Limits on Allomorphy: A Case Study in Nominal Suppletion

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Abstract

Reporting on a study of 79 languages (see appendix B), I argue that (morpho-)syntactic structure plays a crucial role in two observed asymmetries: (i) in nouns number-driven root suppletion is common while case-driven root suppletion is virtually unattested, and (ii) in contrast to lexical nouns, pronouns commonly supplete for both number and case. I propose that the structural difference between lexical nouns and pronouns, combined with locality effects as proposed in Distributed Morphology (DM; Halle and Marantz 1993), account for the two asymmetries, which raises the question whether these can be captured in frameworks that deny that hierarchical syntactic structure plays a role in the morphology, such as Word and Paradigm approaches (e.g. Anderson 1992, Stump 2001).

1 Introduction

Suppletion refers to the situation where a single lexical item is associated with two phonologically unrelated forms, and the choice of form depends on the morphosyntactic context (see Corbett 2007 on specific criteria for canonical suppletion). Although rare in absolute terms, it is regularly observed across languages (Hillisley et al. 2004). For illustration, compare the (non-suppletive) adjective-comparative-superlative paradigm smart-smarter-smartest in which the root remains the same throughout with the familiar example of good-better-best. In the latter case, we see that the root in the adjective surfaces as good, but in the context of the comparative (and superlative) we see be(tt). When we look at nouns, we observe that cross-linguistically languages can display suppletion for number (#). In Ket (Werner 1997), canonical nouns display a nasal suffix in the plural (1), but those in (2) display root suppletion in the context of plural #.

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1 The important question of the exact formulation as to what counts as a suppletive root cannot be resolved here; rather, the criterion for noun suppletion here is 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.

2 See Appendix A for a (non-exhaustive) list of languages with #-driven noun suppletion.
Curiously, though, as remarked briefly by Bybee (1985:93), and confirmed in the study of 79 languages described here, root suppletion of nouns in the context of case (K) seems to be largely unattested (apparent counterexamples are discussed in section 4.1).

In stark contrast, pronouns regularly display suppletion for # (see also Corbett 2005), as well as K. Consider, for instance, # driven suppletion in second person pronouns (3) and K driven suppletion in first person pronouns (4) in Latvian (Mathaissen 1997):

(3)  SINGULAR  PLURAL  (4)  SINGULAR  PLURAL  
NOM  tu  jūs  NOM  es  mēs  
DAT/ACC  tev/tevi  jums/jūs  DAT/ACC  man/mani  mums/mūs

Indeed, it is widely assumed that pronouns have less structure than lexical nouns (Postal 1969, Longobardi 1994, Déchaine and Wiltschko 2002). Crucially, I assume that lexical nouns (5) contain, at a minimum, a root and a category defining node \( n \). In essence, the \( n \) node will have the effect that the root and K are not sufficiently local.\(^3\) In contrast, pronouns (6) are, at their core, functional (D) (‘D’ is merely used as a label), and thus lack the category defining node that intervenes between the root and K in (5).\(^4,5\)

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\(^3\) As pointed out by two anonymous reviewers, nouns and pronouns also differ in terms of frequency as well as their diachronic history. However, whilst diachrony and frequency effects relate to typological generalizations, locality effects as proposed here are assumed to be universal (see Corbett 2007); and, as such, allow no exceptions; see Kiparsky (2008) for discussion. Also recall that the second asymmetry involves nouns alone: whilst noun suppletion is well attested, it is only in the context of number but not of case.

\(^4\) In (5)-(6), I use standard adjunction structures, with \( X^0 [ X^0 Y^0 ] \). All tree diagrams here and below will represent internally complex \( X^0 \)s, however those are derived (see Bobaljik 2012). The labeling of the non terminal (branching) nodes of the structures will not play a role in the analysis.

\(^5\) De Belder & Van Craenenbroeck (2011) suggest that pronominal exponents can also be inserted in root position, rather than always occurring as true pronouns, in order to account for forms such as \( ge-ik \) ‘egocentricity’ (Dutch) and \( duzen \) ‘to address with the familiar 2nd person singular form’ (German). Indeed, following this line of thought, then these particular forms should fail to supplet for K, which is correct (\*ge-mij, \*dirzen).
In the following, I first introduce the relevant background in which the analysis is couched, and briefly discuss the relevant notion of structural locality in morphology. In section 3, I discuss the structure of nominals in more detail and how they interact with locality restrictions to prohibit case-driven root-suppletion in lexical nouns. Section 4 discusses some particular predictions that follow from recognizing this condition, showing further support for its role in suppletion; and in section 5 I offer final remarks.

2 Locality

DM 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.

Suppletion is modelled as contextual allomorphy; 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 again the good-better-best paradigm; its regular (context-free) exponent is good but in the context of the comparative (and superlative) it corresponds to be(tt):

\[
\sqrt{\text{GOOD}} \simeq \text{be(tt) / _ comparative} \\
\sqrt{\text{GOOD}} \simeq \text{good}
\]

Now, consider the representation of lexical nouns (see (5) above). A key assumption here, standard in DM (Marantz 1997), is that they contain, at a minimum, a root which is unspecified for features traditionally associated with nouns (person, number, case, etc.), and a category-defining node \(n\): [ root \(n\)]. In addition, I use K as an umbrella for what is realized as case (see Caha 2009, Radkevich 2010, Pesetsky 2013, i.a. for more articulated representations). Similarly, I collapse the \(\varphi\)-features, and for expository reasons I equate \(\varphi\) with its internal constituents, in particular with number (#). Furthermore, in accordance with Greenberg’s (1963) universal, K is assumed to be located higher than #.
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 number always comes between the noun base and the expression of case.

This gives the abstract representation for a canonical lexical noun in (5). As alluded to above, the crucial characteristic that distinguishes lexical nouns from pronouns is that the former contain a root and category-defining n. Specifically, the presence of n results in K being insufficiently local to the root to govern its suppletion (see in particular Embick 2010 and Bobaljik 2012 for locality restrictions in DM).

Minimally, the cyclicity hypothesis is assumed, which entails that accessibility to structure is domain-dependent. That is, certain nodes in the structure function as domain delimiters and morphological processes are confined to operate within domains. In syntax, cyclic domains are implemented as phases (Chomsky 2000, 2001), where the head of a phase triggers spellout of its sister, rendering elements in the sister opaque to interactions with elements in higher domains. The analogous notion within morphology is that there are locality domains within a complex X*. Domain-delimiting heads induce the morphological analogue of spellout, vocabulary insertion, of their sister. In a complex X*[ [ A α ] B ], if α is a cyclic head, it spells out its sister: A. Assuming that spellout freezes a string, B and A cannot interact across α (Embick 2010, Bobaljik 2012; see Scheer 2010 for an overview). In morphology, domain delimiters are category heads (Embick 2010).

On the assumption that category heads are cyclic heads that spell out their sister, n causes spellout of the root, which here amounts to VI of the root. Now, if spellout and accessibility to govern suppletion lined up perfectly, no allomorphy would ever cross a category-defining node, since the root would always be closed off. However, this theory would be too restrictive, incorrectly limiting suppletion to be exclusively sensitive to category-defining nodes, where there is plenty of evidence that the root must have access to at least a small amount of structure above the domain-defining head (Embick 2010).

Following Embick (2010), I assume that a morphological dependency may span no more than one cyclic node. In effect, this amounts to the following: in a structure [ [ A α ] B ] where α is cyclic, although only A is subject to spellout, both (cyclic) α as well as B are accessible to condition contextual allomorphy at A (provided that α is phonologically null since Embick adds linear adjacency as a requirement on contextual allomorphy). There are at least two ways this condition might be derived. On the one hand, it may simply be stipulated, a kind of morphological subjacency (see Moskal to appear), along the lines of Embick’s (2010) C1LIN (see also section 5). On the other hand, it may be derived from a dynamic approach to domains. Specifically, Bobaljik & 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 2014). That is, not until the next node is accessed is it known whether the potential phase initiator is the top

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6 I assume both roots and functional vocabulary are inserted late (see Corbett 2007, Bonet & Harbour 2010 and Harley to appear for discussion).
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 VI-node and one node above.

3 Nominals

Returning to the structure of lexical nouns (5), recall that VI proceeds cyclically from the root outwards (Bobaljik 2000, Embick 2010). Cyclic n triggers spellout (here, VI) of its complement, the root. For practical application, consider the VI rules for the suppletive forms for child in Ket (2), illustrative of the general schema for number suppletion:

\[
\begin{align*}
\forall \text{CHILD} & \Rightarrow kA^2t / \_ \text{PL} \\
\forall \text{CHILD} & \Rightarrow di \cdot 1'
\end{align*}
\]

The more specific VI rule is selected, \(\forall \text{CHILD} \Rightarrow kA^2t / \_ \text{PL}\), and the # value is available to condition root suppletion since at the point that the root undergoes VI, # is sufficiently local to govern root-suppletion. That is, when the plural is merged, n (a potential domain) is confirmed as a domain, and VI applies at the root, with n and # being accessible.

\[
\begin{array}{c}
\text{K} \\
\text{#} \quad \text{K} \\
n \quad \text{PL} \\
\forall \text{CHILD} \quad n
\end{array}
\]

Crucially, the root cannot access information about case, however, since at the point that the root is subject to VI, K is located too far away to govern root-suppletion. It is important to note that it is cyclic locality that prevents the root from accessing case information. That is, nothing prevents the formulation of a hypothetical VI entry making reference to K, as in (11); rather, a VI rule as in (11) is an illegitimate item, since K is inaccessible due to locality.

\[
\forall \text{CHILD} \leftrightarrow \text{gu:} / \_ \text{K}
\]

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7 Here I put aside the question of when the plural morpheme is the regular plural exponent or a zero, an issue that arises in English past tense (run - ran vs. tell - tol-d) and comparatives (bett-er, vs. worse) as well.
At this point, a note on portmanteaux is in order (Halle and Marantz 1993, Radkevich 2010, i.a.). In languages in which # and K are fused into a single morpheme (a ‘portmanteau’), we might predict that K should be able to influence root-suppletion since the node hosting the complex of #+K seems sufficiently local:

(12)  
   K  
   /\  
   n  #+K  
   /\ 
   Root n

However, this is not attested; suppletion in the context of a portmanteau # and K morpheme is governed by (plural) # and not by K, as exemplified in (13).\(^8\)

(13)       SINGULAR  PLURAL
NOM čovek   ljud-i  ‘man’ (Serbo-Croatian)
ACC čovek-a ljud-e

Crucially, though, I assume that (12) is not the underlying structure, rather, it is derived from (5). As such, although portmanteaux look like they have the structure in (12), at the relevant point of the derivation, they still have the structure in (5). Specifically, if their portmanteau structure is only relevant when (at least one of) their constituents undergo VI, the portmanteau nature of [#-K] would only be relevant when (at least) # undergoes VI. In this way, portmanteau creation counter-feeds K-driven root-suppletion since the former applies too late. Crucially, at the point that the root is subject to VI, it is irrelevant whether the node which is structurally adjacent, #, will later become part of a portmanteau or not; either way, the locality restrictions hold and K-driven suppletion is banned.\(^9\)

In sum, whilst #-driven root-suppletion is possible, K-driven suppletion is excluded by cyclic locality. Thus, we derive the lack of K-driven root-suppletion in lexical nouns.

With regard to pronouns (6), recall that I assume they lack n. Importantly, the absence of n has the result that in pronouns both # and K are potential contexts for suppletion. Concretely, the VI entries for Latvian (singular) 1st person (4) correspond to:

(14)  
[2] ↔ man / _ K
[2] ↔ es

---

\(^8\) _Prima facie_, Slovenian offers a counterexample: in the dual, člóvek ‘person’ suppletes for GEN and LOC; however, GEN.DU and LOC.DU are syncretic with GEN.PL and LOC.PL, respectively (Corbett 2009). Thus, we observe PL-driven rather than K-driven suppletion.

\(^9\) 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 2011, Merchant to appear).
 Crucially, VI entries for pronouns that make reference to K are legitimate items since K is accessible. That is, given the lack of a category-defining node, no domain is created low in the structure: in pronouns, suppletion in the context of # as well as K is possible.

4 More or less structure

4.1 Numberless nouns

An interesting prediction from the proposal here is that in nouns which lack a # node we predict K-driven root-suppletion to become possible.10 In Archi (Nakh-Daghestanian), the form for ‘father’ displays suppletion for ergative case (Archi Dictionary):

\[
(15) \begin{array}{ll}
\text{SINGULAR} & \text{PLURAL} \\
\text{ABS} & ábt:u \quad \text{---} \\
\text{ERG} & úmmu \quad \text{---} \\
\end{array}
\]

Intriguingly, though, this form is a singulare tantum and as such does not have a corresponding plural. I propose that Archi’s ‘father’ is defective in that it lacks a number projection and its inherent singular value is located on n (see Kramer 2012 and Smith 2014 for proposals that inherent number may be on n). Given that # is missing in Archi’s ‘father’, the (ergative) K node is accessible as a context for root-suppletion since K becomes the node above category-defining n. The VI rules for (15) are given in (17).

\[
(16)\quad \begin{array}{c}
K \\
\downarrow \\
\text{[ERG]} \\
\downarrow \\
\text{\_FATHER} \\
\overline{n} \\
\end{array}
\quad (17)\quad \sqrt{\text{FATHER}} \leftrightarrow úmmu /_K
\quad \sqrt{\text{FATHER}} \leftrightarrow ábt:u
\]

Crucially, the VI entries in (17) are interpretable since K is accessible for this item.

In addition to Archi’s ‘father’, the form for ‘child’ in Archi and ‘water’ and ‘son’ in Lezgian (Nakh-Daghestanian) also supplete for K.11 In Moskal to appear, I argue that these three nouns lack a number node in the relevant context, thus allowing for (limited) K-driven root-suppletion. For instance, consider Lezgian ‘water’ (Haspelmath 1993, p.c.).

\[\text{\#MOS}\]

10 It is the presence or absence of # rather than the overt realization of #-morphology that determines K’s accessibility to govern root suppletion (see Moskal 2013 for discussion).

11 The only other apparent counterexample comes from Gaelic: NOM.SG. ‘wife’ is bean but in GEN and DAT we see mnà and mnaoi, respectively. In the plural, we have mnatha (NOM) and mnathan (DAT) but GEN.PL. ban. Whilst I leave a detailed study for future research, these forms might involve readjustment: syncope of the first syllable and /b/ to /m/ before nasals. Many thanks to David Adger for bringing this case to my attention.
First note that the plural morpheme (-ar) blocks the suppletive root from surfacing (jat-ar-i ‘water-PL-OBL’ rather than *c-ar-i). Indeed, we expect the regular root to surface in the oblique plural, since the presence of the plural morpheme intervenes between the root and K, blocking root suppletion (see also section 4.2): [[ [[ √WATER n ] PL ] OBL ].

Secondly, the suffix on the oblique singular form is a single vowel -i, which I analyze in Moskal to appear as a ‘pure’ oblique suffix. Other nouns have an additional affix between the root and the oblique marker, in the singular, which I take to be an exponent of singular number: fil-d-i ‘elephant-SG-OBL’. As such, I suggest that in the item for ‘water’, the singular is pruned in the context of oblique case, resulting in a structure analogous to that of Archi’s ‘father’: [[ √WATER n ] OBL ].

### 4.2 Blocking

A second prediction that follows from the locality restrictions identified here is that when a node X intervenes between n and #, we predict that #-driven root-suppletion should be blocked, since only n and X would be accessible to potentially govern suppletion.

\[
\begin{align*}
\text{X} & \quad \quad \text{#} \\
\text{n} & \quad \quad \text{X} \\
\text{Root} & \quad \text{n}
\end{align*}
\]

In Slavic languages, the diminutive is closer to the root than #: [[ [[ root n ] DIM ] # ]. Strikingly, this configuration indeed prevents #-driven root-suppletion.

Rather than a suppletive form ljudići, in Serbo-Croatian the diminutive plural is formed by a periphrastic construction, mali ljudi ‘small people’ (ćoveći is marginally accepted).

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\text{12} 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 SFLR 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.
Similarly, in Polish the suppleting singular-plural pair for ‘man’, człowiek – ludzie fails to supplete in the diminutive: *ludziki (if anything, człowiek-k-i is accepted). Note that Polish does have a form ludz-ik-i, but this refers to figurines and has a corresponding singular ludz-ik ‘figurine-DIM’. In Russian, the form ljudčiki is not attested in the Russian National Corpus, as compared to čelovečki which is attested.

In sum, when an element intervenes between n and number, #-driven root-suppletion is blocked, exactly as predicted by the formulation locality assumed here.\footnote{As an anonymous reviewer points out, the current proposal makes predictions about more fine-grained morphological subanalysis; at this point, I leave this to future research.}

It is worth noting that Arregi & Nevins (to appear) account for the lack of suppletion in one form of disuppletive forms, such as worse/badder, by drawing on a parallel notion of blocking where an additional functional head intervenes in the structure. For example, suppletion is blocked in the comparative form of evaluative bad, badder, due to the presence of an evaluative element, adding further support to locality as defined here.

5 Final remarks

In this squib I addressed the peculiar asymmetry between lexical nouns and pronouns with regard to K-driven suppletion. A minimal approach to locality, which crucially draws on syntactic hierarchical structure as the input to morphology, has been shown to be sufficient to account for the observation that K-driven suppletion fails to be observed in canonical lexical nouns, while it is common in pronouns. Specifically, the presence of a category-defining node n induces a domain low in the structure, preventing K to be sufficiently local to govern root suppletion give a dynamic approach to locality. Furthermore, nodes that are accessible to govern root suppletion are the category-defining (potentially domain-inducing) node as well as the node above it.

One last issue that warrants attention is how the current proposal compares to Embick’s (2010) approach to locality. Drawing on (a version of) the Phase Impenetrability Condition (PIC), he proposes that a phasal head β induces spellout not of its own complement but of the complement of phasal head α lower in the structure than β (where β itself is not accessible as an allomorphy restrictor). Applied to nouns, the ban on K-driven root-suppletion would require that, in addition to n, some other cyclic node would need to be present in the structure, crucially located above n. Indeed, on an approach where K would be cyclic (e.g., by virtue of being the highest node), K induces spellout of the root but is not accessible. However, numberless nouns provide the crucial argument against cyclic K: the lack of (non-cyclic) # should have no effect on locality and K should still be inaccessible, contrary to fact. Alternatively, as an anonymous reviewer suggests, D would be a plausible candidate; however, in addition to facing the same problem as K being cyclic, it is controversial whether D is universally present (Bošković 2008 et seq.). In contrast to Embick, the approach here naturally accommodates for the possibility of numberless nouns suppleting for K, and relies on
fewer stipulations about which nodes are domain delimiters, (currently) only committing to category-defining nodes.

In sum, this study bears on the formalization of locality domains as employed in DM. The hypothesis advocated here relies on (morpho-)syntactic structure playing a crucial role in the discrepant behavior, which raises the question whether these observations can be captured in frameworks that give no role to hierarchical structure in the morphology.

Appendix A: Languages that display root-suppletion in the context of number
!Xõõ (Khoisan), Afrikaans (Indo-European), Arapesh (Torricelli), Archi (North-East Caucasian), Dinka (Nilo-Saharan), Eastern Pomo (Pomoan), Gaelic (Indo-European), Hebrew (Afro-Asiatic), Hopi (Uto-Aztecan), Hua (Trans-New Guinea), Ket (Yeniseian), Khakas (Altai), Komi (Uralic), Lango (Nilo-Saharan), Lavukaleve (Central Solomons), Lezgian (North-East Caucasian), Russian (Indo-European), Tariana (Arawak), Tiwi (isolate), Turkana (Nilo-Saharan), Yimas (Sepik-Ramu), Zulu (Niger-Congo).

Appendix B: Languages included in the study
!Xõõ (Khoisan), Afrikaans (Indo-European), Akwesasne Mohawk (Iroquoian), Arapesh (Torricelli), Archi (North-East Caucasian), Basque (isolate), Bilua (Central Solomons), Boumaa Fijian (Austronesian), Burushaski (isolate), Cahuilla (Uto-Aztecan), Carib (Cariban), Cavineña (Tacanan), Crow (Siouan), Dagaare (Niger-Congo), Dinka (Nilo-Saharan), Dolakha Newar (Sino-Tibetan), Dumi (Sino-Tibetan), Đzongkha (Sino-Tibetan), Eastern Pomo (Pomoan), Evenki (Altai), Finnish (Uralic), Gaelic (Indo-European), Georgian (Kartvelian), Hebrew (Afro-Asiatic), Hopi (Uto-Aztecan), Hua (Trans-New Guinea), Hungarian (Uralic), I’aska (Skou), Itelmen (Chukotko-Kamchatskan), Itzaj Maya (Mayan), Jaltec (Mayan), Japanese (Japonic), Jarawara (Arauan), Jingulu (Austro-Asiatic), Kannada (Dravidian), Kashmiri (Indo-European), Kayardild (Australian), Ket (Yeniseian), Khakas (Altai), Kham (Sino-Tibetan), Kiowa (Kiowa-Tanoan), Klon (Trans-New Guinea), Koasati (Muskogean), Komi (Uralic), Koromfe (Niger-Congo), Kwaza (isolate), Ladakhi (Sino-Tibetan), Lango (Nilo-Saharan), Latvian (Indo-European), Lavukaleve (Central Solomons), Lezgian (North-East Caucasian), Malayalam (Dravidian), Manam (Austronesian), Mangarayi (Australian), Maori (Austronesian), Mapucche (Mapudungun), Mayali (Australian), Maybrat (Maybrat), Mina (Indo-European), Modern Khwe (Khoisan), Mosetén (Mosetenan), Nahualtl (Uto-Aztecan), Nishnaabemwin (Algonquian), Paraguayan Guarani (Tupian), Puyuma (Austronesian), Rabha (Sino-Tibetan), Russian (Indo-European), Semelai (Mon-Khmer), Sinaugoro (Austronesian), Tamil (Dravidian), Tariana (Arawak), Thai (Tai-Kadai), Tiwi (isolate), Turkana (Nilo-Saharan), Turkish (Altai), Vietnamese (Austro-Asiatic), Yanyuwa (Australian), Yimas (Sepik-Ramu), Zulu (Niger-Congo).
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