Greek Root-Allomorphy without Spans

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1. Background
1.1. Locality in morpho-syntactically-conditioned allomorphy

This paper deals with the locality constraints on morpho-syntactically-conditioned morphological alternations. In such alternations, the exponence of an element X depends on the morpho-syntactic context in which X occurs. The notation in (1) will be used to describe a situation where X is realized as β in the presence of the morpho-syntactic feature Y, and as α elsewhere.[1] In this case, Y will be said to *condition/trigger* allomorphy on X which will be referred to as the *target* of allomorphy. α and β will be referred to as *allomorphs* of each other. A concrete example from English is found in (2), where past tense ([+PST]) is the feature that triggers allomorphy on $\sqrt{\text{GO}}$, and where *go* and *went* are allomorphs of each other.

(1)   a. $[\sqrt{\text{X}}] \leftrightarrow \beta \,/\, \_\_ \,[\text{Y}]$ (2)   a. $[\sqrt{\text{GO}}] \leftrightarrow went \,/\, \_\_ \,[+\text{PST}]$
       b. $[\sqrt{\text{X}}] \leftrightarrow \alpha$ b. $[\sqrt{\text{GO}}] \leftrightarrow go$

One question that researchers have been interested in is whether there are locality constraints acting upon allomorphy and what the relevant constraints are (e.g. Embick, 2010; Bobaljik, 2012; Merchant, 2015; Moskal, 2015; Moskal & Smith, 2016). A strong hypothesis defended in Embick (2010) has been that, the trigger and the target of allomorphy must be linearly adjacent to each other, as in (3).[2]

(3)   **Node Adjacency Hypothesis** (henceforth, NAH; reformulated from Merchant, 2015)
      The appearance of a particular outward-sensitive allomorph μ can be conditioned only by morphosyntactic features of a node that is linearly adjacent to μ.

According to the view of Morphology where roots are categorized in the syntax (e.g. Distributed Morphology), there is always a categorizer (for our purposes v, since we'll be dealing with verbs) that structurally intervenes between the root and higher functional heads. In the case of (2), a v is therefore assumed to structurally intervene between $[\sqrt{\text{GO}}]$ and $[+\text{PST}]$, the exponent of v being $\varnothing$.

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[1]   The formalism here implies that (1a) and (1b) are separate Vocabulary Items, i.e. $\alpha \sim \beta$ is treated as a 'suppletive' alternation. We believe that many of the relevant alternations are better captured in terms of morphophonological changes i.e. readjustment rules, because there are recurring patterns that are missed with a suppletion-all-the-way treatment. Since the main claim we want to make is not affected by this theoretical debate, we choose to use the formalism in (1) throughout nonetheless, for an easier comparison to Merchant (2015) who assumes this treatment for all alternations relevant to this paper.

[2]   The hypothesis in (3) is intended as a necessary, not as a sufficient locality condition for the occurrence of allomorphy. It is evident that there are also additional relevant restrictions at play. For example, whereas [+PST] triggers root-allomorphy on $[\sqrt{\text{GO}}]$ when the two are realized within the same morphological word, in periphrastic constructions where [+PST] is realized on the auxiliary, root-allomorphy on $[\sqrt{\text{GO}}]$ does not occur, even though the trigger and the target are linearly adjacent to each other e.g. *had gone* (for discussion of periphrastic constructions in relation to the locality of allomorphy see Bobaljik, 2012). Even within the same morphological word, and even if the trigger and the target are linearly adjacent to each other, allomorphy is in some cases systematically blocked, e.g. in denominal verbs (e.g. *The soldiers ringed the city* rather than **The soldiers rang the city*) (for references and discussion, see Adamson, 2017). Given all of the cases we discuss occur within single-category morphological words, we will not be concerned with such additional restrictions.

Without further comment, this situation violates (3). Embick (2010) therefore assumes, along with (3), the operation of *Pruning*, whereby nodes realized as ∅ get eliminated from the structure, as illustrated in Table 1. In this paper, we follow Embick (2010) in making this assumption. The condition in (3) is therefore taken to allow for allomorphic triggering between elements that are structurally non-adjacent to each other, as long as all nodes that structurally intervene between the trigger and the target are realized as ∅.

$$\sqrt{\text{GO}} \,]_{\sqrt{}} \, v \,]_v \, [\text{+PST}] \,]_{\text{TNS}}$$

rules of exponence	*derivation*
$\sqrt{\text{GO}} \leftrightarrow \text{go}$ $v \leftrightarrow \varnothing$	a. *Vocabulary Insertion*: ⤳ $\text{go} \,]_{\sqrt{}} \varnothing]_v \, [\text{+PST}] \,]_{\text{TNS}}$ b. *Pruning*: $\text{go} \,]_{\sqrt{}} \, [\text{+PAST}] \,]_{\text{TNS}}$
$\sqrt{\text{GO}} \leftrightarrow \text{went} \,/\, \_] \, [\text{+PST}] \,]_{\text{TNS}}$ $[\text{+PST}] \leftrightarrow \varnothing \,/\, \_]_{\text{TNS}}$	c. *Vocabulary Insertion*: ⤳ $\text{went}]_{\sqrt{}} \, \varnothing \,]_{\text{TNS}}$

Table 1: Derivation of the form *went*, involving Pruning

Below, we focus on a particular set of data from Greek root-allomorphy that has been recently presented by Merchant (2015) as a counterexample to (3). Both this paper and Merchant (2015) assume the grammatical architecture developed in Distributed Morphology, i.e. that syntax manipulates abstract features which are only at a later point in the derivation matched with phonological realizations through the process of Vocabulary Insertion and subsequent morphophonological/phonological operations (Late Insertion).

1.2. Merchant (2015)

Merchant (2015) points out that under a particular set of assumptions about Greek morphology drawn from the literature, root-allomorphy in Greek verbs presents us with a counterexample to (3). Following Rivero (1990), Merchant assumes the morpho-syntactic structure in (5), the segmentation of a regular first conjugation Greek verb like *iðrio* 'I found' in Table 2 and the exponence in (4).[3]

'FOUND'	+ACT		−ACT	
3SG.	−PFV	+PFV	−PFV	+PFV
−PST	**iðri**-i	**iðri**-s-i	**iðri**-ete	**iðri**-θ-i
+PST	**iðri**-e	**iðri**-s-e	**iðri**-otan	**iðri**-θ-ik-e

Table 2: 3SG forms of *iðrio* 'I found'

(5)

(Merchant, 2015)

(4) a. $\sqrt{\text{FOUND}} \leftrightarrow$ *iðri-*
   b. $[-\text{ACT}] \leftrightarrow \theta \,/\, \_\_\_ \, [\text{+PFV}]$
   c. (i) $[\text{+PFV}] \leftrightarrow \text{ik} \,/\, [-\text{ACT}]\_\_\_[\text{+PST}]$
      (ii) $[\text{+PFV}] \leftrightarrow \text{s}$
   d. $[-\text{PST, 3SG}] \leftrightarrow \text{i}$
   e. $[\text{+PST, 3SG}] \leftrightarrow \text{e}$
   f. $[-\text{ACT, }-\text{PFV, }-\text{PST, 3SG}] \leftrightarrow \text{ete}$[4]
   g. $[-\text{ACT, }-\text{PFV, +PST, 3SG}] \leftrightarrow \text{otan}$

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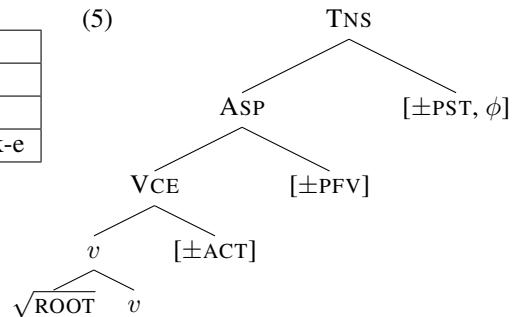
[3] *v*= verbalizer, VCE= Voice, ASP= Aspect, TNS= Tense; [±ACT]= Active/Non-Active, [±PFV]= Perfective/Non-Perfective, [±PST]= Past/Non-Past, , ϕ= subject Person/Number agreement.
[4] Merchant allows for the realization of a span of multiple nodes with a single Vocabulary Item (Svenonius, 2012).

Given the above assumptions about the Greek verbal structure, morphological segmentation and exponence, Merchant (2015) shows that root-allomorphy in Greek verbs poses certain challenges for the hypothesis in (3). Take, for example, the verb *serno* 'I drag', where the root exponent seems to undergo allomorphy triggered by the feature [+PFV], as indicated in (6). The problem that arises with such verbs is observed in their [+PFV,−ACT] forms, where [+PFV] appears to condition allomorphy across an overt [−ACT] exponent (namely, -*θ*-), as sketched in (7), a situation predicted to be impossible by (3). As Merchant himself aknowledges, however, this objection to (3) relies on the above assumptions about segmentation and exponence, which in fusional languages such as Greek is bound to be controversial.[5]

'DRAG'	+ACT		−ACT	
3SG	−PFV	+PFV	−PFV	+PFV
−PST	**ser**-n-i[6]	**sir**-i	**ser**-n-ete	**sir**-θ-i
+PST	e-**ser**-n-e	e-**sir**-e	**ser**-n-otan	**sir**-θ-ik-e

Table 3: Forms of *serno* 'I drag'

(6) a. $\sqrt{\text{DRAG}} \leftrightarrow$ *sir-* / _[+PFV]
     b. $\sqrt{\text{DRAG}} \leftrightarrow$ *ser-* / *elsewhere*

(7)
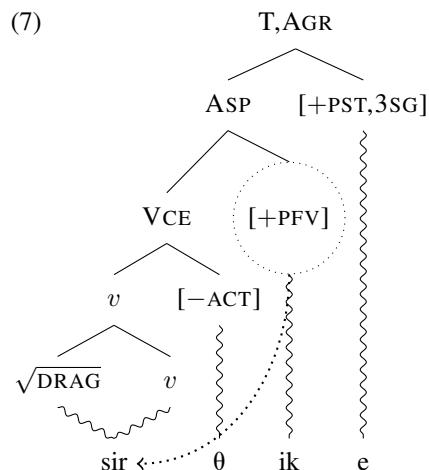
The second problematic case (and we think the most serious one)[7] that Merchant points to is that, in Greek, we also find cases where *multiple nodes* seem to be able to jointly trigger allormophy on the root, as illustrated with the verb *vrexo* 'I wet' in Table 4: the root-exponent *vrax-* only appears in [−ACT,+PFV] forms. Given that VCE and ASP features occupy different nodes in the structure, verbs such as *vrexo* pose a challenge to (3), since root-allomorphy is jointly triggered by two nodes linearized on the same side of the target, thereby violating adjacency.

'WET'	+ACT		−ACT	
3SG	−PFV	+PFV	−PFV	+PFV
−PST	**vrex**-i	**vrek**-s-i	**vrex**-ete	**vrax**-i
+PST	e-**vrex**-e	e-**vrek**-s-e	**vrex**-otan	**vrax**-ik-e

Table 4: Forms of the verb *vrexo* 'wet'

(8) a. $\sqrt{\text{WET}} \leftrightarrow$ *vrax-*/_[−ACT,+PFV]
     b. $\sqrt{\text{WET}} \leftrightarrow$ *vrex-*/ *elsewhere*

(9)

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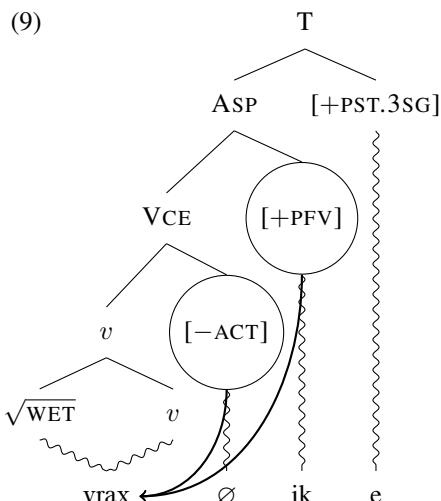
[5] We later discuss the different possible alternative ways of going about segmentation and exponence of -*θ* and -*ik*.

[6] Merchant (2015) actually considers -*n*- as part of the [−PFV] form of the root. We instead segment it as a separate exponent (see, e.g. Philippaki-Warburton, 1973). This can be either an exponent of *v* in the context of [−PFV] or simply an exponent of [−PFV], that applies in the context of a specific class of roots. This change of assumption does not seem to us to affect Merchant's argumentation, but it will be relevant for our own proposal.

[7] This is because this objection does not rely on particular assumptions about the segmentation and exponence which as we have already mentioned are not uncontroversial.

Given these observations, Merchant (2015) proposes to replace (3) with a weaker locality condition that can capture the above cases. He proposes that the locality constraint on allomrophy should be formulated in terms of *structurally adjacent spans* rather than of *linearly adjacent nodes*, as in (10). The term *span* refers to "a complement sequence of heads [...] in a single extended projection" (Svenonius, 2012:1), i.e. a set of contiguous nodes (cf. Moskal & Smith, 2016). Every individual node is a trivial span.

(10)   **Span Adjacency Hypothesis** (reformulated from Merchant, 2015)
         The appearance of a particular outward-sensitive allomorph μ can be conditioned only by morphosyntactic features of a span that is structurally adjacent to μ.

The hypothesis in (10), Merchant argues, allows us to capture both types of problematic cases described above, since in both, the relevant root-allomorphy can be thought to be triggered by features of the VCE-ASP span, which is in both cases taken to be structurally adjacent to the target.[8]

(11) a.

TNS/AGR

ASP   [+PST,3SG]

VOICE   [−PFV]

v [−ACT]

$\sqrt{\text{DRAG}}$ v

sir ← θ   ik   e

b. [$\sqrt{\text{DRAG}}$, v] ↔ sir / _[−ACT, +PFV]

(12) a.

TNS,AGR

ASP   [+PST.3SG]

VOICE   [+PFV]

v [−ACT]

$\sqrt{\text{WET}}$ v

vrax ← ∅   ik   e
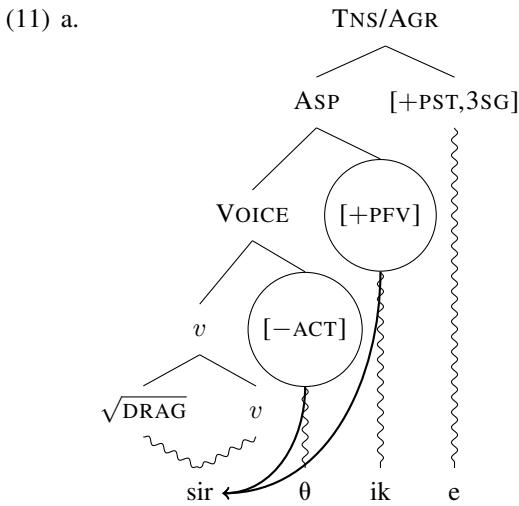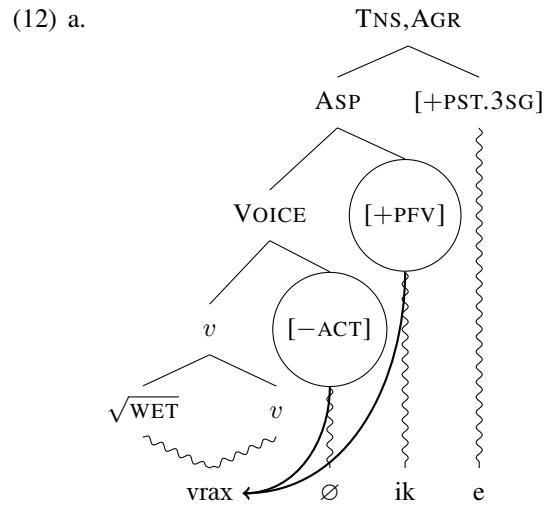
b. [$\sqrt{\text{WET}}$, v] ↔ vrax / _[−ACT, +PFV]

1.3. Overview of the paper

In this paper we argue that Merchant's abandonment of (3) leads to the loss of an implicational generalization, namely, that root-allomorphy never occurs in the presence of overt verbalizers. We propose an alternative account of the above-mentioned problematic cases of Greek root-allomorphy under which (3) is not violated and where ASP and VCE form a single node via re-bracketing .

The remainder of the paper is organized as follows. In section 2, we show how Merchant's solution misses the implicational generalization involving the presence of an overt verbalizer and the occurrence of root-allomorphy. In section 3 we turn to our proposal and discuss how it allows us to both explain the above cases and to maintain (3). Section 4 concludes the paper.

2. A problem with Merchant's solution

Let us first point out that (10) receives a non-straightforward interpretation in Merchant (2015). According to (10), ASP may only trigger root-allomorphy together with VCE, since ASP itself is not adjacent to the root, and therefore, root-allomorphy in verbs like *serno* (Table 3), should be analyzed as involving root-allomorphy triggered by [±ACT, +PFV]. Though Merchant stresses that no nodes in an allomorphy-triggering span should be 'otiose', it is hard to take the VCE features in such cases to not

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[8] Merchant assumes that what we have been calling 'root-exponent' may actually be realizing both the root and v, (i.e. that it is a cumulative exponent/lexical span/portmanteu exponent) in an attempt to do away with pruning v altogether. He aknowledges, however, that, assuming Pruning, v may equivalently be assumed to be realized separately from the root, with ∅ as its exponent.

be otiose, since they seem to play absolutely no role in the triggering of the particular root-allomorphy, other than helping us meet the condition in (10). So once we adopt an interpretation of (10) where cases such as the one illustrated with *serno* are ruled in, the empirical predictions of (10) become equivalent to those of an alternative hypothesis such as the one in (13), where adjacency is eliminated altogether from the locality conditions on allomorphy (cf. Moskal & Smith, 2016).[9]

(13)   **Span Hypothesis (No adjacency required) (cf. Moskal & Smith, 2016)**
       The appearance of a particular outward-sensitive allomorph μ can be conditioned only by morphosyntactic features of a span.

In the following subsection, we show that, unlike a hypothesis such as (3), (10)/(13) seems to be too loose in that it fails to predict an implicational generalization that connects the non-overtness of verbalizers to the occurrence of root-allomorphy.

2.1. Greek root-allomorphy and the (non-)overtness of verbalizers

Greek has various realizations of v that have been increasingly attracting attention in theoretical work (a.o., Spyropoulos et al., 2015; Efthymiou, 2015). Some examples of v are listed in the table below, and the 3SG forms of a verb that involves a verbalizer is given in Table 6.

kaθar-os/i/o	*'clean'* (A)	**kaθar**-*iz*-o	*'I clean'*
trom-os	*'terror'* (N)	**trom**-*az*-o	*'I scare'*
pal-i	*'fight'* (N)	**pal**-*ev*-o	*'I fight'*
plij-i	*'wound'* (N)	**pliɣ**-*on*-o	*'I hurt'*
ɣlik-os/ja/o	*'sweet'* (A)	**ɣlik**-*en*-o	*'I sweeten'*

Table 5: Greek verbalizers

'FIGHT'	+ACT		−ACT	
3SG	−PFV	+PFV	−PFV	+PFV
−PST	**pal**-*ev*-i	**pal**-*ep*-s-i[10]	**pal**-*ev*-ete	**pal**-*ef*-t-i
+PST	**pal**-*ev*-e	**pal**-*ep*-s-e	**pal**-*ev*-otan	**pal**-*ef*-t-ik-e

Table 6: 3SG forms of the verb *palevo* 'I fight'

What is striking is that we find no case in which root-allomorphy occurs across an overt verbalizer, i.e. all cases of root-allomorphy co-incide with $\varnothing$-realizations of v.[11] This can be stated as the implicational generalization in (14), where the occurrence of root-allomorphy implies the absence of an overt verbalizer.

(14)   **Verbalizer/Root-Allomorphy generalization**
       If a verbal form shows root-allomorphy, the form lacks a verbalizer.

Notice that the generalization in (14) is straightforwardly predicted by (3) —Since overt material are predicted to fatally block adjacency between the trigger and the target of allomorphy, v is also predicted to fatally block root-allomorphy triggered by higher functional heads. (10)/(13), on the other hand, have nothing to say about (14). Since this is a major advantage of (3) over (10)/(13), in what follows, we revisit the Greek root-allomorphy data in search for a plausible account of these in keeping with (3).

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[9] Things might be potentially different if we assume, contra Rivero (1990) and Merchant (2015), that ASP is actually lower than VCE in the Greek morphosyntax. We don't explore this direction further here.

[10] The alternations on the labial consonant of the verbalizer are due to predictable morpho-phonological operations involving cross-boundary de-assimilation and voicing assimilation.

[11] The correlation between the overtness of verbalizers and absence of root allomorphy has been claimed for other languages too (e.g., Italian: Calabrese, 2015a,b; Latin and Sanskrit: Calabrese, in press).

3. Towards an alternative solution in keeping with (3)

So far we have shown that, the interpretation of (10) in Merchant (2015) (and the only interpretation of this hypothesis that is consistent with the data presented there) makes (10) equivalent to a hypothesis like (13) that does completely without an adjacency condition between the trigger and the target of allomorphy. Though the weak nature of one such hypothesis allows it to sufficiently capture the facts about what can trigger root-allomorphy in Greek, we have also seen that, if adjacency plays no role in restricting allomorphy, it becomes hard to understand why root-allomorphy only ever occurs in the absence of overt verbalizers, an obvious blocking effect under (3). Recall that the main motivation for considering spans as a unit that can be referred to by allomorphic rules in the first place in Merchant (2015), was that features of VCE and ASP which are, by assumption, situated on different nodes in the structure, may appear to trigger root-allomorphy jointly. In order to achieve the same effect without reference to spans, one may decide to grant the VCE-ASP span the status of a single node. In the extract from Merchant (2015) below, we see that one such solution is explicitly rejected by Merchant himself:

> "While pairs like [Merchant's] *(24) and (25) might suggest that Greek Voice and Aspect nodes are in fact the same node in some way (given standard reasoning from their complementary distribution), and that collapsing the two nodes would provide a way to save the Node Adjacency Hypothesis (assuming counterfactually that we could ignore the implications for the compositional semantics that provide some of the best reasons for positing the articulated syntactic structure to begin with), there are reasons to be doubtful such a solution is feasible. Recall that there are forms in which both the Voice node and the Aspect node have overt exponents: the nonactive perfective pasts in -θ-ik illustrated in* [Merchant's] *(17) above, for example, in which -θ is the usual Voice[-Act] and -ik realizes Aspect[+ Perf]."* (Merchant, 2015:285)

In what follows, we first flesh out a proposal along the lines of the one Merchant rejects in the above extract and then show how Merchant's concerns are easily accommodated. Specifically, the concern about the semantic composition will be avoided by the very nature of the mechanism we adopt, which is post-syntactic. The second concern, namely, that the exponents of VCE and ASP are not always in complementary distribution, will require us to depart from Merchant's assumptions about exponence in Greek verbal forms, which are, however, anyway controversial.

3.1. Our proposal, Part I: VCE and ASP as a single node for Greek morphology

In order to create a single node out of the VCE-ASP span, we adopt the post-syntactic, pre-Vocabulary Insertion rule of rebracketing from Radkevich (2010) which turns two contiguous nodes in the syntactic structure into a single node. The rule is taken to be language-specific but language-wide — not all languages employ this rule, nor do all contiguous nodes in a given language undergo re-bracketing, but if two nodes in a given language do undergo it, this happens across the board.[12] Re-bracketing achieves what spanning achieves, namely, to create a unit which is referrable by rules of morphology, out of multiple contiguous nodes. Our specific proposal is then that this re-bracketing operation in Greek targets the contiguous nodes VCE and ASP, as schematized below.[13]

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[12] Compared to other similar proposed operations e.g. Fusion (which Merchant also rejects), the mechanism proposed in Radkevich (2010) avoids an often-discussed look-ahead problem, whereby re-bracketing is contingent on the available Vocabulary Items in a system where syntactic operations feed Vocabulary Insertion. Since in Radkevich (2010)'s proposal it is not particular Vocabulary Items that trigger the re-bracketing, but rather, re-bracketing occurs independently, the look-ahead problem is avoided.

[13] Note that we keep AGR and TNS on separate nodes in our own structures, even though we have them in a single node in our illustration of Merchant's argumentation, just as he does. This is because we believe that a particular complication arises regarding the morphosyntax of TNS and AGR, as might also become evident from the discussion that follows. It has been often assumed that TNS and AGR are realized on a single node in Greek (e.g. Rivero, 1990), but it has also been claimed that in certain cases, e.g. in the [−ACT,+PFV,+PST] forms, they are realized separately (e.g. Spyropoulos & Revithiadou, 2009; Manzini et al., 2016). We also note that in [−ACT,−PFV,+PST] forms there is also a previously ignored and plausibly segmentable [+PST] exponent, namely -*n*, which however appears to the

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        AGR                                           AGR
       /   \                                         /   \
     TNS   [φ]                                     TNS   [φ]
    /   \                              →          /   \
  ASP   [±PST]                                VCE,ASP  [±PST]
 /   \                                       /   \
VCE  [±PFV]                                 v    [±ACT,±PFV]
/  \                                       /  \
v  [±ACT]                               √ROOT  v
/  \
√ROOT  v
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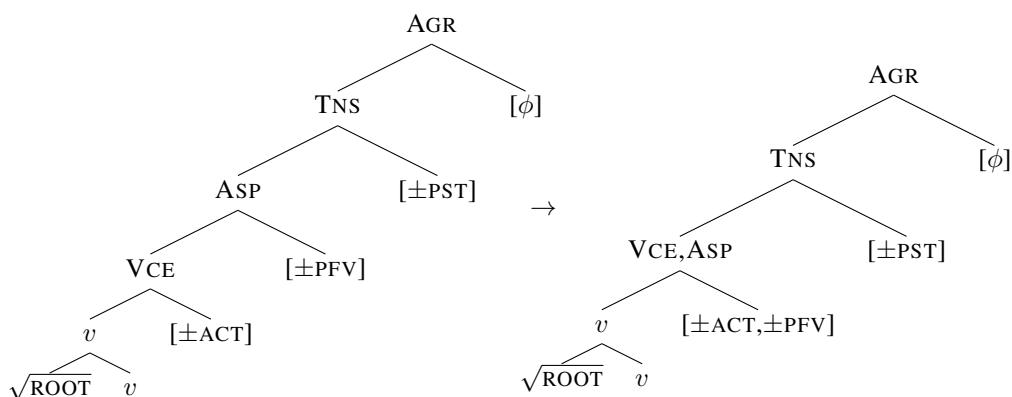
Note that, since the rule of re-bracketing we adopt is post-syntactic, it is not expected to change anything for the compositional semantics of the structure, thus immediately avoiding the first one of Merchant's concerns from the extract above. In the next subsection, we address the second one.

3.2. Our proposal, Part II: What are -θ and -ik exponents of?

Merchant's second and main concern is the problem that arises in our proposal with the exponence he assumes. Under the assumptions that -θ is an exponent of [−ACT] and -ik one of [+PFV], we should never be able to find -θ and -ik co-occurring, a prediction which is not borne out, as evident from the [−ACT,+PFV,+PST] forms, e.g. *iðri-θ-ik-a* in Table 7.[14] We first want to point out that neither of these assumptions about the exponents -θ and -ik is uncontroversial (see e.g. discussions in Philippaki-Warburton, 1973; Joseph & Smirniotopoulos, 1993; Galani, 2005; Spyropoulos & Revithiadou, 2009; Manzini et al., 2016). To see why this is the case, Table 7 presents the inflectional morphology of the regular, first conjugation Greek verb *iðrio* 'I found'.

		−PFV,+ACT	+PFV,+ACT	−PFV,−ACT	+PFV,−ACT
−PST	1SG	iðri-o	iðri-s-o	iðri-ome	iðri-**θ**-o
	2SG	iðri-is	iðri-s-is	iðri-ese	iðri-**θ**-is
	3SG	iðri-i	iðri-s-i	iðri-ete	iðri-**θ**-i
	1PL	iðri-ume	iðri-s-ume	iðri-omaste	iðri-**θ**-ume
	2PL	iðri-ete	iðri-s-ete	iðri-osaste	iðri-**θ**-ite
	3PL	iðri-un	iðri-s-un	iðri-onde	iðri-**θ**-un
+PST	1SG	iðri-a	iðri-s-a	iðri-omu-n	iðri-**θ**-**ik**-a
	2SG	iðri-es	iðri-s-es	iðri-osu-n	iðri-**θ**-**ik**-es
	3SG	iðri-e	iðri-s-e	iðri-ota-n	iðri-**θ**-**ik**-e
	1PL	iðri-ame	iðri-s-ame	iðri-omasta-n	iðri-**θ**-**ik**-ame
	2PL	iðri-ate	iðri-s-ate	iðri-osasta-n	iðri-**θ**-**ik**-ate
	3PL	iðri-an	iðri-s-an	iðri-onda-n	iðri-**θ**-**ik**-an

Table 7: Inflectional morphology on the verb *iðrio* 'I found'

As can be seen from the table above, the distributions of -θ and -ik are compatible with multiple analyses for each of these pieces (see Table 8 for a summary of the main proposals). Specifically, the distribution of -θ is compatible with and in the past has been analyzed as a cumulative exponent of [−ACT,+PFV] (Joseph & Smirniotopoulos, 1993), or an exponent of [−ACT] in the context of [+PFV] (Rivero, 1990; Merchant, 2015; Spyropoulos & Revithiadou, 2009; Manzini et al., 2016). Similarly,

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right of AGR morphology, see Table 2. Though we leave an account of these facts for the future, we keep the nodes separate for the rest of the paper, since it will be important for our analysis of the exponent *-ik*.

[14] We assume, following Spyropoulos & Revithiadou (2009) Merchant (2015) and Manzini et al. (2016), that -θ and *-ik* are separate exponents and not a single one *-θik* (e.g. Philippaki-Warburton, 1973; Galani, 2005), due to the fact that the two parts also appear independently of each other. -θ appears without *-ik* in [−ACT,+PFV,−PST] forms, while *-ik* appears without -θ in the [−ACT,+PFV,+PST] forms of a class of verbs called 'athetic' (Merchant, 2015).

the distribution of *-ik* has been analyzed it as a cumulative exponent of $[-\text{ACT},+\text{PFV},+\text{PST}]$ (Joseph & Smirniotopoulos, 1993), as an exponent of $[+\text{PFV}]$ in the context of $[-\text{ACT},+\text{PST}]$ (Rivero, 1990; Merchant, 2015) or as an exponent of $[+\text{PST}]$ in the context of $[+\text{PFV}]$ (Spyropoulos & Revithiadou, 2009; Manzini et al., 2016). Since the issue seems far from settled, we take it that the particular assumptions made in Merchant (2015) regarding this matter can't be a real obstacle to analyses that require different assumptions about exponence. Given our proposal in the previous section, we follow Joseph & Smirniotopoulos (1993) in assuming that *-θ* is an exponent of $[-\text{ACT},+\text{PFV}]$, while for *-ik*, we follow the view that it is an exponent of $[+\text{PST}]$ (Spyropoulos & Revithiadou, 2009; Manzini et al., 2016), but contrary to the cited authors, we take it to be triggered in the context of $[-\text{ACT},+\text{PFV}]$. (15) presents our assumptions in the form of rules of exponence, while Table 8 compares of our account with other proposals that treat *-θ* and *-ik* separately.

(15) a. $[+\text{PFV},-\text{ACT}]\leftrightarrow\text{-}\theta$
      b. $[+\text{PST}] \leftrightarrow$ *-ik* / $[+\text{PFV},-\text{ACT}]$__

	θ	*-ik-*
Rivero (1990) Merchant (2015)	$[-\text{ACT}]$ / __$[+\text{PFV}]$	$[+\text{PFV}]$ / $[-\text{ACT}]$ __$[+\text{PST}]$[15]
Spyropoulos & Revithiadou (2009) Manzini et al. (2016)		$[+\text{PST}]$ / $[+\text{PFV}]$ __
Joseph & Smirniotopoulos (1993)	$[-\text{ACT},+\text{PFV}]$	$[-\text{ACT},+\text{PFV},+\text{PST}]$
Christopoulos & Petrosino (2018)		$[+\text{PST}]$ / $[-\text{ACT},+\text{PFV}]$ __

Table 8: Summary of the main accounts of *-θ-* and *-ik-*

The assumptions about exponence that we make accommodate Merchant's second concern, namely that, if ASP and VCE are a single node, all their exponents should be in complementary distribution —under our solution, the only reason the exponents *-θ* and *-ik* may co-occur is because they are not both exponents of either ASP or VCE. Having shown that an analysis whereby VCE and ASP are a single node by the time of Vocabulary Insertion is actually plausible more generally, we move on to show how, under this analysis, the problematic cases of Greek root-allomorphy mentioned at the begining of the paper end up obeying adjacency, i.e. how they are compatible with (3).

3.3. Our proposal, Part III: The cases of root-allomorphy

In verbs like *serno* where root-allomorphy is triggered by the feature $[+\text{PFV}]$, allomorphy occurs under linear adjacency i.e. there is no overt intervener between the trigger and the target, as in (17), where v is pruned (indicated with double lines on the v node).

'DRAG'	+ACT		−ACT	
3SG	−PFV	+PFV	−PFV	+PFV
−PST	**ser**-n-i	**sir**-i	**ser**-n-ete	**sir**-θ-i
+PST	e-**ser**-n-e	e-**sir**-e	**ser**-n-otan	**sir**-θ-ik-e

Table 9: 3SG forms of *serno* 'I drag'

(16) a. $\sqrt{\text{DRAG}} \leftrightarrow$ *sir-* / __$[+\text{PFV}]$
   b. $\sqrt{\text{DRAG}} \leftrightarrow$ *ser-* / *elsewhere*

(17)

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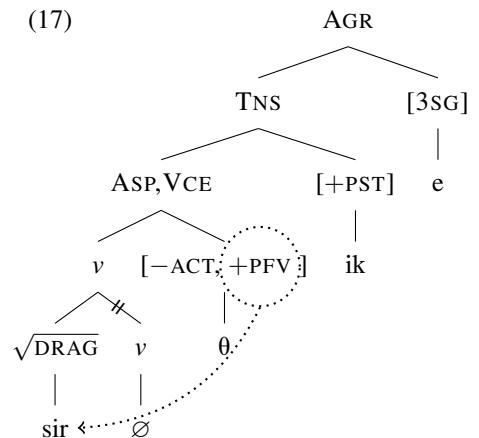
[15] We would like to point out that though this claim is attributed to Rivero (1990) in the literature (e.g. Joseph & Smirniotopoulos, 1993; Merchant, 2015), Rivero herself doesn't explicitly assume this.

Similarly, for cases where root-allomorphy is triggered by a combination of VCE and ASP features. In the case of the verb *vrexo* below, the trigger [−ACT,+PFV] is linearly adjacent to the target, as in (19).

'WET'	+ACT		−ACT	
3SG	−PFV	+PFV	−PFV	+PFV
−PST	**vrex**-i	**vrek**-s-i	**vrex**-ete	**vrax**-i
+PST	e-**vrex**-e	e-**vrek**-s-e	**vrex**-otan	**vrax**-ik-e

Table 10: Forms of the verb *vrexo* 'wet'

(18)   a. $\sqrt{\text{WET}} \leftrightarrow$ *vrax-/_[−ACT,+PFV]*
        b. $\sqrt{\text{WET}} \leftrightarrow$ *vrex-/ elsewhere*

(19)
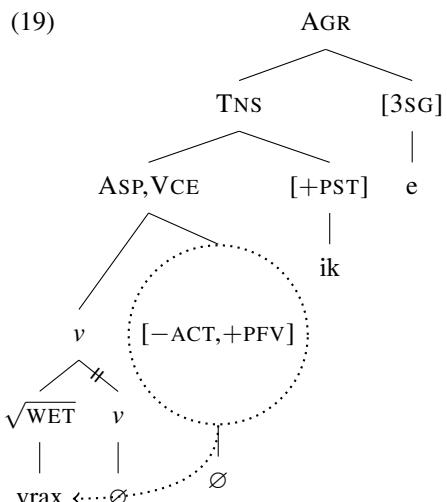
The hypothesis in (3) also predicts that TNS features may potentially trigger root-allomorphy, just in case neither *v* nor [−ACT,+PFV] have an overt exponent. Such cases albeit limited do exist. A striking case where this prediction is borne out is found in the forms the verb *perno* 'take' in Table 11 below, where [+PST] triggers root-allomorphy in the only cell in the paradigm where both *v* and VCE-ASP are realized as ∅. Under a spanning approach, these cases would be accounted for as root-allomorphy triggered by the span [+ACT,+PFV,−PST], which is a mere description of the facts.

'TAKE'	+ACT		−ACT	
3SG	−PFV	+PFV	−PFV	+PFV
−PST	**per**-n-i	**par**-i	**per**-n-ete	**par**-θ-i
+PST	e-**per**-n-e	**pir**-e	**per**-n-otan	**par**-θ-ik-e

Table 11: Forms of the verb *perno* 'take'

(20)   a. $\sqrt{\text{TAKE}} \leftrightarrow$ *pir-/_[+PST]*
        b. $\sqrt{\text{TAKE}} \leftrightarrow$ *par-/_[+PFV]*
        c. $\sqrt{\text{TAKE}} \leftrightarrow$ *per-/ elsewhere*

(21)
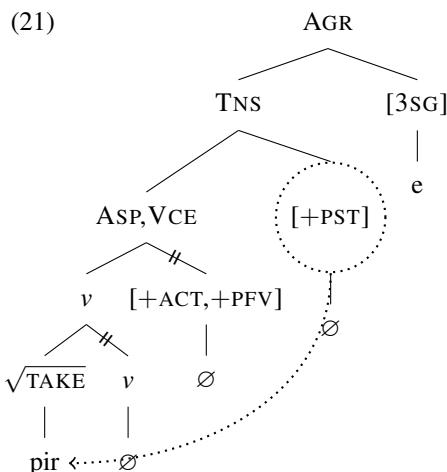
4. Final remarks

In this paper, we focused on a set of data from Greek root-allomorphy that has been recently presented by Merchant (2015) as a counterexample to the strong hypothesis from Embick (2010) that linear adjacency between the trigger and the target is required for morphosyntactically-conditioned allomorphy to arise. We took issue with Merchant's proposed alternative hypothesis which essentially eliminates adjacency as a locality condition for allomorphy, due to the fact that one such solution leads to the loss of a striking (and not language-specific) implicational generalization, namely, that root-allomorphy never occurs in the presence of overt verbalizers, a straightforward blocking effect under the linear adjacency hypothesis i.e. (3). We proposed an alternative account of the problematic cases of Greek root-allomorphy, whereby ASP and VCE form a single node via post-syntactic re-bracketing, allowing us to save the linear adjacency hypothesis.

Our proposal may turn out to have more advantages over the spanning approach than the one mentioned here. First of all, we predict that there will be no case of root-allomorphy triggered by the ASP-TNS span in Greek, which seems to be a true prediction and not one made by the spanning account. Additionally, since our account essentially singles out the VCE-ASP span as having a special status compared to other spans in the Greek morphology, we might also expect that this particular span will behave in a special way in Greek morphology as compared to other spans, e.g. ASP-TNS, even beyond root-allomorphy. This also seems to be a true prediction inasmuch as we find various morphological rules that target specific combinations of VCE-ASP and none that target specific combinations of, say, ASP-TNS. Some examples are the special AGR morphology for the [−ACT,+PFV] (see Table 7), a paradigmatic gap in the [−ACT,+PFV] forms of imperatives, and an optionality in the [+ACT,+PFV] forms of the singular imperatives of second conjugation verbs (e.g. traɣuð-a ∼ traɣuð-i-s-e). We tentatively take these cases as evidence that our proposal is on the right track, while we leave a closer examination of this more general special behavior of the VCE-ASP span for the future.

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