Morphology Driven by Syntax: XP Movement and Allomorphy

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1 Introduction

In the introduction to syntax class I took with Liliane Haegeman in 1994 in Geneva, I sure learned that syntax was driven by morphology. This was primarily referring to head movement (Pollock 1989), as I recall. Later that decade coming back from the GLOW meeting in Berlin, I had the pleasure of bringing Liliane a handout by Matt Pearson on X(P)-movement which she seemed interested in. Now, two decades later, the relation between syntax and morphology is still on many a syntactician's daily mind, and (even) the head vs XP-movement issue doesn't seem to have been decisively settled on all battle grounds. Therefore I will address, in this short paper, how some aspect of morphology is driven by syntax, and more concretely, how an XP movement analysis of verb movement makes more interesting predictions for allomorphy than a head movement analysis, exemplified for one particular kind of case. I do so by adding to Merchant's (2015) discussion of Greek verb stem allomorphy an analytical option which was not considered by Merchant. I will show how my proposal is able to capture the fact that although four feature (value)s are among the conditioning factors, the resultant allomorphy patterns are systematically limited to a maximally three-way variation.

2 Merchant (2015): Spanning allomorphy

Merchant discusses locality constraints on the conditioning context for suppletive allomorphy as exemplified by the voice-aspect system of Greek verbal morphology. The backdrop to his discussion is work by Bobaljik (2000, 2012) and Embick (2010) from which Merchant distills the following proposals:[1]

(1)   a.   Lexical insertion proceeds bottom-up / root-outward.
       b.   Contextual allomorphy requires linear adjacency.

Merchant calls (1b) the *Node Adjacency Hypothesis*. The assumed syntactic ((2)a) and corresponding synthetic ((2)b) structures for the clause and verb, respectively, express the semantic composition of Aspect with a previously formed VoiceP.

(2)   a.   b.
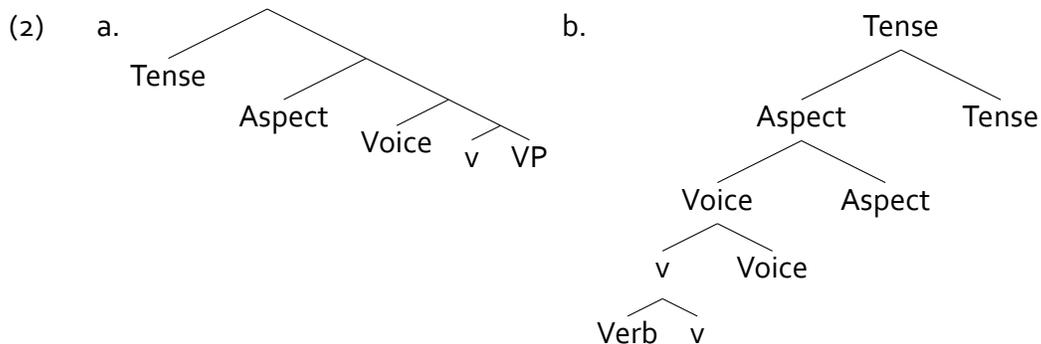
2.1 Merchant's explicit problem

Modern Greek verb morphology, as discussed by Merchant, exhibits stem allomorphy sensitive to the combination of Voice and Aspect specifications, which, in some relevant cases, are individually realized/lexicalized, as illustrated in (4d) below. Of particular (though not exclusive) gravity are three verbs which exhibit a three-way stem suppletion pattern that is sensitive to a combination of (the features of) Voice and Aspect.[2] (3) gives the three stems (with the non.active suffix -θ-) for the three suppletive verbs with a description of the relevant conditioning environments (Merchant 2015: p.277, 11).

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[1]For fuller discussion, obviously, see the sources cited, among others.

[2]A larger set of verbs raises the same locality issue for non-suppletive allomorphy, all of which also show at most a three-way allomorphy pattern, cf. (Merchant 2015: 281).

(3)   'eat'   'see'   'say'
    a.   tro(χ)-   vlep-   le(χ)-   IMPERFECTIVE
    b.   fa(χ)-   ð-   p-   ACTIVE.PERFECTIVE
    c.   faχó-θ-   iðo-θ-   lex-θ-/ipo-θ-   NON.ACTIVE.PERFECTIVE

The categories that determine the context for allomorph selection are some-
times not overtly realized. This fact has some systematicity to it, to which I will
return.

(4)   a.   *tróo*
             tró -Ø   -Ø   -o
             eat -ACT -IMPERF -NON.PAST.1.SG
       b.   *tróχome*
             tróχ -Ø   -Ø   -ome
             eat   -NON.ACT -IMPERF -NON.PAST.1.SG
       c.   *fáo*
             fá -Ø   -Ø   -o
             eat -ACT -PERF -NON.PAST.1.SG
       d.   *faχóϑika*
             faχó -θ   -ik   -a
             eat   -NON.ACT -PERF -PAST.1.SG

I will, for the sake of argument, assume Merchant's morphological segmentation
to be correct. Since Greek (4d) has overt exponents in both (non-active) Voice
and (perfective) Aspect, pruning (i.e. structural annihilation of heads) is not an
option. And since Voice and Aspect are individually targeted by VI (Vocabulary
Insertion) in (4d), they clearly are not fused.

In [+active] Voice, vocabulary insertion needs to know perfective from imper-
fective contexts, (4a) vs (4c). And in [-active] Voice, vocabulary insertion, too,
needs to know perfective from imperfective contexts, (4b) vs (4d). Hence, as-
suming ((2)b), there is a locality problem: Allomorph selection for the stem is
sensitive to features of a non-adjacent head. In Merchant's words: *"The form of
the stem is determined by the aspect of the verb, but by hypothesis, this aspectual
node is not adjacent to the stem in the non-active"* (p.281).

The vocabulary items (lexical insertion rules) in (5) capture the right distribu-
tion. As Merchant points out (p.280), making stem-allomorph selection sensi-
tive to the presence of /θ/ (which would correctly register non-active perfective)
would violate inside-out lexicalization, and is, therefore, on standard assump-

tions not available.

(5) a. $\sqrt{EAT} \rightarrow$ fa(ɣ) / _____ Voice[+act] Aspect[+perf]
     b. $\sqrt{EAT} \rightarrow$ faɣo / _____ Voice[-act] Aspect[+perf]
     c. $\sqrt{EAT} \quad \rightarrow \quad$ tro(ɣ) *(elsewhere form, found in*
     [±active].[imperfective])

Of particular relevance to the proposal I will develop in section 3 is that in the imperfective, (5c) is used irrespective of the Voice specification. Hence it is the perfective Aspect that correlates with the more specific allomorphy, where allo-morph allomorph selection differentiates Voice specification.

2.2   Merchant's proposal

Keeping to the structure in ((2)b), Merchant loosens the locality requirements on allomorphy to a sufficient degree by calling upon the notion of *span* (Abels & Muriungi 2008, Taraldsen 2010, Svenonius 2012) which has been formulated in some of the nanosyntactic literature. Merchant (p.288) mentions Svenonius' (2012) formulation of a span as *"a complement sequence of heads ... in a single extended projection."* This shall be sufficiently precise for our purposes. His pro-posal now consists of two claims, which can be informally rendered as follows.

(6) a. Only a span can be targeted by vocabulary insertion.
     b. Allomorphy can be conditioned only by an adjacent span.

(6a) is standard in the spanning literature.[3] (6b) is Merchant's replacement of (1b), which he calls the *Span Adjacency Hypothesis*. Note that whether the heads of a span are lexicalized individually or in a portmanteau fashion is immaterial to their involvement in allomorph-selection in a subjacent node.[4] This is, of course, expected (for inside-out sensitivity) given inside-out lexicalization.

2.3   Merchant's (implicit) prediction

Of interest to my contribution here is the prediction, implied in Merchant's pro-posal, regarding the variety of allomorphy patterns allowed and hence expected.

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[3]This allows an X-bar friendly variant of aspects of Brody's (2000) mirror theory proposal.

[4]*"Allomorphy is […] conditioned locally […] by features in adjacent spans, whether or not those spans are themselves lexicalized by Vocabulary items."* (Merchant 2015: 294)

In the empirical domain of Modern Greek verbs considered by Merchant, we observe three allomorphy patterns: (a) lack of allomorphic variation (e.g. *enϑarin-* '*encourage*', p.283, 20, 15); (b) two-way allomorphy (e.g. *din-* / *di-* '*dress*', p.283, 20, 12); and (c) three-way allomorphy (e.g. *empne-* / *empnef-* / *empnefs-* '*inspire*', p.283, 20, 3). The latter pattern constituted the crucial cases for his proposal.

Interestingly, though, Merchant's proposal would also allow a four-way allomorphy pattern in which different stem variants would be used in active.imperfective vs. nonactive.imperfective. This, however, does not seem to be attested in Modern Greek. In other words, his proposal may be too permissive. More specifically, not only is there maximally three-way stem allomorphy, but all such cases exhibit the same conditionning contexts. Furthermore the conditioning contexts in the two-way allomorphy cases forms a subset of the three-way pattern. In particular, there is no case of sensitivity to [±active] in the imperfective. On Merchant's account, there is no reason to expect this asymmetry.

In the next section, I will briefly outline an alternative which allows only up to a three-way allomorphy pattern, excluding the unattested fourth case.[5]

3   An XP-alternative

Key to the limitation to a three-way allomorphy pattern is, I believe, the observation that, while indeed stem selection shows sensitivity to both Aspect (perfective vs imperfective) and Voice (active vs nonactive), the Voice-sensitivity is limited to one of the values of the aspectual contrast. Concretely, stem selection is sensitive to the [±active] Voice distinction only in the perfective. On Merchant's analysis this is accidental. I will try to provide a rationale for it.

I will, without discussion, adopt Merchant's (and hence indirectly Rivero's 1990) data structural lay of the land, in particular, the syntactic hierarchy in ((2)a), the treatment of perfective and imperfective as the two values of the same syntactic head Aspect[6], and the overt morphological segmentation (i.e. the proposal that *-ik-* spells out [perfective] in [-active] __ [+past] environments, and that -θ- spells out [-active] in [perfective] environments[7]).

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[5]Christopoulos & Petrosino (2017) propose another account of the Merchant facts, respecting strict adjacency by making use of post-syntactic re-bracketing. Their proposal is, however, inert relative to the limitation to the three-way allomorphy pattern I observe.
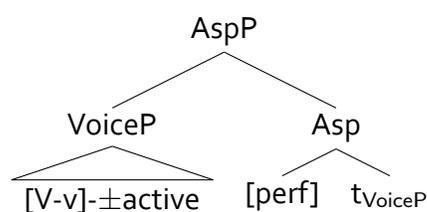
[6]Abandoning this assumption might allow for a more elegant variant of my alternative, but it would also require a more spacious elaboration.

[7]These relevant contexts are all linearly adjacent to the lexicalisation target on my proposal,
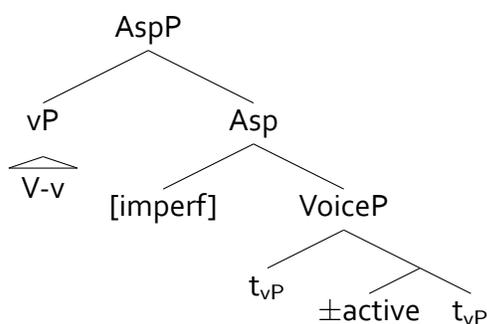
What I crucially reject from his proposal is the idea that the inflected verb corresponds to a complex syntactic head derived by head-movement. Instead I assume verb movement to be XP-movement (Koopman & Szabolcsi 2000, Mahajan 2003). More concretely, the verb moves qua vP or VoiceP (or...), i.e. in a successive-cyclic or a roll-up fashion (Cinque 2005).[8]

Let me propose that Modern Greek distinguishes perfective and imperfective in its syntactic derivation: $Asp_{perfective}$ attracts Voice(P), but $Asp_{imperfective}$ attracts vP, rather than Voice.[9]

(7)   a.

```
                      AspP
                  ┌────┴────┐
              VoiceP        Asp
            ┌───┴───┐     ┌──┴──┐
      [V-v]-±active  [perf]  t_VoiceP
```

b.

```
                  AspP
              ┌────┴────┐
            vP          Asp
          ┌─┴┐       ┌───┴────┐
         V-v      [imperf]   VoiceP
                            ┌──┴──┐
                          t_vP    ┌─┴─┐
                              ±active  t_vP
```

Furthermore, $Asp_{imperfective}$ seems to have the property of hiding from PF everything its mother dominates (i.e. itself and its complement), cf. Merchant (2001) on sluicing.[10]

On this proposal, out of the four logically possible feature combinations (as-

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ignoring traces.

[8]For the present discussion, the crucial difference between XP-movement and head movement emerges on the standard assumption that head movement disallows excorporation. If that assumption is abandoned, my proposal can be mimicked in head movement terms.

[9]It may not be accidental that it is the imperfective - aspect which references "the internal temporal structure of the [event]" (Comrie 1976: 24) - that requires a closer syntactic relation with vP, i.e. with the event.

[10]An effect being that there is no overt mirror principle violation. The fact that the relevant heads are non-overt in the configuration in which their overtness would violate the mirror (i.e. imperfective everywhere and voice in the imperfective) may well suggest a more principled analysis of this correlation, perhaps in terms of phrasal spellout (cf. Starke 2009, Caha 2009). I will leave this for other (occasion)s.

suming, as Merchant does, a binary Voice and a binary Aspect opposition) exactly three strictly linear stem adjacency possibilities are derivable (8). The linearly adjacent environment of the verb stem is identical in (8c) and (8d):

(8) a. [V+v] - [Voice$_{active}$] - [Aspect$_{perfective}$]
      b. [V+v] - [Voice$_{non-active}$] - [Aspect$_{perfective}$]
      c. [V+v] - [Aspect$_{imperfective}$] - [Voice$_{active}$]
      d. [V+v] - [Aspect$_{imperfective}$] - [Voice$_{non-active}$]

Therefore at most a three-way allomorphy pattern is admissible under strict linear adjacency.

(9) a. $\sqrt{EAT} \rightarrow$ fa(ɣ) / _____ Voice[+act]
      b. $\sqrt{EAT} \rightarrow$ faɣo / _____ Voice[-act]
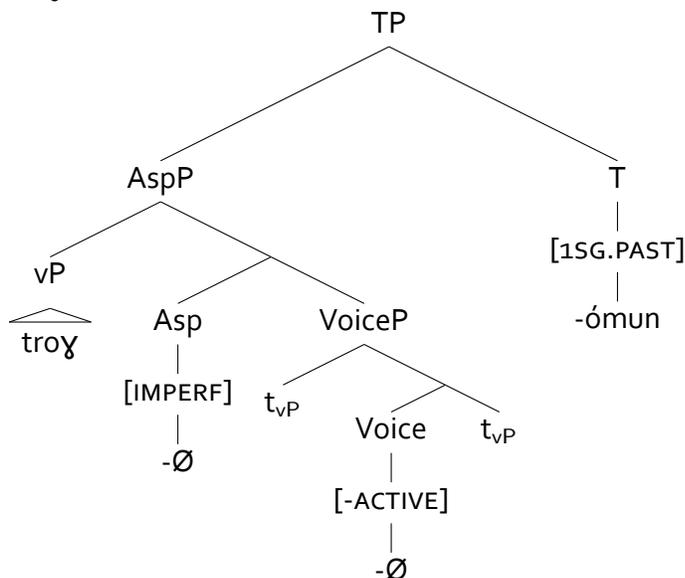   c. $\sqrt{EAT} \rightarrow$ tro(ɣ)   *(elsewhere)*

In the imperfective, the stem is not adjacent to Voice and hence the elsewhere form is used. To enhance clarity, please consult the tree diagrams for the 1.SG.NONACTIVE.PERFECTIVE.PAST form *faɣó-θ-ik-a* (8b)=(9b) in (10),

(10) *faɣó-θ-ik-a*   (1.SG.NONACTIVE.PERFECTIVE.PAST)
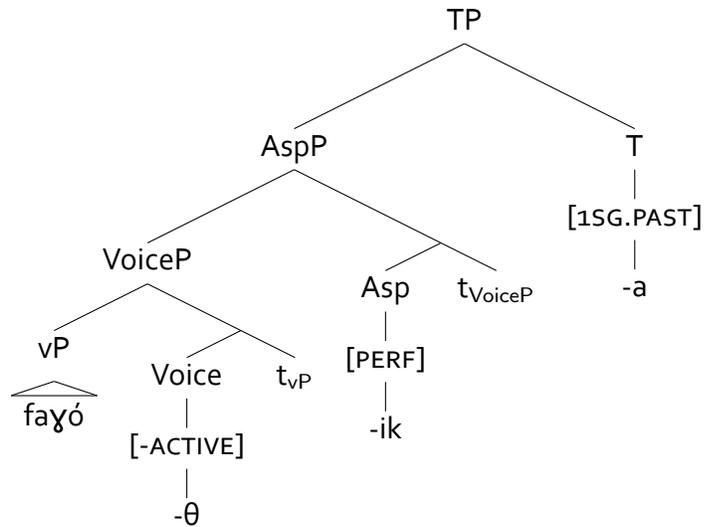
and for the 1.SG.NONACTIVE.IMPERFECTIVE.PAST form *troɣ-ómun* (8d)=(9c) in (11).

(11)   *troɣ-ómun*   (1.SG.NONACTIVE.IMPERFECTIVE.PAST)

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                              TP
                   ┌───────────┴───────────┐
                 AspP                       T
          ┌────────┴────────┐               │
         vP                 │          [1SG.PAST]
        ╱‾‾╲         ┌───────┴───────┐       │
        troɣ        Asp            VoiceP   -ómun
                     │         ┌─────┴─────┐
                 [IMPERF]     t_vP         │
                     │            ┌────────┴────┐
                    -Ø          Voice          t_vP
                                  │
                              [-ACTIVE]
                                  │
                                 -Ø
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This analysis makes a second prediction, essentially a flip-side prediction of the first: Given that T is linearly adjacent to Aspect in the perfective, and linearly adjacent to Voice in the imperfective, it seems natural to expect the possibility of allomorphy in T (tense-agreement) to be sensitive to a [±active] Voice contrast in the imperfective but not in the perfective. This is illustrated here by the 1SG.PAST forms of the verb *tróo 'I eat'* in (12)–(13), comparing the tense-agreement forms (following Merchant taken as fusional, which may be too simplistic) across the four cells of the ±active and ±perfective dimension.

(12)   Imperfective (1SG.PAST, *'eat'*)

    a.   ACTIVE: é-troɣ-a
    b.   NON-ACTIVE: troɣ-**ómun**

(13)   Perfective (1SG.PAST, *'eat'*)

    a.   ACTIVE: é-faɣ-a
    b.   NON-ACTIVE: faɣó-θ-ik-a

The non-active imperfective (12b) is the odd one out. Since only in the imperfective is T linearly adjacent to Voice on my proposal (cf. (11)), this can be suppletion conditioned by [-active] Voice, assuming that the morphosyntactic features stick around for another while after VI. The pattern seems to be rather pervasive in Greek verbal morphology across different conjugation classes and different

tenses.[11] Whether this prediction withstands more detailed scrutiny, only such scrutiny will be able to tell.

4 Conclusion

Modern Greek verb stem allomorphy shows sensitivity to perfective vs imperfective Aspect, and within perfective Aspect to the [±active] Voice distinction. On the assumption that Verb, Voice, and Aspect are individuel syntactic heads in that (hierarchical) order, the sensitivity to both Voice and Aspect has been taken argued, by Merchant, to show the need to loosen the locality restrictions on the conditioning of vocabulary insertion from strict linear *node* adjacency to *span* adjacency.

Observing that the observable allomorphy patterns do not exploit the full potential of diversity allowed under Merchant's approach, but instead systematically fail to distinguish [±active] Voice in the imperfective, I propose an analysis in which the verb stem is linearly adjacent to Voice only in the perfective, and is adjacent to Aspect in the imperfective. On this analysis, strict linear adjacency in allomorph selection without reference to spans can be maintained.

The contrast in linear adjacency is derived on the assumption that word formation is accomplished syntactically, by XP-movement, in conjunction with the proposal that Voice attracts vP, perfective Aspect attracts VoiceP, and, crucially, imperfective Aspect attracts vP.

The proposal may catch a second fly on the same boat, providing the beginning of a principled approach to the generalization that the tense-agreement exponent shows sensitivity to nonactive in the imperfective but not in the perfective.

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[11]I'm grateful to Arhonto Terzi for very helpful confirmation of this prediction.

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