RESEARCH

XP- and X⁰-movement in the Latin verb: Evidence from mirroring and anti-mirroring

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Latin verbs appear to both obey and disobey the Mirror Generalization (Baker 1985), albeit in different inflectional forms (Cinque 1999). Given the importance of the Mirror Generalization to morphosyntactic theorizing, this situation deserves scrutiny. We develop an analysis on which all Latin finite verbs, whether *mirroring* or *anti-mirroring*, share a single, simple, virtually invariant derivation, involving one step of head movement (Asp to T) and one step of phrasal movement (*v*P to [Spec,TP]). On this analysis, the Mirror Generalization is valid for Latin, despite appearances, but it is crucially about structures formed by operations on heads: phrasal movement can give rise to apparent violations of it (Myler 2017). The analysis extends readily to nonfinite forms, solving an anti-mirroring paradox arising among the participles. It also makes correct syntactic predictions. When the verb word is a constituent, it is a TP, and the analysis correctly predicts that it should move as a phrase, not as a head. The analysis also makes correct predictions about the positions of *v*P-adjuncts, and is fully compatible with what is known about leftward argument movement out of *v*P. Finally, unlike two competing analyses (Embick 2000; Calabrese 2019), it accounts for anti-mirroring in Latin without any stipulations placing passive Voice in an unexpectedly peripheral position within the verb word. The larger picture that emerges is one in which phonological words need not correspond to syntactic constituents, but can instead be reflexes of linearly contiguous series of morphemes suspended across potentially vast regions of syntactic space (Julien 2002).

Keywords: Mirror Generalization; Mirror Principle; anti-mirroring; XP-movement; head movement; wordhood

1 Introduction

A great deal of crosslinguistic evidence (see especially Cinque 1999) suggests that something like (1) holds:[1]

(1)   *Mirror Principle* (Baker 1985: 375)
      Morphological derivations must directly reflect syntactic derivations (and vice versa).

The concept in (1) is standardly interpreted as making available the following structural diagnostic:

(2)   If a root and some functional heads in its extended projection (Grimshaw 1991) are assembled into a single "morphological word," then, ceteris paribus, the higher that one of those functional heads is syntactically, the farther away from the root it should be in the morphological word (and vice versa).

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[1] See Bybee (1985) and Rice (2000) for related investigations.

This diagnostic, which makes it possible to infer the composition of portions of clause structure from that of complex words, has been put to use very fruitfully indeed in contemporary work on morphosyntax.

Although (1) is often referred to as the Mirror Principle, it is now typically held—correctly, in our view—that it is not in fact a principle, but a generalization to be derived from more fundamental principles (Brody 2000: 31; Dékány 2018: 3). Accordingly, we will refer to (1)/(2) as the Mirror Generalization (MG), following Brody and Dékány.

Because the MG has played such a prominent role in enabling us to understand syntax/morphology interactions, any apparent counterexamples to it need to be scrutinized to determine whether the MG can survive them—and, if so, what their etiology is. To that end, this paper will investigate certain apparent counterexamples to the MG in Latin, to determine what they reveal about the MG and the relation between syntactic and morphological structure more broadly.
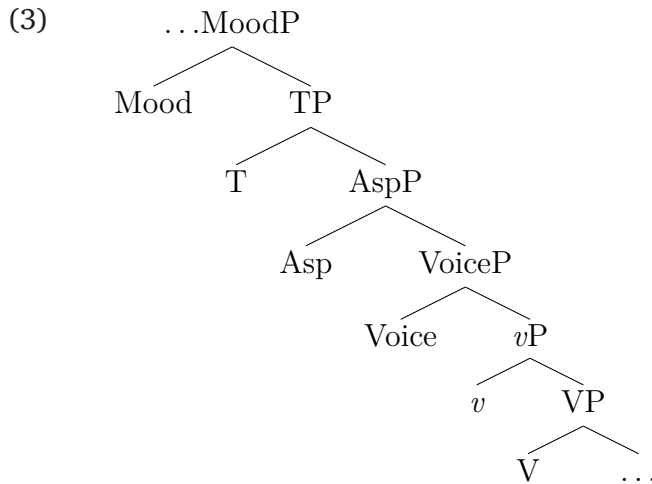
The paper proceeds as follows. Section 2 presents the main empirical puzzle: Latin verbs seem to both obey and disobey the MG, but in different inflectional forms. Section 3 lays out the theoretical desiderata for a principled analysis of this situation. It then develops an analysis (the *XP/X⁰ Analysis*) on which all synthetic finite verb forms in Latin, whether they appear to obey the MG or not, have the same derivation, which involves one step of head movement (Asp to T) and one step of phrasal movement (*v*P-movement to [Spec,TP]). On this analysis, the MG does in fact hold for Latin (as a generalization about structures formed by head movement), but this is obscured in certain verb forms by the application of *v*P-movement.

Section 4 shows that the analysis, though developed for finite forms, extends straightforwardly to nonfinite forms. In particular, the view that Latin makes use of *v*P-movement makes possible a principled understanding of another case of apparent MG noncompliance that arises among the participles. Section 5 investigates whether the analysis is compatible with what is independently known about Latin syntax by testing and confirming two syntactic predictions it makes: (a) that the verb word (which is sometimes a constituent, namely a TP) should be able to move as a phrase, but not as a head, and (b) that the putative *v*P-movement to [Spec,TP] should be able to carry along *v*P-adjuncts. This section also investigates how the XP/X⁰ Analysis interacts with what is independently known about leftward argument movement out of *v*P in Latin. Section 6 reviews two other analyses of apparent MG noncompliance in Latin verbs (Embick 2000 and Calabrese 2019) and shows that they are forced to make stipulations specific to passive morphemes, whereas the XP/X⁰ Analysis is not, providing an argument against the former two and in favor of the latter. Finally, Section 7 summarizes the results of the investigation and lays out the larger conclusions they lead us to about the MG, the syntax/morphology mapping, and the relationship between phonological words and syntactic constituents.

2 The puzzle: Mirroring and anti-mirroring in Latin verb forms

Suppose, following fairly standard assumptions, that the extended projection of V is, in part, the following (argument phrases omitted; cf. Cinque 1999: 106):[2]

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[2] We will refer to the root of the verb (i.e., the head of the complement of *v*) as V, but our analysis will be unaffected if "V" is actually a categoryless root (Marantz 1997).

(3)

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              ...MoodP
              /      \
          Mood        TP
                     /   \
                    T     AspP
                         /    \
                      Asp      VoiceP
                              /      \
                          Voice       vP
                                     /   \
                                    v     VP
                                         /   \
                                        V     ...
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In Latin, the heads in the extended projection of V shown in (3) do seem to be packaged into a single morphophonological word. Therefore, the MG, in conjunction with the clause structure in (3), leads us to expect that the Latin verb word should display the following morpheme order:[3]

(4)   Root > *v* > Voice > Aspect > Tense > Mood   (> = 'precedes')

If this were so, Latin verbs would transparently obey the MG. But in fact, they seem to both obey and disobey the MG, albeit in different parts of their paradigm, as will be shown in Sections 2.1 and 2.2. This is peculiar, and naturally gives rise to the following question:

(5)   Given the crosslinguistic robustness of the MG, how can it be that Latin verbs seem to both obey and disobey it (in different inflectional forms)?[4]

An analysis that answers this question will be developed in Section 3. But first, we will give concrete examples of Latin verb forms that appear to obey the MG (henceforth *mirroring* forms) and Latin verb forms that appear to disobey it (*anti-mirroring* forms). This is the task of the next two subsections.

2.1 Mirroring verb forms

In the pluperfect, the perfective Aspect morpheme (-*v*) occurs closer to the root than does the past Tense morpheme (-*erā*),[5] in accordance with the MG:[6]

(6)   a.   laud-ā-**v**-**era**-m
             praise-TH-PFV-PST-1SG
             'I had praised'

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[3] Assuming iterated head-raising with left-adjunction (cf. Pollock 1989) or lowering with right-adjunction (cf. Embick & Noyer 2001). A wider range of possible morpheme orders is predicted if affix-specific linearization (Harley 2013) is possible. Even if it is, though, syntactically higher heads should always surface outside syntactically lower heads within the morphological word.

[4] This question is of interest not only because apparent counterexamples to the MG need to be scrutinized, for the reasons discussed above, but also because the development of Latin into Romance provides an excellent laboratory in which to learn how morphosyntactic change happens (Ledgeway 2012a; b; Danckaert 2017a, a.m.o.)—but this requires an accurate understanding of the synchronic morphosyntax of the "start" and "end" states.

[5] Embick (2000: 213–214) argues convincingly that -*erā* is not an incorporated form of *esse* 'be'.

[6] For Latin verb paradigms, see Gildersleeve & Lodge (2000) or any other standard Latin grammar (and the Appendix). Attested examples larger than a single verb form are drawn from the Latin linguistic literature. Also given below are a few supplementary constructed examples (marked [C]).

　　b.　laud-ā-**v**-**erā**-s
　　　　praise-TH-PFV-PST-2SG
　　　　'you had praised'

　　c.　laud-ā-**v**-**era**-t
　　　　praise-TH-PFV-PST-3SG
　　　　'he/she/it had praised'

　　d.　laud-ā-**v**-**erā**-mus
　　　　praise-TH-PFV-PST-1PL
　　　　'we had praised'

　　e.　laud-ā-**v**-**erā**-tis
　　　　praise-TH-PFV-PST-2PL
　　　　'you guys had praised'

　　f.　laud-ā-**v**-**era**-nt
　　　　praise-TH-PFV-PST-3PL
　　　　'they had praised'

Likewise, in the future perfect, the same perfective Aspect morpheme (*-v*) occurs closer to the root than does the future Tense morpheme (*-eri*), also in conformity with the MG:

(7)　　a.　laud-ā-**v**-**er**-ō
　　　　　praise-TH-PFV-FUT-1SG
　　　　　'I'll have praised'

　　　b.　laud-ā-**v**-**eri**-s
　　　　　praise-TH-PFV-FUT-2SG
　　　　　'you'll have praised'

　　　c.　laud-ā-**v**-**eri**-t
　　　　　praise-TH-PFV-FUT-3SG
　　　　　'he/she/it will have praised'

　　　d.　laud-ā-**v**-**eri**-mus
　　　　　praise-TH-PFV-FUT-1PL
　　　　　'we'll have praised'

　　　e.　laud-ā-**v**-**eri**-tis
　　　　　praise-TH-PFV-FUT-2PL
　　　　　'you guys will have praised'

　　　f.　laud-ā-**v**-**eri**-nt
　　　　　praise-TH-PFV-FUT-3PL
　　　　　'they'll have praised'

The forms in (6) and (7) follow the MG-compliant template in (8):

(8)　　　Root > Theme Vowel > **Aspect** > **Tense** > $\phi_{\text{(Person + Number)}}$

2.2 Anti-mirroring verb forms

In many passive forms, on the other hand, the exponents of Mood, Tense, and sometimes Aspect occur closer to the root than does the exponent of passive Voice, in seeming contravention of the MG. (The unexpectedly external position of the passive Voice morpheme is discussed in Cinque 1999: 197, citing Calabrese 1985; Embick 2000: 196–199; Baker 2014: 8–9; and Calabrese 2019, §3.4.4.2.)

　　As an example, consider the present passive subjunctive forms of *laud-* 'praise' ((9)). In these forms, the morpheme *-ē*, a portmanteau that expones both subjunctive Mood and

present Tense, occurs closer to the root than does the exponent of passive Voice.[7] In the 3SG, 1PL, and 3PL forms, the Mood/Tense portmanteau -ē is even separated from Voice by an agreement morpheme. (To briefly foreshadow part of the analysis, we will propose below that mood and tense features are both on T in Latin.)

(9)   a.   laud-**e**-**r**
            praise-PRS.SJV-PASS.1SG
            '(that) I may be praised'

        b.   laud-**ē**-**ri**-s
            praise-PRS.SJV-PASS.2SG
            '(that) you may be praised'

        c.   laud-**ē**-t-**ur**
            praise-PRS.SJV-3SG-PASS
            '(that) he/she/it may be praised'

        d.   laud-**ē**-m-**ur**
            praise-PRS.SJV-1PL-PASS
            '(that) we may be praised'

        e.   laud-**ē**-**minī**
            praise-PRS.SJV-PASS.2PL
            '(that) you may be praised'

        f.   laud-**e**-nt-**ur**
            praise-PRS.SJV-3PL-PASS
            '(that) they may be praised'

Nor is anti-mirroring in passive forms restricted to the paradigm in (9). The exponent of passive Voice also occurs farther from the root than do the following morphemes, among others (see the Appendix for the full paradigm):

(10)   a.   *-bi (indicative Mood + future Tense)*
            laud-ā-**bi**-t-**ur**
            praise-TH-FUT.IND-3SG-PASS
            'he/she/it will be praised'

        b.   *-bā (indicative Mood + past Tense + imperfective Aspect)*
            laud-ā-**bā**-t-**ur**
            praise-TH-IMPF.IND-3SG-PASS
            'he/she/it was being praised'

        c.   *-rē (subjunctive Mood + past Tense + imperfective Aspect)*
            laud-ā-**rē**-t-**ur**
            praise-TH-IMPF.SJV-3SG-PASS
            '(that) he/she/it might be praised'

All the forms examined in this subsection follow the template in (11), which appears to violate the MG. (The notation *{X, Y}* here means that the order of X and Y depends on the particular form at hand.)

(11)   Root (> Theme Vowel) > **Mood** + **Tense** (+ **Aspect**) > {$\phi_{\text{(Person + Number)}}$, **Voice**}

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[7] The 2SG form *laudēris* '(that) you may be praised' has an alternate form *laudēre*.

    For convenience, every subjunctive verb is translated here as if it were the main predicate of a rationale clause (e.g., 'so that I may be praised'), but the interpretation of Latin subjunctive verbs is context-dependent (Lakoff 1968, a.m.o.).

The question, then—as mentioned—is how it can be that some verb forms seem to violate the MG (and in a language in which other verb forms obey it, no less).

3 Analysis

An optimal, maximally principled solution to the mirroring/anti-mirroring puzzle just presented should satisfy the following theoretical desiderata:

(12) a. *Uniformity:* All the finite verb forms—whether they appear to obey the MG or not—should share a single derivation (which would keep idiosyncratic, verb-form–specific stipulations to a minimum).
b. *Generality:* Although the puzzle arose among the finite forms, the analysis should extend parsimoniously to (and ideally shed new light on the structure of) nonfinite and even deverbal forms.
c. *Syntactic fit:* Although the puzzle is "morphological," in that it is about morpheme order, the solution should ideally make correct predictions about Latin syntax, and should be compatible with everything that is independently known about it.

This challenge can be met. The present section will develop an analysis of mirroring and anti-mirroring in Latin that satisfies all three desiderata in (12).

On the analysis developed below, mirroring and anti-mirroring verb forms have the same derivation—which involves one step of XP-movement (*v*P-movement to [Spec,TP]) and one step of head movement (Asp to T). The following two subsections lay out this derivation for a mirroring and an anti-mirroring verb form, respectively.
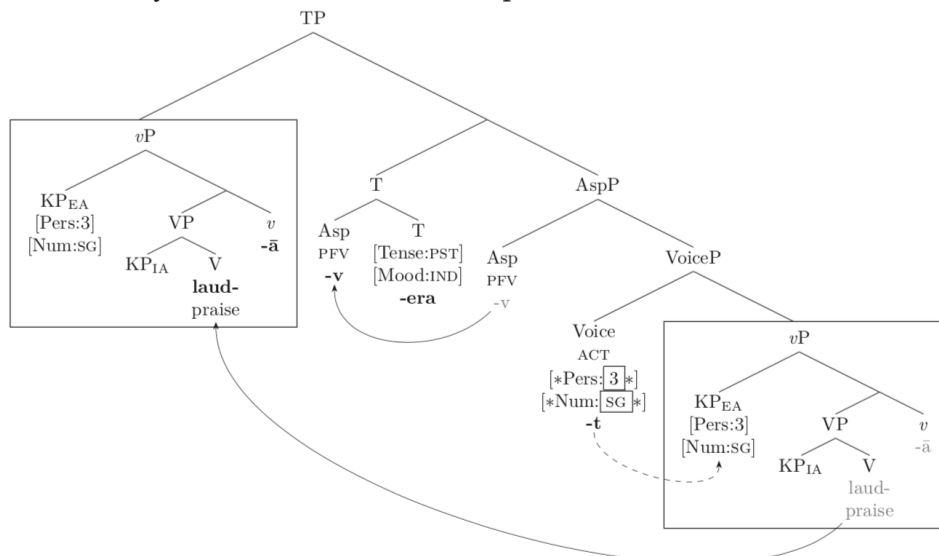
3.1 Deriving the mirroring forms

Consider the following mirroring form:

(13) *Perfective Aspect inside past Tense*
laud-ā-**v**-**era**-t
praise-TH-PFV-PST-3SG
'he/she/it had praised'

On our analysis, (13) has the following derivation:

(14) *Derivation of* laudāverat *'he/she/it had praised'*

Five aspects of this derivation deserve comment.

First, the Voice head in finite clauses bears two ϕ-probes that trigger Agree operations: one for Person and one for Number.[8] (On nonfinite environments, see Section 4.3.) This proposal is motivated by the observation that there appears to be a tight connection in the Latin verb word between the exponence of Voice proper (active vs. passive/nonactive) and the exponence of ϕ-features (henceforth ϕ for short), whose values are obtained from the structurally most prominent nominal.[9] This is particularly clear in passive paradigms such as (9). In the 2PL form *laudē-**minī*** '(that) you may be praised', passive Voice and 2PL are realized by the portmanteau *-minī*. And in the forms in which passive Voice and ϕ are realized separately, their order is variable across forms. Thus, in *laudē-t-**ur*** (3SG), *laudē-**m**-**ur*** (1PL), and *laude-**nt**-**ur*** (3PL), ϕ precedes Voice, but in *laudē-**ri**-**s*** (2SG), Voice precedes ϕ. All this can be accommodated straightforwardly if Voice bears the ϕ-probes in the syntax, and Voice nodes with certain combinations of features after Agree undergo postsyntactic Fission (in the Distributed Morphology sense: Harley & Noyer 1999, §3.3), with the resulting nodes linearized in particular orders depending on their features (cf. Embick 2000: 199).[10]

Secondly, Asp undergoes head movement to T (and is linearized to the left of T, just as the V-*v* complex is in French: Pollock 1989). The derivation in (14) shows this head movement as occurring in the syntax, but that is only for convenience: nothing will hinge on whether this step of head movement, or any other, is syntactic or postsyntactic, so we will remain agnostic on this point. (For discussion, see Matushansky 2006; Arregi & Pietraszko 2018; to appear; Dékány 2018; Newman 2018a; and Harizanov & Gribanova 2019, a.m.o.)

Third, *v*P undergoes phrasal movement to [Spec,TP]. That is, Latin belongs to the class of languages in which the derivation of an ordinary clause involves movement of a (phrasal) verbal projection (cf. many of the papers in Carnie & Guilfoyle 2000 and Carnie, Harley & Dooley 2005). The proposal that Latin has this property is also defended by Danckaert (2012; 2014; 2017a; b) and Gianollo (2016) on independent grounds (modulo certain differences concerning the precise categorial identity of the verbal projection moved, and its landing site; see also Bailey 2010). To our knowledge, however, this hypothesis has never been employed to explain the (mirroring and anti-mirroring) morpheme orders within the Latin verb word; our analysis will do just that.[11]

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[8] Following Heck & Müller (2007), we use the following feature notation: [F:□] = unvalued feature; [∗F:□∗] = unvalued feature that probes for a value; [∗F:$\overline{\text{VAL}}$∗] = initially unvalued feature that has successfully probed for a value.

[9] We assume for concreteness that Latin nominals are KPs, headed by a case morpheme K (cf. Lamontagne & Travis 1987; Bittner & Hale 1996), but nothing hinges on this.

[10] The claim that the ϕ-probes are on Voice might seem surprising, since their counterparts in better-studied languages (e.g., English) are on T. (A reviewer raises this concern in connection with the Person probe, noting that (14) "involves agreement with person features, whose overt exponence is standardly linked to T.") But this component of the analysis is empirically and conceptually unproblematic. Empirically, the location of agreement probes within clause structure varies a great deal crosslinguistically (Cinque 1999, a.m.o.). Conceptually, nothing in the theory rules out Voice heads of the sort proposed here. Since T and Voice are both clausal functional heads, and T bears Person and Number probes in some languages, we expect Voice to in other languages: forbidding this would require a stipulation. This expectation is especially clear because Person and Number probes seem to have no more of an inherent connection to Tense than they do to Voice. That said, the view that the ϕ-probes are on Voice will make some additional assumptions necessary in Section 4.3; see fn. 23 for an alternative.

[11] A reviewer asks what drives this *v*P-movement. We assume for concreteness that, in Latin, T (as well as a certain *a* head discussed in Section 4) bears a movement-driving feature [•*v*•] (omitted in the trees; notation from Heck & Müller 2007), which attracts the closest element bearing the categorial feature [CAT:*v*] (i.e., *v*P) to [Spec,TP] (following the view that movement can be driven by a feature of a c-commanding head; see Chomsky 1995: 297; Lasnik 1995; McCloskey 2001, a.m.o.). This idea could perhaps be made somewhat more explanatory by positing that *v*P-movement is how Latin satisfies the EPP, thereby relating it to superficially different phenomena such as English subject movement (see Bailey 2010; Danckaert 2012;

Fourth, as suggested to us by Nico Baier, T is the locus of both tense and mood features—i.e., T(ense) and Mood are not projected as separate heads in Latin. This view has two advantages over an alternative on which T and Mood are separate heads in Latin. First, it makes it easy to understand why there are no clear cases of tense and mood being exponed separately in this language (see the Appendix). Secondly, if T and Mood were separate in Latin, Mood would presumably be higher, and we would therefore have to stipulate that leftward adverbials standardly analyzed as TP-adjuncts in English were MoodP-adjuncts in Latin (since, if they were TP-adjuncts, they would interrupt the verb word, which in fact is impossible). This stipulation is avoided on the T-only view adopted here: on this view, TP-adjuncts in English correspond to TP-adjuncts in Latin, and the latter do not interrupt the verb word.

Fifth, the external argument (EA) originates in [Spec,vP], not [Spec,VoiceP] (Collins 2005; Merchant 2013). This is advantageous for three reasons. First, if the EA originated in [Spec,VoiceP], it would be incorrectly predicted to interrupt the verb word, unless it were stipulated either that [Spec,VoiceP] was linearized to the right or that the EA obligatorily moved to some position above [Spec,TP]. Both stipulations are avoided if the EA originates in [Spec,vP]. Secondly, if the EA originated in [Spec,VoiceP], then, after vP-movement, the EA would not c-command the internal argument. Although it is unclear how problematic that would be, it might make it difficult to account for the fact that, even when all the arguments scramble leftward past low adverbs, the EA precedes the internal argument by default (see fn. 32 and Section 5.3). This problem is avoided if the EA originates in [Spec,vP]. Finally, if the EA originated in [Spec,VoiceP], then Voice would have to probe upward into [Spec,VoiceP] and then, only if that was unsuccessful, downward into vP, complicating the theory of probing. But if the EA originates in [Spec,vP], Voice can uniformly probe downwards, into its c-command domain.[12]

On this analysis, then, the derivation of every synthetic finite verb form in Latin involves one step of XP-movement (vP-movement to [Spec,TP]) and one step of head movement (Asp to T). The analysis could therefore be dubbed "the XP-movement + X⁰-movement Analysis," but for convenience we will shorten this to *the XP/X⁰ Analysis*.

As illustrated in (14), the XP/X⁰ Analysis accounts straightforwardly for clearly mirroring verb forms. In the form derived in (14), for example—*laud-ā-v-era-t* 'he/she/it had praised'—the mirroring order (perfective Aspect inside past Tense) comes about because Asp undergoes head movement to T.

3.2 Deriving the anti-mirroring forms

Consider now the following anti-mirroring form:

(15)   *Subjunctive Mood/present Tense portmanteau inside passive Voice*
         laud-**ē**-t-**ur**
         praise-PRS.SJV-3SG-PASS
   '(that) he/she/it may be praised'

2014; 2017a; b; and Gianollo 2016 for relevant discussion). We cannot attempt to evaluate the arguments for this latter view here, especially since they generally assume that all languages satisfy the EPP somehow, which, however, is controversial (see Cable 2012 for arguments to the contrary). At any rate, nothing in the analysis will hinge on the [•v•] assumption; consequently, we do not exclude the possibility that Latin vP-movement is instead driven by a feature of the vP itself (cf. Bošković 2007, a.m.o.).

[12] Two final remarks are in order about vP. First, we assume that VP is linearized to the left of v, since this derives the default SOV order without further ado. (On other orders, see fn. 32 and Section 5.3.) V might undergo string-vacuous head movement to v, but, lacking evidence for this, we assume it does not.

Secondly, (14) shows the theme vowel *-ā* as exponing v. Alternatively, it may be postsyntactically adjoined to v (Oltra-Massuet 1999; Embick 2010). If overt verbalizers such as *-fic* '-fy' are v heads, the latter view would allow us to avoid positing a double-vP configuration for, e.g., *ampli-fic-ā-re* 'widen'. But if *-fic* is a V (cf. Bruening 2016), *ampli-fic-ā-re* does not involve a double vP regardless of the status of the theme vowel. Nothing will hinge on whether theme vowels expone v or are postsyntactically adjoined to it; the trees adopt the former treatment for convenience.

On the XP/X⁰ Analysis, this anti-mirroring form has exactly the same syntactic derivation as the mirroring form examined in Section 3.1:[13]

(16)   *Derivation of* laudētur *'(that) he/she/it may be praised'*
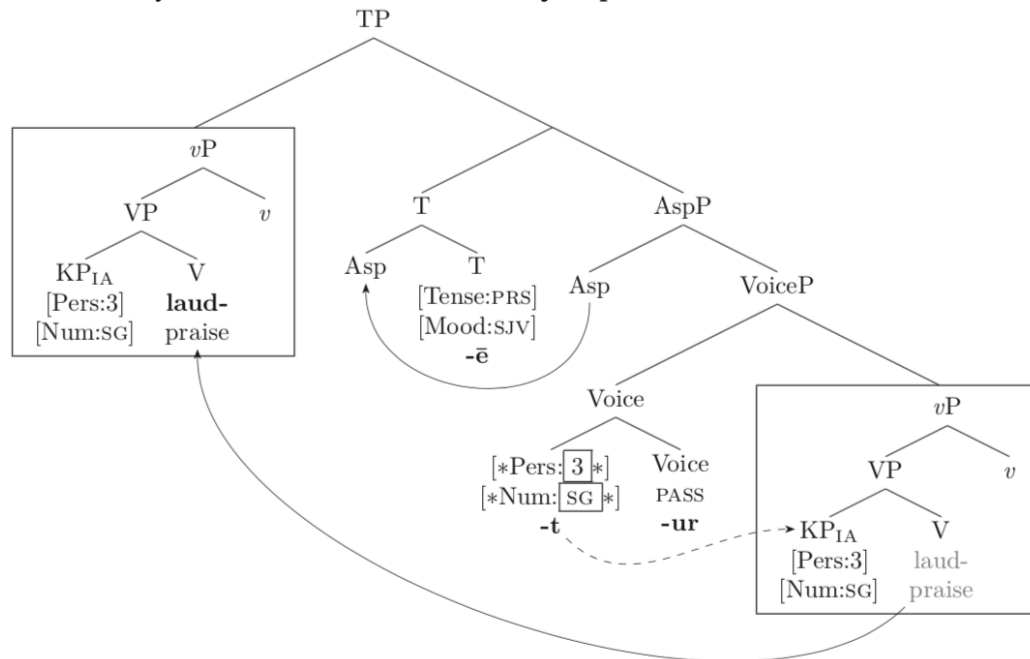
In (16), as in (14), Voice probes to value its ϕ-features and gets the values it seeks from the structurally closest KP. (As discussed in fn. 13, Voice$_{\text{PASS[Pers:3, Num:SG]}}$ undergoes postsyntactic Fission, the result of which is anticipatorily shown in (16).) As before, Asp undergoes head movement to T, although this has no overt effect in (16) because Asp itself is not overt in this form. Finally, also as before, vP moves to [Spec,TP], and it thereby comes to precede the T head *-ē*, which expones both subjunctive Mood and present Tense.

The anti-mirroring observed in *laud-ē-t-**ur*** '(that) he/she/it may be praised' can be analyzed as involving two anomalies: Mood/Tense surfaces unexpectedly close to the root, and Voice surfaces unexpectedly far from it. On the XP/X⁰ Analysis, these anomalies have a single source: both come about because vP moves to [Spec,TP], stranding Voice. This vP-movement carries the root to a position where it is linearized close to the exponent of Mood/Tense and far from the exponent of Voice.

3.3 Interim summary and theoretical implications

On the XP/X⁰ Analysis, then, all synthetic finite verbs in Latin, whether they appear to obey the MG or not, share a single, simple derivation, involving one step of head movement (Asp to T) and one step of phrasal movement (vP to [Spec,TP]).

On this analysis, the MG is in fact valid for Latin—contrary to initial appearances—but it must crucially be understood as a generalization about structures formed by operations

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[13] We say "exactly the same syntactic derivation" because there is one minor postsyntactic difference: when Voice$_{\text{PASS}}$ bears the features [Pers:3] and [Num:SG], as in (15)/(16), it undergoes postsyntactic Fission, resulting in separate exponents for the ϕ-features (*-t*) and Voice proper (*-ur*). In the mirroring form *laud-ā-v-era-t* 'he/she/it had praised', by contrast ((14)), Voice$_{\text{ACT}}$ is not exponed separately from the ϕ-features, so by hypothesis there is no Fission. As discussed in Section 3.1, Voice$_{\text{PASS}}$ does not always undergo Fission: Voice$_{\text{PASS[Pers:2, Num:PL]}}$ is realized by the portmanteau *-minī*. The generalizations about when Voice does and does not undergo Fission appear to be true morphological idiosyncrasies of Latin, though rather superficial ones (cf. Embick 2000: 199). Because Fission is standardly considered a postsyntactic operation (Harley & Noyer 1999, §3.3), the observations discussed in this footnote are fully compatible with our claim that mirroring forms ((13)) and anti-mirroring forms ((15)) have identical syntactic derivations.

on heads (e.g., head movement).[14] As shown in Section 3.2, Latin does have some verb forms that appear to disobey the MG, but that is an illusion caused by the fact that all the verb forms are derived in part by a step of phrasal (vP) movement. Phrasal movement, being subject to less strict locality constraints than head movement,[15] can give rise to superficially anti-mirroring morpheme orders, a conclusion also arrived at on independent grounds by Buell (2005); Buell & Sy (2005); Koopman (2005); Muriungi (2008); Buell, Torrence & Sy (2014); Cinque (2014); and Myler (2017).

On the XP/X⁰ Analysis, the Latin verb word (e.g., *laudāverat* 'he/she/it had praised' or *laudētur* '[that] he/she/it may be praised') is not a complex head, contra Embick (2000) and Calabrese (2019, §3.4.4.2). A perhaps more surprising consequence of the analysis is that, when one or more arguments (or adjuncts) remain within vP, the verb word is not even a constituent (see (14) and (16)).

If the XP/X⁰ Analysis is on the right track for Latin, then, it strongly supports an *alexist* or *squishing* view of syntax/morphology relations. (The term *alexist* is from Svenonius 2018, and *squishing* is from Myler 2017; Myler credits Glyne Piggott for the coinage.) On such a view, there is no syntactic correlate of (morpho)phonological wordhood; hence, there are no syntactic words. Instead, phonological words are autonomously assembled by the prosody from syntactic terminals, on the basis of phonological properties of the exponents of those terminals—e.g., some exponents are inherently phonologically dependent and therefore simply lean (left or right) in the prosody. A consequence of this view is that phonological words can be assembled from collections of morphemes that are linearly adjacent but suspended across large regions of syntactic space—and, in fact, phonological words need not always correspond to syntactic constituents, as is argued on independent grounds by Julien (2002); Buell (2005); Buell & Sy (2005); Koopman (2005); Muriungi (2008); Buell, Sy & Torrence (2014); Cinque (2014); Kayne (2017); Myler (2017); Kim (to appear); and references cited in those works; see also Halle & Marantz (1993) and much related work in Distributed Morphology.

See the Appendix for the full paradigm of all the (synthetic) finite, nonfinite, and deverbal forms of the sample verb *laud-* 'praise', laid out in a way that makes it clear how the XP/X⁰ Analysis successfully derives them.[16]

3.4 A note on the locality of allomorph selection

Before we extend the XP/X⁰ Analysis to nonfinite forms, it will be worth noting how it interacts with existing hypotheses about the locality domain for allomorph selection, given the allomorphy patterns observed within Latin verbs. The basic observation to be accounted for is that, within the verb word, a head can often trigger allomorphy on another head in a way that seems nonlocal in terms of hierarchical structure, given the structures proposed here.

For example, consider the verbs *manēre* 'stay', *monēre* 'warn', and *vidēre* 'see'. These are second-conjugation verbs: their theme vowel, when present, is *-ē/-e*. Yet they behave differently in the presence of perfective Aspect (Embick 2000: 189). Consider their 3sg

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[14] This is true of the diagnostic version of the MG ((2)). Baker's formulation ((1): "Morphological derivations must directly reflect syntactic derivations (and vice versa)") is almost completely obeyed on the XP/X⁰ Analysis even if attention is not restricted to operations on heads. As a reviewer notes, together with head movement, "phrasal syntactic movement can produce a morphological derivation that directly reflects (in linearization) the syntactic computation, including both External/Internal Merge." The only caveat is that the small amount of postsyntactic Fission in Latin (Section 3.1) does not appear to directly reflect anything in the syntactic derivation.

[15] For further discussion of this hypothesis, see Section 5.1, particularly fn. 24.

[16] There are a couple of oddities in the imperative forms.

pluperfect active indicative forms ((17)). (We illustrate with these for maximum comparability with *laudāverat* 'he/she/it had praised' in (14).)

(17) a. mān-**s**-era-t
          stay-PFV-PST-3SG
          'he/she/it had stayed'

     b. mon-**u**-era-t
          warn-PFV-PST-3SG
          'he/she/it had warned'

     c. **vīd**-∅-era-t
          see-PFV-PST-3SG
          'he/she/it had seen'

In each of (17a–c), a particular V idiosyncratically triggers the realization of Asp_{PFV} in a different way: as *-s*, *-u*, or zero. Furthermore, in (17-c), Asp_{PFV} also triggers allomorphy on V, causing it to surface as *vīd-* rather than *vid-*. (By contrast, the long vowel in (17-a) is due to regular phonology.) On the XP/X⁰ Analysis, however, V and Asp are not structurally close to one another: V is within the *v*P in [Spec,TP], and Asp is a subconstituent of the complex T head.

The XP/X⁰ Analysis is therefore incompatible with the hypothesis that, for two elements α and β, α cannot trigger allomorphy on β if the two are separated by a maximal projection boundary (Bobaljik 2012: 13). A fortiori, the analysis is incompatible with the hypothesis that α cannot trigger allomorphy on β if they are separated by the boundary of any non-minimal (non-X⁰) projection, even an intermediate projection (Bobaljik & Harley 2017: 150). As a reviewer notes, however, the XP/X⁰ Analysis dovetails naturally with Ostrove's (2018) stretching-based approach to Vocabulary Insertion (see Embick 2010 for related ideas). Ostrove (2018: 1281) defines *stretch* as follows:

(18) Let *T* be an ordered *n*-tuple of linearly ordered terminal nodes $\langle t_1, \ldots, t_n \rangle$ such that for all $t \in T$, $t = t_1$ or t is an element of the extended projection of t_1.
     a. For all $k = 1 \ldots n$, t_k is a stretch. (Every node is a trivial stretch.)
     b. For any $n > 0$, if t_k is a stretch, then $\langle t_k, \ldots, t_{k+n} \rangle$ is a stretch.

Ostrove argues that, in Irish, a single exponent can sometimes realize the sequence of terminals Mood–√ROOT–*v*, to the exclusion of T, even though the former three nodes form neither a span ("a complement sequence of heads […] in a single extended projection"—Svenonius 2012) nor a morphosyntactic constituent. On his analysis, this is because that sequence is nonetheless a stretch, and Vocabulary Insertion can target stretches.

Ostrove, then, invokes stretches primarily as targets for Vocabulary Insertion. However, his definition of stretch is modeled on Merchant's (2015: 288) definition of span, and Merchant argues for what he calls the Span Adjacency Hypothesis: "Allomorphy is conditioned only by an adjacent *span*." Pursuing the stretching-based approach, it is natural (in fact, a minimal extension) to develop it further by proposing (19):

(19) *Stretch Adjacency Hypothesis*
     Allomorphy {is conditioned only / can be conditioned} by an adjacent stretch.

(Which version is more adequate is an open question.) If (19) is on the right track, the allomorphy patterns in (17) become unsurprising: in all three forms, the form of

Asp$_{PFV}$ is conditioned by the linearly adjacent stretch V–v; and in (17-c), the form of V is conditioned by the linearly adjacent stretch v–Asp$_{PFV}$, even though the latter is not a constituent.

Naturally, the proposals in (18)–(19) deserve much more detailed testing, and they are discussed further in Section 4.3. What is important here is that, as a reviewer notes, the XP/X⁰ Analysis is compatible with (a minimal extension of) one independently motivated existing approach to Vocabulary Insertion: Ostrove's (2018) stretching approach.

4 Extension: Deriving nonfinite verb forms

Section 3 developed an analysis of the derivation of Latin finite verb forms that relies crucially on vP-movement. On that analysis, all the finite verb forms in the language, whether mirroring or anti-mirroring, have the same derivation—one that involves one step of head movement and one step of vP-movement.

This result in itself furnishes a strong argument that Latin makes use of vP-movement (see Bailey 2010; Danckaert 2012; 2014; 2017a; b; and Gianollo 2016 for similar proposals). Nonetheless, it is worth asking whether there is any (further) independent evidence for this conclusion—e.g., other empirical phenomena that initially appear puzzling, but receive a satisfying explanation if vP moves in Latin.

This section argues that the answer is yes—and specifically, that a phenomenon of exactly this type emerges when we turn our attention from the finite to the nonfinite verb forms. The discussion that follows will focus on two nonfinite forms in particular: the Perfect Passive Participle and the Future Active Participle (cf. Matthews 1972: 83–86; Embick 2000: 215–216; Calabrese 2019, §3.4.4.1.5; and references cited there). We will argue that the Future Active Participle has what initially seem to be contradictory properties, but the apparent paradox vanishes if both participles are derived partially by vP-movement.

4.1 Deriving the Perfect Passive Participle

The Future Active Participle (e.g., *laudātūrus* '[that is] going to praise') is derived from the same "stem" (descriptively speaking) as the Perfect Passive Participle (e.g., *laudātus* 'having been praised'—the "stem" in this case being *laudāt-*), with the addition of an element *-ūr*. Because the Perfect Passive Participle lacks *-ūr* and is thus structurally simpler, we will discuss first its derivation and then that of the Future Active Participle.

Two examples follow of the Perfect Passive Participle in a larger context. (Example (20) is adapted from Panhuis 2006: 102.)

(20)   Livy, *Ab Urbe Condita* 32.29.1
        …mūrus   et   porta   dē   caelō   **tāc-t-a**   era-nt.
          wall.NOM and gate.NOM from sky.ABL touch-PTCP-N.NOM.PL be.IMPF-3PL
        '…the wall and the gate had been struck by lightning.' ('…the wall and the gate were having-been-touched from the sky.')

(21)   Anna **laud-ā-t-a**   es-t.   [C]
        Anna praise-TH-PTCP-F.NOM.SG be-3SG
        'Anna {was / has been} praised.' ('Anna is having-been-praised.')

On our analysis, the derivation of (21) is, in part, the following. (On the syntax of the auxiliary, see fn. 19. On the apparent ϕ-lessness of Voice in nonfinite forms, see Section 4.3.)

(22)   *Partial derivation of (21)*
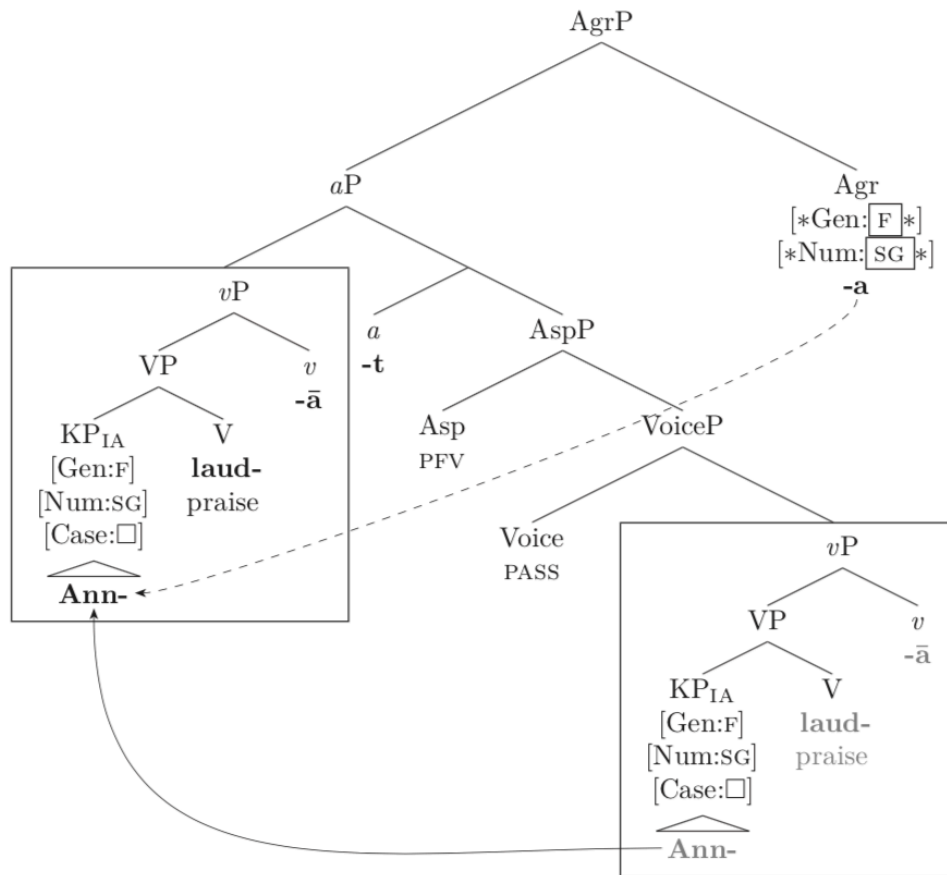
On this analysis, the participial morpheme *-t* here is a categorizing little *a* head—i.e., an adjectivalizing head (Marantz 1997, a.m.o.)—that takes a full-fledged (phrasal) verbal projection as its complement.[17] What is most important here about (22) is that the *v*P moves to [Spec,*a*P], and it is in this way that the V-*v* sequence *laud-ā-* comes to immediately precede *-t*. Finally, the *a*P is the complement of an Agr(eement) head that bears unvalued Gender and Number features.[18] Agr probes for the closest goal that can value those features, finds [$_{KP}$ *Ann-*] 'Anna', and uses the latter's [Gen:F] and [Num:SG] features to value its own corresponding unvalued features. (This KP will get case later; that is not shown in (22). Note that (22) suggests that there is no adjunction to VoiceP in Latin, since Agr cannot be linearly separated from *-t*; left-adjunction to *v*P, however, is unproblematic [see Section 5.2].)[19]

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[17] This complement is shown in (22) as an AspP containing Asp and Voice heads, but little hinges on this; the complement could in principle be as small as VoiceP or *v*P (though, in the latter case, the complement of *a* would have to move to [Spec,*a*P]—i.e., complement-to-specifier movement would have to be possible, contra Abels 2003).

  See fn. 21 for more on our analysis of *-t* and a comparison with an alternative.

[18] This portion of the structure is not compatible with the Final-Over-Final Condition (Sheehan, Biberauer, Roberts & Holmberg 2017). How problematic this is and whether it suggests that this part of (22) should be revised somehow are questions that, for space reasons, must be left for future work.

[19] A question arises here as to how the auxiliary *esse* 'be' in analytic structures like (22) fits into the analysis. Since it agrees (e.g., *est* is 3SG), and on the XP/X⁰ Analysis, the clause-level ϕ-probes are on Voice, the natural analysis is (i), with *es-*, the auxiliary's "root," a V or *v* taking as its complement the participial AgrP (whose internal structure is given in (22)):

(i)   [$_{TP}$ [$_{vP}$ [$_{AgrP}$ Anna laudāta] es-]$_2$ Asp$_1$ + T$_{[Tense:PRS, Mood:IND]}$ ___$_1$ -t$_{VoiceACT}$ ___$_2$]

In (i), the highest Voice head, which is in the extended projection of *es-* 'be', is active, and T is present, exactly as in (present-tense) copular clauses; the passive and (aspectually) anterior properties of (i) are contributed by the participle. A rough gloss would be 'is [Anna having-been-praised].' Two remarks are in order here.

The derivation in (22) yields the correct morpheme order, but no argument has yet been given that [$_{vP}$ … *laud-ā-*] surfaces to the left of *-t* as a result of *v*P-*movement*. (After all, if the complement of *-t* were simply linearized to its left, no *v*P-movement would be needed to derive the morpheme order.) The argument for *v*P-movement will emerge only once we have examined the more complex of the two participles under discussion: the Future Active Participle.

4.2 Deriving the Future Active Participle

The Future Active Participle is shown in context in (23) (adapted from Pinkster 1987: 194) and (24):

(23)   Sallust, *Bellum Iugurthinum* 5.1
  Bellum **scrīp-t-ūr-us**   sum quod   populus
  war.ACC write-PTCP-PROSP-M.NOM.SG I.am which.N.ACC.SG people.NOM
  Rōmānus   cum Iugurthā … gess-i-t.
  Roman.M.NOM.SG with Jugurtha.ABL wage-PERF-3SG
  'I propose to write (lit. 'I am going to write') of the war which the Roman people waged with […] Jugurtha.'

(24)   Mārcus Annam **laud-ā-t-ūr-us**   es-t.   [C]
  Mark.NOM Anna.ACC praise-TH-PTCP-PROSP-M.NOM.SG be-3SG
  'Mark is going to praise Anna.'

As mentioned, the Future Active Participle is built from the same structural core as the Perfect Passive Participle. Whichever allomorphs of the root and the participial morpheme appear in the Perfect Passive Participle, the same ones appear in the Future Active Participle (with a few exceptions—Aronoff 1994: 177), along with the extra element *-ūr* that is unique to the latter: *vehere* 'carry', *vec-t-us* 'having been carried', *vec-t-ūr-us* '[that is] going to carry'; *iubēre* 'order', *ius-s-us*, *ius-s-ūr-us*; *ferre* 'bear', *lā-t-us*, *lā-t-ūr-us*, etc. (Embick 2000: 216). This systematic correspondence shows that the two participles must have similar syntactic derivations.

Further scrutiny, however, reveals that the Future Active Participle has properties that seem rather contradictory. These have to do with the suffix *-ūr*, which we take to be a prospective Aspect head, accounting for the participle's "future" orientation.

First, on the XP/X⁰ Analysis, when T is merged in, *v*P obligatorily moves to [Spec,TP] (and it never moves away). Thus, the fact that, alongside [C]*Anna laudāta est* 'Anna was praised', Latin also allows [C]*Anna est laudāta* might seem problematic, since this might seem like *optional v*P-movement. But the problem is illusory: [(*Anna*) *laudāta*] (where *Anna* may or may not move out) is not a *v*P but a (participial/adjectival) AgrP, and can therefore move around rather freely, as adjectival phrases can generally in Latin (see also fn. 32). This accounts for the fact that participle and auxiliary need not be adjacent. For example, [C]*Anna laudāta nōn est* 'Anna was not praised' is derived from (i) by movement of [$_{AgrP}$ *Anna laudāta*] leftward past the higher particle *nōn* 'not' (possibly with further, string-vacuous leftward movement of *Anna*). This proposal is independently (if indirectly) motivated by the ability of XPs quite generally to move leftward out of *v*P and past *nōn* (Section 5.3).

Secondly, (i), contra Embick (2000), does not treat [C]*Anna laudāta est* 'Anna was praised' as having essentially the same syntax as synthetic passives (e.g., [C]*Anna laudātur* 'Anna is praised') but different features and consequently a different morphological realization. Rather, according to (i), [C]*Anna laudāta est* is built from *esse* 'be' and a (participial/adjectival) AgrP. One might worry that this might predict that such structures should always be interpreted as stative (they are in fact often interpreted as eventive). But there is no incorrect prediction here, because the relevant categorial features—[CAT:*a*], [CAT:Agr], and [CAT:V] or [CAT:*v*] (for *es-* 'be')—are fundamentally syntactic features. Nothing in the theory forces them to yield a stative interpretation; rather, what denotations the lexical items in (i) have is an empirical matter. The eventive interpretation of (i) is presumably due to material within [$_{vP}$ *Anna laud-ā-*].

Naturally, (i) requires further elaboration and testing, and comparison with alternatives—which, for space reasons, we leave for future work.

On the one hand, *-ūr* occurs farther from the root than does the participial suffix *-t*, which we analyze as a categorizing *a* head (Section 4.1). This would seem to suggest that *-ūr* is syntactically higher than *-t*, given the MG—particularly since Section 3.3 showed that there is good evidence that the MG holds for Latin.

On the other hand, that conclusion seems backwards. *Laud-ā-t-ūr-us* '[that is] going to praise' is fundamentally a participle, not a prospective AspP (the latter of which would be a verbal category in the extended projection of V). Crucially, both Future Active and Perfect Passive participial phrases can serve as adnominal adjuncts, as in (25) (adapted from Pinkster 2015: 546) and (26), respectively; this falls out if they are adjectival phrases, but would be quite unexpected for AspPs. (The Perfect Passive Participle in (26) even bears a superlative suffix, just as ordinary adjectives can.)

(25)   Cicero, *Tusculanae Disputationes* 4.14
        opīniō   **ven-t-ūr-ī**   bonī
        belief.NOM come-PTCP-PROSP-N.GEN.SG good.GEN
        'a belief in good to come' ('…good that is going to come')

(26)   Cicero, *Ad Atticum* 4.1.2
        in […] **exopt-ā-t-issim-ā**   grātulātiōne
        in   wish.for-TH-PTCP-SUPERL-F.ABL.SG congratulation.ABL
        'in the midst of […] the most gratifying (lit. 'wished-for') congratulations'

The paradox, then, is that the Future Active Participle's categorial identity seems to be determined by the participial morpheme *-t*, but the prospective Aspect morpheme *-ūr* occurs outside of *-t*—another case of anti-mirroring.

Just as the Mood/Voice anti-mirroring in certain finite forms (which is really two puzzles: the unexpectedly internal position of Mood and the unexpectedly external position of Voice) was argued in Section 3.2 to come about through *v*P-movement, so too, we propose, does this instance of anti-mirroring:

(27)   *Partial derivation of* Mārcus Annam laudātūrus est [C] *'Mark is going to praise Anna'*
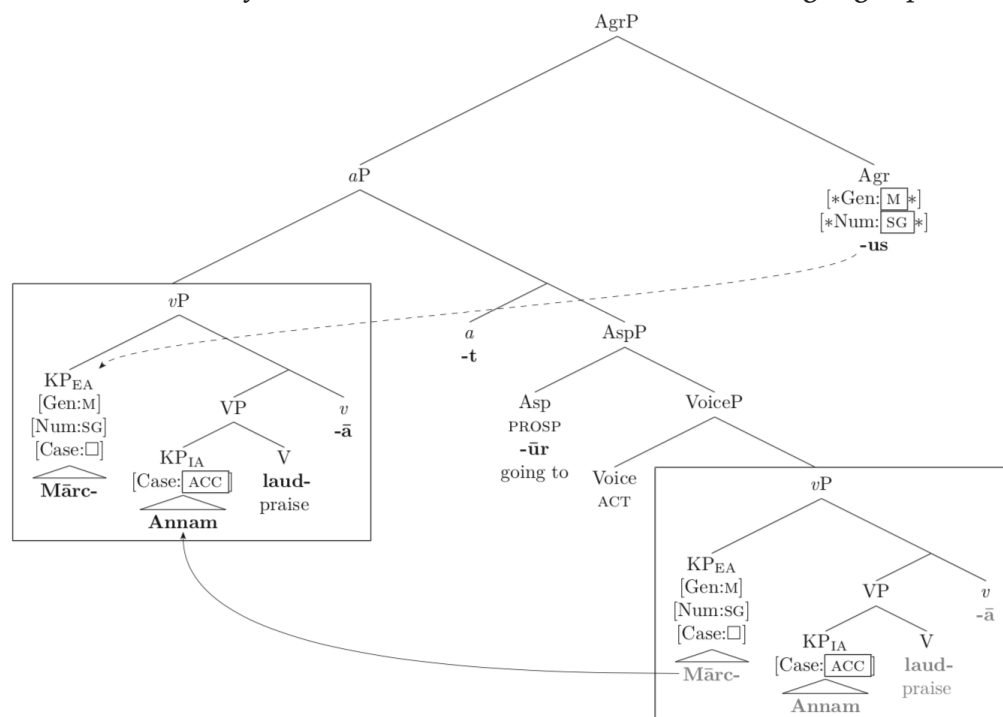
This analysis solves the paradox laid out above. On the analysis in (27), participial *-t* is higher than prospective Aspect *-ūr*, explaining why it is the former that determines the categorial identity of the participle. But although *-t* is higher than *-ūr*, it ends up linearly closer to the root than *-ūr* does, because *v*P moves to the specifier of *-t* (i.e., to [Spec,*a*P]), carrying the root along.

Let us recapitulate. Section 4.1 proposed that, in Perfect Passive Participles such as *laud-ā-t-us* 'having been praised', [$_{vP}$ … *laud-ā-*] ends up to the left of the participial morpheme *-t* (= *a*) because it undergoes phrasal movement to [Spec,*a*P]. This is not obvious if one considers only the Perfect Passive Participle. However, the hypothesis that *v*P moves to the specifier of *-t* pays a significant empirical and theoretical dividend in connection with the Future Active Participle: it explains straightforwardly why, in this participle, *-t* occurs closer to the root than *-ūr* does, even though it determines the categorial identity of the participle and therefore must be higher than *-ūr*.[20]

The hypothesis that Latin makes use of *v*P-movement, then—which was adopted in Section 3 to explain anti-mirroring in certain finite verb forms—is indeed supported by evidence independent of those forms: it solves an otherwise thorny paradox involving the Future Active Participle.[21]

4.3 A note on the φ-lessness of Voice in nonfinite forms

Before we consider the syntactic predictions of the analysis, a few words are in order about the apparent φ-lessness of Voice in nonfinite forms such as the Perfect Passive Participle *laudāta* 'having been praised' ((22)) and the Future Active Participle *laudātūrus*

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[20] Another positive consequence of this analysis is that the relation between Agr and *a* is identical in the two participles: in both, Agr takes *a*P as its complement. By contrast, if the Gender and Number probes were on *a*, and the agreement morpheme resulted from postsyntactic Fission, then the morpheme order in the Perfect Passive Participle could still be accounted for, but not that in the Future Active Participle. The former would still be correctly predicted to be (e.g.) *laud-ā-t-us* 'having been praised', but the latter would be incorrectly predicted to be (e.g.) *laud-ā-t-us-ūr (intended: '[that is] going to praise'). This problem could be fixed by positing a Local Dislocation operation (Embick & Noyer 2001), but such a stipulation is unnecessary on the analysis in (27).

[21] Embick (2000: 215–219) analyzes *-t* (which he refers to as *-t-/-s-*) as a default realization of Asp surfacing in deverbal structures—those built from a verbal core but lacking T. (He focuses on the same two participles as we do.) He writes: "The motivation for positing the head Asp in such cases lies in the syntax and the semantics […] in that aspectual properties are implicated in nominalizations and other deverbal formations. The affixes *-s-* and *-t-* are then the default realizations of this aspectual head…" (Embick 2000: 216). On his analysis of the Future Active Participle, Asp is lower than *-ūr* (which he analyzes as a modal element of category Mod), so this participle straightforwardly obeys the MG:

(i)   [$_{ModP}$ *-ūr*$_{Mod}$ [$_{AspP}$ *-t-/-s-*$_{Asp}$ [$_{vP}$ *v* [$_{VP}$ V DP]]]]   (adapted from Embick 2000: 219)

However, Embick does not specify what the relevant "aspectual properties" are, and it is not clear that all structures containing *-t-/-s-* really do have "aspectual properties"—or, at least, aspectual properties attributable to *-t-/-s-*. For example, *occī-s-ūr-us* '[that is] going to kill' and *am-ā-t-ūr-us* '[that is] going to love' seem to have nothing in common aspectually besides prospectiveness, which is contributed by *-ūr*, not *-t-/-s-*. Turning to nominalizations, *occī-s-or* 'slayer' and *am-ā-t-or* 'lover' also seem to have little in common aspectually; likewise for *occī-s-iō* 'murder' and *amā-t-iō* 'love, caressing'. If the claim is that, in deverbal environments, *-t-/-s-* can realize any Asp head regardless of its features or denotation, then the link between the exponent *-t-/-s-* and the head Asp is considerably weakened.

Furthermore, even if deverbal structures with *-t-/-s-* do turn out to invariably have aspectual properties, and even if these are contributed by a head Asp, it will not follow that *-t-/-s-* *is* Asp, and Embick does not argue further that it is. In view of all this, the claim that *-t-/-s-* is Asp strikes us as undermotivated. The same remarks apply to Calabrese's (2019, §3.4.4.1.5) analysis, which also incorporates the claim that *-t-/-s-* is an Asp head below *-ūr* (and that there is thus no anti-mirroring here); the morphological structure he posits is shown in (ii) (adapted from his (389) and (391–392)):

(ii)   [$_{Adj}$⁰ [$_n$⁰ [$_{Asp}$⁰ [V (TV)] *-t*$_{Asp}$⁰] *-ūr*$_n$⁰] *-u*$_{Adj}$⁰] …   (TV = theme vowel)

The theoretical issues raised by *-t-/-s-* (including whether all its uses should be unified) deserve deeper investigation than space permits here; our point here, though, is that the *-t-/-s-* in the Perfect Passive and Future Active Participles is plausibly a categorizing *a* head, and if so, the hypothesis that Latin makes use of *v*P-movement makes available an elegant explanation for the apparent anti-mirroring in the Future Active Participle.

'[that is] going to praise' ((27)). If, as argued in Section 3.1, Voice bears Person and Number probes in finite clauses, an account is needed of why it does not expone ϕ-features in nonfinite forms like those just mentioned.

There are at least two possible accounts of this that are compatible with the XP/X⁰ Analysis. One possibility, mentioned in fn. 17, is that Voice is simply absent from these participles. (If so, it must be possible for a head in the middle of a functional sequence to sometimes not be merged in, as argued by Rizzi 1997: 314–315; Starke 2004, §§2.1–2.2; Bošković 2016: 42; and Erlewine 2016: 475.)

Alternatively, this may be a matter of Vocabulary Insertion. In particular, it may be that Voice does successfully probe for ϕ-features in nonfinite forms, but it is simply a fact of Latin morphology that the Voice node, ϕ-features and all, is realized as null in these environments. Vocabulary Items that would yield this result for the Perfect Passive and Future Active Participles are given in (28). The conditioning elements to the right of the slashes are stretches (Ostrove 2018; see Section 3.4).[22]

(28)   a.   Voice $\Leftrightarrow \varnothing$ / a (Asp$_{PFV}$) ___
       b.   Voice $\Leftrightarrow \varnothing$ / Asp$_{PROSP}$ ___

As long as insertion of (28-a) precedes the Fission that Voice$_{PASS}$ sometimes undergoes in other contexts (Section 3), Fission, and hence ϕ-exponence, will be bled, as desired.

The choice between the two accounts just laid out is left open here.

One final remark is in order. Consider the following infinitives:

(29)   a.   laud-ā-r-**e**
            praise-TH-PRS.INF-ACT
            'to praise'

       b.   laud-ā-r-**ī**
            praise-TH-PRS.INF-PASS
            'to be praised'

Here, as in the participles, Voice does not overtly expone ϕ-features. But here it cannot be structurally absent, because it is overt. The following Vocabulary Items are therefore needed:

(30)   a.   Voice$_{ACT}$ $\Leftrightarrow$ *-e* / T$_{[Tense:PRS, -FIN]}$ ___
       b.   Voice$_{PASS}$ $\Leftrightarrow$ *-ī* / T$_{[Tense:PRS, -FIN]}$ ___

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[22] The parentheses in (28-a) are shorthand. Asp$_{PFV}$ should be mentioned in this Vocabulary Item iff it is projected in Perfect Passive Participles (this was left open in fn. 17).

Asp$_{PFV}$ and a do not belong to the same extended projection, since a starts a new one. Therefore, if Asp$_{PFV}$ is projected in Perfect Passive Participles, and consequently mentioned in (28-a), the definition of stretch ((18)) will have to be revised, dropping the requirement that the elements of a stretch belong to the same extended projection, a possibility that Ostrove (2018: 1281) himself considers. This may be necessary anyway (if stretches are the targets for Vocabulary Insertion), since in some English idiolects, including the second author's, *me* + *'s* can surface as *my* even when *me* is a final conjunct: %*the principal and my boxes* (= '[the principal and me]'s boxes'). Here, the terminals elsewhere realized as *me* and *'s* are adjacent, but belong to different extended projections; thus, they will form a stretch (= Vocabulary Insertion target) only if stretches can straddle extended projection boundaries. (Such a revision—like stretching more generally—may run into overgeneration issues, an important topic for future work.)

However, if Asp$_{PFV}$ is not projected in Perfect Passive Participles (and hence not mentioned in (28-a)), (28-a) will not require a revised definition of stretch.

Here too, as long as insertion of (30-b) precedes the Fission that Voice$_{PASS}$ sometimes undergoes, Fission, and hence ϕ-exponence, will be bled.[23]

Naturally, this discussion raises questions that merit more detailed investigation. What is important here, however, is that although Voice in Latin was argued in Section 3 to bear ϕ-probes, it is perfectly possible on the XP/X⁰ Analysis to capture the fact that Voice does not overtly expone ϕ-features in nonfinite forms—particularly on Ostrove's (2018) stretching-based approach to Vocabulary Insertion or some similar approach.

5 Syntactic predictions and consequences of the analysis

The previous sections developed an analysis of Latin verbal morphology that is highly syntactic. On this analysis, Latin verb forms are built largely by narrow-syntactic operations—including, notably, XP-movement.

It is therefore crucial to determine what predictions the XP/X⁰ Analysis makes about other aspects of Latin syntax, and whether these are correct. That is the objective of this section. Section 5.1 lays out and confirms the prediction that the verb word should move as an XP, skipping intervening heads, and not as a head. Section 5.2 lays out and confirms the prediction that the putative vP-movement to [Spec,TP] should be able to carry along vP-adjuncts. Finally, Section 5.3 considers how the XP/X⁰ Analysis interacts with what is independently known about leftward argument movement out of vP in Latin.

It is possible that (some versions of) an alternative analysis—particularly an analysis on which the Latin verb word is a complex head, henceforth *the Complex-Head Analysis*—could also account for some or all of the syntactic observations presented in this section. The investigation of this possibility and a detailed comparison between the Complex-Head Analysis and the XP/X⁰ Analysis are tasks that, for space reasons, must be left for future work. The discussion in this section will restrict itself to showing that the XP/X⁰ Analysis leads to the expectations about syntactic phenomena mentioned above, and that those expectations are indeed met. (Section 6, however, will compare the XP/X⁰ Analysis and two existing versions of the Complex-Head Analysis that aim to account for the anti-mirroring in passive forms, arguing in favor of the former.)

5.1 Prediction A: The verb word should move as an XP, not as a head

On the XP/X⁰ Analysis, the Latin verb word is a sequence of morphemes—most of them phonologically dependent—that are suspended across a large syntactic expanse.

As mentioned in Section 3.3, if there are any overt arguments or adjuncts within vP that do not move out of TP, then, on the XP/X⁰ Analysis, the verb word is not even a constituent—as in (31) (adapted from Devine & Stephens 2006: 103):

(31)   Cicero, *Tusculanae Disputationes* 1.115
        cum   [$_{TP}$ [$_{vP}$ graviter   [$_{vP}$ fīliī   mortem   maer-ē]]$_1$-re-t   __$_1$]
        when   intensely   son.GEN death.ACC grieve-TH-IMPF.SJV-3SG
        'when he was intensely grieving over the death of his son'

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[23] A drawback of this analysis is that the Vocabulary Items in (28) and (30) are somewhat stipulative. As a reviewer notes, however, there may be an alternative analysis that overcomes this issue to some degree. On this analysis, the ϕ-probes are not on Voice but on an Agr head that takes TP as a complement. If TP is linearized to the left of Agr, or comes to immediately precede Agr via movement, then Voice and Agr will be adjacent, and—on the stretching-based approach to Vocabulary Insertion—can therefore interact in the necessary ways (e.g., the Voice–Agr stretch can be realized by the portmanteau -*minī* in 2PL passive forms). If this Agr head is missing in nonfinite environments, the ϕ-lessness observed in these environments follows. The detailed elaboration of this intriguing alternative, and a thorough comparison with the analysis in the text, must be left for future work.

In (31), the verb word *maerēret* 'was grieving' is not a constituent; rather, [$_{vP}$ *filiī mortem maer-ē-*] 'grieve over the death of his son' is. However, it is also possible in Latin for the *v*P to contain no overt material other than V and *v*; this happens whenever (a) no other material is generated within *v*P, or (b) some other material is, but it is null (as in the case of null pronouns), or (c) overt material other than V and *v* is generated within *v*P, but it all scrambles out of TP.

   In any of these situations, the string referred to here as the verb word *is* the reflex of a constituent, albeit a very large one: TP. An example (adapted from Danckaert 2012: 12) is given below:

(32)   Livy, *Ab Urbe Condita* 37.47.7
        …cum   cēterī$_2$ centūriās$_3$ [$_{\Sigma P}$ **nōn** [$_{TP}$ [$_{vP}$ __$_2$ __$_3$ exple]$_1$-sse-nt   __$_1$]].
           since others.NOM centuries.ACC   not   fill-PLUP.SJV-3PL
        '…since the others did not win the required number of centuries.'

On the XP/X⁰ Analysis, then, when the Latin verb word is a constituent, it is a maximal projection (an XP—specifically, a TP); it is never a complex head. This leads to the following prediction:

(33)   *Prediction A$_1$: XP-movement*
        The verb word should be able to move as an XP, skipping intervening heads—i.e., movement of the verb word should not be subject to the Head Movement Constraint (HMC, Travis 1984).

Sections 5.1.1–5.1.2 will show that the finite verb can move to the left of (thereby skipping) the left-peripheral heads *ut* 'so that', *cum* 'when', *sī* 'if', and =*ne* 'YNQ', bearing out the prediction in (33).[24] Section 5.1.3 will argue that, by contrast, the verb word cannot move as a head.

5.1.1 Test cases A$_{1(a-c)}$: Movement past intervening Fin heads

The complementizers *ut* 'so that', *cum* 'when' (among other meanings), and *sī* 'if' are argued convincingly by Danckaert (2012: 107) to be Fin(iteness) heads in a Rizzi (1997)–style left periphery:

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[24] The prediction in (33) is based on the traditional assumption that phrasal movement, but not head movement, can skip intervening heads. This assumption has been questioned, however. Harizanov & Gribanova (2019) argue that what has traditionally been known as head movement is in fact two distinct phenomena: genuine syntactic head movement and postsyntactic amalgamation. On their analysis, syntactic head movement is subject to exactly the same locality constraints as XP-movement, and is thus free to skip intervening heads (it is not subject to the HMC). Postsyntactic amalgamation, by contrast—which can be either Raising or Lowering—is much more local, being restricted to structurally adjacent heads. (For discussion, see Dékány 2018 and Newman 2018a; b.) The notion of relatively nonlocal head movement is somewhat controversial (see Matushansky 2006, §5.1.3). Thus, Arregi & Pietraszko (2018: 8ff.; to appear: 12ff.) argue that at least some cases of what Harizanov and Gribanova analyze as relatively nonlocal syntactic head movement are actually subject to strict, HMC-like locality, despite appearances. Angelopoulos & Sportiche (2018: 3, 32) take the strong view that all head movement is subject to the HMC. Likewise, Svenonius (2018: 10) "take[s] the HMC to be essentially empirically correct"; see also Buell, Sy & Torrence (2014: 77) for essentially the same view. This debate cannot be settled here, but if, as Harizanov and Gribanova argue, syntactic head movement exists and is no more local than XP-movement, then the Latin verb word's ability to move past intervening heads will not decisively favor the XP/X⁰ Analysis over the Complex-Head Analysis, though it will certainly remain compatible with the former. See, though, (40) and (45) below, where we argue that the TP housing the verb word moves across an intervening head and carries along nonverbal XPs inside it (and thus must be moving as an XP rather than as a complex head): since these cases must involve TP-movement, it would be redundant to posit that the verb word is a complex head that can move relatively nonlocally.

(34)   [_ForceP Force [_TopP Top [_FocP Foc [_FinP ut/cum/sī_Fin …]]]]

Significantly, the verb word can move to the left of these complementizers, as in (35)–(36) with *ut* (adapted from Danckaert 2012: 275 and Gildersleeve & Lodge 2000: 283–284):

(35)   Tibullus 2.6.42
    …nōn ego sum tantī,   [plōr-e-t   **ut**   illa
      not I   am   that.much.N.GEN.SG   cry-PRS.SJV-3SG so.that that.F.NOM.SG
    semel].
    once
    '…I am not worth a single tear from her.' ('…I am not worth that much that she may cry once.')

(36)   Ovid, *Ars Amatoria*, I. 99
    Spect-ā-tu-m   veni-unt, veni-unt [spect-e-nt-ur   **ut**
    watch-TH-SUP-ACC come-3PL, come-3PL [watch-PRS.SJV-3PL-PASS so.that
    ipsae   ] …
    self.F.NOM.PL]
   'They come to watch, they come to be watched themselves…' ('…they come so that they may themselves be watched…')

On the XP/X⁰ Analysis, whenever *plōret* 'she may cry' or *spectentur* 'they may be watched' is a constituent, it is a TP, so it is unsurprising that these verbs can move as XPs, skipping the intervening head *ut*.[25] For explicitness, the derivation of the bracketed clause in (36) is briefly laid out below. First, the following structure is built:

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[25] Such derivations, in which the verb word moves to the left of Fin, are made use of only in poetry, not in prose (Danckaert 2012: 275; 2017: 75). This does not threaten the argument, however. Danckaert (2012: 275), citing Schünke (1906), reports that "the fronting of a finite verb [past Fin —Authors] is well attested with numerous authors of poetic texts, and occurs in various periods. Moreover, it is compatible with diverse types of metrical patterns and with different types of genres." This virtually eliminates the possibility that the relevant structures are actually unacceptable (*). Furthermore, we find a sharp contrast between, e.g., (36) (which strikes us as acceptable, if somewhat marked) and the analogous English sentences in (i-c)–(i-f), which are completely unacceptable even in poetry (cf. the controls in (i-a)–(i-b)). (Native English speakers could choose to use (i-c)–(i-f) in poetry, but they would be deliberately deploying ill-formed structures.) These crosslinguistic contrasts would be puzzling if (36) were as underivable as (i-c)–(i-f), but fall out from our analysis, on which (i-c)–(i-f) are underivable but (36) is derivable. (For convincing evidence of the usefulness of crosslinguistic acceptability comparisons, see Bošković to appear, §5.)

(i)   a.   They come [**so that** they may be watched themselves].
       b.   They come [**so that** they may themselves be watched].
       c.   *They come [they may be watched **so that** themselves].
       d.   **They come [may be watched **so that** they themselves].
       e.   *They come [they may be watched themselves **so that**].
   f.   *They come [they may themselves be watched **so that**].

Crucially, we assume that (non-avant-garde) poetry in a language can differ syntactically from prose in that language only in ways in which (prose registers of) different languages can differ from one another—i.e., only in ways that the theory of syntax independently allows—clearly the most restrictive and hence most interesting hypothesis. That is, we adopt the Development Hypothesis (on which see Fabb 2010) for syntax. In this case, we propose that, in the poetic but not in the prose grammar of Latin, Top can optionally bear a movement-driving feature [•T•], which attracts TP to [Spec,TopP], a standard case of attraction-driven movement (fn. 11). The two grammars thus differ in what movement-driving features they allow to appear on Top, much as (on one attraction-driven approach to movement) T bears [•D•] obligatorily in English, but only optionally in Dholuo (Cable 2012).

(37)   *Derivation of* spectentur ut ipsae: *part 1*
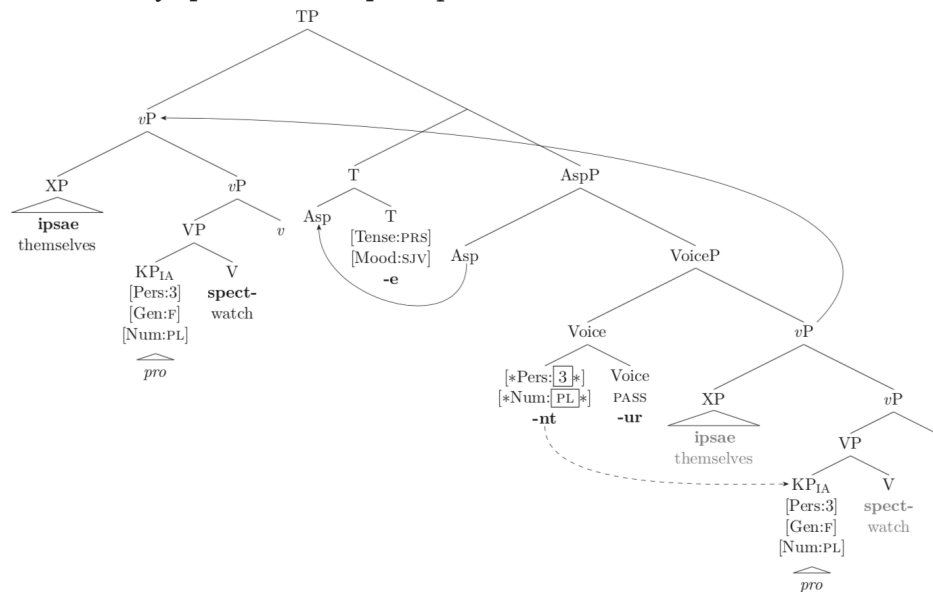
(For convenience, (37) shows *-nt* '3PL' and *-ur* 'PASS' as already fissioned off from one another, although we assume Fission is postsyntactic.) Then, the emphatic reflexive *ipsae* 'themselves' scrambles out of TP. Further structure-building yields (38). (Following Devine & Stephens 2006: 108ff., we use *ScrP* as a placeholder term for whatever projection this scrambling targets.)

(38)   *Derivation of* spectentur ut ipsae: *part 2*
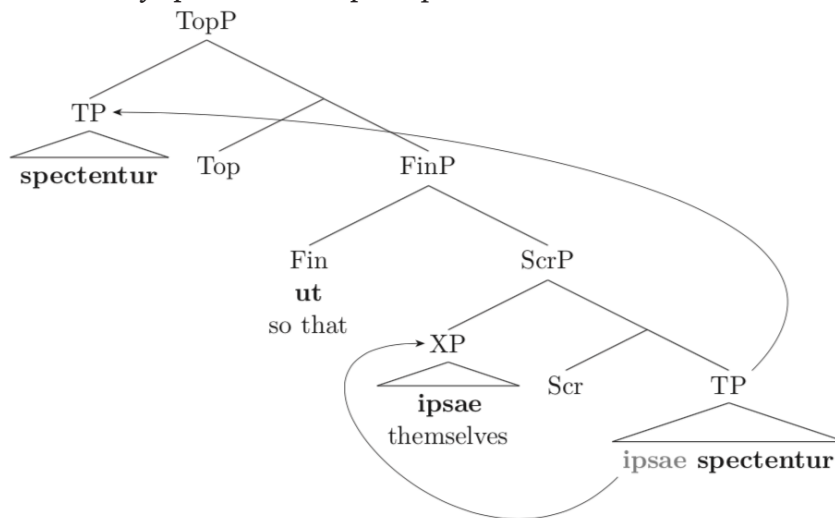
Because the verb word *spectentur* 'they may be watched' moves as an XP in (38), there is no impediment to its crossing the intervening head *ut*.[26]

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[26] Zyman (2019) argues for a generalization he dubs Phasal Antilocality: "For a phase YP, movement from within a constituent at the edge of YP must cross an XP dominating YP" (Zyman 2019: 2). He further argues that the set of phases comprises not only CP and *v*P but also TP. If all this is correct, then *ipsae* 'themselves' cannot move from within the *v*P in [Spec,TP] to [Spec,ScrP] as shown in (38), because this movement would not cross a maximal projection dominating the TP phase. Instead, it must be that (a) there is more structure between TP and Fin than (38) shows, and the scrambling of *ipsae* actually does cross some XP dominating the TP phase, or (b) *ipsae*, prior to *v*P-movement, undergoes intermediate movement to the TP phase edge (thereby circumventing Phasal Antilocality) before scrambling further. Which of these possibilities is correct, if either, is not directly relevant here.

As mentioned, the finite verb can also move to the left of the Fin head *cum* 'when', as in (39) (adapted from Danckaert 2012: 275):

(39)   Lucretius, *De Rerum Natura* 3.1065
        Oscit-a-t   extemplō,   [tetig-i-t   **cum** līmina
        yawn-TH-3SG immediately   touch-PERF-3SG when thresholds.ACC
        villae   ] …
        house.GEN
        'He yawns as soon as he has reached the threshold of the house…'

On the XP/X⁰ Analysis, when the verb *tetigit* 'he (has) touched' is a constituent, it is a TP, so it is unsurprising that it can cross an intervening Fin head.

In (35)–(39), Fin is preceded by only one clausemate element: the verb word. On the XP/X⁰ Analysis, this is because, in those examples, all the overt elements within TP except the verb word scramble out of TP before the (remnant) TP moves to the left of Fin. If this is correct, then, since scrambling is (descriptively speaking) optional in Latin, there should be sentences in which some nonverbal material does not scramble out of TP, and TP moves to the left of Fin, carrying this material along in addition to the verb word. This expectation is borne out by sentences such as (40) (adapted from Danckaert 2012: 275):

(40)   Vergil, *Aeneid* 8.560[27]
        Ō [$_{TP}$ [$_{vP}$ __₁ mihi   praeteritōs   __₂ refer]₃-a-t   __₃]₄ …
        oh   me.DAT past.M.ACC.PL   bring.back-PRS.SJV-3SG
        [$_{FinP}$ **sī** [$_{ScrP}$ Iuppiter₁   annōs₂   __₄]] …
        if   Jove.NOM years.ACC
        'If only Jove brought back to me the years that have gone by…'

In (40), *Iuppiter* 'Jove' and *annōs* 'years' scramble out of TP, but two other nonverbal elements remain within TP: *mihi* 'to me' and *praeteritōs* 'past'. Consequently, when the TP moves past *sī* 'if' (Fin), it carries along not only the verb word but also the latter two phrases, revealing clearly the phrasal nature of this movement.

A defender of a Long Head Movement (LHM) analysis of (35)–(39) (cf. fn. 24) might argue that, in (40), *referat* 'would bring back' undergoes LHM past Fin, and *mihi* 'to me' and *praeteritōs* 'past' move to the left periphery independently. But although a topicalization analysis might be plausible for *mihi* (on the grounds that 1SG pronouns are always discourse-given), there appears to be no motivation for claiming that *praeteritōs* 'past' in (40) moves to one of the (information-structure–related) positions in the left periphery. It is unlikely to be in [Spec,TopP] or [Spec,FocP], since it is not topical (in fact, (40) is discourse-initial, being the very beginning of a speech) and does not appear to be focused either.[28]

Finally, consider (41)–(42) (adapted from Schünke 1906: 75, 72)—two more examples in which TP-movement to the left of Fin carries along nonverbal material. In (41), TP-movement past *sī* 'if' carries along the internal argument *aulaea* 'the canopy'. In (42), TP-movement past *quoniam* 'since' (historically *cum/quom* 'when, since' + *iam* 'now, already') carries

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[27] The … indicates not that overt material was omitted from (40) (none was) but that we are remaining agnostic as to where exactly in the left periphery the TP moves in (40).

[28] The LHM analyst might concede this point but respond that, on the analysis in (40), it is not clear where the TP moves or what effect this movement has on information structure, if any. The point is well taken, but since FinP is left-headed in Latin, the conclusion that (a constituent containing) *referat* 'would bring back' undergoes *some* sort of movement to the left of Fin is virtually inescapable. This is not true of the under-motivated claim that *praeteritōs* 'past' in (40) moves to the left periphery independently—an alternative to which we have just laid out.

along one of the internal arguments, the infinitival TP *īnsānīre* 'to be crazy'. (The preceding context for (41) is 'Add besides disasters such as'.)

(41)   Horace, *Satires* 8.71
        [$_{TP}$ [$_{vP}$ aulaea   ru]$_1$-a-nt   __$_1$]$_2$ **sī** __$_2$
                canopy(PL).NOM fall.down-PRS.SJV-3PL   if
        'the canopy falling' ('if the canopy should fall')

(42)   Vergil, *Eclogues* 3.36
        [$_{TP}$ [$_{vP}$ __$_3$ īnsān-ī-r-e   lib-e]$_1$-t   __$_1$]$_2$ **quoniam**
                be.crazy-TH-PRS.INF-ACT be.pleasing-TH-3SG   since
        [$_{ScrP}$ tibi$_3$ __$_2$]
                you.DAT
        'since you like to be crazy' ('since being crazy is pleasing to you')

In both examples, the additional material carried along (*aulaea, īnsānīre*) is discourse-new and apparently neither topical nor focal. This strongly suggests that, in (41)–(42), the verb word is not a complex head that undergoes LHM (with the other fronted material moving to [Spec,TopP] or [Spec,FocP]), but rather, everything to the left of Fin gets there in a single step of TP-movement.

   Recapitulating, our claim that movement of the verb word alone past Fin ((35)–(39)) is in fact TP-movement is lent plausibility by (40)–(42), in which the phrasal nature of the movement past Fin is particularly clear.

5.1.2 Test case A$_{1(d)}$: Movement past the intervening head *=ne*

Another test case is provided by the left-peripheral element *=ne*, which heads matrix and embedded yes/no questions. (We will not determine the precise categorial identity of *=ne*, which is not directly relevant here.)

   Consider (43) (adapted from Pinkster 2015: 324):

(43)   Cicero, *Tusculanae Disputationes* 5.21
        Contrā Brūtum=ne   mē   dic-t-ūr-um   put-ā-s?
        against Brutus.ACC=YNQ me.ACC speak-PTCP-PROSP-M.ACC.SG think-TH-2SG
        'Do you think I will contradict Brutus?'

The head *=ne* makes available an XP-position—specifically, a specifier position, [Spec,*ne*P]—which in (43) is occupied by the moved PP *contrā Brūtum* 'against Brutus'. That this position is occupied by a full-fledged PP in (43) provides evidence that it is an XP-position rather than a head position. (But see fn. 30 on some less straightforward examples and a possible alternative analysis.)

   On the XP/X⁰ Analysis, the verb word, when it is a constituent, is an XP (a TP). Thus, the XP/X⁰ Analysis leads us to expect that the verb word (= TP) should perhaps be able to move to [Spec,*ne*P] (a phrasal position) and, consequently, immediately precede *=ne*.

   This expectation is met. Sentences in which *=ne* is immediately preceded by the verb word are amply attested, an example being (44) (adapted from Pinkster 2015: 324):

(44)   Cicero, *2nd Philippic*, 2.45
        Scī-s=ne   mē   dē   rēbus   mihi   nōtissimīs
        know-2SG=YNQ me.ACC about things.ABL me.DAT extremely.well.known.ABL
        dīc-e-r-e?
        speak-TH-PRS.INF-ACT
        'Do you know that I am speaking of matters with which I am fully familiar?'

On the XP/X^0 Analysis, *scīs* 'you know' in (44) moves as a TP, so there is no obstacle to its crossing the intervening head =*ne*.

Someone who was skeptical about the XP/X^0 Analysis might claim that the verb word undergoes head movement to =*ne* in (44) rather than XP-movement across =*ne*. However, this would require an additional stipulation, namely that =*ne* determines not only a landing site for phrasal movement, but also a landing site for head movement. This stipulation is avoided on the XP/X^0 Analysis, which unifies verb + =*ne* and XP + =*ne* sentences: the former are analyzed as a subcase of the latter, and thereby reduced to an independently observable phenomenon. (See Lee 2006: 57–58 for a similar argument from San Lucas Quiaviní Zapotec.)

In (44), the (infinitival) clausal complement of V scrambles out of (or is extraposed from) TP before TP moves to [Spec,*ne*P]. Consequently, the only overt material inside TP is the verb word.[29] But if, as argued here, Latin allows TP-movement to [Spec,*ne*P], this process should be able to carry along nonverbal material. This expectation is met, as shown by (45) (adapted from Devine & Stephens 2006: 237), which on our analysis is derived as in (46). (The preceding context for (45) is 'And so that they will not be taken by surprise by me all of a sudden, these are the things I will ask'.)

(45) Cicero, *In Verrem* 2.4.150
      Nāvem   populō   Rōmānō   dēb-e-a-nt = ne. […]
      ship.ACC people.DAT Roman.M.DAT.SG owe-TH-PRS.SJV-3PL = YNQ
      'Whether they are obligated to provide a ship to the Roman people. […]'

(46) [$_{ne}$P [$_{TP}$ [$_{vP}$ *pro* nāvem populō Rōmānō dēb-e]$_1$-a-nt __$_1$]$_2$ = ne __$_2$]

Devine & Stephens (2006: 237) assume that, in (45), *nāvem* 'a ship' and *populō Rōmānō* 'to the Roman people' are topicalized independently (i.e., they do not analyze *nāvem populō Rōmānō dēbeant* 'they owe a ship to the Roman people' as a constituent in (45)). However, they do not argue for this view, and it would be difficult to: all the overt constituents in (45) convey discourse-new information, and more generally, it is hard to see, given the preceding context, how one could motivate the claim that the two internal arguments undergo movement related to topicality. On the XP/X^0 Analysis, by contrast, the fact that these constituents precede the verb + =*ne* sequence in (45) receives a straightforward explanation: they do not scramble out of TP, so they are carried along when TP moves to [Spec,*ne*P].[30]

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[29] It might be objected that it is a weakness of the XP/X^0 Analysis that its advocates must posit scrambling out of TP (prior to remnant TP movement) in (44), (35), and (39). This objection has little force, however, because scrambling is a prominent and amply attested feature of Latin syntax (see fn. 32 and Section 5.3), so it is hardly a liability for the XP/X^0 Analysis that its defenders must posit scrambling in certain sentences. Crucially, too, there are sentences in which (on the XP/X^0 Analysis) little or nothing scrambles out of TP before TP moves to the left periphery, so the phrasal nature of the movement can be seen clearly ((40)–(42), (45)).

[30] The sentences containing =*ne* 'YNQ' that are most straightforward syntactically are those in which the element that moves to [Spec,*ne*P] immediately precedes =*ne* in its entirety (e.g., (43)). However, the fronted element can also surround =*ne*, as in (i) (adapted from Devine & Stephens 2006: 236):

(i) Cicero, *In Verrem* 2.4.101
     Iīs = ne   **rēbus**   manūs   adfer-r-e   nōn dubit-ā-stī…?
     those.DAT = YNQ things.DAT hands.ACC lay.on-PRS.INF-ACT not hesitate-TH-PERF.2SG
     'Did you not hesitate to lay your hands on those things…?'

Because =*ne* presumably cannot move into its own specifier, and there is no independent motivation for claiming that it undergoes sideward head movement into the moved XP before that XP is merged in [Spec,*ne*P], we take it that sentences like (i) are derived by postsyntactic encliticization of =*ne* to the first morphophonological word in the fronted XP in [Spec,*ne*P].

Since the placement of =*ne* is at least partially sensitive to prosodic constituency, one might try to account for it largely or entirely in terms of prosodic constituency. We cannot construct and evaluate such an alternative analysis here, but if one turns out to be possible, that may undermine the argument from =*ne* that the Latin verb word can only move as a phrase—though not our other arguments to this effect.

5.1.3 The inability of the verb word to move as a head

On the XP/X^0 Analysis, the verb word is often not a constituent. However, if there is no other overt material within TP, then the verb word is the reflex of a (phrasal) constituent—TP—and can therefore be expected to undergo XP-movement. All of Section 5.1 so far has argued that this expectation is met.

However, although the verb word sometimes corresponds to a phrasal constituent (TP), no operations can assemble its parts into a (complex) head on the XP/X^0 Analysis—which therefore makes the following prediction:

(47)   *Prediction A$_2$: No head movement*
         The Latin verb word should be unable to move as a head.

This prediction is testable. As foreshadowed in (32), and discussed further in Section 5.3, we take *nōn* 'not' to be a Σ head (Laka 1990), and, crucially, to be—when it is projected—the lowest head above the verb word. (For detailed empirical arguments that *nōn* is a head rather than a specifier, see Danckaert 2017: 51ff.) Concretely, then, (47) means that the verb word should be unable to undergo head movement to *nōn*.

Consider first (48) (adapted from Gianollo 2016: 116), in which the verb word does not undergo head movement to *nōn*:

(48)   Caesar, *De Bello Gallico* 5.14.1
         Interiōrēs   plērīque   frūmenta   **nōn** ser-u-nt…
         inlanders.NOM most.M.NOM.PL corn.ACC.PL not   grow-TH-3PL
         'Most of the inlanders do not grow corn…'

If the verb word can undergo head movement to *nōn*, (49) should also be acceptable. (As is standard, we expect that, if the verb word can undergo head movement to *nōn*, it will be linearized to the left of *nōn* within the resulting complex head.)

(49)   [*]Interiōrēs   plērīque   frūmenta   **ser-u-nt-nōn**…
             inlanders.NOM most.M.NOM.PL corn.ACC.PL grow-TH-3PL-not
         ('Most of the inlanders do not grow corn…')

In our (admittedly nonnative) judgment, though, (49) and other such sentences are completely unacceptable; and, to our knowledge, such sentences are unattested. The verb word, then, apparently cannot undergo head movement to *nōn*, as the XP/X^0 Analysis predicts.

5.2 Prediction B: The putative vP-movement should carry along vP-adjuncts

On the XP/X^0 Analysis, a central part of the derivation of Latin verb forms is *v*P-movement to [Spec,TP]—which gives rise to the following prediction:

(50)   *Prediction B: vP-adjuncts*
         The putative *v*P-movement should be able to carry along an adverbial left-adjoined
         to *v*P—i.e., it should be possible for a *v*P-adverbial to immediately precede the core
         *v*P in surface syntax.[31]

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[31] We do not claim that only the XP/X^0 Analysis gives rise to this expectation about constituent order. Bailey (2010), without drawing firm conclusions, considers the possibility that a synthetic finite verb in Latin surfaces in T (owing to head movement), and the remnant *v*P moves to [Spec,TP], deriving the default SOV order. On this analysis too, the putative *v*P-movement should be able to carry along a *v*P-adjunct. (As shown in Section 6, though, Complex-Head Analyses like this struggle to explain anti-mirroring in passive forms without ad hoc stipulations.) The goal of this section, then, is to show that a particular expectation that the XP/X^0 Analysis gives rise to ((50)) is met (i.e., the analysis is consistent with certain observable facts about Latin constituent order), not to argue that only the XP/X^0 Analysis can account for the relevant observations.

The reason for this is straightforward. If, as the XP/X^0 Analysis contends, vP obligatorily moves to [Spec,TP] in Latin (when T is in the structure), this operation should be equally applicable when the maximal vP is formed by adjunction of an adverbial to a smaller vP containing all the arguments. (It is this latter, smaller vP that we call the *core vP*.)

The expectation in (50) is met, as shown in (51) (adapted from Devine & Stephens 2006: 103). In (51), the low adverb *graviter* 'grievously, intensely' immediately precedes the core vP.[32]

(51)　　Cicero, *Tusculanae Disputationes* 1.115 (= (31))
　　　　cum　[$_{TP}$ [$_{vP}$ graviter　[$_{vP}$ fīliī　　mortem　　maer-ē]]$_1$-re-t　　　　__$_1$]
　　　　when　　　　　　intensely　　son.GEN death.ACC grieve-TH-IMPF.SJV-3SG
　　　　'when he was intensely grieving over the death of his son'

Likewise, in (52) (adapted from Pinkster 1972: 125), the adverbial [$_{AdvP}$ *item ut tum, dērēctō et palam*] 'just as [they did] then, directly and openly' immediately precedes the core vP.

(52)　　Cicero, *De Lege Agraria* 2.44
　　　　…cūr　nōn　[$_{TP}$ [$_{vP}$ item　　ut tum, dērēctō et　palam [$_{vP}$ regiōnem
　　　　　why　not　　　　　likewise as then, directly and openly　　region.ACC
　　　　illam　　pet-ī]]$_1$-v-ēru-nt　　　　__$_1$]?
　　　　that.ACC seek-TH-PFV-PST-3PL
　　　　'…why didn't they go to that region just as [they did] then, directly and openly?'

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[32] It might be objected that, Latin word order being flexible, the constituent order in (51) reveals little about its derivation. But this would be conceptually and empirically misguided. Conceptually, "flexible word order" is an observation, not an explanation. Thus, the acceptability of (51) is not explained by saying that Latin has "flexible word order"; rather, the observation that Latin has "flexible word order" is to be explained by a principled analysis of the mechanisms giving rise to it, as is well appreciated (Walker 1918; Marouzeau 1922; Ostafin 1986; Polo 2005; Salvi 2005; Devine & Stephens 2006; Bailey 2010; Longobardi & Roberts 2010, §3; Spevak 2010; Danckaert 2012; 2014; 2017a; b; Gianollo 2016, a.m.o.). Empirically, Devine & Stephens (2006) argue convincingly that Latin word order is not "just random" (as was already noted in Marouzeau 1922: 1), but rather "a default order clearly emerges from the data," namely (i) (adapted from Devine & Stephens 2006: 79)—departures from which are derived by movement, which often has information-structural effects. This strongly suggests that the approach to Latin word order argued for above on conceptual grounds is the right one.

(i)　　subject > direct object > indirect object/oblique argument > adjunct > goal/source phrase > non-referential direct object > verb

Questions arise here as to how particular constituent orders are derived on the XP/X^0 Analysis. For example, in analytic passives (fn. 19), the order Perfect Passive Participle > internal argument > *esse* 'be' is possible (Danckaert 2014): [C]*Laudāta Anna est* ('having.been.praised Anna is' = 'Anna {was/has been} praised'). On the XP/X^0 Analysis, the natural hypothesis here is that this order is derived from (ii) by leftward movement of *Anna* followed by leftward movement of the remnant participial AgrP [*Anna ~~laudāta~~*].

(ii)　　[$_{TP}$ [$_{vP}$ [$_{AgrP}$ Anna laudāta] es-]$_2$ Asp$_1$ + T$_{[Tense:PRS, Mood:IND]}$ __$_1$ -t$_{VoiceACT}$ __$_2$] (from fn. 19)

This hypothesis is independently motivated by sentences like (iii) (judgment from Samuel Zyman, p.c.):

(iii)　　*Spanish*
　　　　[Alabada　　　__$_1$ en la　tele]$_2$, Ana$_1$ no　fue __$_2$.
　　　　[praised.F.SG　　on the TV　　Anna not was
　　　　'Praised on TV, Anna wasn't.'

In (iii), the internal argument *Ana* moves out of a participial projection, which subsequently undergoes remnant movement. (The empty category __$_2$ must result from movement, not ellipsis, since Spanish lacks post-auxiliary verb phrase ellipsis—Zagona 1988: 162.) We do not claim that leftward movement of remnant participial AgrPs in Latin is necessarily topicalization, as the remnant movement in (iii) is, but only that the general type of derivation proposed here for [C]*Laudāta Anna est* is independently (crosslinguistically) motivated. Determining the precise nature and landing sites of the two movements posited here for [C]*Laudāta Anna est* must, for space reasons, be left for future work.

Since one of the fundamental properties of adjunction is iterability (Hornstein & Nunes 2008: 60), it should be possible to adjoin adverbials to vP iteratively, and the XP/X⁰ Analysis predicts that the largest vP formed by iterated adjunction should be movable to [Spec,TP] as a unit. When this happens, the core vP should be immediately preceded by a sequence of two or more vP-adverbials. This is indeed possible, as shown in (53) (adapted from Pinkster 1972: 129):

(53)   Cicero, *Ad Atticum* 1.19.7
        …ut   [$_{TP}$ [$_{v\mathbf{P}}$ in senātū   [$_{v\mathbf{P}}$ nōn semel sed saepe multīs = que   verbīs
         that   in Senate.ABL   not once but often many.ABL = and words.ABL
        huius   [$_{v\mathbf{P}}$ mihi   salūtem   imperī   atque   orbis   terrārum
        this.GEN   me.DAT safety.ACC empire.GEN and.also orb.GEN lands.GEN
        adiūdic-ā]]]$_1$-ri-t   ___$_1$].
        attribute-TH-PERF.SJV-3SG
        '…that he credited me in the Senate, not once but often and at length, with having saved the empire and the world.'

Our claim that the adjuncts in (51)–(53) are adjoined to vP (and moved along with it) is lent crosslinguistic plausibility by the fact that their English counterparts can be carried along when vP moves:

(54)   a.   But [$_{v\mathrm{P}}$ intensely [$_{v\mathrm{P}}$ grieve over the death of his son]]$_1$ though he did ___$_1$, …
        b.   But [$_{v\mathrm{P}}$ [$_{v\mathrm{P}}$ go to that region] just as they did then, directly and openly,]$_1$ though they most certainly did ___$_1$, …
        c.   But [$_{v\mathrm{P}}$ [$_{v\mathrm{P}}$ [$_{v\mathrm{P}}$ credit me with the welfare of the empire and the world] in the Senate] not once but often and at length]$_1$ though he admittedly did ___$_1$, …

Summarizing, the XP/X⁰ Analysis leads us to expect that it should be possible for the core vP to be immediately preceded by one or more vP-adverbials in surface syntax, and this expectation is met.[33]

5.3 A note on leftward argument movement out of vP

Section 5.2 showed that, as predicted by the XP/X⁰ Analysis, it is possible for one or more vP-adverbials to immediately precede the core vP, with the latter containing all the (overt) arguments.

   However, arguments can also precede vP-adverbials. In (55) (adapted from Devine & Stephens 2006: 104), the object *mortem hominis necessārī* 'the death of a close friend' precedes the vP-adverb *graviter* 'grievously':

(55)   Cicero, *Epistulae ad Familiares* 11.28.2
        quod   mortem   hominis   necessārī   **graviter**   fer-ō
        because death.ACC person.GEN close.GEN grievously bear-1SG
        'because I take the death of a close friend grievously'

Likewise, in (56) (adapted from Devine & Stephens 2006: 102), the object *cohortēs* 'the cohorts' and the PP argument *ex castrīs* 'out of the camp' precede the vP-adverb *celeriter* 'quickly':

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[33] No adverbial can intervene between Voice and the rest of the verb word, suggesting that there is no left-adjunction to VoiceP in Latin, but only to vP (e.g., for manner, instrumental, and comitative adjuncts), in keeping with a suggestion made on partially independent grounds in Section 4.1.

(56)　　Caesar, *De Bello Gallico* 7.49
　　　　ut　　cohortēs　　ex　　castrīs　　**celeriter** ēdūc-e-re-t
　　　　that cohorts.ACC out.of camp.ABL quickly lead.out-TH-IMPF.SJV-3SG
　　　　'that he should lead the cohorts out of the camp quickly'

The XP/X⁰ Analysis, then, requires that (57) hold:

(57)　　In Latin, arguments generated within vP can move leftward out of vP (thereby coming to precede left-adjuncts to vP).

But the hypothesis in (57)[34] is very well motivated, and on grounds independent of the relative ordering of arguments and vP-adjuncts. Consider the relative ordering of arguments and the particle *nōn* 'not', which we analyze as a Σ head (Laka 1990; cf. Danckaert 2017: 51ff.). The arguments can follow *nōn*, as in (58) (adapted from Danckaert 2012: 13):

(58)　　*Neg-S-O-KP_{arg}-Verb* (Livy, *Ab Urbe Condita* 21.43.17)
　　　　[$_{ΣP}$ **Nōn** [$_{TP}$ [$_{vP}$ ego　　illud　　parvī　　aestim]$_1$-ō　　___$_1$]].
　　　　　　　not　　　　I.NOM that.ACC small.GEN estimate-1SG
　　　　'I don't consider that a small thing.'

But the arguments can also precede *nōn*, as in (59) (adapted from Danckaert 2012: 12):

(59)　　*S-O-Neg-Verb* (Livy, *Ab Urbe Condita* 37.47.7) (= (32))
　　　　…cum　cēterī$_2$　　　centūriās$_3$　　**nōn** [$_{TP}$ [$_{vP}$ ___$_2$ ___$_3$ exple]$_1$-sse-nt　　　___$_1$].
　　　　　since others.NOM centuries.ACC not　　　　　　　　　fill-PLUP.SJV-3PL
　　　　'…since the others did not win the required number of centuries.'

Alternatively, some arguments can follow *nōn* while others precede it, as in (60) (adapted from Danckaert 2012: 13):

(60)　　*S-Neg-O-Verb* (Tacitus, *Annals* 15.16.4)
　　　　Corbulō$_2$　　　… [$_{ΣP}$ **nōn** [$_{TP}$ [$_{vP}$ ___$_2$ eam　　speciem　　īnsignium　　et
　　　　Corbulo.NOM　　　not　　　　　　that.ACC show.ACC emblems.GEN and
　　　　armōrum　　praetul]$_1$-i-t　　___$_1$]] …
　　　　weapons.GEN display-PERF-3SG
　　　　'Corbulo did not make such a display of emblems and weaponry…'

This flexibility of argument positioning vis-à-vis *nōn* is standardly interpreted as indicating that arguments in Latin are able, though not required, to move leftward out of vP (Devine & Stephens 2006: 88–89).[35] The flexible positioning of arguments with respect to

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[34] We take argument movement out of a moved vP to be unproblematic in principle, since movement out of moved constituents is sometimes possible:

(i)　　[Which building]$_2$ did it seem that [on PICTURES of ___$_2$]$_1$, she HAD relied ___$_1$, but [on MODELS of ___$_2$], she HADN'T?

In (i), both instances of *of* are stranded (suggesting that *which building* moves across the board from their complement positions), and both instances of *on* are lexically selected by *rely*, demonstrating that the *on*-PPs move from within the corresponding VPs.

[35] We argue, then, that the subject, like other arguments, can scramble out of the moved vP in [Spec,TP]. We assume, as is standard in the Latin generative literature, that the subject does not obligatorily move to [Spec,TP]. There is thus no need to posit, problematically, that T can attract the subject from within the vP in its own specifier (and into a second specifier of TP).

　　The important question of what drives scrambling in Latin must, for space reasons, be left for future work.

*v*P-adverbials is standardly taken as evidence for the same conclusion (Devine & Stephens 2006, §1.6).[36]

In permitting arguments to optionally move leftward out of *v*P, then ((57)), the XP/X⁰ Analysis falls fully in line with the current understanding of what Latin syntax allows.[37]

6 Comparison with other analyses of anti-mirroring forms

As alluded to above, a significant advantage of the XP/X⁰ Analysis is that it accounts for anti-mirroring forms such as passive subjunctives (e.g., *laud-ē-t-ur* '[that] he/she/it may be praised'), with their apparently peculiar morpheme ordering, without any stipulations specific to these forms. This is because, on the XP/X⁰ Analysis, anti-mirroring forms have exactly the same syntactic derivation as mirroring forms.

This section considers two other analyses of anti-mirroring in Latin passive verbs (Embick 2000 and Calabrese 2019) and shows that they, by contrast, are forced to make passive-specific stipulations to account for the anti-mirroring in these forms—providing an argument against these analyses and in favor of the XP/X⁰ Analysis.

6.1 Embick (2000)

Embick (2000: 196–199) assumes that the Latin verb word is assembled by head movement. On his analysis, there is successive head movement from the root to *v* to Asp to T, producing a complex T head. In the (postsyntactic) morphological component, an Agr(eement) head is added within this complex T head, yielding (61):

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[36] As noted by Danckaert (2017a: 38ff.), the highest, and only the highest, verbal element in a clause is unable to precede *nōn* 'not' (qua clausal negation), as shown in (i) (adapted from his (67b) and (72c)):

(i) Gaius, *Institutes* 3.32
Praetor   hērēdēs   fac-e-r-e   ⟨***potes-t**⟩ nōn ⟨**potes-t**⟩.
praetor.NOM heirs.ACC make-TH-PRS.INF-ACT ⟨*can-3SG⟩   not   ⟨can-3SG⟩
'The praetor cannot appoint heirs.'

On Danckaert's analysis, this is because the verb word is a complex head and thus cannot cross the intervening head *nōn*, owing to the HMC. This explanation is unavailable on the XP/X⁰ Analysis, on which the verb word is not a complex head. There is, however, a straightforward way to capture this effect on the XP/X⁰ Analysis. Suppose, essentially following Grohmann (2003: 74ff.), that the highest projection in each of the three clausal domains (lexical, inflectional, and complementizer—Rizzi 1997: 281) functions as a phase (a dynamic phasehood analysis—Bobaljik & Wurmbrand 2005, a.m.o.), and that complement-to-specifier movement is banned by antilocality (Abels 2003). Then, when *nōn* (= Σ) is projected, the verb word (= TP complement of Σ) cannot move to [Spec,ΣP] because of antilocality, and cannot move higher in one fell swoop because ΣP (= the inflectional domain) is a phase. Thus, the verb word cannot come to precede *nōn* at all. This holds only for the highest verb/auxiliary, as desired: a lower verbal projection can move to [Spec,ΣP] (and possibly higher), since complement-to-specifier antilocality is irrelevant in this case. On this analysis, ordinary affirmative clauses (lacking *nōn*) lack Σ; in these clauses, the highest projection in the inflectional layer is TP, which can therefore move to the left of Fin (Section 5.1) unhindered by antilocality. We leave further testing of this analysis, and alternatives, for future research.

[37] Relatedly, the XP/X⁰ Analysis makes a prediction about OV structures like (i) (adapted from Danckaert 2017a: 70). (We analyze the *-r* in present infinitives like *facere* 'to make' as a portmanteau of present T [which presumably bears a [–FIN] feature in this case] and Asp, and the final *-e* as an active Voice head; compare active *laud-ā-r-e* 'to praise' with passive *laud-ā-r-ī* 'to be praised'. See the Appendix.)

(i) Cicero, *In Verrem* 3.211
[_TP_ [_vP_ PRO innumerābilem   pecūniam   fac-e]₁-r-e   __₁]
          uncountable.F.ACC.SG money.ACC make-TH-PRS.INF-ACT
'to make an enormous amount of money'

Whenever the subject in a structure like (i) either is null (as in (i)) or scrambles out of TP, the object-plus-verb-word string should pass constituency tests, since, on the XP/X⁰ Analysis, it is the reflex of a constituent (TP). Danckaert (2017a: 68–73), who focuses on OV sequences in which the verb is infinitival (as in (i)), shows that this expectation is met: such OV sequences can be coordinated, preposed, elided, and pronominalized, and can antecede relative pronouns.
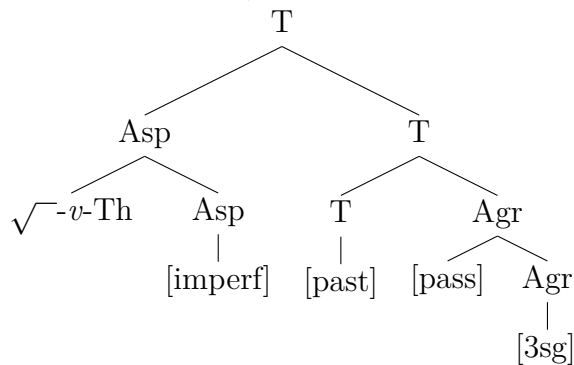
(61)   *Structure of the Latin verb word according to Embick (2000: 197)*[38]

```
                    T
              ┌─────┴─────┐
            Asp           T
         ┌───┴───┐     ┌──┴──┐
       √-v-Th   Asp    T    Agr
```
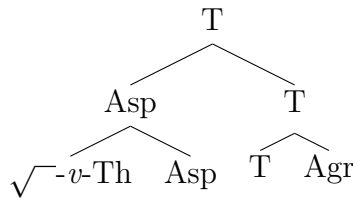
As Embick acknowledges, synthetic passive verb forms pose a problem for this analysis. In his assessment, "[t]he reason for this is that whereas the feature [pass], which is directly related to the passive forms, appears in the √-*v* domain, or possibly with Asp, [pass] is realized in the T-Agr area, typically in an *-r-* component" (Embick 2000: 198).

Embick's solution to this problem is worth quoting in detail: "if the only starting positions for the [pass] feature are below T-Agr, the structure must be readjusted to place [pass] in T-Agr [… T]wo mechanical operations are required: first, the [pass] feature must be separated from Asp through the process of *Fission*; and, second, it must be adjoined to Agr, via a form of *Morphological Merger*" (Embick 2000: 199). The output structure produced by these operations is shown below.[39]

(62)   *Final morphological structure of synthetic passive verb forms according to Embick (2000: 199)*

```
                         T
              ┌──────────┴──────────┐
            Asp                      T
         ┌───┴───┐            ┌──────┴──────┐
       √-v-Th   Asp           T            Agr
                 |            |          ┌──┴──┐
             [imperf]      [past]      [pass] Agr
                                               |
                                             [3sg]
```

This analysis does manage to account for the fact that, although the passive Voice head (or the [pass] feature, in Embick's terms) originates low in the syntactic structure, it surfaces to the right of Asp and T in the verbal complex. However, it accounts for this at a considerable cost: it is forced to posit two obligatory morphological operations (one instance of Fission and one of Morphological Merger). These operations are apparently posited exclusively to handle the anti-mirroring morpheme order in passive forms; owing to their lack of independent motivation, they must be considered stipulations.[40]

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[38] Embick uses the abbreviated notation "√-*v*-Th" (Th = theme vowel) rather than explicitly indicating the hierarchical structure he posits for this complex head; this abbreviation is reproduced in (61).

[39] Embick exemplifies this structure with imperfect indicative passive forms like (i):

   (i)   laud-ā-bā-t-ur
         praise-TH-IMPF-3SG-PASS
         'he/she/it was being praised'

   —hence the choice of imperfective Asp, past T, and 3SG features in (62). Our (62) reproduces Embick's (22) exactly; we take it that his feature bundles [imperf], [past], and [3sg] are not to be interpreted as literally the daughters of Asp, T, and Agr, respectively.

[40] To be fair, accounting for the anti-mirroring in passive forms is not Embick's (2000) main goal; in fact, he states that "[t]he suggestion here merely highlights the problem, which may be resolved mechanically" (Embick 2000: 199). As argued above, though, the apparent need for a stipulative mechanical solution is an artifact of the assumption that the Latin verb word is built exclusively by operations on heads—an assumption that the XP/X⁰ Analysis profitably dispenses with.

It might be objected that the XP/X⁰ Analysis posits vP-movement to [Spec,TP], which could also be considered a stipulation. Crucially, however, this vP-movement is not claimed to occur only in anti-mirroring passive forms, nor is it posited exclusively to derive the anti-mirroring in passive forms: rather, it plays a key role in deriving the morpheme orders in anti-mirroring and mirroring forms alike. The empirical benefits of the proposed vP-movement, then, are considerably wider-ranging than those of Embick's morphological operations—not to mention that the XP/X⁰ Analysis makes correct syntactic predictions that are not shared by Embick's (largely postsyntactic) analysis without further assumptions (Section 5).[41]

6.2 Calabrese (2019)

Calabrese (2019, §3.4.4.2) also develops an analysis of the anti-mirroring in passive forms.

Calabrese proposes that the passive morpheme (what was analyzed in Section 3.2 as a Voice$_{PASS}$ head) is actually a reflexive-like clitic ("D$_R$") originating in [Spec,VoiceP] (in passives of transitives) or in direct object position (in the case of unaccusatives with passive/nonactive morphology—i.e., deponent unaccusatives). On his analysis, the verb word is assembled largely by head movement, which causes it to surface in Mood, but also partially by certain postsyntactic operations that are not directly relevant here.

On Calabrese's analysis, D$_R$ undergoes LHM and adjoins to a high functional head F. It subsequently undergoes morphological merger with the complex Mood head (= the verb word). Finally, "[t]he characteristic property of Latin /-r/ [= D$_R$ —Authors] is a further merger operation that adjoins D$_R$ to AGR" (Calabrese 2019: 431). The entire derivation is schematized in (63), which is adapted from Calabrese (2019: 429–431, (458–460), (464)).[42]

(63)   *Derivation of passive anti-mirroring according to Calabrese (2019)*

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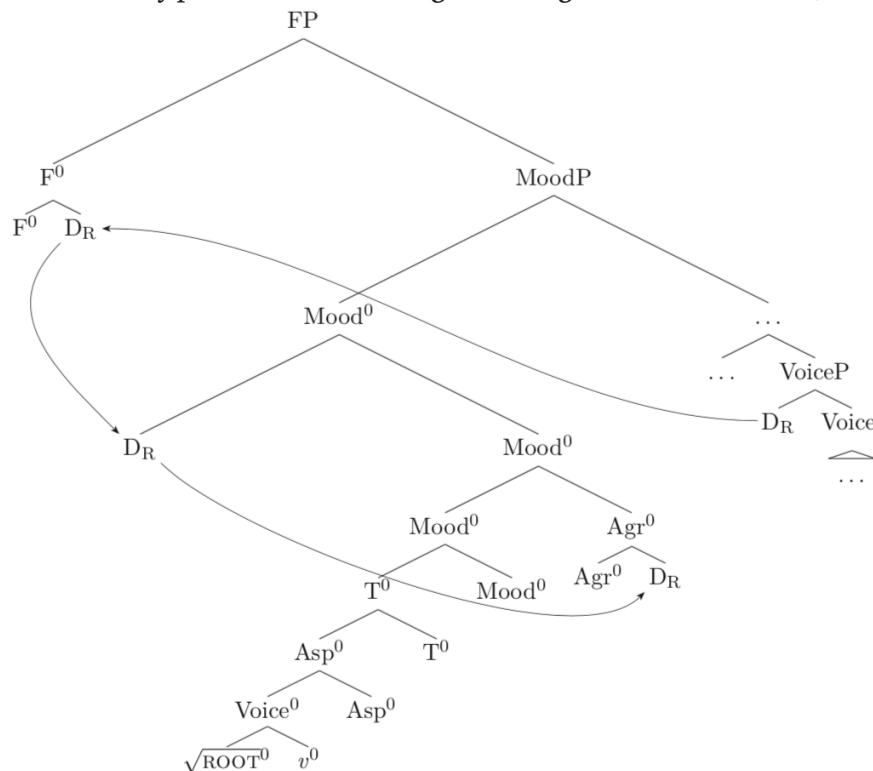
[41] Embick (2000: 201) actually ends up proposing that synthetic finite verbs not only are complex heads but in fact surface in Asp; on this analysis, deriving constituent orders such as low adverb > object > verb word (Section 5.2) would presumably require remnant vP-movement to [Spec,AspP] or [Spec,TP]—bringing the analysis closer to the XP/X⁰ Analysis, but complicating it further in the process.

[42] Our (63) omits structure and operations that are not directly relevant here. For clarity, we have added a ⁰ to the label of every X⁰ category in (63) (except D$_R$, which is both minimal and maximal).

It might be objected that this derivation is rather complex, since D_R moves three times. However, the first two movements may be independently motivated, since they are modeled after analogous movements that, according to Calabrese, the Italian clitic *si* undergoes. (Calabrese's motivation for giving a unified analysis of D_R and *si* is that Latin passive/nonactive clauses and Italian *si*-constructions have a similar range of interpretations.) Evaluating Calabrese's analysis of *si* is beyond the scope of this paper; what is important here is the last movement step in (63).

If D_R underwent only the first two movements in (63), it would surface at the left edge of the verb word, whereas in fact it surfaces at the right edge. To solve this problem, as mentioned, Calabrese posits that it is an idiosyncratic property of D_R that it adjoins to Agr. This analysis, then—like Embick's—can derive the morpheme order in anti-mirroring passive forms only by making at least one stipulation specific to the passive morpheme.

6.3 Summary

Both Embick's (2000) and Calabrese's (2019) analyses resort to stipulations specific to the passive morpheme to derive the morpheme order in anti-mirroring passive forms.

The XP/X⁰ Analysis, by contrast, accounts for this anti-mirroring order with no passive-specific stipulations whatsoever (Section 3). On the XP/X⁰ Analysis, the anti-mirroring order in these forms simply follows from their syntactic derivation, which is shared with all other synthetic finite verb forms in Latin, including those whose morpheme order is mirroring rather than anti-mirroring. This provides a significant argument for the XP/X⁰ Analysis and against the two alternatives just considered.

7 Conclusion

As we have seen, Latin verbs present a morpheme-ordering puzzle: they seem to both obey and disobey the Mirror Generalization (MG), albeit in different inflectional forms (Cinque 1999: 197, citing Calabrese 1985, a.o.). Given the theoretical and diagnostic significance of the MG, this situation merited careful investigation to determine whether it indicated that the MG was fundamentally on the wrong track.

The result that has emerged is that, contrary to initial appearances, the MG is in fact valid for Latin—but it should be understood as a generalization about structures formed by operations on heads. Head movement, being extremely local, readily gives rise (in conjunction with other operations) to Latin verb forms displaying morpheme orders that straightforwardly obey the MG. Phrasal movement, by contrast, is subject to much less strict locality conditions than head movement (or at least the canonical head movement at play in the relevant Latin verb forms), and can consequently bring about apparent violations of the MG. This, we have argued, is exactly what happens in apparently anti-mirroring Latin verb forms.

Our analysis of anti-mirroring in Latin lends plausibility to the notion that other instances of anti-mirroring crosslinguistically, including instances not yet discovered, also owe their existence to phrasal movement. However, the analysis does not entail that phrasal movement is the only possible culprit for anti-mirroring in any language. Whether a particular instance of anti-mirroring is due to syntactic XP-movement, to postsyntactic operations, or perhaps even to something else is an empirical question.

On the XP/X⁰ Analysis, every synthetic finite verb form in Latin, whether it appears to obey the MG or not, has exactly the same derivation[43]—one involving one step of head movement (Asp to T) and one step of phrasal movement (*v*P to [Spec,TP]).

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[43] Modulo certain minor postsyntactic idiosyncrasies (fn. 13).

The analysis satisfies the theoretical desiderata in (12). It is *uniform*, in that all the synthetic finite verb forms share a single derivation.[44] It is *general*, in that it extends readily to nonfinite and even deverbal forms (see the Appendix). (In particular, the hypothesis that Latin makes use of vP-movement allows us to make sense of an otherwise seemingly paradoxical instance of anti-mirroring that arises among the participles.) Finally, the analysis has good *syntactic fit*: it correctly predicts that the verb word, when it moves, should move as a phrase; it makes correct predictions about the placement of vP-adverbials; and it is fully compatible with what is independently known about leftward argument movement out of vP in Latin.

A perhaps surprising consequence of the analysis is that the Latin verb word, though a phonological word, is not always a syntactic constituent. (And when it is a constituent—because there is no overt nonverbal material within vP—it is the reflex of a large phrasal constituent, TP, hence why it moves as a phrase.) The larger picture that emerges from this squishing-based or alexist analysis is one in which phonological words need not always correspond to syntactic constituents, and can in fact mismatch them dramatically. And whether a particular phonological word corresponds to a syntactic constituent or not, it is entirely possible that it is not the reflex of a complex head, but of a linearly contiguous series of morphemes suspended across a potentially vast region of syntactic space (Julien 2002; Buell 2005; Buell & Sy 2005; Koopman 2005; Muriungi 2008; Buell, Sy & Torrence 2014; Cinque 2014; Kayne 2017; Myler 2017; Kim to appear, a.o.).

Abbreviations

ABL = ablative, ACC = accusative, ACT = active, arg = argument, [C] = constructed example, DAT = dative, EA = external argument, F = feminine, FUT = future, GEN = genitive, IA = internal argument, IMPF = imperfect "tense" (= past tense + imperfective aspect), IND = indicative, lit. = literal translation, M = masculine, N = neuter, Neg = negative particle, NOM = nominative, O = object, PASS = passive, PERF = perfect "tense" (perhaps = present tense + perfective aspect), PFV = perfective aspect, PL = plural, PLUP = pluperfect "tense" (= past tense + perfective aspect), PROSP = prospective aspect, PRS = present, PST = past, PTCP = participle, S = subject, SG = singular, SJV = subjunctive, SUP = supine, SUPERL = superlative, TH = theme vowel, YNQ = yes/no question particle, 1/2/3 = first/second/third person

Additional File

The additional file for this article can be found as follows:

- **Supplementary file 1.** Appendix to 'XP- and X⁰-movement in the Latin verb: Evidence from mirroring and anti-mirroring'. DOI: https://doi.org/10.5334/gjgl.1049.s1

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[44] Crucially, the vP-movement is not restricted to the anti-mirroring forms, so it is not a stipulation tailor-made to deliver the correct morpheme orders in just these forms: it plays a role in deriving the morpheme orders in the mirroring forms also.

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