Visibility and intervention in allomorphy: Lessons from Modern Greek*

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Abstract

An often discussed dimension of the locality conditions on allomorphy is visibility: when do the trigger and target of allomorphy 'see' each other? An equally important dimension is intervention: when do the trigger and target *stop* seeing each other? Through the lens of a detailed analysis of Greek verbal morphology, this paper examines the conditions under which intervention forces the insertion of a default exponent. On the basis of two case studies on affixal allomorphy and one on stem allomorphy, I argue that patterns of intervention are easily accommodated under adjacency-based theories of the locality of allomorphy, and mysterious under less restrictive alternatives.

Keywords: morphology; allomorphy; locality; Distributed Morphology

1 Introduction

An adequate theory of morphology must encompass a *theory of contexts*, that is, a theory specifying what sorts of contextual interactions are countenanced by the grammar. Among the many questions that such a theory must address is the following, which concerns the locality conditions on contextual allomorphy:

(1) How local must the trigger of allomorphy be to the target, and what sorts of representations is locality computed over?

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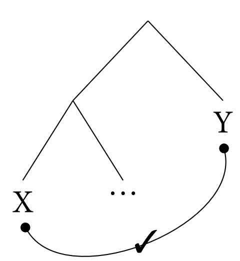
This question is both general enough and important enough to transcend theoretical boundaries, and has been the topic of investigations going back at least as far as Siegel (1978) and Allen (1979). In this paper, I approach these questions from the perspective of the theory of Distributed Morphology (DM; Halle and Marantz 1993; Harley and Noyer 1999; Embick and Noyer 2007; Embick 2010, *i.a.*) a syntactic, piece-based, realizational theory of morphology.

Within DM, (1) has been the topic of much recent attention. The architecture of the theory is in principle compatible with different approaches to the mechanics of Vocabulary Insertion, and different commitments on this issue yield different approaches to (1). For example, in Embick (2010), the targets of insertion are heads, and insertion takes place after Linearization; as such, the insertion condition is sensitive to a linear relation, linear adjacency, and the proposed locality condition is quite strict, permitting only adjacent heads to interact (*modulo* the special case of null heads). Adjacency of a different sort, computed over hierarchical structures, has been separately invoked as a condition on allomorphic locality (Adger, Béjar, and Harbour 2003). In theories where the targets of insertion are *not* heads, different kinds of locality conditions are posited. For instance, in the context of a non-terminal insertion theory, Bobaljik (2012) proposes that suppletion cannot be conditioned across an XP boundary. In the theory of spanning, where insertion targets sets of contiguous nodes, notions of adjacency at the level of the span have been invoked (Merchant 2015).

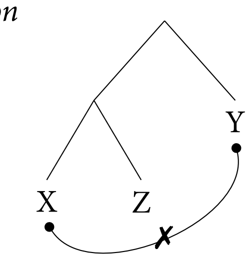
An important question concerns how the predictions of these different approaches can be teased apart. This type of comparison is not always straightforward, given that individual proposals will differ not only on the exact nature of the locality conditions assumed, but also on the nature of the units undergoing insertion, as just discussed.

Argumentation in this domain thus often begins from considerations of *visibility*: arguments for or against particular locality conditions on allomorphy often take the form 'insertion at target X is apparently conditioned by trigger Y; therefore our theories must allow for interactions within the minimal domain that includes X and Y' (e.g. Merchant 2015; Moskal and Smith 2016; Božič 2019; Ganenkov 2020). But an equally important dimension involves *intervention*, whereby X and Y, which normally interact, cease to do so when a third element Z intervenes between them.

(2) *Visibility*



(3) *Intervention*



The main goal of this paper is to argue, on the basis of a number of case studies from Modern Greek, that considering intervention alongside visibility favors localist, adjacency-based approaches to (1) over less restrictive alternatives. By offering an analysis of Modern Greek verbal morphology guided by the question of 'what sees what when', I argue that the intricate patterns of intervention found in the Greek verb are neatly accommodated under head-adjacency-based theories, and left unexplained in less restrictive approaches.

The first two case studies discussed here illustrate what I refer to as *default by intervention*: a specific Vocabulary Item loses the competition to a more general one because the context for insertion of the more specific exponent is present in the structure, but inaccessible. Such patterns follow naturally under adjacency-based theories of insertion, but seem mysterious under less restrictive theories such as spanning (Svenonius 2012; Merchant 2015).

Modern Greek has figured prominently in recent discussions of (1), as the language has been argued to instantiate a pattern of non-local Root allomorphy (Merchant 2015). In the third case study, I take up this issue as well. I show that the non-local nature of suppletion in the language is only apparent, and that Root allomorphy in Greek is in fact fully compatible with adjacency-based theories of insertion once the right analysis of the Greek verb is assumed. I thus argue that Greek does not, in fact, provide evidence in favor of the necessity of a spanning mechanism. I also discuss how a localist theory of the kind defended here correctly predicts the restricted distribution of true suppletion intra- and inter-linguistically, with possible implications for the division of labor between Root allomorphy and morphophonology in DM.

Viewed more broadly, the way of thinking about morphological intervention presented here provides insights on two issues central to morphological theory.

The first concerns how competition (in this case, between Vocabulary Items) is adjudicated. The specificity-based ordering enforced by the Elsewhere Condition is frequently invoked here, and rightly. But the phenomenon of default by intervention, discussed here in detail, suggests that, alongside specificity, constraints involving *locality* also play a role in adjudicating competition in morphology (Embick 2010; Marantz 2013). This paper thus offers a detailed look at the interplay of specificity and locality in determining the outcome of competition.

The second broad issue touched upon here concerns the role of zero exponents in allomorphic conditioning. The case studies considered here suggest that null nodes have a special status, insofar as only these nodes are capable of being transparent for the purposes of allomorphy, thereby enabling ostensibly non-local conditioning. This result accords with the conclusions (or assumptions, as the case may be) of earlier work. But this paper provides further technical insight on how transparency is achieved. Within DM, the transparency of null nodes has often been implemented by means of the operation of Pruning (Embick

2010), which removes null nodes from the structure. Important questions have arisen regarding when this operation applies, and how exactly it proceeds. By examining carefully the ordering of operations coexisting with Pruning, I argue that Pruning must be conceived of in its purest form, namely, as a *destructive* operation, literally removing null heads from the representation. Weaker alternatives fail to capture the observation that applications of Pruning may bleed further conditioning by the removed null node, as illustrated over the course of the second case study.

These points of theoretical interest are made on the basis of a detailed morphological analysis of the Greek verb. The Greek verbal system occupies an uneasy position in recent morphological discussions: despite some amount of consensus on the functional categories involved (see (4) below), there is widespread disagreement on how phonological exponents are distributed among these categories, yielding a variety of subtly different segmentations. My aim here is not to provide merely another possible analysis of the morphology of the Greek verb. Instead, this paper shows how, armed with tools as simple as traditional node insertion and a sharpened understanding of Pruning, we can arrive at an approach to the exponence of the Greek verb that sheds light on the inner workings of competition, as revealed through the lens of intervention and visibility. As it happens, the resulting analysis of Greek verbal morphology also succeeds at capturing intricate patterns of affixal allomorphy, morphophonology, and Root suppletion.

In furnishing a decompositional analysis of the Greek verb, this paper takes a sharply different stance to 'portmanteaux-based' analyses of this system (Joseph and Smirniotopoulos 1993, replicated in some respects in Merchant 2015). So-called 'fusional' systems of the Greek type, where individual affixes ostensibly realize multiple categories at once, have sometimes formed the basis for arguments against piece-based approaches to morphology. Seen against the analysis presented here, such claims are at best premature. Not only is the Greek system accounted for under piece-based theories; the appropriate decompositional theory also explains properties of the system that other theories leave unaccounted. In developing the analyses of each case study, I also touch upon questions on the mechanics of spanning (Svenonius 2012) as they relate to issues of competition.

The paper is structured as follows. Section 2 provides necessary background on the Greek verbal system. Sections 3-5 each present one of the case studies and accompanying theoretical discussion. Section 6 concludes.

2 Background on Greek verbs

Descriptively speaking, the Greek verbal system is structured around three binary oppositions, in Voice (active verus non-active), Aspect (perfective versus imperfective) and Tense (past versus non-past). Table 1[1] illustrates with the first-singular forms of the verb 'write', segmented to reflect the decomposition argued for in this paper (cf. Joseph and Smirniotopoulos 1993; Galani 2005; Christopoulos and Petrosino 2018; Merchant 2015).

I take these forms to follow from an input to PF as in (4). Here, [NONACT] is a feature assigned postsyntactically to syntactic configurations lacking an external argument (see Embick 1998, 2004 and below); Asp and T bear binary [PFV] and [PST] features, respectively; and Agr is a dissociated morpheme hosting person and number features (see Adamson 2019 for recent detailed discussion of the mechanics of dissociation).

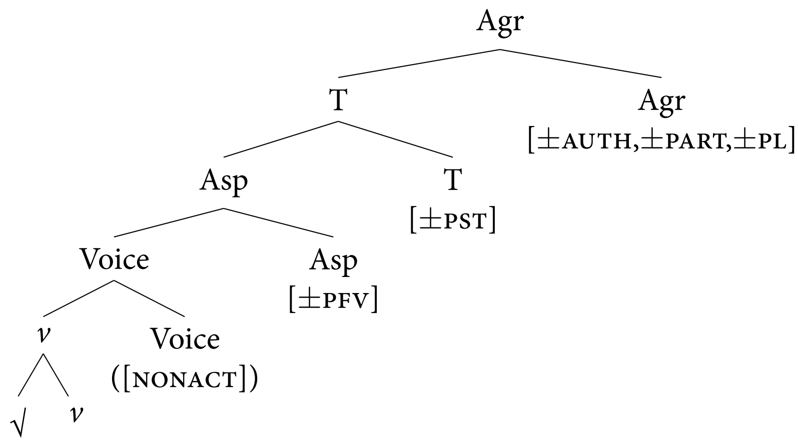
ACT.IPFV.NONPST ɣràf- o √WRITE AGR	**ACT.PFV.NONPST** ɣràf- s- o √WRITE ASP AGR
NONACT.IPFV.NONPST ɣràf- ome √WRITE AGR	**NONACT.PFV.NONPST** ɣraf- θ- ò √WRITE ASP AGR
ACT.IPFV.PST è- ɣraf- a TNS √WRITE AGR	**ACT.PFV.PST** è- ɣraf- s- a TNS √WRITE ASP AGR
NONACT.IPFV.PST ɣraf- òmun √WRITE AGR	**NONACT.PFV.PST** ɣràf- θ[2]- ik- a √WRITE ASP TNS AGR

Table 1: First-singular forms of *ɣrafo* 'write'.

[1]Glossing abbreviations: 1 = first person, 2 = second person, 3 = third person, ACT = active, ADJ = adjective, AGR = agreement, ASP = aspect, F = feminine, GEN = genitive, IPFV = imperfective, M = masculine, N = neuter, NMLZ = nominalizer, NONACT = non-active, NONPST = non-past, PFV = perfective, PL = plural, PST = past, SG = singular, TNS = tense, VBZ = verbalizer.

[2]A regular phonological process of manner dissimilation changes /θ/ to [t] after fricatives, thus forms like this end up as *[ɣraf-t-ik-a]*. I 'undo' this process and notate the affix as /θ/ throughout this paper for the reader's convenience.

(4)



A few introductory notes are in order here. Firstly, it can be seen from Table 1 that the form of Agr varies depending on the features on Voice: one set of agreement endings (-*o* and -*a*) appears in active forms, another (-*ome* and -*òmun*) in some nonactive forms. Secondly, [PST] can be realized either as a prefixal *e*-, known as the augment, or as a suffix -*ik*. The realization of Agr and T will form the basis of the discussion in Sections 3 and 4, respectively.

In the analysis to be developed here, Voice is systematically null, but there is nonetheless good reason to posit Voice in the structure of the Greek verb. That the agreement suffixes are sensitive to Voice features suggests that the latter must be present somewhere in the structure by the time insertion operates; that these features must be hosted on a dedicated Voice head is in turn suggested by the morphosyntax of Voice in the language.

Greek shows a well-known pattern of Voice syncretism (Embick 1998, 2004). As the following examples show, NONACT morphology expresses a range of distinct argument structure configurations, including passives, dispositional middles, reflexives, reciprocals, and (some) anticausatives:

(5) To vivlio ðiavas- θ- ik- e apo to Jani.
the book √READ- PFV.NONACT PST 3SG by the John
'The book was read by John.' *(passive)*

(6) I supa ka- ik- e (*apo ti Maria).
the soup √BURN- PST.NONACT 3SG by the Mary
'The soup burned.' *(anticausative)*

(7) Afto to vivlio ðiavaz- ete efkola.
this the book √READ- 3SG.NONACT easily
'The book reads easily.' *(d. middle)*

(8) I Maria pli- θ- ik- e.
the Mary √WASH- PFV.NONACT PST.NONACT 3SG
'Mary washed.' *(reflexive)*

(9) I Maria ke o Janis aŋgalias- θ- ik- an.
the Mary and the John √HUG- PFV.NONACT PST.NONACT 3PL
'Mary and John hugged.' *(reciprocal)*

As noted in Embick (1998), these syntactic configurations form a natural class with respect to one structural factor, namely, the absence of an underlying external argument.[3] In other words, morphological realization is sensitive to the fact that, though distinct in important ways, these syntactic configurations all exhibit 'unaccusative syntax' (Embick 2004). One way of capturing this intuition is by means of the postsyntactic rule in (10), which assigns the feature NONACT to Voice whenever Voice lacks an external argument.

(10) Voice $\rightarrow$ $\text{Voice}_{[\text{NONACT}]}$ / __ No DP specifier
(Embick 2004; Alexiadou, Anagnostopoulou, and Schäfer 2015; Spathas, Alexiadou, and Schäfer 2015)

Given (10) and the facts it is intended to capture, the existence of a Voice head at both the syntactic and morphological levels becomes natural. The NONACT feature which Agr (and Asp, see below) makes reference to for the purposes of allomorphy arises from the absence of the external argument, and it is thus no surprise that the head that carries this feature is the head that normally introduces the external argument (Kratzer 1996; Legate 2014; Pylkkänen 2008). Thus, even though the NONACT feature on Voice is systematically null, its presence is necessary for the purposes of realization, and its syntactic origins are clear.

Moreover, crucial in what follows will be the realization of Asp – I thus devote the necessary attention to this issue here. Though imperfective Asp is always zero in the language,[4]

[3]It must be noted that there is a wrinkle here, in the form of the language's deponent verbs, which show non-active morphology but not unaccusative syntax:

(i) I Maria metaiçirize- **te** ton eafto tis me aɣapi.
the Mary √TREAT 3SG.**NONACT** the self her with love
'Mary treats herself lovingly'

(ii) *I Maria metaiçiriz- **i** ton eafto tis me aɣapi.
the Mary √TREAT 3SG.**ACT** the self her with love

See Grestenberger (2018) for one proposal that reckons with these facts while maintaining a version of (10), whereby the external argument of deponents is merged below VoiceP.

[4]This fact makes a privative treatment of Asp possible, whereby imperfective is simply the absence of an Asp head; see footnote 14 for some discussion of this possibility.

perfective Asp is realized with two exponents. Its default realization is with the suffix *-s*, which appears in the active forms. That *-s* has not always been recognized as a distinct exponent (e.g. Christopoulos and Petrosino 2018) may be due to its systematic disappearance after sonorant-final Roots:[5]

IPFV	ACT.PFV	Gloss
per-n-	par-(*s)-	`take'
fer-n-	fer-(*s)-	`bring'
stel-n-	stil-(*s)-	`send'

Table 2: Loss of *-s* after sonorant-final Roots

As can be seen in Table 1 above, *-s* is systematically absent in *nonactive* perfective forms: here, in place of *-s*, we find the exponent *-θ*, the widely assumed analysis of which is (11):

(11) $[\text{NONACT}]_{\text{Voice}} \leftrightarrow$ /θ/ / ___ $[+\text{PFV}]_{\text{Asp}}$

(Rivero 1990; Merchant 2015; Spyropoulos and Revithiadou 2009; Manzini, Roussou, and Savoia 2016)

Note now that the complementary distribution of *-s* and *-θ* is not incidental to Table 1; these two exponents are complementary throughout Greek verbal morphology.[6] (11) fails to capture this fundamental fact: all things being equal, this VI, in tandem with the VI inserting *-s* as the default on Asp, will incorrectly yield underlying /θ-s/ clusters. One possible solution is to specify the VI for *-s* as having 'active Voice' in its context (Ralli 2003; Merchant 2015), but this move amounts to treating the complementary distribution of *-s* and *-θ* as a coincidence. These problems do not arise if the two exponents directly compete for insertion at Asp, with *-θ* being the more specified exponent.

The following VIs then summarize the treatment of Asp and Voice just defended.

(12) *VIs for Voice and Asp*

a. $[\text{NONACT}]_{\text{Voice}} \leftrightarrow \emptyset$
b. $[-\text{PFV}]_{\text{Asp}} \leftrightarrow \emptyset$
c. $[+\text{PFV}]_{\text{Asp}} \leftrightarrow$ /θ/ / $[\text{NONACT}]_{\text{Voice}}$ ___
d. $[+\text{PFV}]_{\text{Asp}} \leftrightarrow$ /s/

[5]The *-n* in the imperfective forms of Table 2 is a verbalizer; see Section 4 for more.

[6]Note that apparent Mirror-Principle-violating co-occurrence of these exponents is illusory: in [sθ] clusters of the kind seen in perfective forms like ***θa klis-θ-o*** 'I will be closed', the /s/ is part of the Root, as evidenced by its presence in the participles (***klis-tos***, ***klis-menos*** 'closed'; cf. ***ɣra-(*s)-tos***, ***ɣra-(*s)-menos*** 'written'.

3 Case study 1: Voice-conditioned allomorphy

3.1 The basic analysis

The role of intervention in insertion can be illustrated firstly with reference to the interaction between Voice and Agr. As mentioned above, the realization of Agr in Greek is conditioned by the features on Voice. Descriptively, Agr can take the set of 'active' endings (*-o* in the non-past, and *-a* in the past), or the set of non-active endings (*-òme* in the non-past, and *-òmun* in the past).

Interestingly, however, the distribution of the two sets of endings is asymmetric; this becomes clear in Table 3 below, which shows the forms of Table 1 with the two classes of agreement suffixes shaded differently. The left column shows that, in the imperfective, the expected distribution is found: 'active' agreement endings (in light gray) in the active forms, and non-active ones (in dark gray) in the non-active forms. But in the perfective, the 'active' agreement endings are found throughout; the non-active endings do not appear in the non-active perfective forms (Joseph and Smirniotopoulos 1993; Leu 2020). We thus find ***γraf-θ-ò*** instead of expected *****γraf-θ-òme***, and ***γràf-θ-ik-a*** instead of expected *****γraf-θ-ik-òmun***.

ACT.IPFV.NONPST γràf- o √WRITE AGR	**ACT.PFV.NONPST** γràf- s- o √WRITE ASP AGR
NONACT.IPFV.NONPST γràf- ome √WRITE AGR	**NONACT.PFV.NONPST** γraf- θ- ò √WRITE ASP AGR
ACT.IPFV.PST è- γraf- a TNS √WRITE AGR	**ACT.PFV.PST** è- γraf- s- a TNS √WRITE ASP AGR
NONACT.IPFV.PST γraf- òmun √WRITE AGR	**NONACT.PFV.PST** γràf- θ- ik- a √WRITE ASP TNS AGR

Table 3: \`Active' and non-active Agr in the 1SG forms of \`write'

Competition must be somehow implicated in the asymmetric distribution of agreement suffixes here. Descriptively, it looks as if the VIs inserting the non-active endings 'underapply'; why is the distribution asymmetric in this way?

There is a striking generalization evident in Table 3: Agr is only realized with the non-active endings when all heads between Agr and Voice are null. This is the case in the imperfective nonactive forms, where Voice and Asp are null, and T, if overtly realized, is prefixal; but in the perfective nonactive forms, T and/or Asp are overt. This generalization follows straightforwardly if intervention is at work: the trigger of allomorphy, Voice, ceases to be visible to the target, Agr, when overt exponents intervene between the two.

To derive this generalization, I will make use of three ingredients.

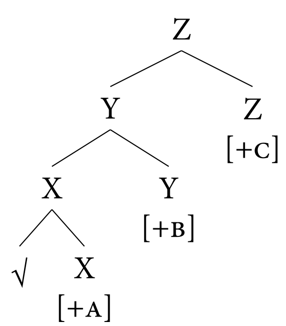
Firstly, it is necessary to set up the appropriate Vocabulary. Although the non-active agreement endings are true contextual realizations of Agr sensitive to the features of Voice (13a)-(13b), I will take it that the so-called 'active' endings are in fact default realizations of Agr, with the VIs inserting them making no reference to Voice (13c)-(13d).

(13) *VIs for Agr*

a. $[\text{+AUTH, +PART, -PL}]_{\text{Agr}} \leftrightarrow$ /omun/ / $[\text{NONACT}]_{\text{Voice}}\ [\text{+PST}]_{\text{T}}$ __
b. $[\text{+AUTH, +PART, -PL}]_{\text{Agr}} \leftrightarrow$ /ome/ / $[\text{NONACT}]_{\text{Voice}}$ __
c. $[\text{+AUTH, +PART, -PL}]_{\text{Agr}} \leftrightarrow$ /a/ / $[\text{+PST}]_{\text{T}}$ __
d. $[\text{+AUTH, +PART, -PL}]_{\text{Agr}} \leftrightarrow$ /o/

The second ingredient of the analysis of this intervention pattern is an adjacency-based theory of insertion. I adopt the linear adjacency-based model of (Embick 2010); in principle, the analysis may be made compatible with the assumptions of structural adjacency-based theories (see footnote 7). I will thus assume that a hierarchical structure of the kind in (14) is linearized into the statement in (15). (15) expresses a set of pairwise concatenation relationships: the Root is concatenated with X, X with Y, and so on. (15) is the representation over which insertion takes place, constrained by (16). This guarantees that, all things being equal, in (15), the Root can only be conditioned by X, X can only be conditioned by the Root and Y, and so on.

(14)



(15) $\surd ^\frown X_{[+A]}, X_{[+A]} ^\frown Y_{[+B]}, Y_{[+B]} ^\frown Z_{[+C]}$

(16) *Node Adjacency Hypothesis*
Allomorphy is only possible with elements that are concatenated.
(Embick 2010, 2012)

Unless augmented with an additional ingredient, (16) is too strong, effectively barring all long-distance interactions. The third ingredient required, then, is a device that effectively renders null nodes transparent for allomorphy, guaranteeing that apparent long-distance allomorphy is possible only across a null head. This is the role of the mechanism of Pruning in Embick (2010): Pruning removes null nodes from the linearization statement, and its application triggers re-concatenation, such that two nodes that were previously separated by a null head are now adjacent. To illustrate Pruning, consider (17), where (15) has undergone insertion up to Y: the Root has been realized as some exponent /π/, X has received an exponent /α/, and Y is null. Pruning of Y is illustrated in (18): Y is removed from the structure, and Z and X become adjacent.

(17) $\sqrt{}_{/\pi/}{}^\frown \mathrm{X}_{[+\mathrm{A}]\,/\alpha/}, \mathrm{X}_{[+\mathrm{A}]/\alpha/}{}^\frown \mathrm{Y}_{[+\mathrm{B}]/\emptyset/}, \mathrm{Y}_{[+\mathrm{B}]/\emptyset/}{}^\frown \mathrm{Z}_{[+\mathrm{C}]}$

(18) $\mathrm{X}[\alpha]^\frown \mathrm{Y}[\emptyset], \mathrm{Y}[\emptyset]^\frown \mathrm{Z} \rightarrow \mathrm{X}[\alpha]^\frown \mathrm{Z}$

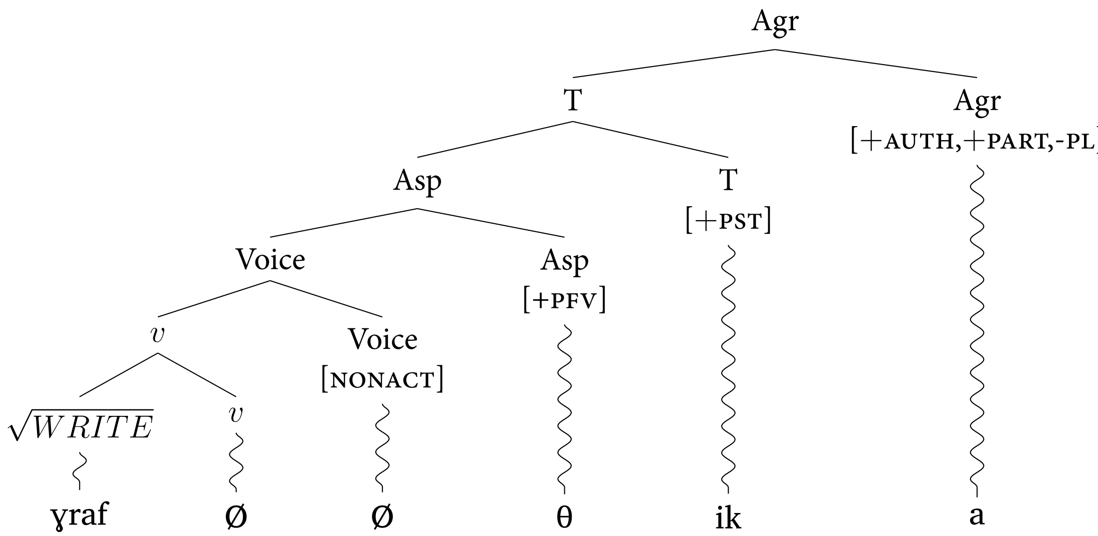
An important question here concerns which zeroes are transparent. In a Pruning-based treatment, this question effectively translates into a need to specify the conditions under which Pruning applies. I will tentatively take it that Pruning is a last resort operation, triggered just in case there exists a VI which demands access to a non-local node; the VI in (19) is one particular subcase of such a VI (namely, a *hyper-contextual* VI, in the terms of Moskal and Smith 2016). Whether this approaches a correct statement of the conditions on Pruning on a more general level is a question I leave open.[7]

(19) $[+\mathrm{c}]_{\mathrm{Z}} \leftrightarrow /\beta/ \;/\; [\;]_{\mathrm{X}}\;[\;]_{\mathrm{Y}}\;\_\_$

With these ingredients in place, we are now in a position to derive the asymmetric distribution of agreement endings noted above. I illustrate here with trees for the purposes of readability, reminding the reader that the targets of insertion are linear representations, not hierarchical ones. First, consider the derivation of a nonactive perfective past form such as ***γraf-θ-ik-a*** in Table 3.

[7]Whether the analysis offered here is fully compatible with structural adjacency depends to some extent on what the equivalent of Pruning would be in a theory with structural adjacency. It also seems that the specific notion of structural adjacency would itself have to be made precise: assuming a representation like (14), simple sisterhood will likely not give the correct result, given that, say, the sister of Z is not Y itself but rather a projection of Y that also contains X and the Root.

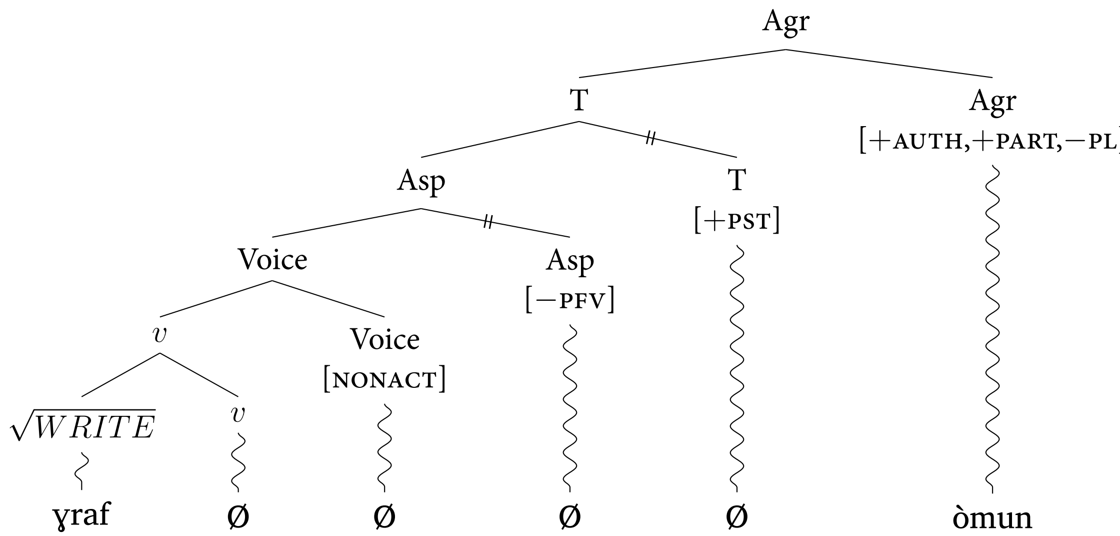
(20)



Assume with Bobaljik (2000) that insertion proceeds from the Root outwards, and consider the stage of (20) where every node but Agr has undergone insertion. Of the candidate VIs in (13), (13a) and (13b) demand access to Voice. In demanding access to a non-local context, these VIs will trigger Pruning, but Pruning cannot apply; Agr is concatenated with T, which has been overtly realized as *-ik*. The context for (13a) and (13b) thus cannot be satisfied; the insertion mechanism will default to a more general VI, in this case, (13c), which demands reference to [+PST]. This VI will apply, correctly inserting the default exponent *-a*. In the corresponding *nonpast* form of Table 1, ***ɣraf-θ-o***, T can undergo Pruning but the overt exponent of Asp will intervene, again forcing Agr to retreat to a default realization.

By contrast, in an imperfective form such as nonactive imperfective past ***ɣraf-òmun*** in (21) below, no exponent will intervene between Agr and Voice. Asp and T, both null, will undergo Pruning, schematized here with a delink symbol; with Voice and Agr becoming adjacent, the most specific VI (13a) will apply.

(21)



The careful reader may notice a timing-related intricacy of the derivation in (20): for Agr to gain access to Voice, T must be Pruned, but VI in (13a) is sensitive to the features on T. This creates an apparent paradox: viewed statically, this derivation requires both that T be present in the structure and that it be Pruned. Under one conception of the timing of local conditioning, however, the paradox is only apparent. Consider in more detail how the insertion mechanism will evaluate the conditioning environment of (13a). Suppose that the insertion mechanism scans the VI it evaluates for insertion (selected by the Elsewhere Principle) left to right, comparing its conditioning environment with the structure undergoing insertion. The VI (13a) first encompasses an immediate context, T. T is adjacent to the target of insertion and bears the right feature value, so this first part of the conditioning environment is now satisfied. But the VI also encompasses a non-local context, namely Voice; it is at this point that Pruning is triggered, removing the null T head. At this point, T has already contributed to its conditioning environment (its features have been placed on the 'stack' of the insertion mechanism). This is undeniably a fine-grained requirement on the order of operations here, but not an implausible one; for a case of a more involved ordering interaction with Pruning that supports this serial view of insertion, see section 3.3.

This view of insertion suggests that constraints on allomorphy arise as an interleaving of the Vocabulary and the structure targeted for insertion. Specificity-based ordering applies in the domain of the vocabulary: the Elsewhere Principle selects the most specific VI. The structure in turn evaluates whether this VI can be inserted, and this is where the locality conditions enter the picture. For the most specific VI to apply, it is not enough that the features in its conditioning environment be present somewhere in the structure; rather, the relevant features must also be appropriately *accessible*. If this is not the case, the insertion mechanism defaults to a less specific VI. The interaction of specificity and locality, coupled with a serial view of the insertion mechanism, leads to the surface patterns we observe in Greek.

3.2 Comparison with spanning

Under the theory underlying the analysis just developed, allomorphic conditioning is subject to a strict condition on linear adjacency, which can be circumvented only in the special case of null nodes. The Greek pattern just discussed is precisely what we would expect to find if the conditions of allomorphy were of this kind: Voice and Agr only interact when intervening nodes are 'out of the way', and stop interacting once at least one overt node intervenes, where non-interaction is signaled by the emergence of a default exponent on Agr.

That the facts discussed here are fully compatible with an adjacency-based theory is an important conclusion; it thus becomes crucial to examine the kind of analysis that a competing theory would offer. Here, I briefly review and discuss the spanning analysis of the same facts from Merchant (2015).

Under spanning, the targets and contexts of Vocabulary Insertion are not individual heads, but rather sets of contiguous nodes from the same Extended Projection, called spans (Svenonius 2012; Bye and Svenonius 2012; Svenonius 2016). Taking spans as the objects relevant for insertion has important downstream consequences for the theory of contexts; concretely, Merchant (2015) proposes that allomorphy is constrained by *span adjacency*, whereby the target and trigger of allomorphy must be adjacent spans. Though this theory is nominally an adjacency-based one, it is deliberately less restrictive than the theory defended here; under spanning, non-local interactions of different kinds are predicted to be possible, as discussed in more detail in Section 5.

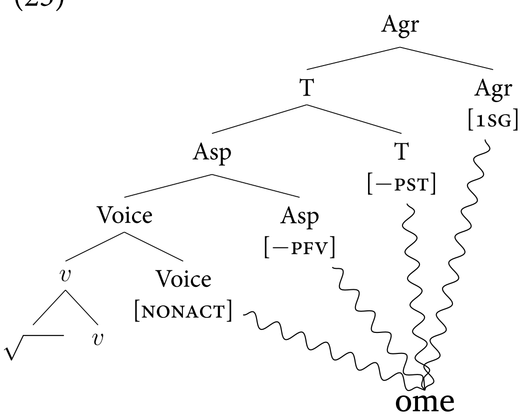
For the purposes of the case study just developed, it is clear that a spanning analysis is perfectly admissible in principle. One such analysis, based on remarks in Merchant (2015: 292-294), is sketched here. The agreement endings in a nonactive imperfective form like ***γraf-ome*** and its corresponding perfective form ***γraf-θ-o*** can be generated by means of the span-based VIs in (22).[8]

(22)
a. $\langle \text{Voice}_{[\text{NONACT}]}\ \text{Asp}_{[\text{-PFV}]}\ \text{T}_{[\text{-PST}]}\ \text{Agr}_{[\text{1SG}]} \rangle \leftrightarrow$ /ome/
b. $\langle \text{T}_{[\text{-PST}]}\ \text{Agr}_{[\text{1SG}]} \rangle \leftrightarrow$ /o/

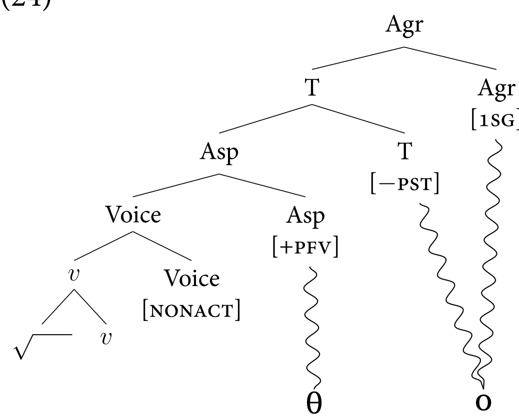
[8] Though no explicit VIs are given for the nonactive agreement endings in Merchant (2015), (22a) follows from (37) therein. Note also that Merchant does not posit a dedicated Agr head, but rather takes subject agreement features to be hosted on T in the morphology; this approach is untenable if the exponent *ik* is on T, see Section 4 below.

These VIs embody the intuition that '[a]s Joseph and Smirniotopoulos (1993) point out, these [nonactive agreement] endings are maximal portmanteaux' (Merchant 2015: 293). They are meant to lead to representations like the following:

(23)



(24)



It is clear that the relevant forms can be perfectly easily generated under a spanning analysis, but it seems far from clear that such an approach leads to a principled treatment of the intervention patterns. The latter seem mysterious: the agreement ending happens to realize the smaller span just when a different (trivial) span, Asp, is realized overtly. But the overtness of an adjacent span (much less an adjacent *head*) does not have any status in this theory. Even if the non-active ending in (23) were treated as a true contextual allomorph sensitive to Voice, instead of as a portmanteau that includes Voice, there is no reason why an overt Asp should disrupt the conditioning of this allomorphy: the span <Asp T Agr> would be adjacent to the trivial span <Voice>.

More broadly, the use of spans is intended (at least in Merchant 2015) as a way of liberally enabling non-local conditioning; but the Greek intervention patterns suggest that non-local conditioning is only possible under a restricted set of circumstances. A spanning approach cannot easily capture the tight link we find between successful non-local conditioning and the the nullness of intervening heads; though the relevant forms are generated, the intervention patterns are arguably not explained, all things being equal.

The obvious counterargument at this point may be that all things are *not* equal; that is, that some other facet of the mechanics of span insertion can account for intervention in a principled way. For this to be the case, some elaboration of how competition is adjudicated in spanning would be necessary.

In particular, given overlapping spans eligible to be lexicalized (e.g. <Voice Asp T Agr> versus <T Agr> above), how does the insertion mechanism decide which one should be targeted for insertion? For (24), one possibility is that, because Asp has formed its own trivial span, it cannot act as part of the bigger <Voice Asp T Agr> span (this perhaps following from a principle such as that in Haugen 2016: 369); and, because discontinuous spans are disallowed, the mechanism somehow defaults to the smaller <T Agr> span. This solution would amount to positing that a given head can only be a member of a single span per derivation, and that spans are 'persistent' throughout cycles of insertion.

But implementing this general idea seems difficult. Besides making reference to the notion 'head' which spanning is arguably meant to eschew for the purposes of insertion, the requirement for heads to enter a single span will quickly run into empirical problems: for example, in the analysis of Greek Root suppletion in Merchant (2015: 289), Voice and Asp form a single span that conditions insertion at the Root, but act as separate trivial spans when insertion targets each of them (see Section 5 for more). Moreover, as Grestenberger (2019) points out, in the analysis in Merchant (2015), Voice is realized in at least four different ways: as a trivial span <Voice> realized as -***θ***; as part of <Voice, Asp>; as part of <√, v, Voice> (for the ***θ***-less stems of athetic verbs, see the next subsection); or as part of <Voice, Asp, T> (as in (23)). Analyses of this kind, where the same head enters multiple spans, seem incomplete without a theory of how the insertion mechanism adjudicates between the overlapping spans.

At a minimum, then, further elaboration of the mechanics of competition and insertion in spanning would be needed to enable a more extensive comparison of approaches here. However, to the extent that the Greek facts suggest a crucial role for both the adjacency of heads and their overtness/nullness, they seem better captured in a theory that explicitly incorporates these parameters.

I postpone further discussion of issues with spanning to Section 5. For now, we may wonder whether some of the intuitions underlying a spanning solution to this first case study may be worth preserving, even if a full-blown spanning solution seems undesirable. In particular, the general idea that certain nodes are *bundled together* for the purposes of insertion is worth exploring further; within DM, this idea of course predates spanning, going back at least to the operation of Fusion, which spanning is arguably meant to supplant. For the specific case of Greek, the pair of nodes that could plausibly be bundled together is Asp and Voice; let us explore this possibility in more detail.

Consider firstly that fusing Asp and Voice would not lead to any issues in terms of the exponence of these nodes: if the segmentation argued for here is correct, Voice is systematically null, and the aspectual VIs will thus realize the bundled head whenever it is overt. Based partly on this observation, Christopoulos and Petrosino (2018) propose that Asp and Voice form a single node in Greek. This proposal is meant to offer one way of accommodating the stem allomorphy patterns discussed in Merchant (2015) in a localist theory (see Section 5 for discussion); of interest here is a different issue. If Asp and Voice form a single head at the point where Asp is targeted for insertion, the intervention patterns just discussed seem difficult to accommodate: Asp will no longer disrupt the Agr-Voice relationship, and the nonactive endings should be eligible for insertion, contrary to fact. The intervention pattern discussed here thus speaks against a solution whereby Asp and Voice are bundled. This conclusion is interesting from a methodological standpoint: this is one case where intervention has served as a diagnostic helping adjudicate between two competing analyses.

3.3 The athetic verbs

So far, all bodes well for the analysis developed in Section 3.1. Before concluding this case study, I highlight one case where the predictions made by this analysis are apparently wrong, and argue that the tension is in fact resolved in a way that may provide interesting insights into the nature of the operation of Pruning.

The problematic case for the analysis of the agreement endings developed thus far involves the Modern Greek verbs traditionally called athetic; the relevant forms of these verbs are given in Table 4.

IPFV	ACT.PFV	NONACT.PFV	Gloss
ke-o	kaf-s-o	ka-o	\`burn'
pniɣ-o	pniɣ-s-o	pniɣ-o	\`choke/drown'
klev-o	klef-s-o	klap-o	\`steal'
kov-o	kof-s-o	kop-o	\`cut'
stref-o	stref-s-o	straf-o	\`turn'
trep-o	trep-s-o	trap-o	\`turn'
tref-o	θref-s-o	traf-o	\`feed'
vrex-o	vrex-s-o	vrax-o	\`wet'

Table 4: Stems of the Modern Greek athetic verbs, in the 1SG.

From a morphological perspective, the unifying characteristic of this set of verbs is the absence of the aspectual -*θ* in the nonactive perfective: we find e.g. *ka-o* in place of expected **ka-θ-o* (compare the corresponding form of 'write', *ɣraf-θ-o*).

For Merchant (2015: 285-287), this observation is important insofar as it militates against an analysis whereby the exponent -*ik* is potentiated by the presence of -*θ* by means of phonologically conditioned allomorphy: the past nonactive perfective form of 'burn' in the first singular is *ka-ik-a* (cf. **ka-θ-ik-a*).

For the purposes of the analysis here, a different concern arises. Since Asp is not realized by means of -*θ*, it is presumably null. If it is null, it should undergo Pruning. If Pruning applies, Agr should be able to gain access to Voice in the perfective, with just this set of verbs. As such, all things being equal, the analysis proposed above incorrectly predicts forms like

**ka-ome*, where Agr is realized by means of the nonactive ending, as opposed to attested *ka-o*. I argue that, far from jeopardizing the analysis as it stands, this problem sheds light on the nature of Pruning.

Suppose, with Merchant (2015), that (at least some of) the athetic verbs lack -*θ* because they take a more specific (null) exponent of Asp, as in (25).

(25) $[+\text{PFV}]_{\text{Asp}} \leftrightarrow \emptyset$ / { $\sqrt{\text{FEED}}$, ... } ___

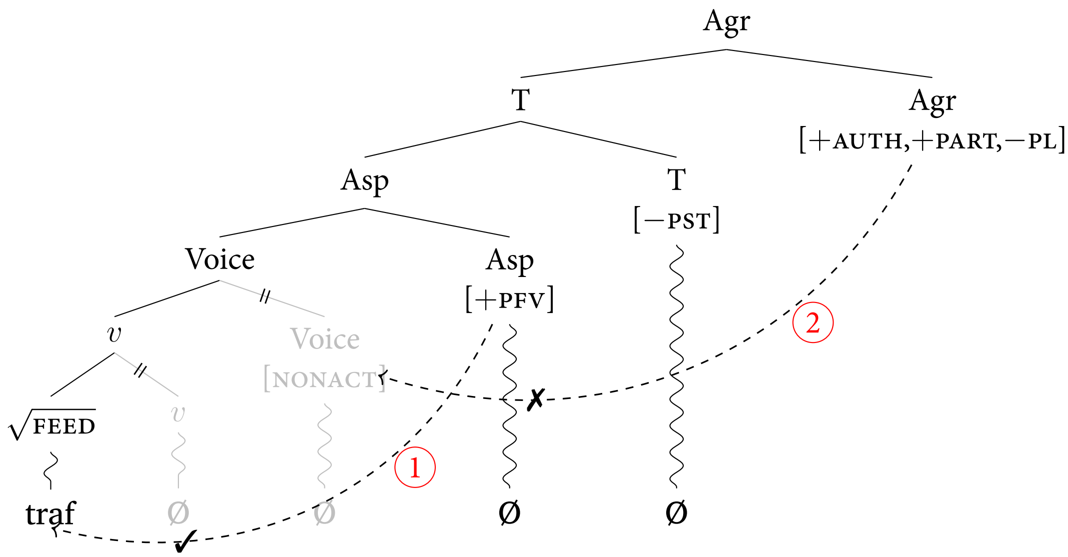
Importantly, this VI demands access to a non-local context. Given the assumptions on Pruning made above, (25) will trigger Pruning of any null nodes that intervene between the target Asp and the conditioning node √. There are two intervening nodes: Voice is systematically null, and the v that verbalizes these Roots is, too. Pruning will thus apply successfully, feeding the application of (25), which beats the more general VI (12c) that inserts -*θ*.[9]

Consider now what kinds of downstream consequences this application of Pruning can have. An important feature of the conception of Pruning outlined in Section 3.1 is that this operation is *destructive*: it makes null nodes transparent by literally removing them from the linearized representation. Presumably, this removal is final: once a null node has been successfully Pruned, it is absent from the structure for all subsequent cycles of insertion. This creates the possibility for bleeding interactions, whereby, to satisfy the demands of a VI at one cycle of insertion, Pruning removes the context required by a VI evaluated at a later cycle.

It is possible to invoke a bleeding effect of precisely this kind to explain the absence of nonactive agreement endings with the Roots on the List in (25). Schematically, the situation would be as in (26):

[9]Note that for (25) to win the competition over (12c), it must be the case that Lists count as more specific for the purposes of the Elsewhere Principle than (bundles of) syntacticosemantic features.

(26)



At an early cycle of insertion, marked (1) here, the exponence of Asp will be evaluated. The most specific VI matching the feature on Asp is (25); this VI will trigger Pruning, and Pruning will successfully remove the intervening v and Voice nodes, making Asp and the Root adjacent and allowing insertion of the zero allomorph in Asp. At a later cycle (2), the insertion mechanism will target Agr. The most specific VI compatible with the local context here is (13b) above. This VI demands access to Voice; but, even if T and Asp were Pruned, reference to Voice cannot be made, because this node is simply not present, having been removed from the structure at cycle (1). At this point, the insertion mechanism will retreat to a default VI, successfully deriving the absence of nonactive endings with the athetic Root √FEED.

Technical as this solution may be, it confers a few advantages. It is notable that bleeding interactions of this kind are precisely what we expect if all of the following holds: *(a)* Vocabulary Insertion is serial and proceeds from the Root outwards; *(b)* Pruning is destructive, removing entire nodes (i.e. both features and exponents) from the linearized structure; *(c)* Pruning is obligatory when the conditions for its application are met (i.e. Pruning *must* apply at cycle (1) above).

Notably, the same analysis cannot be recast under a less radical understanding of why null nodes can be transparent for allomorphy: if Voice in (25) were present in cycle 2, and was 'skipped' at cycle 1 through some means other than Pruning, we would have to seek a different explanation for the emergence of the default agreement endings here.

4 Case study 2: Exponence of [+PST]

In the previous case study, the realization of Agr was shown to be sensitive to Voice, but this contextual conditioning was governed by intervention: Agr was only able to be conditioned by Voice when all intervening nodes were null. The realization of [+PST] in Greek reveals a similar intriguing pattern, one that also involves a morphophonological twist.

The standard realization of [+PST] in Greek is the prefixal *e-* that normally appears in active past forms, known as the augment. It is well known that the appearance of the augment is sensitive to prosodic conditions: specifically, the augment seems to appear whenever a [+PST] form does not supply a syllable to host antepenultimate stress (Kaisse 1982; Galani 2005; van Oostendorp 2012; Spyropoulos and Revithiadou 2009).

This prosodic sensitivity can be illustrated by comparing the shape of past forms of monosyllabic and disyllabic Roots. A monosyllabic Root like *ɣraf-* 'write' obligatorily surfaces with the augment in the past, as in (27a). But the past of a disyllabic Root like *ðjavaz-* 'read' is unaugmented (27b): here, the combination of disyllabic Root and syllabic affix ensures that an antepenult is already supplied, and the augment does not surface.[10] Further illustration of the neatness of this distribution is provided by the paradigm of the active past perfective forms of *ɣraf-* in (28). In the singular, the agreement affixes are monosyllabic and, since the Root is also monosyllabic, the augment is inserted to host antepenultimate stress; in the first and second plural, insertion of the disyllabic agreement endings obviates augment insertion. In the third plural, the agreement affix may or may not be monosyllabic; if the monosyllabic variant is chosen, the augment is inserted, while the disyllabic variant bleeds augmentation.

(27) a. **è**- ɣraf- a , *ɣràf-a
PST- $\sqrt{\text{WRITE}}$- 1SG.PST
'I was writing.'

b. ***e**- ðjavaz- a , djàvaz-a
PST- $\sqrt{\text{READ}}$- 1SG.PST
'I was reading.'

[10] This is so for *standard* Modern Greek; in more conservative varieties, such as Cretan and Cypriot, the augment's distribution is not as intimately tied to antepenultimate stress. See Pavlou (2017) for Cypriot Greek.

(28)

	ACT.PST.PFV
1SG	**è**-ɣraf-a
2SG	**è**-ɣraf-es
3SG	**è**-ɣraf-e
1PL	ɣràf-ame
2PL	ɣràf-ate
3PL	**è**-ɣraf-an / ɣràf-ane

It is thus possible to relegate the conditions for the appearance of the augment entirely to morphophonology (Kaisse 1982): under such an approach, whenever we do not find the augment in a [+PST] form, as in the nonactive forms of Table 5 below, it is because the prosodic shape of the Root and its affixes removes the conditions for augment insertion. At first glance, the complementary distribution of the augment and the exponent *-ik* can also be derived from the former's prosodic conditioning: for example, in Merchant (2015), *-ik* is taken to realize Asp, and, by being syllabic, its addition to a Root (along with the agreement affix) bleeds insertion of the augment.

ACT.IPFV.PST	**ACT.PFV.PST**
è- ɣraf- a	è- ɣraf- s- a
TNS $\sqrt{\text{WRITE}}$ AGR	TNS $\sqrt{\text{WRITE}}$ ASP AGR
NONACT.IPFV.PST	**NONACT.PFV.PST**
ɣraf- òmun	ɣràf- θ- ik- a
$\sqrt{\text{WRITE}}$ AGR	$\sqrt{\text{WRITE}}$ ASP TNS AGR

Table 5: First-singular forms of *ɣrafo* `write'

But an interesting complication for this simple approach arises with a handful of Roots, exemplified by $\sqrt{\text{FIND}}$ in Table 6 (compare Table 3, and cf. Spyropoulos and Revithiadou 2009). The issue arises in the active perfective past form, which is an unaugmented disyllabic form. This is fully unexpected given the augment's prosodic conditioning just discussed: given the above, we would expect **è-vr-ik-a* (in fact the attested Classical Greek form), contrary to fact.

The issue is not confined to this Root: as shown in Table 7, $\sqrt{\text{ENTER}}$ and $\sqrt{\text{EXIT}}$ are like $\sqrt{\text{FIND}}$ in taking *-ik* to form an unexpectedly unaugmented active perfective past form; $\sqrt{\text{TAKE}}$ and $\sqrt{\text{GO}}$ take a null exponent of T, but still form augment-less disyllabic past forms.

It is thus not the case that the augment freely appears whenever a [+PST] form lacks an antepenult. Instead, as the perfective past forms of Table 7 illustrate, we need a layer of *mor-*

ACT.IPFV.PST	ACT.PFV.PST
è -vrisk-a	vr-**ìk**-a
NONACT.IPFV.PST	NONACT.PFV.PST
vrisk-òmun	vre-θ-ik-a

Table 6: Past forms of `find'

ACT.IPFV.NONPST	ACT.IPFV.PST	ACT.PFV.PST	Gloss
vr-isk-o	è-vr-isk-a	vr-**ìk**-a	`find'
b-en-o	è-b-en-a	b-**ìk**-a	`enter'
vj-en-o	è-vj-en-a	vj-**ìk**-a	`exit'
per-n-o	è-per-n-a	pìr-**Ø**-a	`take'
pij-en-o	pìj-en-a	pìɣ-**Ø**-a	`go'

Table 7: Special [+PST] exponents in the active perfective

phological competition capable of altogether obviating the process that evaluates whether the augment's morphophonological conditions are met.

To account for the relevant verbs, then, we may posit two more allomorphs of T, as in (29). One will insert *-ik* with the relevant set of Roots; another will insert a null allomorph of T with a disjoint set of Roots. Importantly, these two VIs compete with the default realization of T, namely the VI inserting the null allomorph /Ø*/.

(29) *Some VIs for T*

a. $[+\text{PST}]_T \leftrightarrow$ /ik/ / $\{\sqrt{\text{FIND}}, \sqrt{\text{ENTER}}, \sqrt{\text{EXIT}}\}$ __

b. $[+\text{PST}]_T \leftrightarrow$ /Ø/ / $\{\sqrt{\text{TAKE}}, \sqrt{\text{GO}}\}$ __

c. $[+\text{PST}]_T \leftrightarrow$ /Ø*/

I take (29c) to be the allomorph that triggers prefixation of the augment. * is here intended as a diacritic to this end: the null allomorph in (29c) causes the form's prosodic profile to be evaluated in the morphophonology, after insertion has been completed. If the form has an antepenult, no operation occurs; but if the form lacks an antepenult, * triggers prefixation of *e-* to host stress. The details of this morphophonological process are not central here; see Spyropoulos and Revithiadou (2009) for one proposal.[11]

[11] The careful reader may wonder why I have not taken (29c) to insert *e-* at T directly, perhaps accompanied

The important aspect of (29) is that, whenever (29a) or (29b) applies, (29c), the augment-triggering VI, will have lost the competition. In other words, (29a) and (29b) will bleed insertion of the augment, because choosing one of these VIs entails not choosing the allomorph capable of inserting the augment.

Note now that, although (29) is necessary to account for the perfective past forms of Table 7, it is not sufficient to account for other forms of this table. The issue we face is that the distribution of the 'special' T exponents (*-ik* or Ø) is asymmetrical: these exponents surface in the active perfective, giving forms like *vr-ìk-a*, but do not surface in the active imperfective. Given (29a) and (29b), we might expect the imperfective past of these Roots to form forms like **vr-isk-ik-a*, but in fact we find the augment surfacing instead, giving e.g. *è-vr-isk-a*.

As in the case of Voice allomorphy discussed in the previous section, the most specific VI ostensibly underapplies: though the Roots which form the context for (29a) and (29b) are clearly present in both the imperfective and the perfective past forms of Table 7, they only seem to successfully condition allomorphy of T in the perfective. Why, then, is Root-sensitive allomorphy only found in the perfective?

I argue that intervention is once again the culprit here. To see why, consider a striking generalization on the relevant verbs, summarized in Table 8 below: these verbs all bear overt verbalizers (cf. Spyropoulos, Revithiadou, and Panagiotidis 2015), but only in the imperfective. In the perfective, v is always null.

One could, of course, dispute the segmentation here; in particular, the facts are *prima facie* compatible with a treatment of ***-(e)n*** as the realization of [-PFV] Asp. The details of Table 8 may be surprising in this light – in particular, we may expect the perfective to be marked relative to the imperfect, and not *vice versa* – but such an approach is possible in principle. It is, however, disfavored by empirical considerations. Alongside the verbs in Table 8, ***-(e)n*** appears productively to form causatives:

(30) a. vaθ- is
$\sqrt{\text{DEEP}}$ M.ADJ
'deep'

b. vaθ- **en**- o
$\sqrt{\text{DEEP}}$ VBZ 1SG
'to deepen'

by linearization of T to the left. Such a solution would not be compatible with serial inside-out insertion, assumed here. Recall that we want *e-* to surface only when the form will lack an antepenult; but, at the point where insertion targets T, this information on the eventual prosodic shape of the form is not yet available, because Agr has not been targeted for insertion yet.

[12] For some speakers, including myself, the active imperfective nonpast of $\sqrt{\text{GO}}$ has an unverbalized variant *pa-o*, homophonous with the corresponding perfective form. This is orthogonal to the point made here on the realization of [+PST] T since, even for these speakers, the *past* imperfective form is always overtly verbalized.

ACT.IPFV.NONPST	ACT.PFV.NONPST	Gloss
vr- **isk**- o √FIND **VBZ** AGR	vr- **Ø**- o √FIND **VBZ** AGR	`find'
b- **en**- o √ENTER **VBZ** AGR	b- **Ø**- o √FIND **VBZ** AGR	`enter'
vj- **en**- o √EXIT **VBZ** AGR	vɣ- **Ø**- o √EXIT **VBZ** AGR	`exit'
per- **n**- o √TAKE **VBZ** AGR	par- **Ø**- o √TAKE **VBZ** AGR	`take'
pij- **en**- o[12] √GO **VBZ** AGR	pa- **Ø**- o √GO **VBZ** AGR	`go'

Table 8: Overt and null verbalizers and aspect.

(31) a. siop- i
√SILENCE F.N
'silence'

b. sop- **en**- o
√SILENCE VBZ 1SG
'to silence'

(32) a. zest- i
√WARM F.N
'heat'

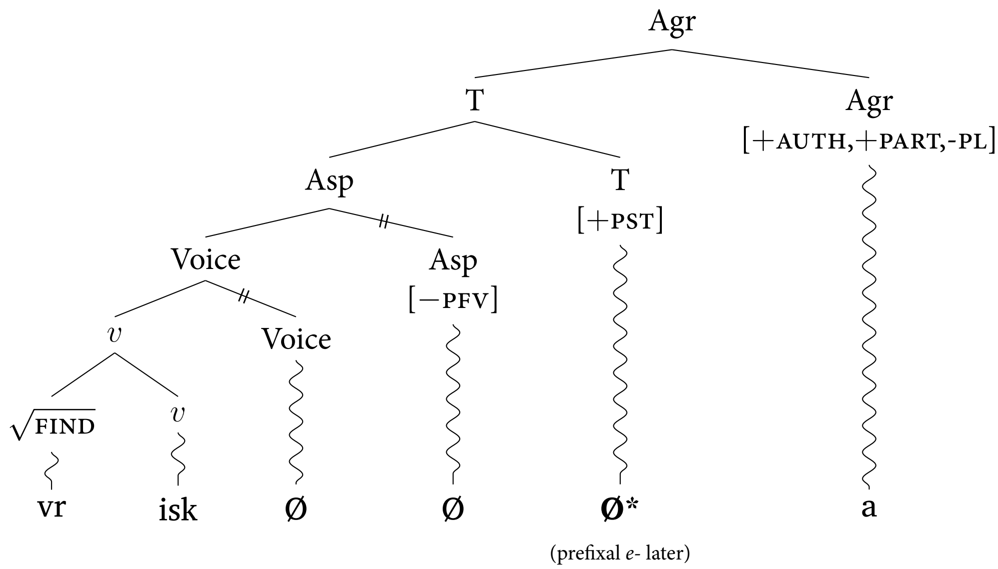
b. zest- **en**- o
√WARM VBZ 1SG
'to warm up'

In the b. examples, the appearance of -***en*** verbalizes the Root, and introduces causative semantics (Giannakidou and Merchant 1999), a function also often associated with v (Pylkkänen 2008). For all intents and purposes, then, -***en*** behaves like a verbalizer. As such, in Table 8, what becomes null in the perfective is v, realized as -***n*** after consonant-final Roots, -***en*** after vowel-final Roots, and -***isk*** after √FIND.

This generalization on the overtness of v is crucially relevant to the way in which the VIs in (29) will apply. Recall that the more specific VIs, (29a) and (29b) , demand access to the Root. Given linear adjacency, T will only be able to access the Root if all intervening heads are null. For the relevant verbs, this may be possible in the perfective, where v, the node adjacent to the Root, is null; but in the imperfective, overt v will close off the Root, forcing T to be realized with the default allomorph in (29c).[13]

As an illustration, consider first the derivation of a past imperfective form like *è-vr-isk-a* 'I was finding' in (33) below. For insertion at T, VI (29a) will be evaluated; this VI demands access to the Root, so Asp and Voice, both null, will undergo Pruning. But this attempt to make T local to the Root will fail, because v, the last barrier, is overt and intervenes. T and the Root thus cannot be made adjacent, and T defaults to the elsewhere VI (29c). The augment-triggering /Ø*/ will thus be inserted and, in this case, lead to prefixation of *e-* in the morphophonology, given that the output of insertion is a disyllabic past form that bears *.

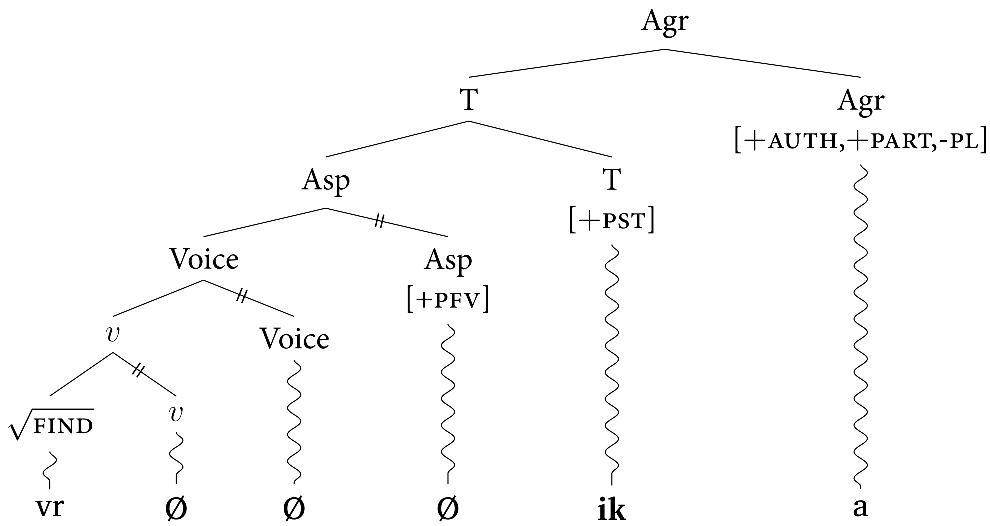
(33)



Now consider the derivation of the corresponding *perfective* form *vr-ìk-a* 'I found' in (34) below. The crucial difference is that, in this case, v is null – Pruning of all intervening nodes will thus make T adjacent to the Root. The context of (29a) is now met, and the more specific exponent *-ik* is inserted. Note that, because the augment-triggering (29c) has lost the competition, augmentation will not be triggered, yielding an unaugmented disyllabic past form.

[13] Christopoulos and Petrosino (2018) make a related interesting observation: no suppletive verb in Greek is overtly verbalized. This conforms to the predictions of a linear adjacency-based theory, whereby overt v would block access to the Root. Note, however, that this generalization is static, unlike the dynamic pattern in Table 8, where T takes different forms within the same 'verb' depending on the presence/absence of overt v. This dynamicity is particularly important in light of the fact that the language only provides a small number of clearly suppletive verbs (see Section 5), making the evaluation of Christopoulos and Petrosino's argument a subtle matter.

(34)



In other words, the interaction of the augment and -***ik*** in the relevant set of verbs again instantiates the phenomenon of default by intervention. Here, a Root-sensitive VI for T ostensibly underapplies, because the Root is inaccesible; T thus defaults to its general realization. The pattern is thus structurally similar to that explored in Case Study 1; here, however, the asymmetric distribution of the default VI is even more striking because the contexts where the specific exponent -***ik*** is inserted yield forms that ostensibly violate the augment's otherwise fully regular prosodic conditioning. Under a less restrictive theory of allomorphy, it may end up seeming accidental that the augment fails to appear whenever v is null; the localist theory advocated here, on the other hand, derives this connection in a principled way.

At this point, the morphology of Greek verbal affixes has provided us with two case studies on default by intervention, whose details favor strict adjacency-based locality conditions on allomorphic conditioning over less restrictive alternatives. The hallmark of the approach defended here is that conditioning is predicted to be impossible across an overt intervening node. The general conclusion to be drawn from the first two case studies of this paper is that the properties of theories designed to accommodate non-local conditioning, such as spanning, should be weighed against intervention patterns of the kind discussed here. In other words, while less restrictive theories may confer the apparent advantage of easily accommodating putatively non-local allomorphy, this may come at the cost of treating fine-grained patterns of intervention as accidents.

This type of thinking is bound to give rise to theoretical dilemmas: when faced with the choice between accommodating an apparent instance of non-local allomorphy on the one hand, and giving a principled explanation of intervention patterns on the other, something has to give. In what follows, I offer an attempt at reconciliation of this kind for the specific case of Greek, arguing that a well-known pattern of stem allomorphy is in fact fully compliant with linear adjacency, *contra* recent claims.

5 Case study 3: Stem allomorphy

5.1 No non-local suppletion

In an influential paper, Merchant (2015) provides an argument against adjacency-based theories, and in favor of the less restrictive theory of spanning. According to Merchant, certain patterns of Root suppletion in Modern Greek verbs require reference to the features of a node that is not adjacent to the Root; crucially, the intervening heads are arguably *not* null. The proposed weaker theory of allomorphy capitalizes on Svenonius' (2012) notion of a *span*, discussed above: Merchant proposes that insertion both targets and is conditioned by spans, such that insertion at any span is conditioned by an adjacent span.

The argument for spanning from the Greek verb rests crucially on a range of decisions on how to segment the Greek forms, alongside architectural assumptions about the division of labor between morphophonology and Root allomorphy. I will begin with the narrowest point, showing that stem allomorphy in Greek does not, in fact, involve non-local conditioning.

Merchant's argument can be exemplified with reference to the three clearly suppletive verbs of Table 9, as well as verbs with less clearly suppletive stem changes. To illustrate Merchant's analysis, consider first the verbs in Table 9.

IPFV	ACT.PFV	NONACT.PFV	Gloss
tro-	fa(ɣ)-	faɣo-	\`eat'
vlep-	ð-	iðo-	\`see'
le(ɣ)-	p-	le(ɣ)- / ipo-	\`say'

Table 9: Greek suppletive verb stems

In the analysis in Merchant (2015), the perfective allomorphs in (35a)-(35b) demand access to Asp across the Voice node, which, under the segmentation proposed in (36), may be overt. These facts are then taken to necessitate a spanning analysis whereby <Voice Asp> conditions Root insertion, as schematized in (37).

(35) *VIs for Root suppletion* (Merchant 2015: 278)

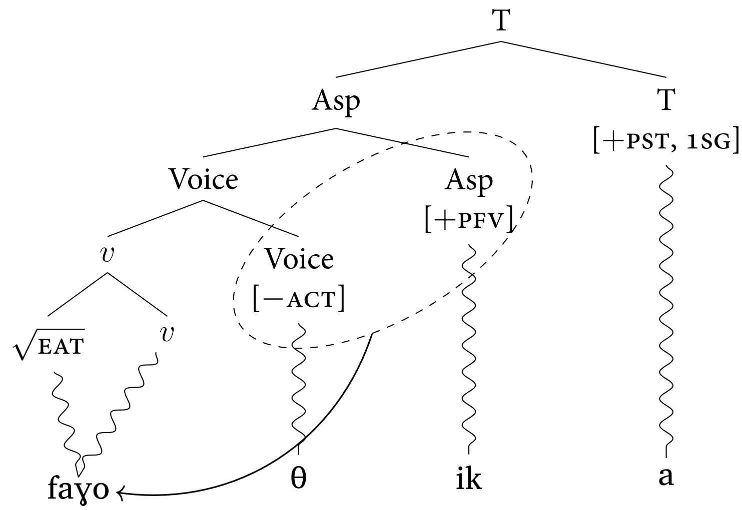
a. $\sqrt{\text{EAT}} \leftrightarrow$ /fa(ɣ)/ / __ $[\text{+ACT}]_{\text{Voice}}$ $[\text{+PFV}]_{\text{Asp}}$

b. $\sqrt{\text{EAT}} \leftrightarrow$ /faɣo/ / ___ $[\text{-ACT}]_{\text{Voice}}$ $[\text{+PFV}]_{\text{Asp}}$
c. $\sqrt{\text{EAT}} \leftrightarrow$ /tro/

(36) *VIs for the affixes* (Merchant 2015: 278)

a. $[\text{+PFV}]_{\text{Asp}} \leftrightarrow$ /ik/ / $[\text{-ACT}]_{\text{Voice}}$ ___ $[\text{+PST}]_{\text{T}}$
b. $[\text{-ACT}]_{\text{Voice}} \leftrightarrow$ /θ/ / ___ $[\text{+PFV}]_{\text{Asp}}$

(37)



As Merchant (2015: 277) himself notes, the argument for non-locality here 'rests on the correctness of the morphological analysis' that is assumed. It in fact emerges that, given an empirically more well-founded treatment of both affixes and Roots, this case of suppletion is fully local.

That this case of Root suppletion is non-local rests on two assumptions. The first is the treatment of the affixes -*θ* and -*ik* seen in (36). As argued in this paper, these exponents are in fact best treated as realizing Asp and T, respectively; taking -*θ* to be in Voice leaves its complementary distribution with the clearly aspectual -*s* unexplained, and the same can be said for -*ik* and the augment. Assuming the empirically more appropriate segmentation has an important consequence: Voice is null even when non-active, such that both (35a) and (35b) can now be made to comply with head adjacency via Pruning.

But the argument for non-locality fails on a second, more interesting point as well. The second assumption underlying non-locality in Merchant (2015) is that the elsewhere allomorph for the relevant verbs is the perfective one, as suggested by (35). This assumption is left tacit and seems innocuous, but turns out to contravene the facts. In all Greek suppletive verbs, it is the imperfective allomorph that is the default. This is evidenced by the fact that the imperfective allomorph (or one of the two imperfective allomorphs, if we follow Merchant in positing both *faɣ-* and *faɣo-*) clearly has the wider distribution, as shown for √EAT in (38): it is the one appearing in participles, Root and event nominals, and Root and verbal adjectives.

(38) a. **Participles** (*faɣo-menos* `eaten', *a-faɣo-tos* `uneaten'); cf. **tro-menos*, **tro-tos*
b. **Root nominals** (*faj-ito* `food'); cf. **tro-ito*
c. **Event Ns** to faɣo-ma/*tro-ma ton niçon ipoðiloni aŋxos
the √EAT-NMLZ the.GEN nails.GEN suggests stress
`Eating one's nails is a sign of stress.'
d. **Deverbal adjectives** (*faɣo-sim-os* `edible'); cf. **tro-sim-os*
e. **Root adjectives** (*faɣ-anos* `foodie', *kalo-faɣ-as* `good eater'); cf. **tro-anos*, **kalo-tro-as*

In other words, the imperfective allomorph ***tro-*** appears in exactly one syntactic environment, namely, imperfective Asp, and the 'perfective' allomorph appears in virtually every other conceivable context. Under any sensible criterion for choosing the elsewhere, then, (35) is untenable. The correct distribution of Root allomorphs is as in (39):

(39) a. $\sqrt{\text{EAT}} \leftrightarrow$ /tro/ / __ $[\text{-PFV}]_{\text{Asp}}$[14]
b. ($\sqrt{\text{EAT}} \leftrightarrow$ /faɣo/ / __ $[\text{-ACT}]_{\text{Voice}}$ $[\text{+PFV}]_{\text{Asp}}$)
c. $\sqrt{\text{EAT}} \leftrightarrow$ /faɣ/

Note that this distribution is not specific to √EAT; the same facts hold for the other suppletive verbs of Table 9, as well as for the language's many weakly suppletive verbs (on which see below).

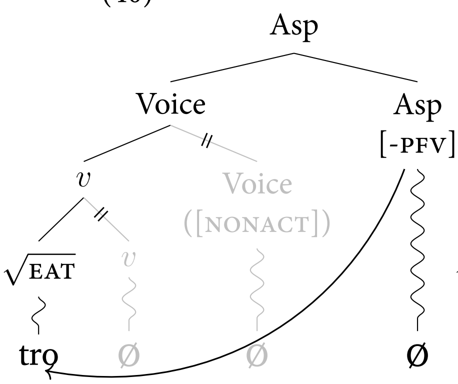
Assuming the empirically justified (39) has an important consequence. Given this Vocabulary, the default Root allomorph appears in the perfective; this means that suppletion targets the *imperfective*, by (39a). Recall now that, under *any* treatment of the affixes, both Asp and Voice must be systematically null in the imperfective, thus no locality issue arises for a theory with head adjacency and Pruning. To see why, consider the trees below.

By (39a), the 'special' Root allomorph is sensitive to [-PFV] Asp; in the imperfective, however, Voice is null (under any segmentation), and is thus eligible to be Pruned. Once null

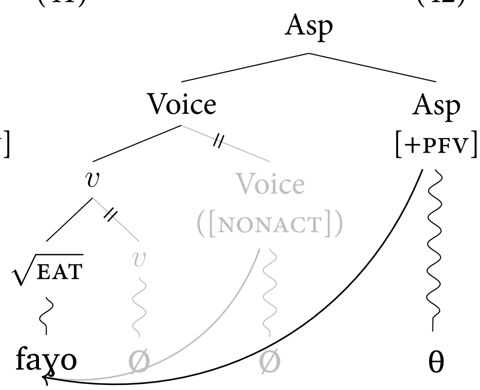
[14] That this VI makes reference to the negative value of [PFV] is the main reason why I take this feature to be binary, thereby forgoing a privative treatment of Asp where imperfective Asp is simply the absence of this head. Nothing crucial rests on this, but it is worth considering some alternatives. As long as (39a) makes reference to Asp, the only way to make this VI compatible with privative Asp is to formulate the context for the VI as '/ No Asp'; the issue at hand would then reduce to whether this is a possible kind of contextual specification in a VI. Alternatively, as Dave Embick (p.c.) points out, it might be that the environment for insertion of ***tro-*** is in fact a different head, say, finite T. This seems promising; lacking the space to spell out the details of what finiteness corresponds to in Greek, I leave this option open.

v is Pruned as well, Asp and the Root will be adjacent, as schematized in (40). In (42), the allomorph ***faɣ***- is inserted by default; there is no conditioning at play, hence no locality issue. Note that a locality issue would not arise on the segmentation argued for here even if the Root were sensitive to an outer node, since Voice will be null and -***θ*** realizes Asp; but even on a Merchant-style segmentation, the default status of ***faɣ***- obviates the locality problem. To the extent that we choose to recognize a separate Root allomorph for the nonactive perfective (39b), Pruning will apply here as well, as in (41). It is, however, worth noting that, in all three verbs of Table 9, it is only the *imperfective* allomorph that is clearly phonologically dissimilar.

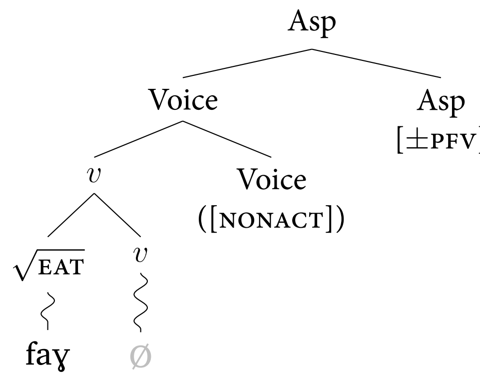
(40)



(41)



(42)



On closer inspection, then, Greek stem allomorphy does not exhibit non-local conditioning, and does not furnish an argument in favor of spanning. Viewed in this light, the argument presented in Merchant (2015) is of a rather weak form. There are certainly *possible* analyses of the Greek verbal morphology that make stem allomorphy seem non-local. Crucially, however, once we adopt the analysis that is justified on independent empirical grounds, no locality problem arises. The methodological implications of this case study should thus be clear: any argument for or against particular locality conditions is as convincing as the morphological analysis on which it is based.

5.2 Further issues with spanning

To further buttress the last point, consider an additional aspect of Merchant (2015). The analysis presented therein, where Voice and Asp jointly condition allomorphy of the Root, is not intended to apply just to the clearly suppletive verbs in Table 9; rather, it is extended to the language's numerous verbs that show stem allomorphs with clear phonological relationships, some of which are called 'irregular' in descriptive grammars (e.g. Holton, Mackridge, and Philippaki-Warburton 2012). As an example, consider the following verbs:

IPFV	ACT.PFV	NONACT.PFV	Gloss
ðern-	ðir-	ðar-θ-	`beat'
eɣir-	eɣir-	eɣer-θ-	`erect'
efevrisk-	evefr-	efevre-θ-	`invent'
fern-	fer-	fer-θ-	`bring'
apofevɣ-	apofiɣ-	apofevɣ-θ	`avoid'
maθen-	maθ-	maθef-t-	`learn'
pern-	par-	par-θ-	`take'
parex-	parex-	parasxe-θ-	`provide'
pin-	pi-	pio-θ-	`drink'

Table 10: Some Greek irregular verb stems (Merchant 2015: 281).

It is noteworthy that this mode of presentation may exaggerate the 'irregularity' of the alternations under consideration:[15] for example, simply recognizing the verbalizers -*(e)n* and -*isk*, as in Section 4, makes many of these alternations (with the verbs 'beat', 'invent', 'bring', 'learn', 'take', and 'drink') much less unpredictable than they initially seem. The residue consists mainly of stem-internal vocalic alternations (e.g. *ðer*- *ðir*- *ðar*- for 'beat'). The general question, then, concerns how such alternations should be treated.

In Merchant (2015), the various surface shapes of a Root like $\sqrt{\text{BEAT}}$ are derived in the same way as those of the Root $\sqrt{\text{EAT}}$, i.e. by means of the Vocabulary in (43) (reflecting the correct choice of default, cf. the discussion of (39)). On the basis of the descriptive classification of Holton, Mackridge, and Philippaki-Warburton (2012), the conclusion drawn in Merchant (2015) is that a very large number of Greek verbs will require more than one Root allomorph, with the relevant allomorphs sharing much of their segmental material (unlike the three verbs of Table 9).

(43) a. $\sqrt{\text{BEAT}} \leftrightarrow$ /ðer/ / __ $[\text{-PFV}]_{\text{Asp}}$
b. $\sqrt{\text{BEAT}} \leftrightarrow$ /ðir/ / __ $[\text{-ACT}]_{\text{Voice}}$ $[\text{+PFV}]_{\text{Asp}}$
c. $\sqrt{\text{BEAT}} \leftrightarrow$ /ðar/

In fact, Roots like $\sqrt{\text{BEAT}}$, which, like $\sqrt{\text{EAT}}$, arguably necessitate three Root allomorphs, in-

[15] Table 10 is an abridged and corrected version of a similar table in Merchant (2015: 281). The original table unfortunately displays numerous errors which conspire to give the appearance of further complexity. Some are purely typographical (e.g. listing the NONACT.PFV of 'provide' as **parsxe*-); some reflect segmentation errors (e.g. taking -*ik* as part of the stem of $\sqrt{\text{FIND}}$, cf. Table 7 above); and some arise from failure to consider the language's regular phonology (e.g. the NONACT.PFV of 'avoid' is listed as *fefx*-*θ*, but this merely reflects regular regressive devoicing of /fevɣ/ triggered by affixation of voiceless -*θ*).

stantiate the rare case in Greek. Far more common are two-stem verbs where, if the relevant alternations are to be treated by means of Root allomorphy, one need only postulate *two* Root allomorphs, differentiated from each other with reference to Asp. $\sqrt{\text{ERECT}}$ in Table 10 is one such example:

(44) a. $\sqrt{\text{ERECT}} \leftrightarrow$ /ejir/ / __ $[\text{-PFV}]_{\text{Asp}}$
b. $\sqrt{\text{ERECT}} \leftrightarrow$ /ejer/

In an adjacency-based theory, inserting the specific Root allomorph /ejir/ requires reference only to Asp, enabled by Pruning of null Voice, as in (44a). But in a spanning theory, a VI like (44a) would be supplanted by a VI making reference to Voice, as in (45). This move is necessary if insertion obeys Span Adjacency: given that spans cannot be discontinuous, any conditioning environment that includes Asp must also include Voice.

(45) $\sqrt{\text{ERECT}} \leftrightarrow$ /ejir/ / __ $[\alpha\text{ACT}]_{\text{Voice}}$ $[\text{-PFV}]_{\text{Asp}}$

The necessity of including Voice here is a symptom of a general issue that arises with spanning, which I dub the *problem of otiose nodes*. The problem lies in the observation that Voice in (44) is (to use Merchant's term) otiose, that is, superfluous outside the analysis itself: Voice is included in the conditioning environment not because the realization of the Root is actually sensitive to its features, but purely for the purpose of gaining access to the higher node Asp.

Merchant (2015: 295, fn 22) is aware of this weakness in the mechanism. He writes:

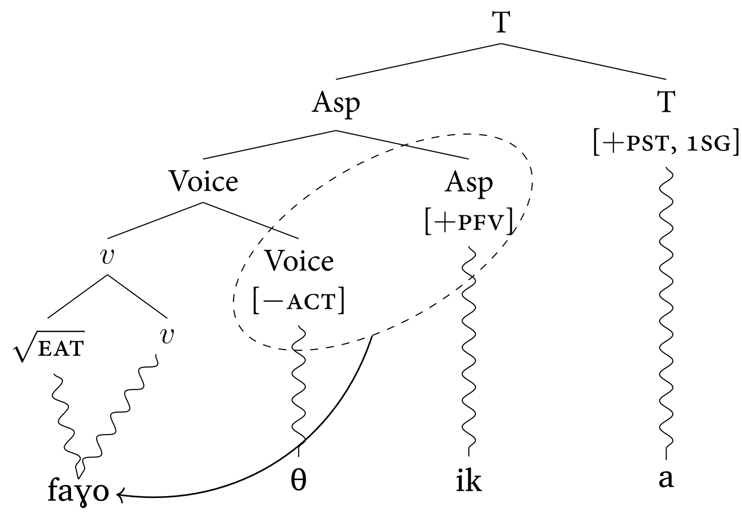
> [T]he Span Adjacency Hypothesis could easily be vacuously satisfied by the inclusion of multiple intervening nodes that play no role at all in conditioning the allomorphy. The constraint [that precludes this unwanted possibility] must be that no otiose nodes are included, that every node in the conditioning span is required, and that no conditioning environment can be stated that includes less information.

How this constraint is to be implemented is left unspecified, and the analysis in Merchant (2015) does end up positing otiose Voice, as pointed out by Christopoulos and Petrosino (2018).

The upshot comes in the form of a concerning conclusion: a spanning analysis does not seem easily able to distinguish between the case where a node is sensitive to the features of both Asp and Voice, and the case where it is sensitive just to the features of Asp. More generally, for any sequence of nodes X-Y-Z where the realization of X is sensitive to Z, span adjacency necessitates that Y be included in the conditioning environment of the relevant VI.

Alongside this problem, consider a second one, which I dub the *problem of non-persistent spans*. To illustrate this problem, review once more the representation in (37), repeated here.

(37)



The central point of such representations is meant to be that Voice and Asp jointly condition insertion at the Root. Consider this facet of the analysis in more detail. It amounts to the claim that, when insertion operates on the Root, the two nodes are treated as a unit. However, when the time comes to determine the exponents of these heads themselves, Voice and Asp are treated separately, each being realized by a different exponent in (37). In other words, given spanning, the two nodes behave differently at different stages of insertion. In this case, then, spans are not persistent: Voice and Asp form a single span at one cycle of insertion, and distinct trivial spans at later cycles.

This observation is not peculiar to this particular analysis; after all, as argued above, there are reasons to think that Greek suppletion does not operate in the way suggested in (37), and that the affixes shown there are in fact in different positions. The point is instead that no aspect of (common formulations of) spanning enforces the requirement that spans be persistent across cycles; and situations of the type in (37) are thus predicted to arise.

This is an important difference between spanning and Fusion. If Voice and Asp were fused prior to Vocabulary Insertion, they would be treated as a single entity for all subsequent operations; in other words, they would be predicted not only to jointly condition allomorphy of the Root, but also to be realized together by a single Vocabulary Item. Spanning, on the other hand, is in this case apparently equivalent to fusing the two nodes such that Root allomorphy can use them as a trigger, and then de-fusing them in time for them to be realized by separate exponents.

This comparison of spanning and Fusion bears on recent criticisms of the latter operation. Fusion has been taken to involve lookahead: nodes fuse just in case there exists a VI that can realize the fused node (Radkevich 2010; Haugen and Siddiqi 2013; Merchant 2015). Two counterpoints must be born in mind here. Firstly, no aspect of the formal statement of Fusion operations actually necessitates this type of lookahead. Secondly, to the extent that spanning is offered as an alternative to Fusion, it must be born in mind that it is not innocuous either, witness the problem of non-persistent spans above. Once again, if the conceptual scales turn out not to lean in either direction, we may need to look for empirical arguments for or against particular analyses.

5.3 Suppletion and morphophonology

Analyses like (43) relate to the broader question of how instances of stem allomorphy should be analyzed. In principle, theories of morphology can make use of two distinct (but not mutually exclusive) theoretical devices for any given case of stem allomorphy. Under one approach, which I call *Stem Listing* following Embick and Marantz (2005), each stem allomorph corresponds to a distinct object in memory. A different possibility involves a single underlying morphological object, whose surface shape undergoes morphophonological readjustment (by means of readjustment rules, a device going back at least to Chomsky and Halle 1968); I refer to this type of analysis with the broad term *morphophonology*. (46) and (47) illustrate each type of analysis for the test case of English *sing*-*sang*.

(46) *Stem Listing*

a. $\sqrt{\text{SING}} \leftrightarrow$ /sæŋ/ / __ $[+\text{PST}]_T$

b. $\sqrt{\text{SING}} \leftrightarrow$ /sɪŋ/

(47) *Morphophonology*

a. $\sqrt{\text{SING}} \leftrightarrow$ /sɪŋ/

b. /ɪ/ → [æ] / X__Y [+PST]
XɪY = {$\sqrt{\text{SING}}$, $\sqrt{\text{SIT}}$, ...}

Analyses like (43) embody the intuition that all instances of stem allomorphy should be treated by means of Stem Listing; such analyses thus generalize Root suppletion to the extreme, completely eschewing the use of readjustment rules. Far from a tacit assumption, this stance has been defended explicitly in recent work (esp. Haugen and Siddiqi 2013; Haugen 2016; cf. Svenonius 2012; Bermúdez-Otero 2013; Merchant 2015), stemming mainly from conceptual concerns over readjustment rules. When explicitly articulated, these concerns center around difficulties in delineating precise criteria for the application of readjustment rules. This type of objection then gives rise to an economy argument: a theory which derives all instances of stem allomorphy by means of competition among stored pieces, the argument goes, is simpler than a theory availing itself of both Root allomorphy and morphophonological processes (Haugen 2016).

The above authors are correct to emphasize that delimiting the application of readjustment rules is an important goal; here, however, I argue that generalizing Stem Listing to the extreme carries its own cost, suggested in part by considerations of locality. To see why, consider again (39) and (43). An analysis that postulates both lists of VIs effectively flattens the traditional divide between *strong* and *weak* suppletion: Roots with stem allomorphs that bear no phonological resemblance to each other, like $\sqrt{\text{EAT}}$, are treated the same as Roots whose stem allomorphs show clear segmental overlap, like $\sqrt{\text{BEAT}}$.

One well-known issue with this type of analysis is that it risks missing significant phonological generalizations, as pointed out most recently in Embick and Marantz (2005). Modern Greek ablaut alternations are admittedly not part of the language's regular phonology; but verbs still cluster into classes in terms of which ablaut pattern they show, and it seems plausible that learners are sensitive to such generalizations. *How* speakers encode these generalizations is, ultimately, an empirical question. Authors such as Haugen and Siddiqi (2013) and Haugen (2016) are at pains to emphasize that this question is difficult to answer; but this analytical difficulty does not itself warrant a solution that effectively circumvents the question altogether, as (43) does.

Here, I articulate one more concern with generalized Stem Listing, inspired largely by the argument in Embick (2012). Consider again the analysis of the clearly suppletive Greek verbs in (40)-(42). A striking feature of the adjacency-based theory of allomorphy defended here was that conditioning of insertion at the Root by a higher node is possible only under limited circumstances, namely, when all heads between the Root and the higher node are null. Because Roots are typically the most embedded node in a morphological word, this situation is presumably even rarer for Roots than for functional morphemes. In other words, for Roots to show suppletion by an ostensibly non-local node, many morphological planets have to align; the Greek verbs in Table 9 simply instantiate this rare case.

A virtue of this way of thinking is that it helps capture a general asymmetry between strong and weak suppletion. Weak suppletion, involving alternations between phonologically overlapping stem shapes as in English *sing-sang* or Greek ***ðir/ðar*** 'beat', is commonly found. By contrast, strong suppletion, involving phonologically dissimilar stems, is arguably rarer both intra- and cross-linguistically: in Greek, for example, it is exemplified by just the three verbs of Table 9.

Under a strict theory of allomorphic locality, this asymmetry is expected: strong suppletion requires a particular set of structural conditions that will be rarely, if ever, met. If weak suppletion is not subject to these conditions precisely because it does not involve true allomorphy, we have a way of understanding why it is arguably much more frequent. An approach that generalizes Stem Listing at the expense of Morphophonology does not seem ideally positioned to capture this asymmetry: if all stem allomorphy involves distinct pieces in competition, why is one type much rarer than the other?

An important caveat is necessary here: the strength of this argument going forward depends to a large extent on an understanding of the structural conditions governing morphophonological readjustment. If readjustment rules are commonly triggered by affixation of particular morphemes local to the target of readjustment, as in Halle and Marantz (1993: 124-138), locality on its own will often not be able to distinguish between true allomorphy and morphophonological readjustment, and something more would need to be said about what possible empirical asymmetries between the two may follow from. The general stance advocated here is that identifying domains where Stem Listing and Morphophonology may make distinct predictions should be an active domain of inquiry. The intricacies implicated in teasing apart the different analytical avenues embodied in (46)-(47) subsume, but cannot be limited to, conceptually oriented argumentation of the type that has fueled recent work on these issues.

Thus far, we have examined grounds on which to suspect that a theory generalizing Stem Listing at the expense of Morphophonology may be disfavored. It is worth asking what the opposite direction of reduction would entail; what about the possibility of a theory that employs Morphophonology, and disallows true Root allomorphy?

The idea that allomorphy is restricted to the functional vocabulary is not new within DM; Marantz (1995, 1997) conjectures that Root suppletion must be barred for reasons related to the (non-)individuation of Roots, and the idea recurs in later work (Borer 2014; Embick 2000; Embick and Marantz 2005; Embick 2010). The issue has been the topic of recent disagreement, owing to a recent focus on cases of apparent suppletion cross-linguistically (Bobaljik and Harley 2017; Choi and Harley 2019; Harley 2014a; Haugen and Siddiqi 2013; Merchant 2015). These works argue that the existence of Root suppletion is an empirical reality: matters of cross-linguistic rarity aside, forms like the three Greek verbs in Table 9 arguably suggest that Root suppletion must be countenanced by the theory after all. Note that, although some instances of apparent suppletion can be treated as involving functional material, such as the auxiliaries and copulas of many Romance languages and perhaps verbs with 'light' properties like English *go*, the same case cannot be made as easily for the Greek Roots at issue here.

The widespread empirical focus on cases of apparent suppletion is an important step forward in this domain. But the assertion that alternations like those in Table 9 involve suppletion is itself predicated on an assumption, namely, that there is a single Root underlying the relevant forms. Whether this assumption is warranted is an important question, and the answer may well vary between cases of apparent suppletion.

One may ask what the alternative would be: if not Root suppletion, what else could govern the alternations in Table 9? A relatively underdiscussed possibility is that these alternations in fact involve multiple Roots occupying complementary portions of the relevant semantic space. Such cases are not as exotic as they first sound. In discussing a case of putative suppletion in Hiaki from Harley (2014b), where verbs apparently vary depending on the number specification of their internal argument, Borer (2014) notes the case of English *murder* and *massacre*: does the fact that these two verbs are encyclopedically similar but come bundled with different expectations of the number of their object warrant an analysis whereby they constitute different realizations of the same Root?

Whether a given alternation involves the same Root or not is, then, an empirical question in its own right. In discussing the Greek alternations of Table 9 or any similar case, one can ask what diagnostics for Root identity we have at our disposal. The answer will likely vary from language to language;[16] in the case of Greek, a starting point would be to specify what it would mean for a given Root to occur only in, say, [+PFV] contexts. Pending a deeper understanding of Aspect in the language, I leave this question open.

6 Conclusion

I have presented three case studies on morphological intervention from the Modern Greek verbal system. In the first two cases, the realization of a head may be conditioned at a distance, but only when all intervening heads are null; overt interveners cause the target of allomorphy to retreat to a default realization.

I have argued that these facts follow under a strict adjacency-based approach to the locality of allomorphy, one whereby apparently non-local conditioning is possible only across null nodes. The same facts do not seem amenable to a less restrictive approach such as one based on spanning.

This conclusion leads to a re-examination of apparent evidence in favor spanning from the same language: upon closer examination, Root suppletion in Greek is not non-local. In fact, adjacency-based theories may allow us to derive the restricted distribution of true Root suppletion compared to morphophonological readjustment; important questions then arise for the division of labor between contextual allomorphy and readjustment, and for the nature of allomorphy of Roots more generally.

The idea that null exponents are transparent for the purposes of allomorphic adjacency recurs throughout this paper. I have defended an understanding of this transparency that crucially implicates the operation of Pruning operating over linearized structures. I have argued that the details of the case studies presented here favor a particular conception of

[16] Ellipsis identity is a possible diagnostic here. This type of thinking is indeed found: see e.g. Choi 2019: 3.1 for Korean honorific suppletion, and Harley (2014a) for Hiaki ellipsis data in response to Borer (2014); see also Gillon (2012) for a parallel argument-structural case. Two points are in order here. Firstly, the assumption behind this diagnostic is that ellipsis identity diagnoses Root identity; though this seems plausible, making the underlying reasoning explicit is an important goal. Secondly, for the specific case of the Greek Roots in Table 9, ellipsis will unfortunately not help: to apply the ellipsis diagnostic, we would need to elide a constituent below Asp, and examine whether the outcome is grammatical if Asp is mismatched. Greek does not have low ellipses of the English VP ellipsis type, so the relevant test cases cannot be constructed.

Pruning, whereby this operation is destructive, completely removing nodes from the representation, over weaker implementations of the idea that null nodes are transparent.

At various points, questions have been raised on the specifics of the mechanism of spanning. An important question concerns how competition is adjudicated in this theory in cases where partially overlapping spans can be targeted for insertion. I have also highlighted two technical issues with spanning, which I have dubbed the *problem of otiose nodes* and the *problem of non-persistent spans*. Addressing these spanning-internal issues is an important step towards enabling more detailed theory comparison.

As in any domain of inquiry, arguing for or against different theories is a process that takes place at a level which includes, but is not limited to, consideration of individual case studies. How well the arguments here generalize depends to some extent on whether cases of intervention of the kind discussed here obtain more broadly. This question is left for a more systematic cross-linguistic discussion; here, I have tried to argue on the basis of Greek that advancing our understanding of the locality conditions on allomorphy requires focus not only on visibility, but also on intervention. This type of focus should help sharpen our understanding of how specificity and locality interact to give rise to constraints on allomorphy.

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