption that they are, then nothing more needs to be said about the root. Although most cases discussed in this dissertation involve a single category-defining node, there are clear predictions concerning structures with multiple category-defining nodes. Given the dynamic approach, we predict the following. Consider the structure below:

(617)

y
  x $\sqrt{\text{ROOT}}$
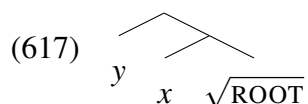
If both y and x are part of the extended projection of the root, or if domain extension is insensitive to the type of category-defining node, then we predict that it is y that constitutes the definitive cyclic node and domain delimiter, thus resulting in extended Spell-Out Domains (as well as Accessibility Domains). As such, we predict that the prosodic boundary is placed at the left edge of the SOD, which is comprised of the root and the first category-defining node x:

(618) y $(_{\omega}$ x **root**

Then, we predict that in case the first category-defining node x is a prefix, it can interact with the root. A prefixal second category-defining node y however cannot. I have not seen cases like these, but this remains an open prediction.

In contrast, if domain extension is sensitive to the type of category-defining node, when x and y in the structure in (617) belong to separate projections, as in for instance a gerund construction where x would be v and y would be n, then we predict that both x and y are domain delimiters, with each their own Spell-Out Domain and concurrent prosodic boundary:

(619) y $(_{\omega}$ x $(_{\omega}$ **root**

In contrast to (618), now we see that neither prefix can interact with the root, since there is a prosodic boundary between *y* and *x*, as above, but crucially between *x* and the root as well.

As a final point, so far, I have presented the absence of dominant prefixes as stemming from a single source, which I have formalised as the prosodic boundary being inserted specifically at the left edge of a Spell-Out Domain. However, as we have seen before, the root has been pointed out as a privileged position (e.g. Alderete 1999, among others). Alternatively, one may want to connect the boundary to a parsing strategy, in which case we see that both prefixes, roots and bases are all potential beginnings of a word, which is known to be a salient position.[75] Thus, taking for granted that it is placed at a left edge of a domain, we see that there seem multiple views as to where to place a boundary:

(620) a. Place the boundary at the left edge of roots:

pfx $(_{\omega}$ root

b. Place the boundary at the left edge of roots, bases and prefixes:

$(_{\omega}$ pfx $(_{\omega}$ root

c. Place the boundary at the left edge of the Spell-Out Domain:

$(_{\omega}$ SOD

Indeed, both (620a) and (620b) seem to be more motivated than the view adopted here (620c), given the independently observed privileged status of roots (620a) and relating the boundary to parsing strategy (620b). However, the view of identifying the root as the relevant constituent runs into problems with the lexical prefixes in Russian (section

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[75]Thanks to Harry van der Hulst for bringing this to my attention.

4.3.1.1) where we saw that these were dominant and interacted with the root, counter to the prediction of the approach in (620a).

The problem with the view in (620b) is that in order to capture the facts here we would have to stipulate that functional material somehow cannot be a potential beginning of a word, since no boundary effects are observed there. That is, placing a boundary at the left edge of all types of words that can be at the beginning leads to a boundary between a prefix and base in functional material, all else being equal. However, we have observed dominant prefixes in functional material in vowel harmony (section 4.2.1) and lexical accent (section 4.3.1.3).

In contrast, placing the boundary at the left edge of the Spell-Out Domain (620c) makes the right cut, allowing for prefixes that are crucially located below a category-defining node to interact, as well as maintaining the contrast between dominant prefixes in lexical material and in functional material.

Crucially, as we have seen throughout the dissertation, the approach advocated here is supported empirically by the contrast between lexical and functional material, with the former being more restrictive in prefix-root interactions than the latter. Now, even if we have established that a boundary is placed at the left edge of a Spell-Out Domain, the question remains how to formulate the delimiting effect of this boundary.

The restrictions could be phrased in terms of a freezing effect on the Spell-Out Domain (or even the root), but this runs into the problem that this constituent is not truly closed off for further interaction, but only interaction at the left edge is limited. Similarly, we do not want to impose a restriction on (dominant) prefixes, given that we then lose the contrast between functional and lexical material identified here. Rather, the final option

is to assign the delimiting power to the configuration of prefix-(lexical) root as a whole, as I have done here, by virtue of (i) inserting a prosodic boundary, and (ii) stipulating the hypothesis below (repeated from above):

(621)   In a configuration x ($_\omega$ y

          x cannot alter (properties of) y,

          y can alter (properties of) x.

However, when we try to find a motivation for the existence of in particular the hypothesis in (621) is difficult. Indeed, it is already difficult to give content to what constitutes properties of x/y, since it is hard to unify the processes dominant-recessive vowel harmony and (deletive) lexical accent under a single umbrella. The formalisation is particularly difficult given that dominant prefixes do seem to exist in tonal processes; thus, a study into the interaction of dominant tonal prefixes might be revealing. However, a potential difference between tone on the one hand and vowel harmony and accent on the other hand is that the former is a phrasal process whereas the latter two are not.

A potential way of looking at the restricting effect of the boundary would be that the prosodic domain is fixed with regard to material to its left boundary since everything within a prosodic domain must meet the phonetics/phonology interface requirements. This can be seen by looking at vowel harmony: the value of an alternating vowel within the domain must be resolved one way or another before a dominant prefix can affect it, and then can no longer be altered. Similarly, given that the boundary is prosodic in nature, we could say that lexical prosodic markings are fixed as well and can no longer be altered. However, for this approach it is problematic that material is not actually frozen as a whole and material

at the right of the boundary is still free to interact with material in the prosodic domain. In other words, it seems that interface conditions should operate cyclically rather than only at a left edge of a constituent.

As was discussed above (section 4.3.3), we cannot phrase the boundary as only operating on morphological material, since at least the vowel harmony processes do not seem to involve dominancy encoded as a morphemic property. Similarly, since dominancy in lexical accent is clearly marked on morphemes we cannot phrase the restrictions of the boundary along the lines of limits on featural and segmental material only.

A slightly different way at looking at the restrictions identified here is to turn it around: maybe rather than trying to find a unified way of stating the limits on prefix-root interactions in lexical material we may want to try to find a common pattern as to what processes *are* allowed to cross the boundary. Though we would then still need to find a motivation for the prosodic boundary as a general delimiter, the second task would not be to find a unified formulation of processes that do not cross the boundary, but rather those that do cross the boundary. Clearly, more, both empirical and theoretical, research on the interaction in prefix-root (and prefix-base) configurations needs to be done in order to investigate whether this is a promising direction to explore.

Indeed, it might turn out that the prosodic boundaries observed in vowel harmony and lexical accent ultimately have different sources altogether and it just seems like the two restrictions can be reduced to a single delimiting factor.

Finally, on a more optimistic note, though the boundary seems controversial, additional support for the existence of a prosodic boundary of the sort discussed here comes from Kim (2014). She argues on the basis of data from Huave that prefixes are invisible to a

vowel copy process determining epenthetic vowel quality. Crucially, she shows that it is not the property of a certain morpheme but rather its linear position; that is, the restriction only holds when the morpheme is realised as a prefix, but not as a suffix. This is exactly what we predict given the assumptions here where a left-edge boundary is inserted, but the right edge is left open.

4.5 Summary of this chapter

In this chapter, I first showed that we see the empirical pattern in languages that display vowel harmony that dominant prefixes are observed in functional material but not in lexical material. Next, I proposed that we can potentially tie this to a second domain that is created by category-defining nodes, which is defined as their complement. This constituent corresponds to the Spell-Out Domain, and as such, I have adopted that terminology. Furthermore, I proposed that prosodic words are built concurrently with VI, and that the left edge of a prosodic word aligns with the left edge of the Spell-Out Domain. Then, I stipulated the hypothesis that this left edge prosodic boundary inhibits interactions between prefix and root, and thus is responsible for the claim that dominant prefixes are not found in vowel harmony (the NDPH). However, counter to claims in the literature, I show that we do find dominant prefixes in vowel harmony. Rather, the true generalisation regarding dominant prefixes in vowel harmony is that they are not seen in lexical material, but are only found in functional material. Tunen, KiBudu and Kinande all show dominant prefixes, but in each case they are restricted to functional items (specifically, demonstratives and numerals). Crucially, none of these languages allow the relevant prefixes to be domi-

nant when they combine with lexical material, even when the lexical material is generally recessive to dominant suffixes. This is explained by the prosodic boundary which is inserted at the left edge of the SOD, which in turn is induced by the category-defining node, coupled with the assumption that certain properties of material within a prosodic domain cannot be altered across the boundary. However, in functional material, the base is spelled out in the same SOD as the prefix, and so the prosodic boundary is crucially placed to the left of the suffix, thus allowing for the possibility of dominant prefixes in functional items.

Next, I tested the No Dominant Prefix Hypothesis by looking at accent, and we saw that languages that make use of additive accent resolution show that there is nothing in the general architecture of the grammar that prevents dominant prefixes. Furthermore, in deletive accent resolution systems the NDPH is active and dominant prefixes are ruled out, since they do not conform to the requirement that certain properties of material within a prosodic domain cannot be altered across a prosodic boundary. Furthermore, we saw that in functional material dominant prefixes are attested, even in a clearly deletive accent resolution language.

Finally, I looked at the predictions of the NDPH for compounding, distinguishing between root-level and stem-level compounding, and showed on the basis of Japanese and Icelandic that the hypothesis are tentatively supported.

At the end of this chapter, I discussed the place of the boundary in the grammar and discussed some of the problems that are involved in deriving rather than stipulating its properties.

Chapter 5

Conclusion

In the following, I first summarise the main points of the dissertation; then, I turn to the implications for linguistics; and finally I discuss some future directions for research.

5.1   Summary

In this dissertation, I have shown that there is a significant difference in the behaviour of lexical and functional material: whilst lexical material is subject to more restrictions, functional items show more permissive behaviour. I argue that this difference stems from grammatical rather than functional considerations.

Specifically, in chapter two I demonstrated on the basis of suppletion patterns in lexical nouns and pronouns that the relevant accessibility domain is to be defined as the category-defining node and one node above it. This correctly derives a ban on case-driven root-suppletion, whilst allowing for case-driven suppletion in pronouns. In addition, I argued on the basis of conceptual as well as empirical grounds that adjacency is *not* an additional

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restrictor on allomorphy. Rather, in order to account for apparent adjacency blocking effects, I propose hyper-contextual VI-rules which make reference to not a single node but a combination of nodes; as follows directly from the approach to locality here, these are restricted by the Accessibility Domain.

In chapter three, I demonstrated on the basis of suppletion patterns in verbs that the dichotomy between lexical and functional material by and large seems to be parallel to that of nominals. Again, on a definition of the AD as comprising the category-defining node and one node above it, we correctly derive a ban on tense-driven root-suppletion, whilst allowing for tense-driven suppletion in auxiliaries. In addition, I discuss the effect of portmanteauhood on accessibility relations in the nominal and verbal domain, arguing that the AD is determined prior to the formation of VI-driven portmanteaux, thus arguing against views in which portmanteaux regularly extend locality relations. Rather, based on the ABC patterns in adjectival and pronominal patterns it seems that portmanteaux only extend locality when there is an obligatory containment relation.

In chapter four, I discussed morpho-phonological asymmetries in lexical and functional material. Specifically, first focusing on vowel harmony, I showed that though it has been claimed in the literature that dominant prefixes are unattested, they are only unattested in lexical material but are observed in functional constructions. I argued that the lack of dominant prefixes in lexical material derives from the complement of the category-defining node forming a category-defining node induced Spell-Out Domain, and I proposed that a prosodic boundary is inserted at the left edge of a SOD, which restricts the interaction between prefixes and their roots. In effect, this results in dominant prefixes not being able to alter the properties of material to the right of the boundary, thus leading to a

ban on dominant prefixes in lexical items.

Finally, I turned to lexical accent assignment, where I showed that in deletive accent resolution systems we again do not observe dominant prefixes in lexical material, which I assume derives from the same restrictions as we saw operative in vowel harmony. Indeed, I showed on the basis of the Russian dominant negative prefix *njé-*, which only combines with functional items, that we do observe an instance of a dominant prefix in functional material. In further support for dominant prefixes being ruled out by virtue of the prosodic boundary rather than never being generated by the grammar, I showed that in additive accent resolution systems we do observe dominant prefixes in lexical material. Importantly, this is not in contradiction with the above, since in additive accent resolution systems dominant prefixes crucially are allowed because they do not alter - but rather add to - properties of material located to the right of the boundary.

5.2 Implications for linguistics

The main topic of this dissertation is an investigation into the reach of universal limitations in morpho-phonology. Such universals are closely connected to the question at the heart of generative linguistics: whether the diversity of languages is constrained by a Universal Grammar, defined as an innate set of principles that restricts the ways in which languages may vary. However, discussion of universals comes with clear controversy; for instance, Evans & Levinson (2009) unleash a harsh critique on the notion that universals exist in language, claiming that languages are too diverse to possibly stem from some innate system of universal grammar. Advocates of this stance, Dan Everett, Michael Tomasello, among

others, suggest that language is a cultural product, and that there are not cognitive constraints specialised towards language itself. Rather, they argue that commonalities across languages are to be explained primarily by appeal to shared aspects of general cognitive processes. This view struggles to explain purely structural universals, which suggest a role for deeper constraints.

However, I have shown here that there are clear restrictions on lexical material, and that these restrictions are specific to language. Thus, I contend that they offer additional, and to some degree, novel arguments in support of the nativist position, countering the viewpoint that we learn language armed with nothing more than a general capacity to learn. Specifically, the universals reveal that both morphological processes, such as suppletion, as well as morpho-phonological processes, such as dominant prefixes in vowel harmony and lexical accent systems, are subject to restrictions that have no obvious basis in (known) language-independent aspects of cognition. Rather, they show that we are endowed with some innate linguistic knowledge: a universal grammar.

Furthermore, the breadth and nature of universal restrictions in morphology and morpho-phonology allows us to decide among competing theories within theoretical linguistics. The hypotheses advocated here crucially rely on (morpho-)syntactic structure playing a fundamental role, which raises the question whether these observations can be captured in frameworks that give no role to hierarchical structure in morphology, such as Word and Paradigm approaches (e.g. Anderson 1992, Stump 2001). Specifically, the Accessibility Domain crucially relies on category-defining nodes and the domain identified here as relevant to the insertion of a left edge boundary is the complement of category-defining nodes.

5.3 Future directions

Whilst this dissertation is concerned with locality relations that can trigger allomorphy, a natural extension would be to consider the role of markedness on allomorphy. Preliminary research on inclusive/exclusive patterns in pronouns has shown that suppletion in the context of solely the exclusive seems unattested (Moskal 2014). There, I argue that in this case suppletion is constrained by markedness, in addition to locality. The features are all located on a single node (cf. section 2.2.1 on the internal structure of case), thus being equally local to the element displaying allomorphy, but (i) either marked features or (ii) both unmarked and marked features can govern suppletion, but unmarked features exclusively cannot govern suppletion (cf. Calabrese 2005, 2008, Nevins 2010). We also saw markedness effects in the discussion of Smith et al. (2015), where evidence from case suppletion suggests case is best represented as increasingly complex features, reflecting markedness relations: more marked cases contain less marked cases, e.g. accusative case contains nominative case.

Regarding nominal suppletion patterns, research in this area could be extended by a more in-depth study on inclusive/exclusive patterns to cover a larger number of languages, as well as including more nuanced number distinctions, such as dual, etc. Another avenue would be to research suppletion in lexical nouns and verbs in the context of number from the perspective of the markedness relations identified in the pronominal domain. In addition, with regard to the verbal domain, it has been argued that the imperfective is less marked than the perfective (Croft 1990, 3), and that the present is an unmarked tense. Thus, it would be worthwhile to investigate the markedness relations within aspect and tense and how they relate to suppletion patterns. The predictions would then be

as follows. In aspect-driven suppletion patterns we predict that we should not observe imperfective-driven suppletion without also observing perfective-driven suppletion. In tense-driven suppletion, on the assumption that present is unmarked, we predict that we should not observe present-driven suppletion in the absence of non-present-driven suppletion. Note that though the accessibility to features on a node is restricted by locality (the Accessibility Domain), the markedness of features does not distinguish between functional and lexical material here, so we can take both auxiliaries and lexical verbs into account.

Indeed, in the languages investigated here that display verbal suppletion, it seems that in terms of suppletion in the context of aspect, all languages in this study allow naturally for an analysis in which suppletion occurs in the context of the perfective, which is exactly in line with the predictions here. However, it should be noted here that this is not particularly revealing, since we see a straightforward divide along perfectivity in Lezgian, Greek, Wichita, Modern Eastern Armenian and Mayali, thus allowing for an analysis of suppletion in the context of either perfective or imperfective. Thus, we need to look at languages that display more fine-grained aspectual distinctions to truly see the role of markedness on aspectual suppletion patterns.

With regard to tense-driven suppletion, we see that by and large languages show suppletion in the context of the past: Lezgian, Hunzib, Khoekhoe, English and Pipil all show (at least) suppletion in the context of the past. Khoekhoe, in addition to past-driven suppletion, also shows suppletion in the future (and indefinite) tense. Turkana shows future-driven suppletion, and Kanuri seems to show suppletion for tense altogether, the latter of which constituting a pattern where both marked and unmarked features can govern sup-

pletion.[1]

Three languages in this study seem to potentially display suppletion in the context of the present. In Suena (section 3.2.1), we saw one form, *susaw*, for 'to go' in the present and a second form, *bam(u)*, in all other tenses: the future and various past tenses. One way to look at the Suena data would be to say that this is another instance of Kanuri: suppletion in the context of all marked tenses and then only in the present we see the default form.

Another language where the present seemed to be referenced was suppletion in the Hunzib verb 'to be' (section 3.2.1). Ignoring the aorist, conditional and infinitive forms, in Hunzib, we saw that suppletion was governed by the past tense, which is in line with the markedness hypothesis put forward here. Specifically, the form in the present was *li, lo* and in the context of the past it was *zuq'(u)* However, when we took into account the negative forms, we saw that we saw yet another form in the negative present, *ga(y)*, even though in the negative past we see the 'regular' past form *zuq'(u)*. Thus, it seems that in order to get the form *ga(y)* we need to reference both the negative and the present. However, we could also say that in Hunzib 'to be' always suppletes in the context of the negative to *ga(y)* but then in the past it suppletes again to *zuq'(u)*. In that way, there is never any reference to the present needed.

Brahui (section 3.4.1.2) showed the most problematic data, though; recall that for the verb 'to go' we have the form *kā* in the present/future and the form *ʔin* in the context of all other (past) tenses. Crucially, we cannot draw on a potential analysis as mentioned above for Suena for two reasons. Firstly, in the presence of the negative the form is re-

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[1]Note that in Kanuri we only show suppletion for past and future, but not present. This follows from the discussion there that in the present there is also an intervening aspectual projection which delimits the AD and as such (present) tense cannot govern suppletion; alternatively, we could argue that present tense is not present in the language. See section 3.2.6 for more details on Kanuri.

alised with ʔ*in*, also in the present. Secondly, the imperative form takes the form ʔ*in* as well; that is, I assume that imperatives lack aspect and tense and thus we cannot say that ʔ*in* is conditioned by temporal information. These two facts lead to ʔ*in* being the non-suppletive variant, and, as such, we are forced to say that *kā* is the suppletive variant in the present/future. Above, I offered the alternative that *kā* can be analysed as the realisation of a portmanteau of the root and present tense, which then would not refer to the present as a context for suppletion; though this then crucially relies on markedness relations not playing a role in portmanteau formation. However, relegating the problem to portmanteau formation seems to be a last resort, and it is clear that we should only assume such an analysis if we find ample support for the role of markedness in verbal suppletion patterns otherwise.

Indeed, as in the case of aspect-driven suppletion we need to look at tense-driven suppletion in more detail. As opposed to the study on clusivity where the singular pronoun was taken to be the non-suppletive base form against which to compare the inclusive and exclusive forms, it is more difficult to establish the basic non-suppletive base variant in verbs. Specifically, we need to take into account a larger verbal paradigm, including variants observed in the context of aspectual, temporal and mood features as well as deverbal constructions.

Another avenue to investigate would be to supplement the current study with an experimental approach in order to investigate the cognitive underpinnings of the generalisations identified in this dissertation. Specifically, it would be beneficial to supplement the research on dominant prefixes with phonetic analyses to verify that their dominancy is of the same nature as that of other types of dominant morphemes. This is particularly relevant

given the claim in some parts of the literature that dominant prefixes do not exist in vowel harmony systems.

In addition, it should be clear that the nature of this boundary prohibiting dominant prefixes in lexical material requires further investigation. An explicit connection to the prefix-suffix asymmetry (Nespor & Vogel 1986) may reveal more. Determining the distribution of the effect of the boundary in phonological processes will answer part of the puzzle, and future research into processing effects might reveal a potential cognitive basis (e.g., Cutler et al. 1985, Hawkins & Cutler 1988).

There remain many questions left to be answered and topics to be explored. However, what will hopefully be clear to the reader at this point is that there is a very real structural difference between lexical and functional material - a difference that is revealed when we look at the potential for items to undergo suppletion, as well as the behaviour of dominant prefixes.

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